BEFORE THE ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
ORDER NO. SJR 2023-32
SJRWMD FILE OF RECORD NO. 2013-17

IN RE: 2023 NORTH FLORIDA REGIONAL WATER
SUPPLY PLAN (2020-2045 Planning Horizon)

ORDER APPROVING THE
2023 NORTH FLORIDA REGIONAL WATER SUPPLY PLAN

THIS MATTER came before the Governing Board of the St. Johns River Water Management District ("District") on December 12, 2023. The Governing Board, having been fully advised of the matter, hereby approves the 2023 North Florida Regional Water Supply Plan with appendices (2023 NFRWSP), recognizing that the District's authority for water supply planning extends to water supply planning regions within the District's jurisdictional boundaries as established in section 373.069, F.S.

The 2023 NFRWSP is attached hereto:

DONE and ORDERED by the Governing Board of the St. Johns River Water Management District on December 12, 2023.

ST. JOHNS RIVER WATER
MANAGEMENT DISTRICT

By: ______________________
Rob Bradley, Chair

Attest: ____________________
J. Chris Peterson, Secretary

Filed December 12, 2023

____
District Clerk

BEFORE THE SUWANNEE RIVER WATER MANAGEMENT DISTRICT
ORDER NO. SR 23-007
SRWMD FILE OF RECORD NO. 2023-02

IN RE: 2023 NORTH FLORIDA REGIONAL WATER SUPPLY PLAN (2020-2045 Planning Horizon)

ORDER APPROVING THE 2023 NORTH FLORIDA REGIONAL WATER SUPPLY PLAN

THIS MATTER came before the Governing Board of the Suwannee River Water Management District ("District") on December 12, 2023. The Governing Board, having been fully advised of the matter, hereby approves the 2023 North Florida Regional Water Supply Plan with appendices (2023 NFRWSP), recognizing that the District's authority for water supply planning extends to water supply planning regions within the District's jurisdictional boundaries as established in section 373.069, F.S.

The 2023 NFRWSP is attached hereto:

DONE and ORDERED by the Governing Board of the Suwannee River Water Management District on December 12, 2023.

SUWANNEE RIVER
WATER MANAGEMENT
DISTRICT

By:

____
Virginia Johns, Chair

Attest:

____
Charles Keith, Secretary

Filed December 12, 2023

____
District Clerk

2023 North Florida Regional Water Supply Plan
(2020–2045)

St. Johns River Water Management District
Palatka, Florida

Suwannee River Water Management District
Live Oak, Florida

December 2023

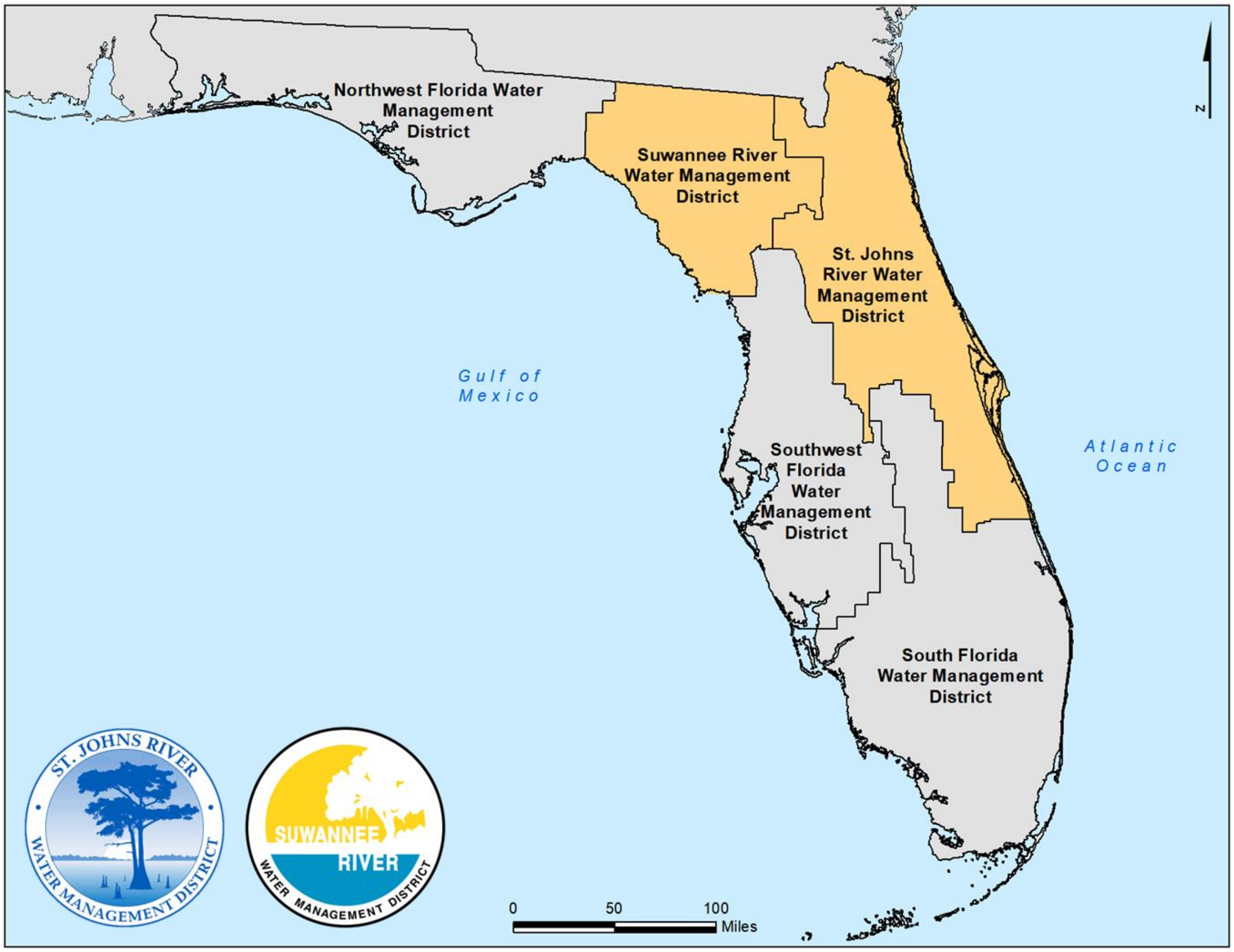

Figure 1. Location and boundaries of the St. Johns River and Suwannee River Water Management Districts

Acknowledgements

The Florida Department of Environmental Protection (DEP), St. Johns River Water Management District (SJRWMD) and Suwannee River Water Management District (SRWMD) recognize and thank our stakeholders for their contributions, comments, advice, information, and assistance throughout the development of the update to the North Florida Regional Water Supply Plan. Furthermore, SJRWMD and SRWMD express their appreciation to all staff who contributed to the development and production of this collaborative regional water supply plan. For further information about this document, please visit northfloridawater.com.

Executive Summary

In Florida, the state's five water management districts (districts) develop regional water supply plans (RWSPs) to identify sustainable water supplies for all water uses while protecting water resources and related natural systems. The North Florida Regional Water Supply Plan (NFRWSP) area includes 14 counties in the St. Johns River Water Management District (SJRWMD) and the Suwannee River Water Management District (SRWMD): Alachua, Baker, Bradford, Clay, Columbia, Duval, Flagler, Gilchrist, Hamilton, Nassau, Putnam, St. Johns, Suwannee, and Union. This 2023 NFRWSP is consistent with the water supply planning requirements of Chapter 373, Florida Statutes (F.S.) and is an update to the 2017 NFRWSP. The 2023 NFRWSP was developed through a highly collaborative process among the Suwannee River and St. Johns River Water Management Districts (Districts), the Florida Department of Environmental Protection (DEP), local governments, public supply utilities, environmental advocates, and other stakeholders.

This regional water supply plan covers a planning period through 2045 and is based on the best data and research available. A key component of the plan is the North Florida Southeast Georgia groundwater flow model (NFSEG), developed by the two Districts in collaboration with the Southwest Florida Water Management District in a separate open-public process with stakeholder input. This groundwater flow model is the largest in the state and incorporates all elements of the water budget including recharge, evapotranspiration, surface water flows, groundwater levels and water use. The development of the model utilized a state-of-the-art calibration process to incorporate the most current data and provides the best available approximation of all components of the water budget within the planning area and the model domain. This model provides the most technologically sophisticated picture of groundwater withdrawals on water resources in North Florida.

The population within the NFRWSP area during the 2015 base year was approximately 2.02 million people. The area's population is projected to reach approximately 3.01 million by 2045, which represents a 49% increase. Irrigated agricultural land is also expected to increase by approximately 30,000 acres, a 24% increase. The total water use in the NFRWSP area, which includes groundwater, surface water, and alternative water supply sources, is projected to increase 32% from approximately 530 million gallons per day (mgd) in 2015 to 698 mgd in 2045, which is a 168 mgd increase.

Fresh groundwater use is projected to increase from 461 mgd in 2015 to 596 mgd in 2045, which is a 135 mgd increase in groundwater demand. Similar to the 2017 NFRWSP, this 2023 NFRWSP concludes that fresh groundwater alone cannot supply the projected increase in demand during the planning horizon without causing unacceptable impacts to water resources. There are waterbodies that have adopted recovery strategies, which indicates the current distribution of groundwater use has already exceeded the fresh groundwater sustainable yield of the system. In addition, the analysis of waterbodies without MFLs, groundwater quality, and wetlands identified potential constraints on increased groundwater withdrawals during the planning horizon.

To meet current and future water demands while protecting water resources, the 2023 NFRWSP identifies water conservation efforts and water supply development (WSD) and water resource development (WRD) project options. The NFRWSP also recognizes the ongoing implementation of the Lower Santa Fe River Basin Recovery Strategy and the Lakes Brooklyn and Geneva Recovery Strategy for these minimum flows and levels (MFL) waterbodies. While there are increases in surface water demand projected, the Districts determined that there are sufficient water sources to meet the projected demand.

Water conservation is an important and cost-effective strategy in meeting future demands. Potential water savings through the implementation of public supply, agricultural and other self-supply water conservation measures ranges from 60 mgd to 83 mgd. This demonstrates the Districts' commitment to water conservation throughout the planning horizon.

The NFRWSP identifies 160 mgd of estimated benefit from WSD, WRD and water conservation project options to assist water users and suppliers in their efforts to meet the projected groundwater demand while protecting our natural resources. Project options range from groundwater recharge to alternative water supply sources like reclaimed water, indirect potable reuse, surface water and stormwater. Both Districts are committed to working with local governments to share costs to help facilitate implementation of these beneficial projects. The breakdown of estimated benefits from projects by type includes:

- 92.4 mgd of WSD
- 51.2 mgd of WRD
- 16.8 mgd of water conservation

The 2023 NFRWSP provides a roadmap that offers options to achieve sustainable water use through the planning horizon. The Districts will continue to encourage and support project implementation within the NFRWSP area to ensure a sufficient water supply to meet 2045 water demand, while protecting water resources and associated natural systems. Water supply planning is an ongoing process, with enhanced scientific methodologies and new data acquired all the time. District staff are already working on the science and data collection for the next five-year update.

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List of Abbreviations

Abbreviation	Description
AG	Agricultural irrigation self-supply
AMI	advanced metering infrastructure
AMR	automatic meter reading
ASR	Aquifer storage and recovery
AWS	Alternative water supply
BAC	Biologically activated carbon
BEBR	Bureau of Economic and Business Research
B-G Recovery Strategy	Recovery Strategy for the Implementation of Lakes Brooklyn and Geneva Minimum Levels
BMAP	Basin management action plan
BMP	Best management practice
CAM	Community Association Manager
CBAT	Carbon-based advanced treatment
CEU	Continuing Education Unit
cfs	Cubic feet per second
CFWI	Central Florida Water Initiative
CII/MD	Commercial/industrial/institutional and mining dewatering self-supply
CP	Current pumping
CUP	Consumptive use permit
DEM	Digital elevation model
DEP	Florida Department of Environmental Protection
Districts	Refers to SRWMD and SJRWMD
districts	Refers to all Florida water management districts
DPR	Direct potable reuse
DSS	Domestic self-supply and small public supply systems
EDR	Electrodialysis reversal
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentive Program
ET	Evapotranspiration
F.A.C.	Florida Administrative Code
F.S.	Florida Statutes
FAS	Floridan aquifer system
FDACS	Florida Department of Agriculture and Consumer Services

FDOT	Florida Department of Transportation
FFL	Florida Friendly Landscaping
FSAID	Florida Statewide Agricultural Irrigation Demand
FWCA	Florida Water and Climate Alliance
FWS	Florida Water Star
FY	Fiscal year
GAC	Granular activated carbon
GEPD	Georgia Environmental Protection Division
GIS	Geographic information system
gpcd	Gallons per capita per day
GWQ	Groundwater quality
H_2OSAV	Water Savings, Analytics, and Verification
HOA	Homeowner Association
IAS	Intermediate aquifer system
ICU	Intermediate confining unit
IFAS	Institute of Food and Agricultural Sciences
IPCC	International Panel on Climate Change
IPR	Indirect potable reuse
KHTM	Keystone Heights Transient groundwater flow Model
LFA	Lower Floridan aquifer
LR	Landscape/recreational irrigation self-supply
LSFI	Lower Santa Fe and Ichetucknee river and priority springs
LSFRB Recovery Strategy	Lower Santa Fe River Basin Recovery Strategy
MCU	Middle confining unit
MFLs	Minimum flows and levels
MFRO	Micro-filtration reverse osmosis
mg/L	Milligrams per liter
mgd	Million gallons per day
MKTA	Mann-Kendall trend analysis
MOR	Monthly operating report
ND	Non-detect
NFRWSP	North Florida Regional Water Supply Plan
NFSEG	North Florida Southeast Georgia Regional Groundwater Model
NFUCG	North Florida Utility Coordinating Group
NOAA	National Oceanic and Atmospheric Administration

NRCS	Natural Resources Conservation Services
NSFAC	No significant Floridan aquifer connection
NWFWMD	Northwest Florida Water Management District
OAWP	Office of Agricultural Water Policy
OFS	Outstanding Florida Spring
Partnership	North Florida Regional Water Supply Partnership
PCS	Public Service Commission
PG	Power generation
PO	Pumps-off
POR	Period of record
PS	Public supply
PSAB	Public service area boundary
PSC	Public Service Commission
REDI	Rural Economic Development Initiative
RIB	Rapid infiltration basin
RIVER	Regional Initiative Valuing Environmental Resources
RO	Reverse osmosis
RWSP	Regional Water Supply Plans
SA	Surficial aquifer
SAS	Surficial aquifer system
SDWS	Secondary drinking water standard
SJRWMD	St. Johns River Water Management District
SL	Significance level
SLR	Sea level rise
SPSS	Small public supply system
SRP	Suwannee River Partnership
SRWMD	Suwannee River Water Management District
SWCD	Soil and Water Conservation District
SWFWMD	Southwest Florida Water Management District
SWI	Saltwater interface
TCAA	Tri-County Agricultural Area
TDS	Total dissolved solids
UF	University of Florida
UFA	Upper Floridan aquifer
USDA	United States Department of Agriculture
USGS	United States Geological Survey

UV	Ultraviolet
VA	Vulnerability assessment
VFD	Variable frequency drive
WIFIA	Water Infrastructure Finance and Innovation Act
WMP	Water Management Partnership
WPCG	Water planning coordination group
WPSP	Water Protection and Sustainability Program
WRCA	Water resource caution area
WRD	Water resource development
WRDWP	Water resource development work program
WRV	Water resource value
WSD	Water supply development
WSPA	Water supply planning area
WTP	Water treatment plant
WUP	Water use permit
WWTF	Wastewater treatment facility
WWTP	Wastewater treatment plant

Chapter 1: About the North Florida Planning Region

Introduction

The North Florida Regional Water Supply Partnership (Partnership) was established in 2011 via a formal Interagency Agreement executed by the Florida Department of Environmental Protection (DEP) and the St. Johns River and Suwanee River Water Management Districts (Districts). The North Florida Regional Water Supply Plan (NFRWSP) area includes 14 counties in the St. Johns River Water Management District (SJRWMD) and the Suwannee River Water Management District (SRWMD): Alachua, Baker, Bradford, Clay, Columbia, Duval, Flagler, Gilchrist, Hamilton, Nassau, Putnam, St. Johns, Suwannee, and Union (Figure 2). In total, the NFRWSP area covers more than 8,000 square miles.

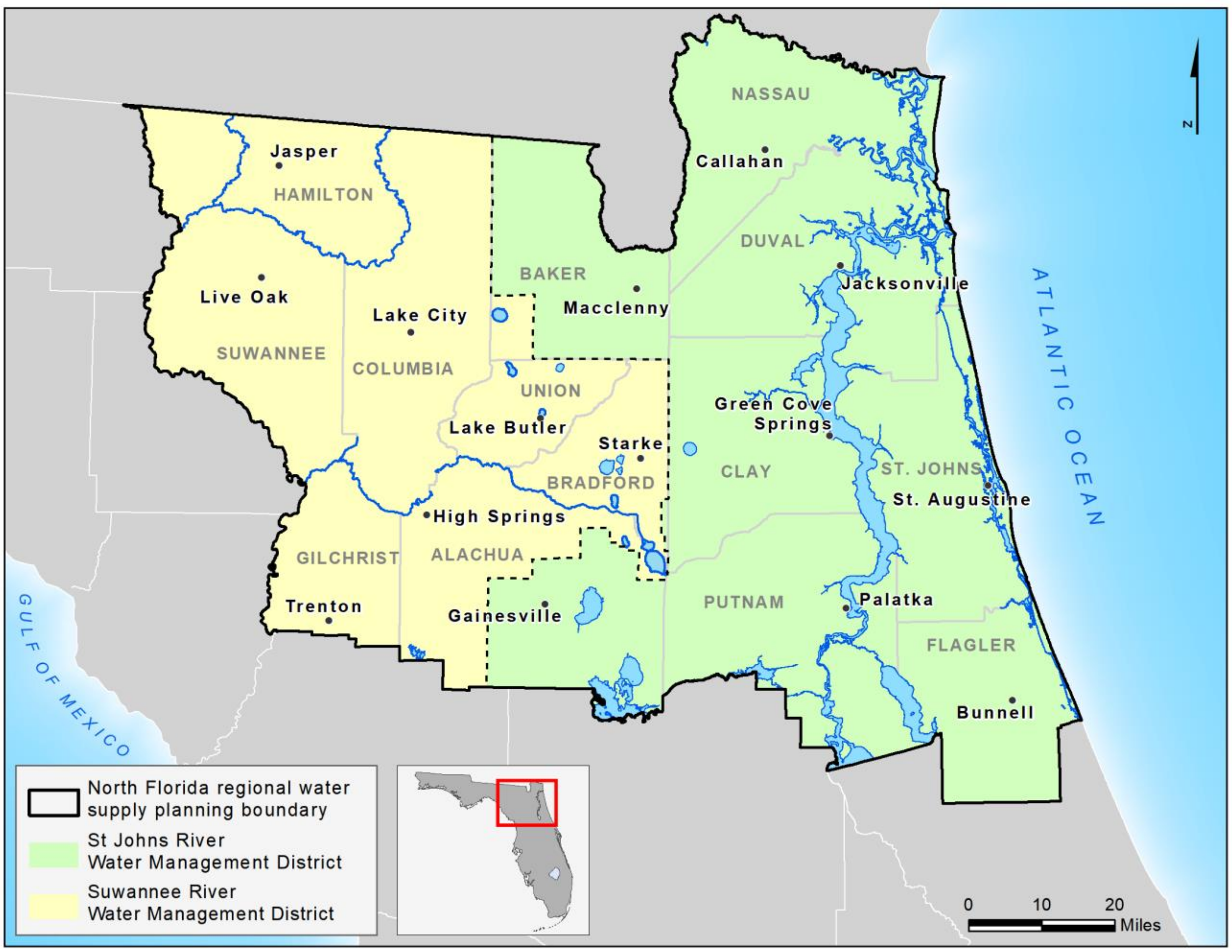

Figure 2. North Florida Regional Water Supply Partnership Area

Purpose

The purpose of the Partnership is to protect natural resources and water supplies in North Florida. This is being achieved through collaborative planning, scientific-tool development, and related efforts. The text of the agreement and other information about the Partnership can be found at northfloridawater.com. This 2023 NFRWSP serves as the 5-year update to the 2017 NFRWSP.

The following statistics apply within the NFRWSP area.

Population:

The population in the Partnership area for 2015, the base year used in this update, is as follows:

- *SJRWMD:* approximately 1.76 million
- *SRWMD:* approximately 264,000
- *Total NFRWSP:* 2.02 million

More information on the use of base years in population and demand projections can be found in Chapter 2.

Watersheds:

- *SJRWMD:* Daytona-St. Augustine, Lower St. Johns, Nassau, Ocklawaha, Santa Fe, St. Marys, Upper St. Johns, and Upper Suwannee (Figure 3).
- *SRWMD*: Alapaha, Lower Suwannee, Ocklawaha, Santa Fe, St. Marys, Upper Suwannee, Waccasassa, and Withlacoochee. Over 90% of the Alapaha and over 55% of the Suwannee River basins are in Georgia (Figure 3).

Springs (4th magnitude and larger):

- *SJRWMD:* There are 18 documented springs, of which there are no Outstanding Florida Springs (OFS).
- *SRWMD:* There are 204 documented springs. On the Lower Santa Fe River, the following springs are OFS: Devil's Ear (Ginnie Group), Poe, Columbia, Treehouse, and Hornsby. On the Ichetucknee River, the Ichetucknee Springs Group is a first magnitude spring complex that is comprised of nine named and many unnamed springs that have collectively been identified as an OFS. The named springs in the Ichetucknee Springs Group, include: Ichetucknee Headspring, Cedar Head, Blue Hole, Mission, Devil's Eye, Grassy Hole, Mill

Pond, and Coffee. On the Suwanee River, the following springs are OFS: Falmouth, Lafayette Blue, Peacock, and Troy.

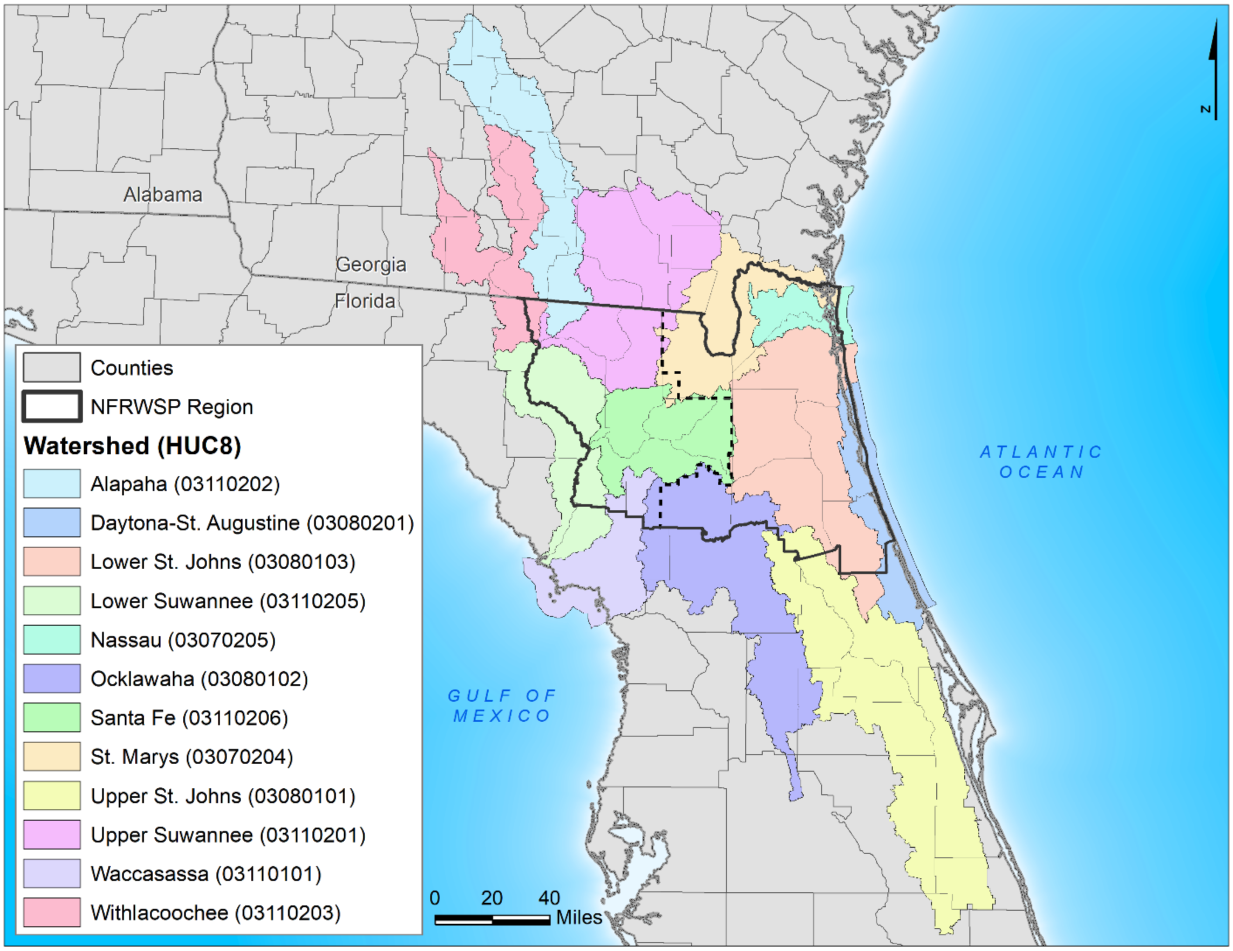

Figure 3. Watersheds (8-digit hydrologic unit code) in the NFRWSP area (USGS, 2023)

Groundwater Resources:

Groundwater resources in the NFRWSP area include the Surficial aquifer system (SAS), the Floridan aquifer system (FAS) and, where present, the intermediate aquifer system (IAS). A brief description of these aquifer systems is listed below:

- The SAS is the uppermost aquifer system, generally unconfined, and comprised primarily of unconsolidated beds of sand, shelly sand, shell, and clay.

- The intermediate confining unit (ICU) or the IAS separates the underlying FAS from the overlying SAS throughout a large portion of the planning region. In some areas, the FAS is unconfined due to the absence of the ICU, such as in the lower Suwannee River basin in the SRWMD. In other areas within the planning region, the ICU is quite thick, such as in Duval and Nassau counties, where it is upwards of hundreds of feet thick.

- The FAS within the planning area is comprised primarily of carbonate rocks. In much of its extent, the FAS is comprised of an upper aquifer, the Upper Floridan aquifer (UFA) and lower aquifer, the Lower Floridan aquifer (LFA). The two aquifers are separated by a semi-confining unit referred to as the middle confining unit (MCU). Regionally, the MCU varies in lithologic and hydraulic characteristics and the degree of confinement of the MCU can vary significantly. In Northeast Florida, the LFA is further subdivided into an upper zone, referred to as the upper zone of the Lower Floridan aquifer and a lower zone, the Fernandina permeable zone. The upper zone of the Lower Floridan aquifer is separated from the Fernandina permeable zone by the lower semi-confining unit.

Detailed information on the representation of these aquifer systems can be found in the North Florida-Southeast Georgia regional groundwater flow model version 1.1 (NFSEG) Final Report (Durden et al., 2019).

Traditional Water Sources:

Current water sources in the NFRWSP area include groundwater (fresh and brackish), reclaimed water, surface water, and stormwater. The majority of water use in 2015 in the NFRWSP area was fresh groundwater (Appendix B, Table B-2). Given this consistent pattern of historical and current utilization of fresh groundwater, the Districts recognize fresh groundwater as the only traditional water supply source in the NFRWSP area and designate all other water sources to be nontraditional (i.e., alternative water supply; (subsection 373.019(1), F.S.).

Chapter 2: Introduction to Water Supply Planning

Introduction

The districts develop water supply plans to identify sustainable water supplies for all existing and anticipated water uses while protecting water resources and related natural systems. Water supply plans provide a view of projected future water needs, potential water supply sources and avoidable water resource impacts to help all water users make informed decisions regarding how to meet their future water needs. The elements of water supply planning are:

- Identify projected water demands for all use types through the planning horizon.
- Identify the water resource impacts that could occur as a result of meeting the projected increase in water demand with traditional sources.
- Identify technically and economically feasible water resource development (WRD) and water supply development (WSD) project options, including water conservation measures, that could be implemented to meet future water demands and avoid unacceptable water resource impacts.

Base Year

Population and water demand projections are essential components to regional water supply plan development. In developing population and water demand projections, a base year comprised of actual population and water use data is needed. The base year is the “starting point” to which projected changes in population and water demand are applied. For the NFRWSP, the base year is 2015, which was the most current year with population and water use data at the time projections were developed. Population and water demand were then projected at five-year intervals throughout the planning horizon, 2020 through 2045, per statewide regional water supply planning guidelines.

The 2023 NFRWSP has been prepared in accordance with the guidance document, “Format and Guidelines for Regional Water Supply Planning” (DEP, 2019). This plan also serves as the 2023 Water Supply Assessment (WSA) for both Districts.

Legislative Mandates

Section 373.709, F.S., provides that the districts shall conduct water supply planning for a water supply planning region where it determines that existing sources of water are not adequate to supply water for all existing and future reasonable-beneficial uses and to sustain the water resources and related natural systems for the planning period. The districts must conduct planning in an open public process, in coordination and cooperation with local governments, regional water supply authorities, water and wastewater utilities, multijurisdictional water supply entities, self-suppliers, reuse utilities, DEP, the Florida Department of Agriculture and Consumer Services (FDACS), and other stakeholders (subsection 373.709(1), F.S.). In addition, subsection 373.709(2), F.S., requires each Regional Water Supply Plan (RWSP) to be based on at least a 20-year planning period and to include the following:

- Water supply and water resource development components.
- Funding strategies for water resource development projects.
- Consideration of how water supply development project options serve the public interest or save costs overall by preventing the loss of natural resources or avoiding greater future expenditures for WRD or WSD projects.
- The technical data and information applicable to each planning region, which are necessary to support the RWSP.
- The minimum flows and minimum water levels (MFLs) established for water resources within each planning region.
- MFLs prevention and recovery strategies, if applicable.
- Reservations of water adopted by rule pursuant to subsection 373.223(4), F.S., within each planning region.
- Identification of surface waters or aquifers for which MFLs are scheduled to be adopted.
- An analysis, developed in cooperation with DEP, of areas or instances in which the variance provisions of paragraph 378.212(1)(g), F.S., or subsection 378.404(9), F.S., may be used to create WSD or WRD projects.
- An assessment of how the RWSP and the projects identified in the funding plans prepared support the recovery or prevention strategies for implementation of adopted MFLs or water reservations while ensuring that sufficient water will be available for all existing and future reasonable-beneficial uses and identified natural systems, while avoiding the adverse effects of competition.

Relationship to SJRWMD and SRWMD Regulatory Programs

Subsection 373.709(7), F.S., states that nothing contained in the water supply development component of the NFRWSP shall be construed to require any entity to select or implement a WSD project identified in the component merely because it is identified in the plan. Pursuant to subsection 373.709(7), F.S., the NFRWSP may not be used in the review of consumptive/water use permits (CUPs/WUPs), unless the plan or an applicable portion thereof has been adopted by rule, with one exception. The one exception is for the evaluation of an application for the use of water which proposes the use of an alternative water supply (AWS) project as described in the NFRWSP and provides reasonable assurances of the applicant's capability to design, construct, operate, and maintain the project (subsection 373.223(5), F.S.). It is then presumed that the AWS use is consistent with the public interest under paragraph 373.223(1)(c), F.S.

It is important to note that, while the NFRWSP may not be used in the review of CUPs/WUPs, the Districts are allowed to use data or other information that was used to establish the plan in reviewing CUPs/WUPs.

NFRWSP Outreach

The Districts held two technical methods public workshops in each District in November 2021. Comments were received during the public workshops and during the subsequent written public comment period lasting approximately four weeks. After reviewing the feedback received, the water use and population demand projections were revised. There was a second public review opportunity on the revised datasets in June 2022, and the datasets were finalized in July 2022. Additionally, there were two constraint assessment public workshops in November 2022 (one in each District), followed by a public comment period of approximately six weeks. Lastly, two draft NFRWSP workshops were held in September 2023, associated with a public comment period of three weeks. All public workshops were consistent with subsection 373.709(1), F.S. The public workshops were available in person and online to maximize the opportunity for public participation. Additionally, the presentation slides and recordings were made available on the North Florida Water Webpage and were available upon request. Comments received during the public workshops and comment periods were considered for incorporation, as appropriate, into the NFRWSP and are detailed in Appendix A.

In addition, beginning in February 2023, District staff held many focused stakeholder meetings with local governments, regional organizations, agricultural entities, and other stakeholders in the NFRWSP area. The purpose of these meetings was to share an overview of the NFRWSP process, provide background information of interest to stakeholders, and answer questions. Staff also solicited feedback and project concepts from stakeholders. These efforts provided a valuable means for stakeholders to engage with the NFRWSP development and share their perspectives with the Districts. The Districts found the expanded input received during these discussions to be beneficial to the NFRWSP development.

Approval Process

As noted previously, the Districts held public workshops consistent with subsection 373.709(1), F.S., to highlight the results of the NFRWSP. The draft plan was posted for 24 days of public comment from September 12, 2023, through October 6, 2023. Upon completion of the updates to the NFRWSP, the Districts presented the NFRWSP to their respective governing boards on December 12, 2023. The order approving the 2023 NFRWSP reflects the final approval date, which is attached at the beginning of this document.

Requirements after Plan Approval

The water supply planning process of the Districts is closely coordinated and linked to the water supply planning efforts of local governments and utilities. Therefore, significant coordination and collaboration throughout the development, approval, and implementation of the NFRWSP is necessary among all water supply planning entities.

Paragraph 373.709(8)(a), F.S., requires the Districts to notify water supply entities identified in the NFRWSP as the parties are responsible for implementing the various project options listed in the NFRWSP. When the notice is received by the water supply entity, the water supplier must respond to the Districts within 12 months informing the Districts of their intentions to develop and implement the project options identified by the NFRWSP or provide a list of other projects or methods to meet the identified water demands (paragraph 373.709(8)(b), F.S.).

In addition to the requirements above, local governments are required to adopt water supply facilities work plans and related amendments into their comprehensive plans within 18 months following the approval of the NFRWSP (subparagraph 163.3177(6)(c)3., F.S.). The work plans contain information to update the comprehensive plan's capital improvements element, which provides specifics about the need for and location of public facilities, principles for construction, cost estimates, and a schedule of capital improvements.

Local governments in the NFRWSP area are required by subparagraph 163.3177(6)(c)3., F.S., to modify the potable water sub-elements of their comprehensive plan by:

- Incorporating the AWS project projects selected by the local government from those projects identified in the NFRWSP or proposed by the local government;

- Identifying such AWS projects and traditional water supply projects and conservation and reuse necessary to meet the water needs identified in the NFRWSP within the local government's jurisdiction; and

  Including a work plan, covering at least a 10-year planning period, for building public, private and regional water supply facilities, including the development of AWS, which are identified in the element as necessary to serve existing and new development.

Chapter 3: Water Demand, Reclaimed Water and Water Conservation Projections

Purpose

The Districts develop water demand projections to determine existing legal uses, anticipated future needs, and existing and reasonably anticipated sources of water and water conservation efforts. The Districts' goal in projecting water demands is to develop reasonable estimates of projected need based on the best information available. Water demand projections were reviewed with water users. Additionally, these projections are consistent with statewide planning guidance on water demand projections. The projected increase in water demand is used in water resource assessments to determine the potential for unacceptable impacts to water resources and related natural systems.

Water use and projected water demand in the Districts is grouped into six water use categories for water supply planning.

- Public Supply (PS)
- Domestic Self-supply (DSS) and Small Public Supply Systems (SPSS)
- Agricultural Irrigation Self-supply (AG)
- Landscape/Recreational Irrigation Self-supply (LR)
- Commercial/Industrial/Institutional and Mining Dewatering Self-supply (CII/MD)
- Power Generation Self-supply (PG)

In addition to the six categories listed above, the Districts project future reclaimed water flows that can potentially offset future water demand.

Total water demand in the NFRWSP area is anticipated to increase from 530 million gallons per day (mgd) in 2015 to 698 mgd in 2045 (32%; Table 1; Figure 5). Public supply represents the largest demand in the NFRWSP area (41%), followed by agriculture (25%) and CII/MD (19%) in 2045, (Table 1, Figure 4). The Districts also calculated a 1-in-10 year drought water demand for 2045, which represents an event that would result in an increase in water demand of a magnitude that would have a 10% probability of occurring during any given year. The Districts estimate that total water demand in 2045 could increase by an additional 12% if a 1-in-10 year drought event occurred.

Table 1. Summary of water use (mgd) by District and use type in the NFRWSP area

Water Use Category	2015 SR	2015 SJR	2015 NF Area	2045 SR	2045 SJR	2045 NF Area	Increase SR	Increase SJR	Increase NF Area
PS	9.3	180.0	189.3	13.8	274.1	287.9	4.5	94.1	98.6
DSS	9.3	30.9	40.3	10.8	35.6	46.4	1.5	4.6	6.2
AG	88.9	48.0*	136.9	111.5	63.9	175.4	22.6	15.9	38.5
CII/MD	45.8	77.5	123.2	46.8	84.6	131.4	1.1	7.1	8.2
L/R	2.7	15.4	18.1	3.2	26.3	29.5	0.5	10.9	11.3
PG	1.9	19.8	21.7	2.1	25.8	27.8	0.1	6.0	6.1
Total	158.0	371.6	529.6	188.2	510.2	698.4	30.2	138.5	168.8

*SJR 2015 AG water use is based on actual reported water use in a wetter than average rainfall year and 2045 water use is estimated based on projections from FSAID VII.

**Totals may be slightly different due to rounding of individual values.

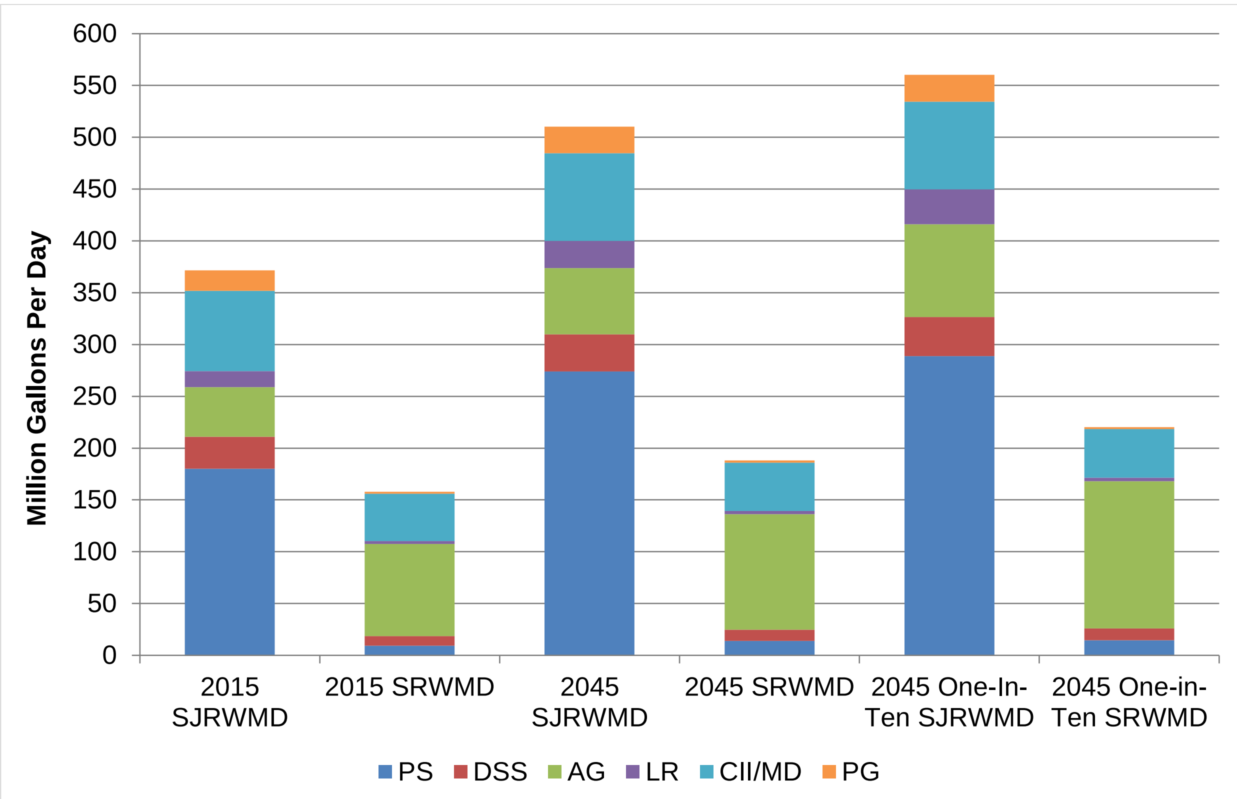

Figure 4. 2015 water use estimates and 2045 water demand projections in the NFRWSP by category

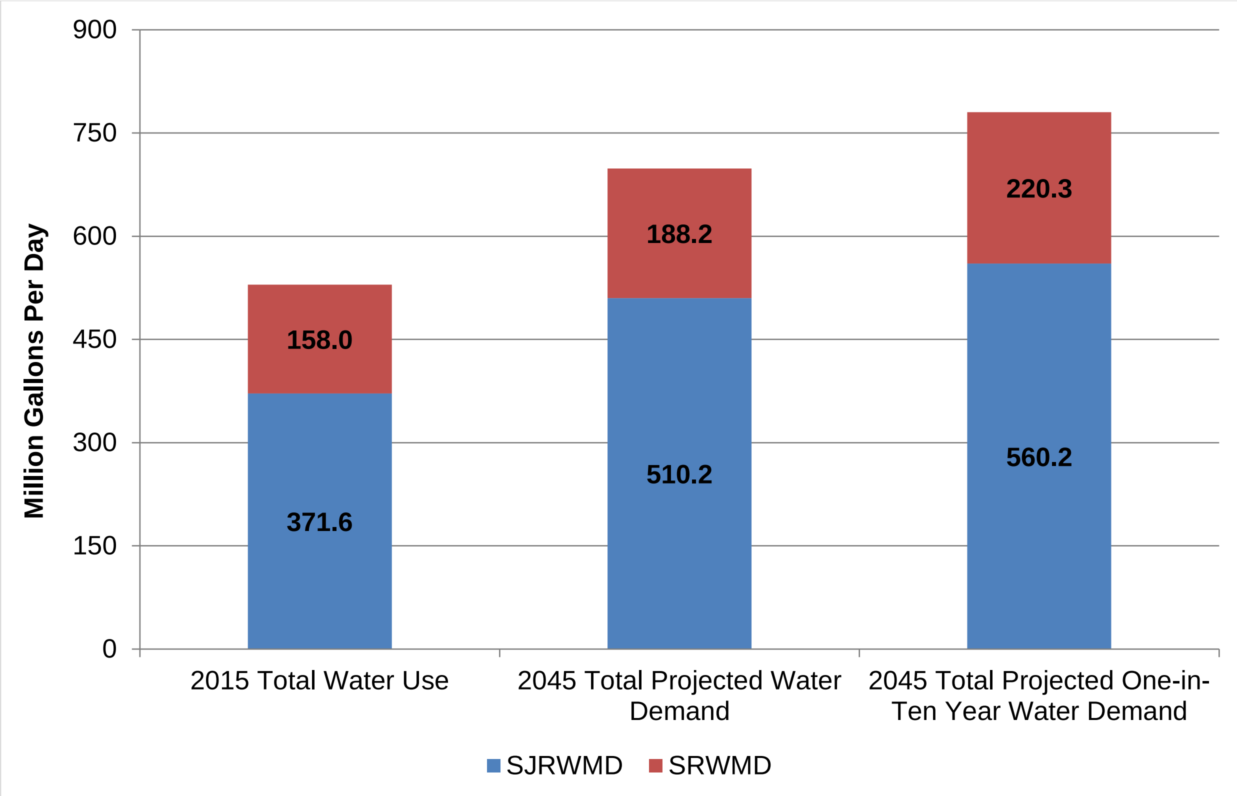

Figure 5. 2015 total water use estimates and 2045 water demand projections in the NFRWSP

Future Water Demand Projections and Methodology

Assumptions

For the purposes of the NFRWSP, the Districts assume that projected increases in supply will come from traditional sources unless users have made a commitment to the development and use of other sources of supply. Public water supply utilities in Florida are in varying stages of transitioning exclusively from fresh groundwater sources to include alternative sources.

Guidance and minimum requirements for developing water demand and population projections are described in section 373.709, F.S. The detailed methodology for the development and spatial distribution of population and water demand projections can be found in Appendix B.

Population Projections

Population projections yield the estimated population growth and percent change from 2015 to 2045. The Districts estimated the population projections for water supply utilities in two categories: public supply and domestic self-supply/small public supply systems.

More details on the methods used for estimating population are described in Appendix B.

The Districts' total population for the NFRWSP area is expected to increase by 982,000 people (50% to approximately 2.96 million people) by 2045 (Figures 6 and 7). The SRWMD population estimates in Figure 7 do not include the institutional population. For the 2045 total population projections, 80% of the projected population will use water from public supply, and the remaining 20% will use water via DSS and SPSS. The population served by public supply utilities in the NFRWSP area is expected to increase by 923,000 people (63% to approximately 2.4 million people) through 2045. Domestic self-supply and small public supply systems population in the NFRWSP area is expected to increase by 59,000 people (11% to approximately 579,000 people) through 2045.

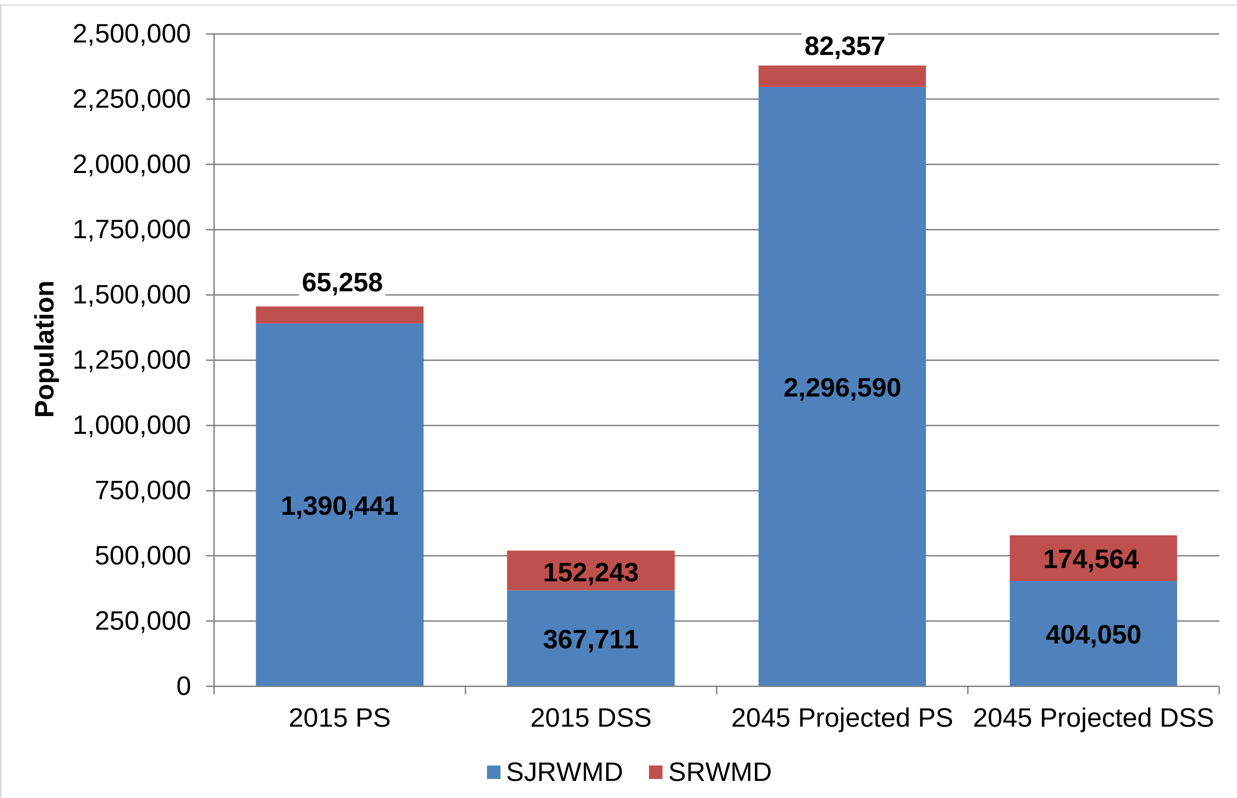

Figure 6. 2015 population estimates and 2045 population projections in the NFRWSP by category

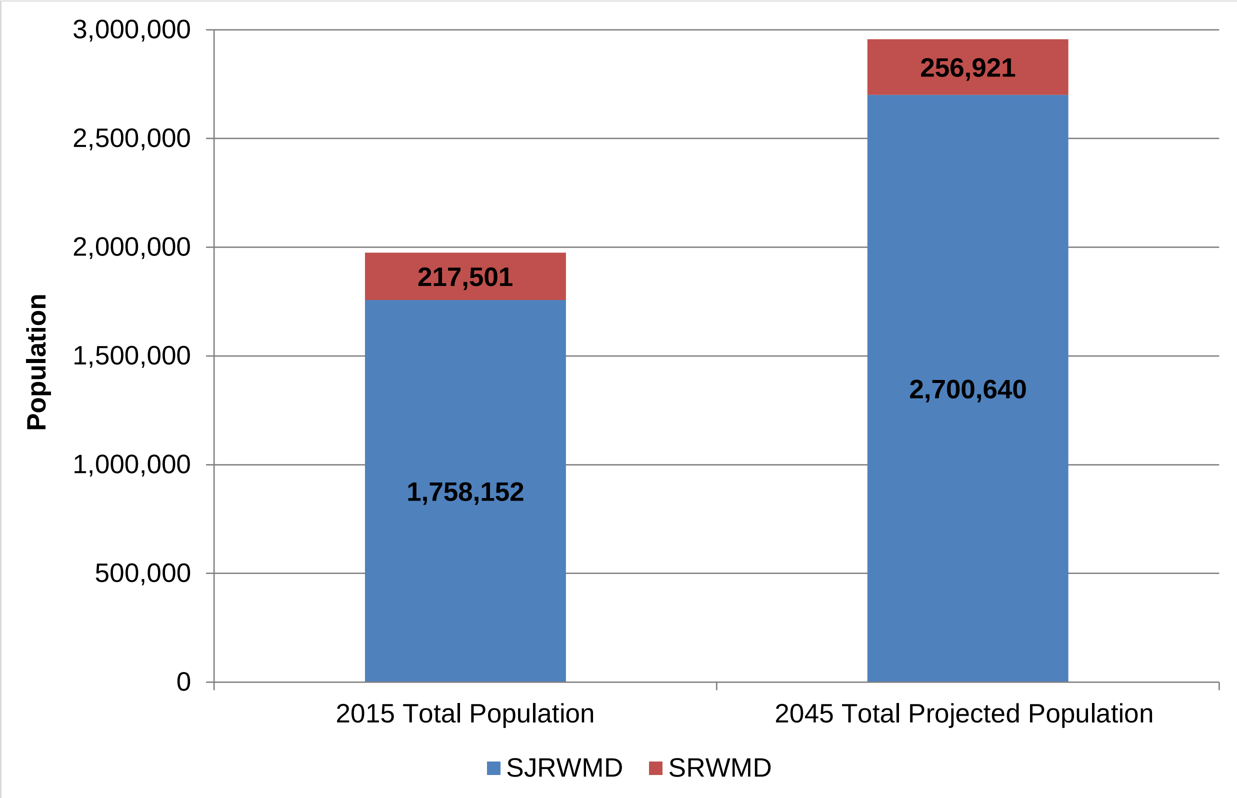

Figure 7. 2015 total population estimates and 2045 population projections in the NFRWSP

Public Supply

The public supply category consists of indoor and outdoor residential and nonresidential uses supplied by a municipality, county, regional water supply authority, special district, public or privately owned water utility or multijurisdictional water supply authority for human consumption and other purposes. This category is split between large public supply systems, which include permits that withdraw an annual average of 0.1 mgd or more, and SPSS that withdraw less than 0.1 mgd. The methods for projecting water demand for SPSS are the same as for large public supply systems and are described immediately below. However, the water use estimates for small public supply are aggregated and incorporated with the domestic self-supply estimates which are described in the next section.

Demand

For the NFRWSP, the Districts based the water demand projections for large public supply and small public supply on the most recent five-year average gross per capita rate (2014-2018). The gross per capita water use rate is the factor applied to projected population to determine future water demand. This rate represents, on average, how much water one person uses in a day. For large public supply and small public supply, the gross per capita rate is defined as the total water use (including residential and nonresidential uses) for each individual permittee divided by its respective residential population served expressed in average gallons per capita per day (gpcd). A five-year average is used to address annual variations in water use due to climate variations and implementation of water conservation programs. The Districts calculated five-year average gross per capita water use rates for each individual public supply and small public supply.

The use of gross per capita is recognized as a national standard methodology for water supply planning. However, this practice assumes that past water use is predictive of future water use and incorporates the current economic conditions and current rates of reclaimed water use and water conservation into the future projections. Factors such as the implementation of water conservation measures, reductions in landscape irrigation with potable water, and increases in multifamily housing occupancy can decrease the gross per capita rates. Conversely, factors such as expanded tourism and other commercial development, larger irrigated lots, and increases in single family housing can increase the gross per capita rates. Factors affecting gross per capita rates and public supply water demands will be captured during future water supply plan updates.

The Districts' large public supply water demand for the NFRWSP area is expected to increase by 99 mgd (52% to approximately 288 mgd) by 2045 (Figure 8). The Districts aggregated the projected water demand for the small public supply for each county and summed those values to the total respective county demand for the DSS category, shown in the next section. Public supply represents 38% of the 2045 projected water demand in the NFRWSP area. Of note, public supply also represents 41% of the total increase in water demand in the NFRWSP area.

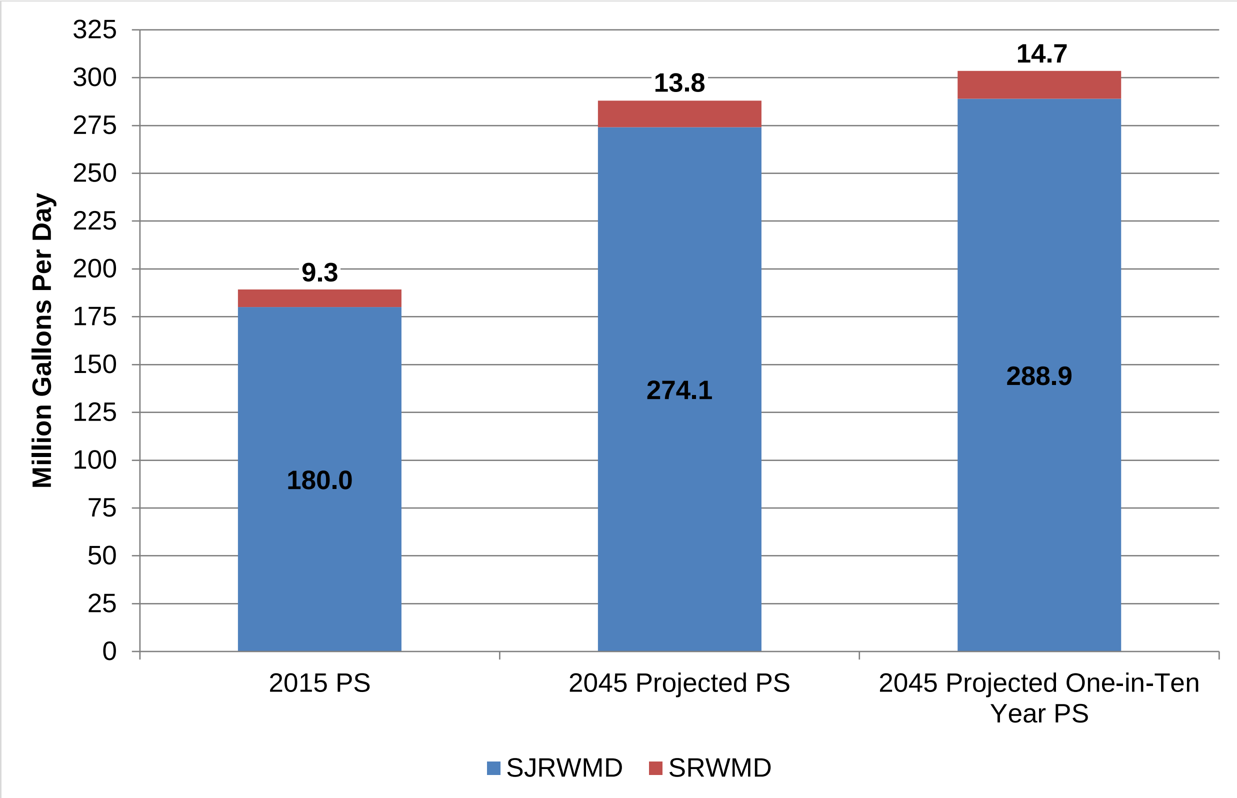

Figure 8. 2015 large public supply water use estimates and 2045 water demand projections in the NFRWSP

Domestic Self-Supply

The DSS category consists of indoor and outdoor water use at residential dwellings not served by a central public supply and water usage from SPSS (systems less than 0.1 mgd). Historic water use and population and projected water demand and population for SPSS are calculated individually but are aggregated with the DSS category for reporting purposes at the county level.

Demand

For the NFRWSP, the Districts based the DSS water demand projections on the most recent five-year average residential per capita rate (2014-2018). For DSS, the residential per capita rate (also referred to as household use, both indoor and outdoor) is defined as the water used for solely residential purposes. Gross per capita is not used for this category as it includes more than just residential uses. Details on the small public supply water demand is described in the Public Supply section.

The Districts' total combined DSS and small public supply water demand for the NFRWSP area is expected to increase by six mgd (15% to approximately 46 mgd) by 2045 (Figure 9). Of the 2045 combined DSS water demand, DSS wells represent 7% of the projected water demand.

The Districts also calculated a 1-in-10 year drought water demand for 2045 (Figure 9). It is estimated that water demand in 2045 could increase by six percent if a 1-in-10 year drought event occurred.

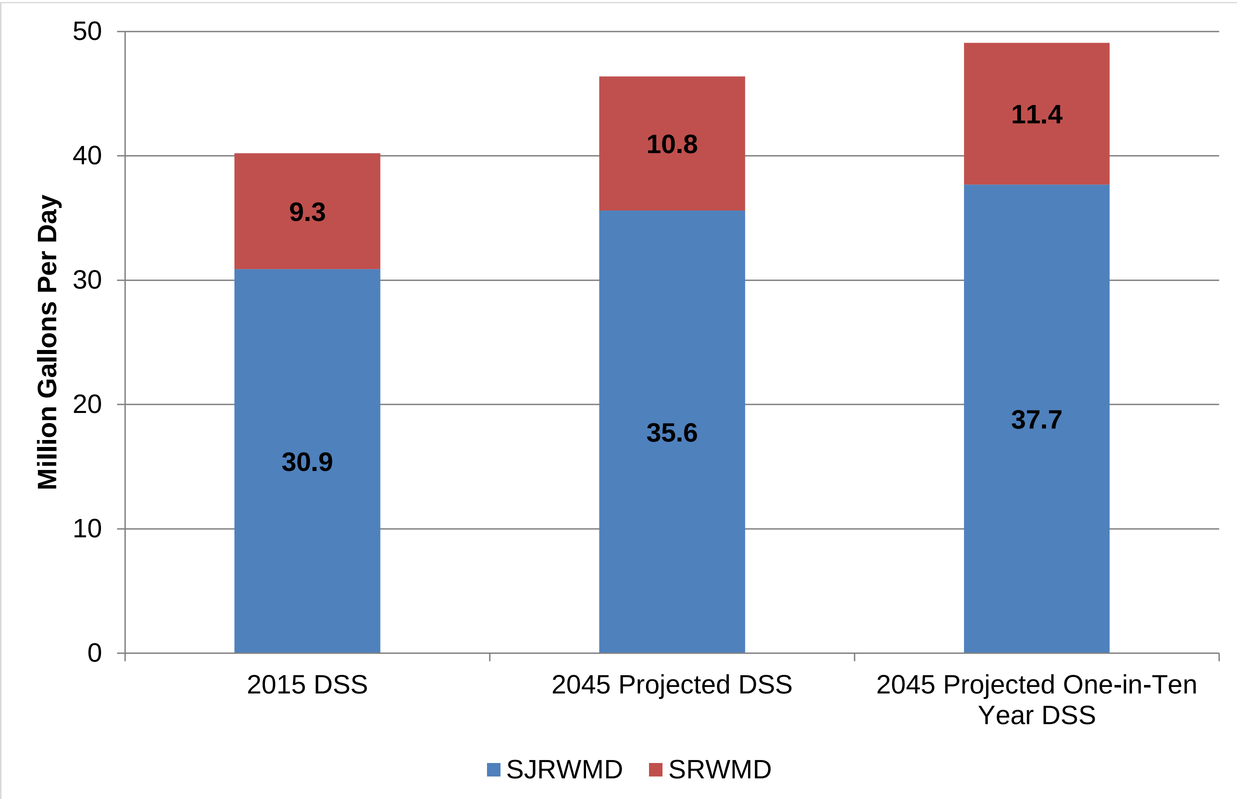

Figure 9. 2015 domestic self-supply water use estimates and 2045 water demand projections in the NFRWSP

Agriculture

The agricultural irrigation self-supply category includes the irrigation of crops and other miscellaneous water uses associated with agricultural production. Irrigated acreage and projected water demands were determined for a variety of crop categories, including citrus, vegetables, fruit, field crops, greenhouse/nursery, sod, etc. In addition, projected water demands associated with other agriculture uses were estimated and reported as miscellaneous type uses, such as aquaculture, dairy/cattle, poultry and other livestock.

Pursuant to subsection 373.709(2)(a)1b., F.S., the districts are required to consider agricultural demand projections provided by FDACS when developing RWSPs. FDACS develops future agricultural acreage, water demand projections, and a 1-in-10 drought demand for the State of Florida, which is updated annually. This product is known as the Florida Statewide Agricultural Irrigation Demand (FSAID), and the final report for the version identified as FSAID VII was delivered on June 30, 2020. This FSAID VII iteration has base year acreage and water use estimates for 2018 with projections for 2020-2045. The Districts used the final FSAID VII agricultural acreage and water demand projections for the NFRWSP. Detailed methodology can be found in the June 30, 2020, FSAID VII Final Report (FDACS, 2020).

Acreage and Demand

The Districts' total agricultural water demand for the NFRWSP area is expected to increase by 39 mgd (28% to approximately 175 mgd) by 2045 and acreage is expected to increase by 29,000 acres (24% to approximately 150,000 acres) (Figures 10 and 11) by 2045. Discussion of the 2015 water use trends for SJRWMD are discussed in Appendix B.

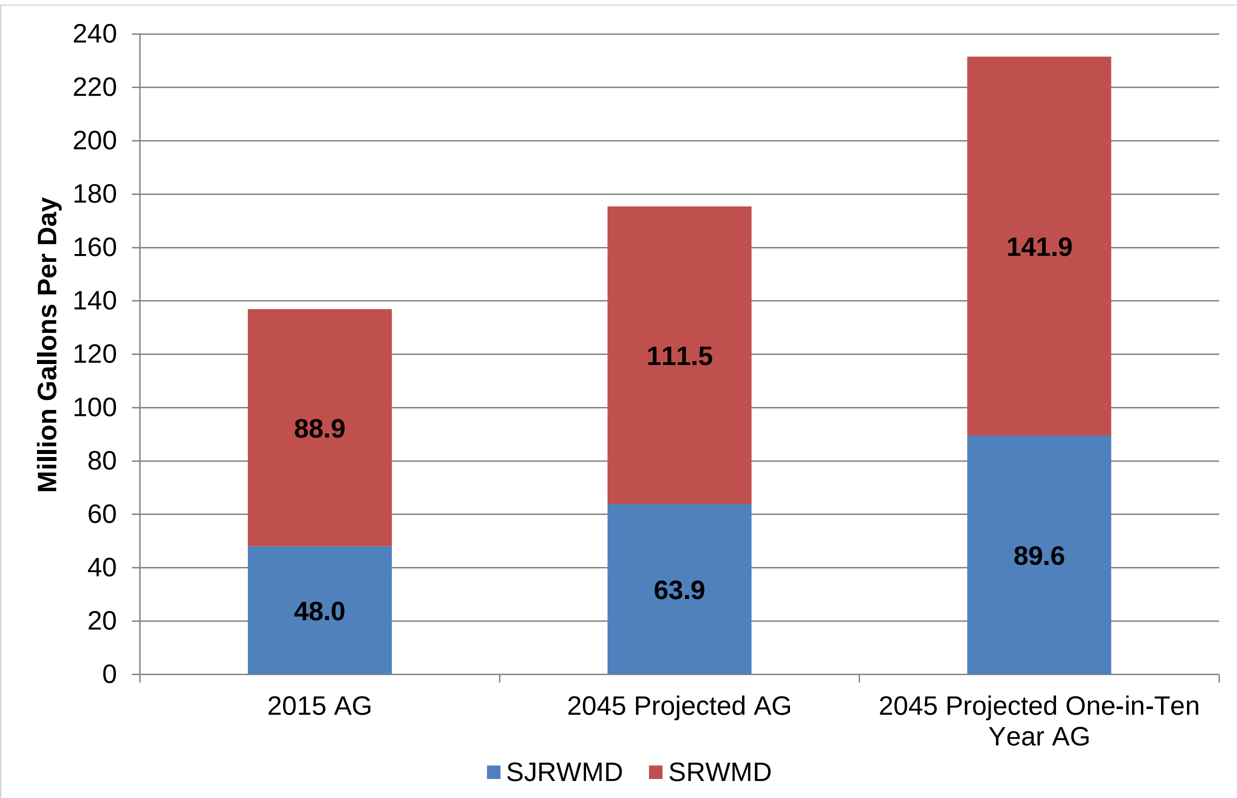

Figure 10. 2015 agriculture self-supply water use estimates and 2045 water demand projections in the NFRWSP

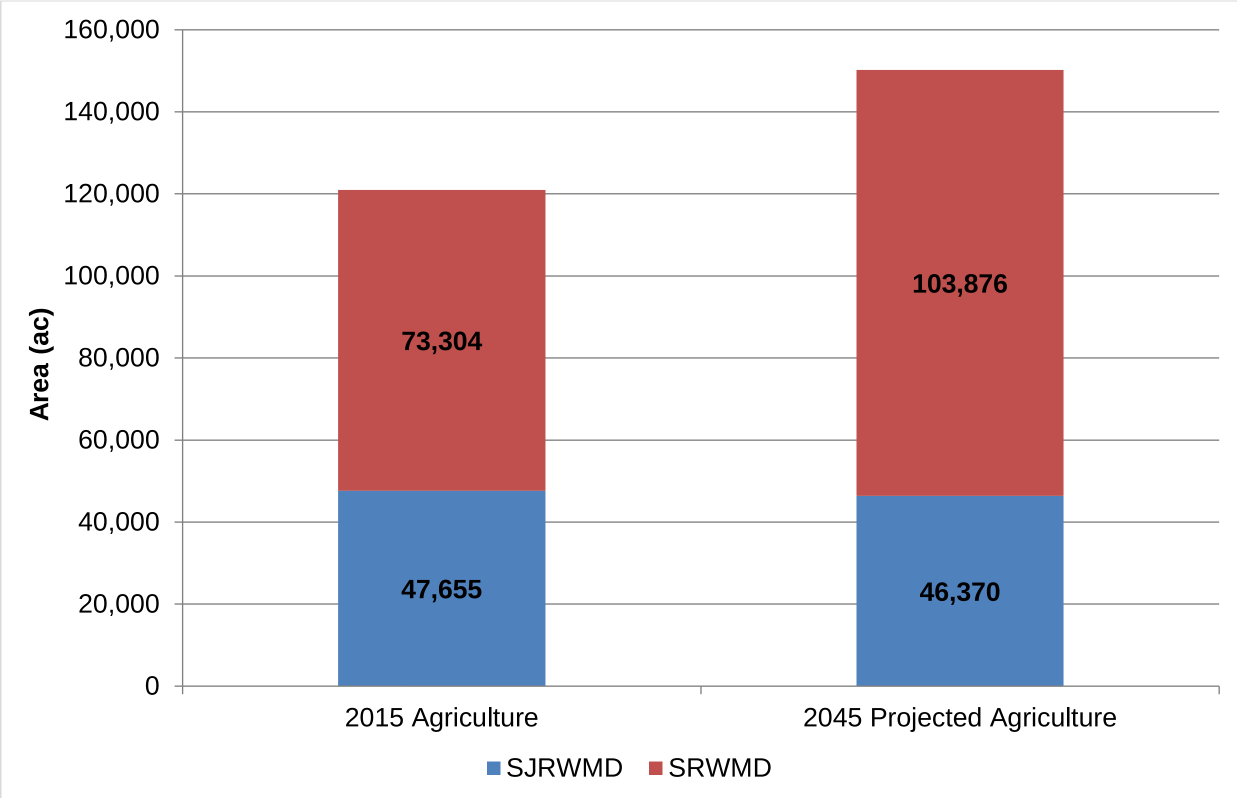

Figure 11. 2015 agriculture self-supply acreage estimates and 2045 acreage projections in the NFRWSP

Commercial/Industrial/Institutional and Mining/Dewatering

The CII/MD category represents water use associated with the production of goods or provisions of services by CII/MD establishments. Commercial uses include general businesses, office complexes, commercial cooling and heating, bottled water, food and beverage processing, restaurants, gas stations, hotels, car washes, laundromats, and water used in zoos, theme parks and other attractions. Industrial uses include manufacturing and chemical processing plants and other industrial facilities, spraying water for dust control, maintenance, cleaning, and washing of structures and mobile equipment and the washing of streets, driveways, sidewalks, and similar areas. Institutional use includes hospitals, group home/assisted living facilities, churches, prisons, schools, universities, military bases, etc. Mining uses include water associated with the extraction, transport, and processing of subsurface materials and minerals. Dewatering uses includes the long-term removal of water to control surface or groundwater levels during construction or excavation activities.

Demand

Water demand for the CII/MD category was projected at the county level using a respective CII/MD historic average gpcd. Commercial/Industrial/Institutional and Mining/Dewatering historic water use and projected water demand consists of only consumptive uses; recycled surface water and other non-consumptive uses were removed. The Districts define consumptive use as any use of water that reduces the supply from which it is withdrawn or diverted. For the NFRWSP, the Districts use the loss of water in the mining operations due to evaporation and water removed in the product in calculating demand. The amount of water lost is represented by 5% of the total surface water withdrawals of the mine operation. The remaining surface water was assumed to be recirculated in the mining process and, therefore, is considered non-consumptive. The CII/MD average gpcd was applied to the additional population projected by BEBR (Rayer, 2020) for each five-year increment and the associated water demand was added to the base year, 2015 water use. Water demands for large commercial and industrial facilities (e.g., pulp and paper mills) that are not impacted by population growth were held constant.

The Districts' total combined CII/MD water demand for the NFRWSP area is expected to increase by eight mgd (7% to approximately 131 mgd) by 2045 (Figure 12). The districts determined that drought events (1-in-10 year) do not have significant impacts on water use in the CII/MD category. Water use for these categories is related primarily to processing and production needs.

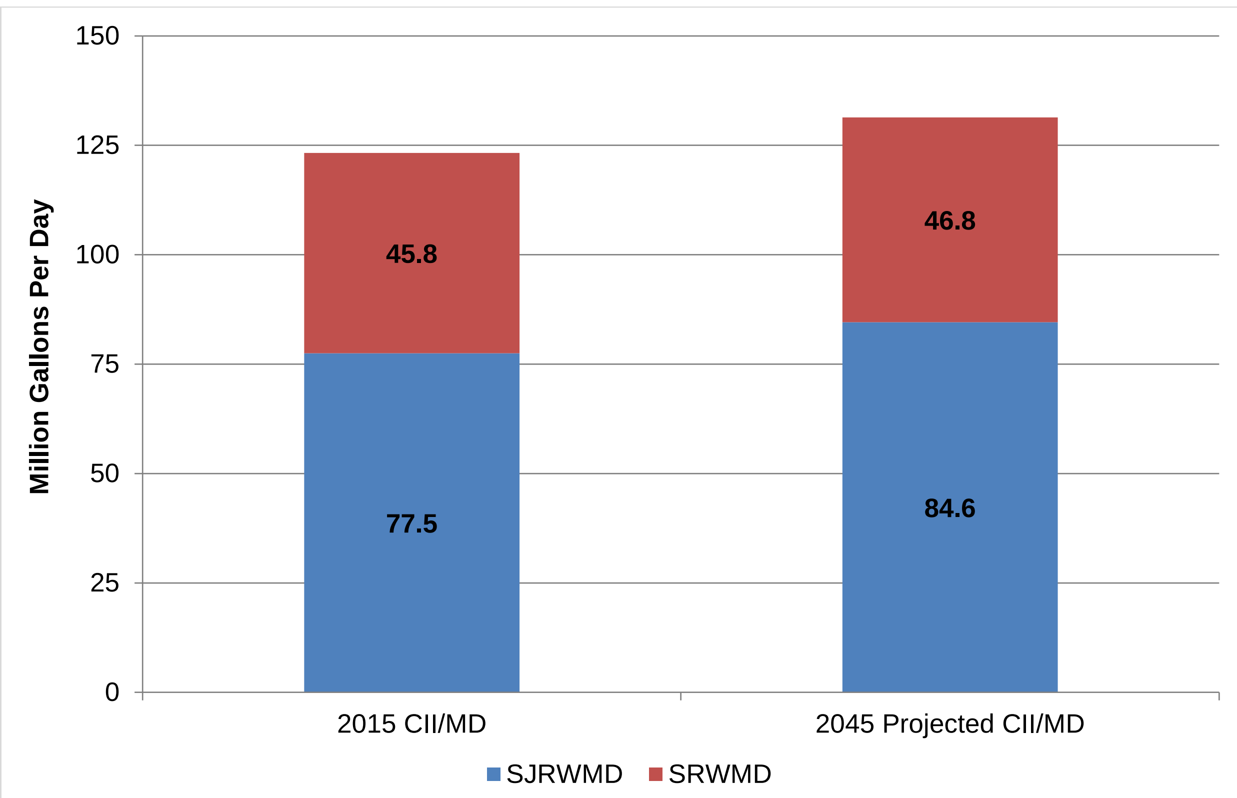

Figure 12. 2015 commercial/industrial/institutional and mining/dewatering self-supply water use estimates and 2045 water demand projections in the NFRWSP

Landscape/Recreation

The LR category represents water use associated with the irrigation, maintenance, and operation of golf courses, cemeteries, parks, medians, attractions, and other large self-supplied irrigation areas. Landscape use includes the outside watering of plants, shrubs, lawns, ground cover, trees and other flora in such diverse locations as the common areas of residential developments and industrial buildings, parks, recreational areas, cemeteries, public rights-of-ways and medians. Recreational use includes the irrigation of recreational areas such as golf courses, soccer, baseball and football fields and playgrounds. Water-based recreation use is also included in this category, which includes public or private swimming and wading pools and other water-oriented recreation such as water parks. Landscape irrigation using water from a public supply utility or a DSS well is included in the PS or DSS category based on best available information, as appropriate.

Demand

Water demand for the LR category was projected at the county level using a respective LR historic average gpcd. The average LR gpcd was applied to the additional population projected by BEBR (Rayer, 2020) for each five-year increment and the associated water demand was added to the 2015 base-year water use.

The Districts' total LR water demand for the NFRWSP area is expected to increase by 11 mgd (63% to approximately 30 mgd) by 2045 (Figure 13).

The Districts determined that historic data and net irrigation ratios are acceptable when calculating the 1-in-10 year LR water demand projection. In addition, agricultural irrigation models have supplemental irrigation values for LR that can also be used. A 1-in-10 year drought factor was developed for each county, using the highest year water use from 2014-2018 and the percent increase from the average 2014-2018 LR water use. For example, if water use in 2015 was five percent higher than the 2014-2018 average, five percent was applied to the average 2045 water demand to project a 2045 1-in-10 year water demand.

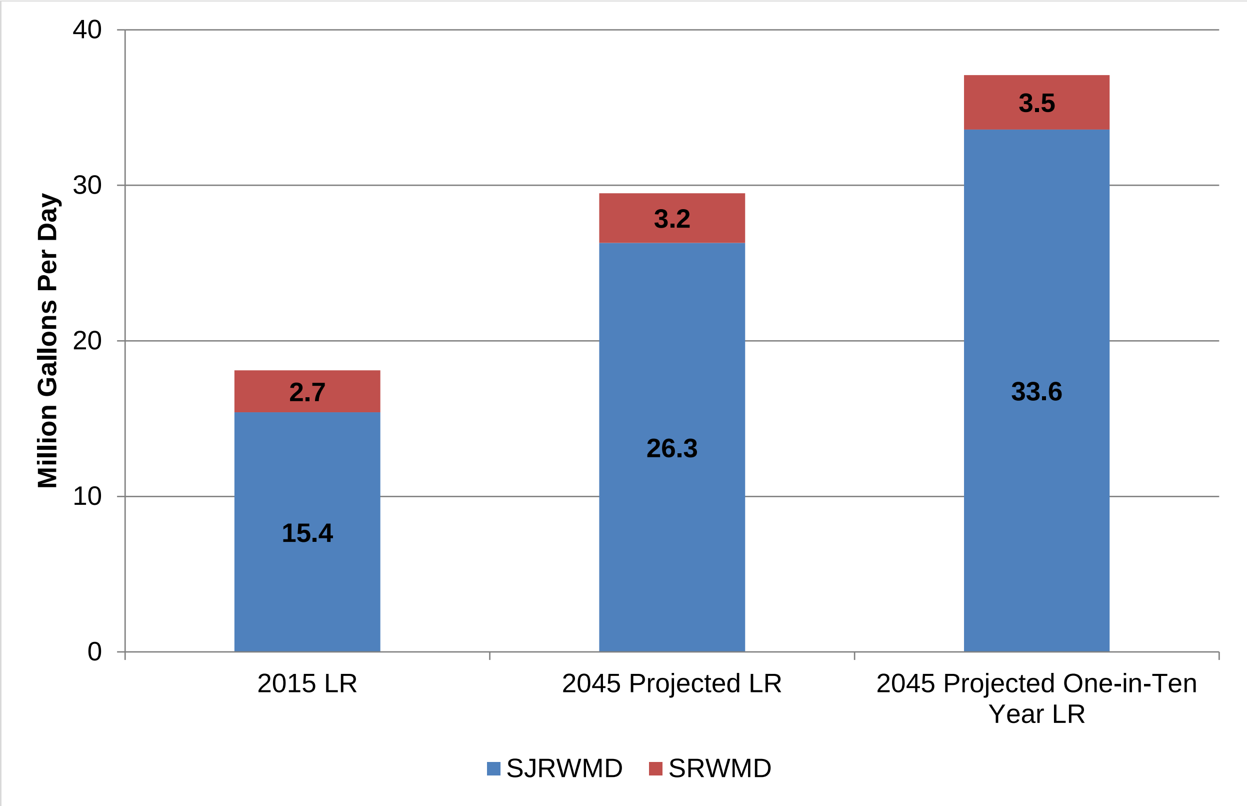

Figure 13. 2015 landscape/recreational self-supply water use estimates and 2045 water demand projections in the NFRWSP

Power Generation

The PG category represents the water use associated with power plant and power generation facilities. Power Generation water use includes the consumptive use of water for steam generation, cooling, and replenishment of cooling reservoirs.

Demand

Water demand was calculated for each PG facility and then summed to the county level for consumptive uses of water only. Non-consumptive uses, such as recycled surface water used for once-through cooling in power plants, were removed from the water demand calculation. For this NFRWSP, two percent of total surface water use by PG facilities is considered consumptive, to account for water loss due to evaporation.

The Florida Public Service Commission (PSC) requires that each PG entity produce detailed ten-year site plans for each of its facilities. These plans include planned facilities and generating capacity expansion, as well as the decommission of facilities and the reductions associated with more efficient processes. The 2020 ten-year site plans for each PG facility within the NFRWSP counties were used in developing the PG water demand projections (Florida PSC, 2020).

For each PG facility with a planned capacity expansion, PG consumptive use capacity projections were interpolated between the existing capacity and the planned capacity, as detailed in the ten-year site plans. The projection of PG consumptive water demand beyond the planned expansion in the ten-year site plans was calculated for each facility using a linear extrapolation of the existing and planned expansion dates and data and BEBR medium population projection rates (Rayer, 2020). In addition, the average daily gallon per megawatt use was estimated for 2014-2018 and used as a proxy to project future water demand beyond the ten-year site plans and when projected water demand (for the ten-year site plan period) was not included.

The Districts' total PG water demand for the NFRWSP area is expected to increase by six mgd (29% to approximately 28 mgd) by 2045 (Figure 14).

The Districts determined that drought events do not have significant impacts on water use in the PG category. Water use for this category is primarily related to processing and production needs.

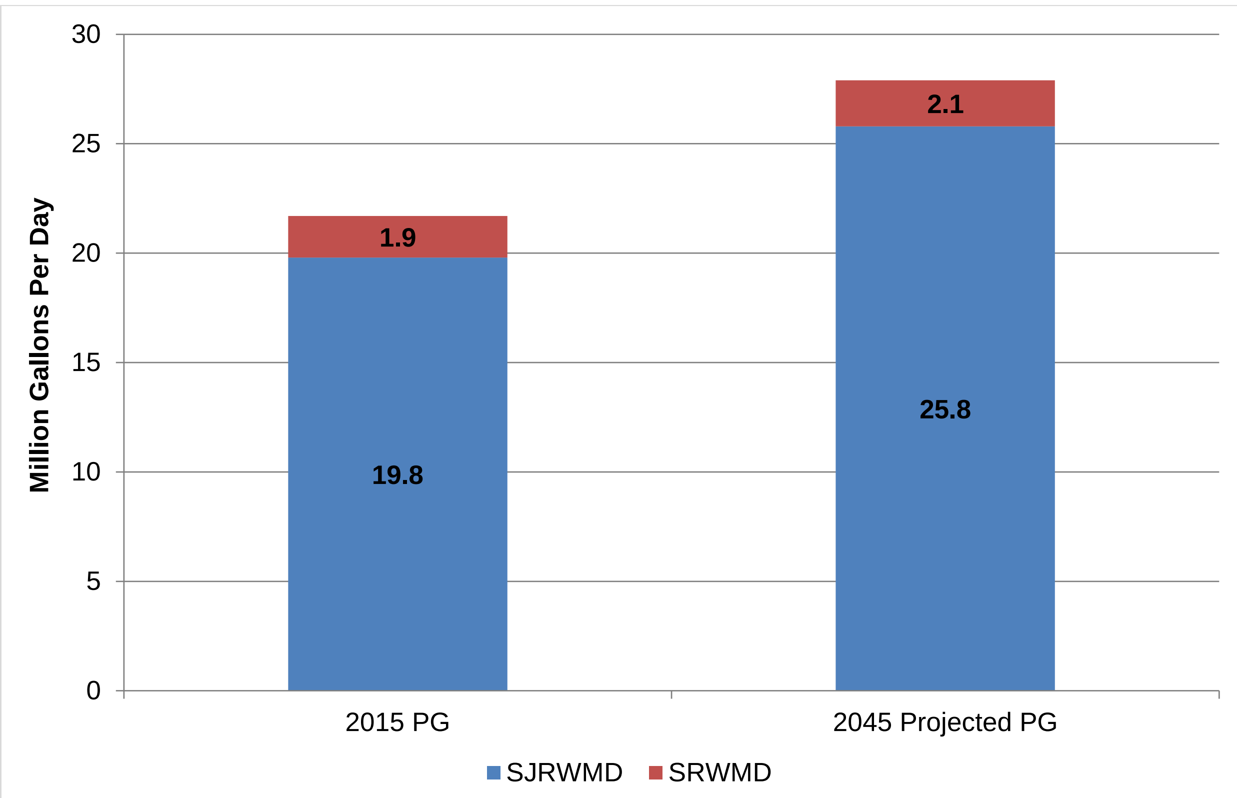

Figure 14. 2015 power generation self-supply water use estimates and 2045 water demand projections in the NFRWSP

Reclaimed Water Projections

Projections were made for domestic wastewater treatment facilities (WWTF) with 2018 permitted wastewater treatment capacities equal to or greater than 0.1 mgd. Detailed methodology for reclaimed water projections can be found in Appendix B.

Existing Flows

The Districts considered existing 2018 reclaimed water flows for future use that were not considered to be used beneficially. The Districts consider beneficial reuse to be only those uses in which reclaimed water takes the place of a preexisting or potential use of higher quality water for which reclaimed water is suitable, such as water used for landscape irrigation. Delivery of reclaimed water to sprayfields, absorption fields and rapid infiltration basins are not considered beneficial reuse, unless located in recharge areas.

The DEP has a statewide reuse utilization goal of 75% (DEP, 2003). The potential existing additional reclaimed water that could be used for reuse was calculated by taking the difference between the 2018 WWTF flow at 75% utilization and 2018 beneficial reuse. This method ensured existing flows would not exceed the 75% utilization goal. It is recognized that each WWTF is unique and items such as system upgrades and treatment, additional storage, system expansion, customer availability, etc., must be taken into consideration.

Figure 15, below, reflects the most recent (2018) reclaimed water flows, both beneficial and disposal. The size of the pie charts represents the total flow. Green represents disposal and purple represents beneficial use of reclaimed water. Facility names and associated 2018 flows can be found in Appendix B. Lines in the graphic show the location of the WWTF for the respective pie chart.

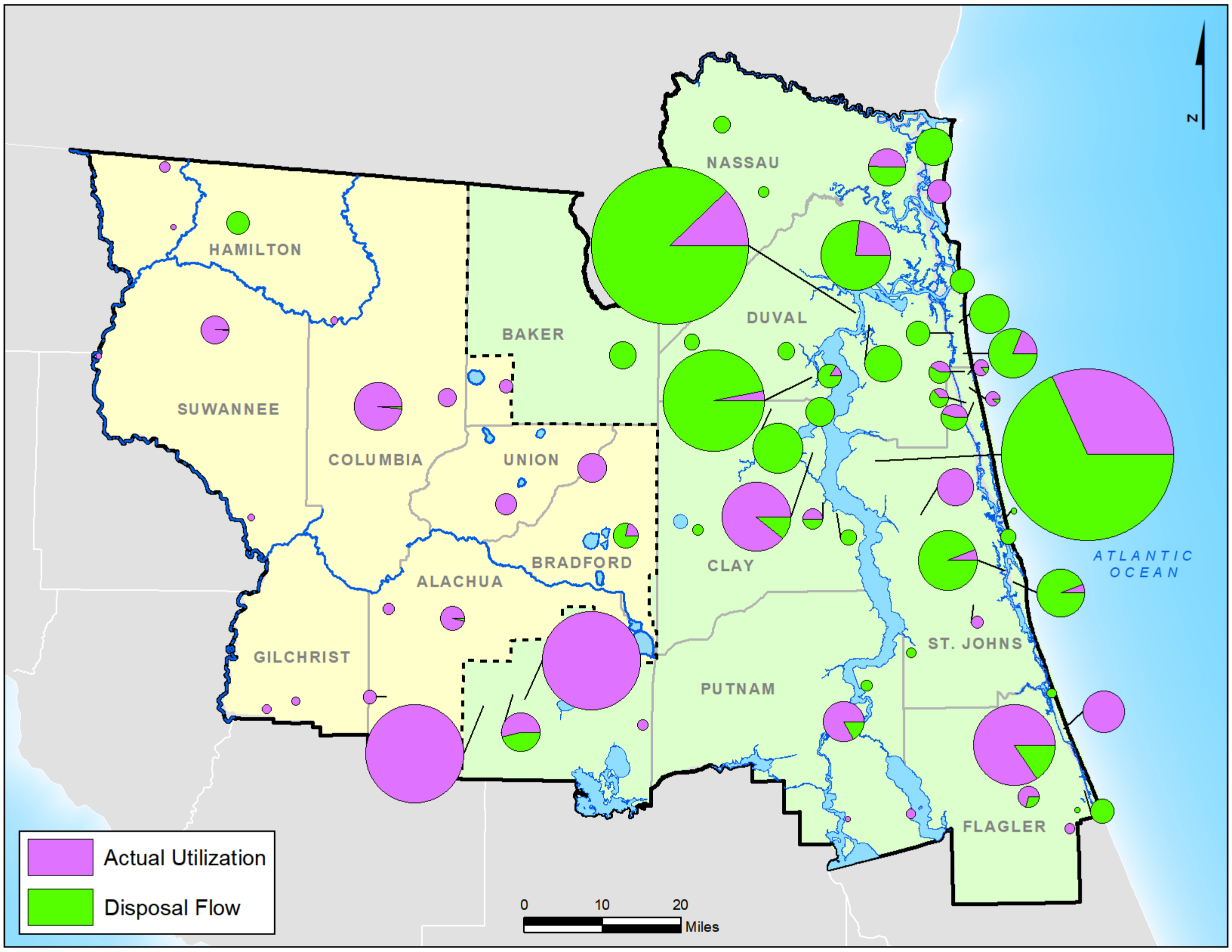

Figure 15. Summary of 2018 reclaimed water flows in the NFRWSP

Future Flows

The Districts identified WWTFs that could potentially receive additional sewered flow as a result of population growth. It was assumed that 95% of the population increase identified will receive sewer service and thereby return wastewater for treatment. It is acknowledged that the percentage of sewered population growth and resulting wastewater flows will vary for individual service providers due to a number of factors.

It was further assumed that the increased sewered population will generate approximately 73 gpcd of wastewater to the local WWTF (sources are identified in Appendix B). The estimated future flow was then multiplied by the DEP utilization goal of 75 % (DEP, 2003) to generate a 2045 quantity of potential new additional reclaimed water available for reuse.

The Districts recognize that only a portion of the existing and future wastewater treated for reuse is actually utilized to offset demands that would otherwise require the use of fresh groundwater. The amount of potable-offset that is typically achieved utility-wide is approximately 65% to 75% but can range from 50% to as much as 100%, depending on the type of use being replaced. The projected wastewater flows do not represent an amount equal to the demand reduction due to system losses, inefficiencies of its reuse customers, and timing of availability relative to demand.

Reclaimed water systems are unique to each utility, and the potential WWTF flow estimated for this NFRWSP may not necessarily represent the reclaimed water that could be used in projects. Current treatment processes, WWTF capacities, storage, and infrastructure have to be considered, which could potentially have a financial impact associated with the utilization of additional or currently available reclaimed water. Likewise, the Districts realize that future and existing utilization may be higher than estimated if the WWTF provided reclaimed water for reuse to more efficient customers.

For the purposes of this NFRWSP, the Districts also created a future reclaimed water scenario using the 2018 percent beneficial reuse utilization for existing and future flows, which would assume that no changes to current treatment processes are made (e.g., WWTF upgrade). In addition, the Districts recognize potential future wastewater flow could be less if additional residential indoor water conservation is achieved. For example, the American Water Works Association has noted on their website (Drinktap.org) that if all residences installed more efficient water fixtures and regularly checked for leaks, daily indoor water use and associated wastewater flows could potentially be reduced to 45.2 gpcd (Vickers, 2001).

The Districts estimated that increased future reclaimed water flows between 55 mgd and 103 mgd, as described above, could be used for beneficial purposes, potentially offsetting withdrawals from traditional water sources and predicted impacts within the NFRWSP area.

Water Conservation and Irrigation Efficiency

Current water demand projections and the water conservation potential for the NFRWSP area were calculated in an effort to gauge the future impact of water conservation. It is important to note that reductions in water use resulting from current and historical water conservation efforts are reflected in the 2045 water demand projections that were calculated for this plan. Detailed methodology for water conservation can be found in Appendix B.

For this NFRWSP, the Districts created two scenarios of potential water conservation for the public supply and DSS categories. Irrigation efficiency estimates for agriculture can be found in the FSAID VII Final Report (FDACS, 2020). For the remaining water use categories, the Districts employed the methodology developed during the Central Florida Water Initiative (CFWI) RWSP process (CFWI, 2020).

For the first scenario (low conservation potential) for the public supply and DSS categories, as well as all other categories excluding agriculture, the Districts used the low-end estimates of percent savings of conservation from the 2020 CFWI RWSP. For the first scenario, it is estimated that approximately 60 mgd of the projected demand for 2045 could be offset by water conservation.

For the second scenario (high conservation potential) for the public supply and DSS categories, the Districts analyzed the average 2014-2018 gross per capita rate for the entire NFRWSP area. If all public supply systems and DSS residents achieved the average 2014-2018 gross per capita rate for the NFRWSP area, water conservation could be increased by 23 mgd, from 60 to 83 mgd, potentially offsetting future demand (Table 2).

Table 2. 2045 water conservation and irrigation efficiency potential in mgd

Category	2045 Low Conservation Potential	2045 High Conservation Potential
Public Supply	20.2	38.9
Domestic Self-supply	1.6	5.8
Agriculture	30.2	30.2
Landscape/Recreation Self-supply	1.4	1.4
Commercial/Industrial/Institutional Self-supply	2.9	2.9
Power Generation Self-supply	3.8	3.8
Total	**60.1**	**82.9**

*Totals may be slightly different due to rounding of individual values.

Chapter 4: Assessment of Groundwater Conditions Associated with Future Water Demand Projections (NFSEG Modeling Simulations)

Purpose

The North Florida-Southeast Georgia regional groundwater flow model (NFSEG) is a modeling tool developed as a requirement of the Partnership (for more background information see: Charter for SJRWMD-SRWMD Cooperative Groundwater Model Development Project). For consistency in water supply planning, establishment and assessment of MFLs, and permitting decisions, the Partnership agreed to implement a joint regional groundwater flow model. The model covers the region depicted in Figure 16, which improves representation of the aquifer system on a regional basis. The current version of NFSEG is referred to as NFSEG v1.1 (Durden et al., 2019). More details about NFSEG v1.1 can be found in Appendix C. Model files are available for download and can be found at northfloridawater.com.

Hydrologic Assessment

NFSEG v1.1 represents the performance of a real system through a series of mathematical equations, which describe the physical processes that occur in that system; they represent a simplified version of the real world that may be used to predict the behavior of the modeled system under various conditions. Groundwater resources in the NFRWSP area include the SAS, the FAS, which is comprised of the UFA and LFA, and where present the ICU/IAS. See Chapter 1 for a description of these groundwater resources.

A primary controlling factor on flow within the FAS is the degree to which it is confined by the ICU. In the northeastern portion of the planning region, where the UFA is more confined, changes due to groundwater pumping are more likely to be expressed as cones of depression in the potentiometric surface. The UFA in the western portion of the planning region is very transmissive; therefore, as the geology transitions from confined areas to unconfined areas, changes due to groundwater pumping result in less drawdown and are expressed as reductions in spring flow.

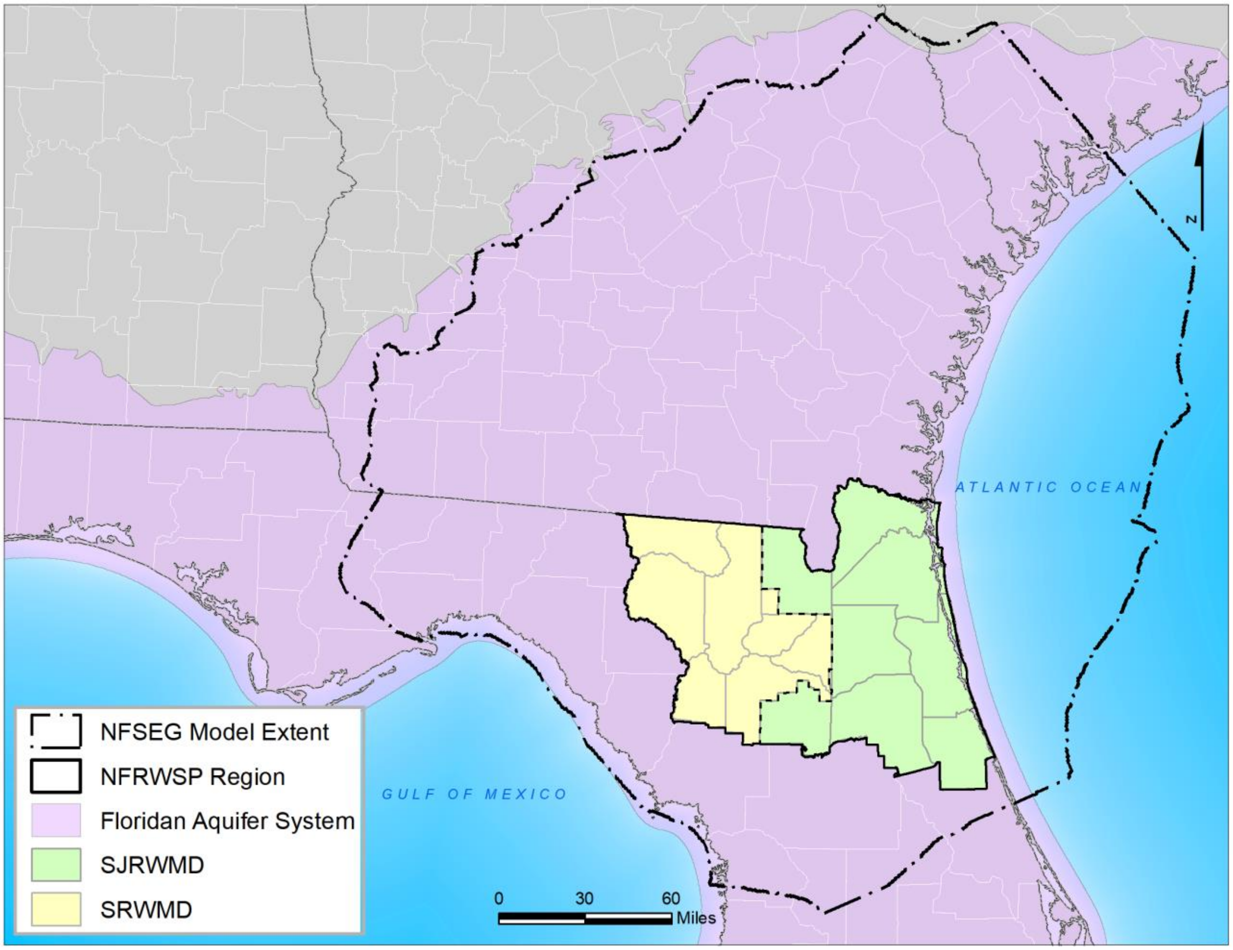

Figure 16. NFSEG model domain

Methodology

The Districts completed a water resource assessment using the NFSEG v1.1 to estimate the potential impacts of groundwater withdrawals on natural systems through the planning horizon. The assessment addressed the potential impacts of groundwater withdrawals with respect to wetlands, adopted MFLs (including OFSs), and waterbodies without MFLs in the NFRWSP area.

NFSEG v1.1 was used to simulate changes in groundwater levels and spring flows by comparing results between the simulated scenarios. Three scenarios were used for this assessment: “pumps off” (PO), the 2014-2018 average groundwater withdrawals, which is referred to as current pumping (CP), and 2045 projected groundwater withdrawals. The “pumps off” scenario does not represent a historic or predevelopment condition; rather, it approximates a condition where no groundwater pumping is taking place. The scenarios were utilized to estimate potential impacts of existing and projected groundwater withdrawals to natural systems.

Results

Figure 17 shows the change in potentiometric surface of the UFA from CP to the 2045 projection, which mostly indicates a decrease in UFA potentiometric surface. There are some small areas of rebound in Figure 17. In general, these rebounds are associated with reductions in pumping between CP and 2045. More information on the simulated change in groundwater levels can be found in Appendix C. The outputs from the modeled scenarios were used to assess potential impacts to water resources as described in Chapter 5.

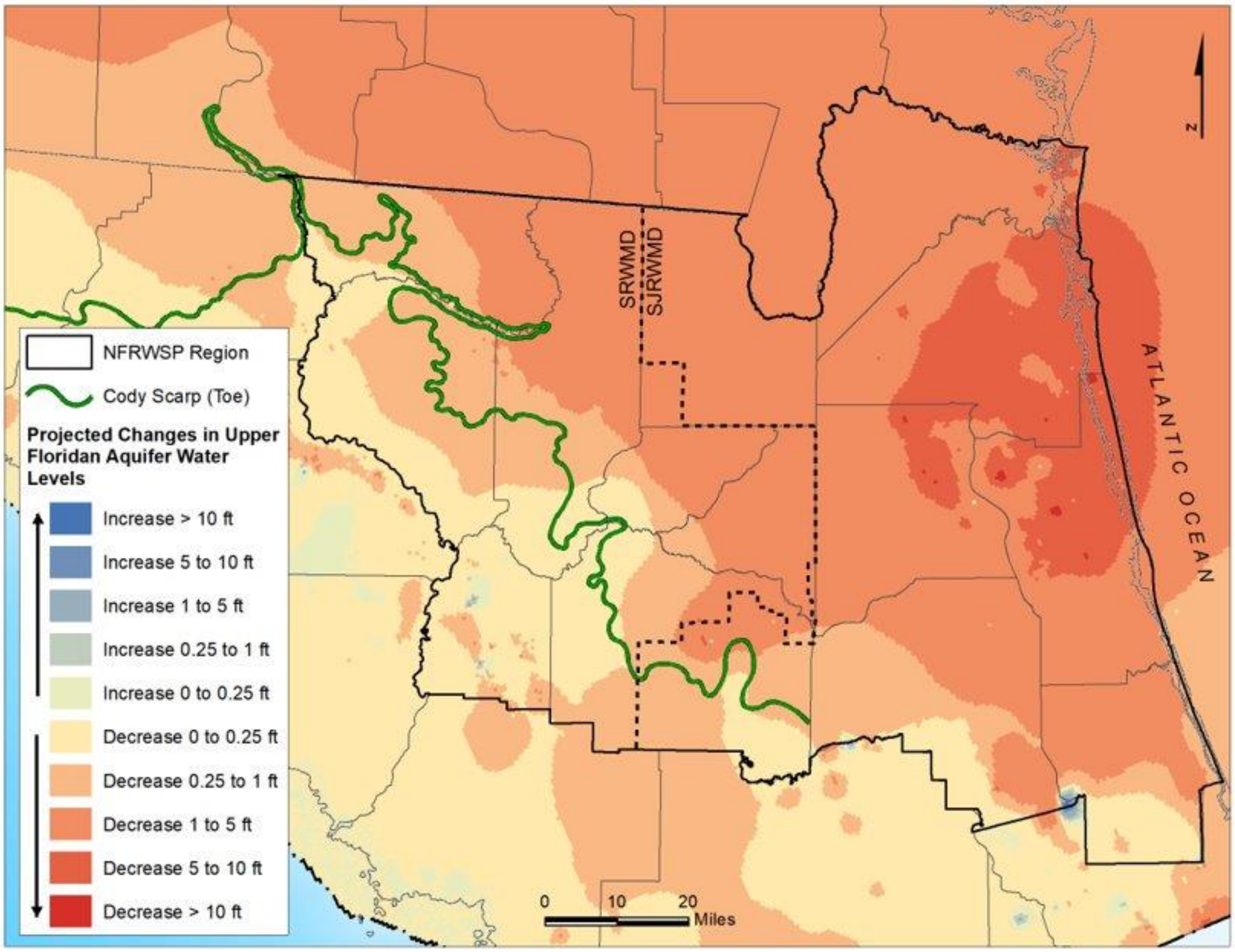

Figure 17. Changes in UFA water levels from CP to 2045 within the NFRWSP area

Chapter 5: Evaluation of Potential Effects of Projected Water Demand on Water Resources (Water Resource Assessment)

Purpose

The purpose of the NFRWSP water resource assessment is to evaluate the extent to which water resources and related natural systems may be impacted if 2045 projected future demands are met with groundwater within the NFRWSP area. The components that are evaluated in the NFRSWP water resource assessment include groundwater quality, MFLs, waterbodies without adopted MFLs, wetlands, and water reservations. Details regarding the water resource assessments can be found in Appendices D through H. The results of the assessment identified potential impacts that could occur absent implementation of projects and measures identified in Chapter 7 for the NFRWSP area. The results were also used to support the continued delineation of water resource caution areas (WRCA) in SJRWMD or water supply planning areas (WSPA) in SRWMD within the NFRWSP area (section 62-40.520(2), Florida Administrative Code (F.A.C.)).

Water Resource Assessment Methods and Results

Groundwater Quality (Saline Water Intrusion)

The FAS is the primary source of potable water in Northeast Florida. Groundwater withdrawals have resulted in lowering of water levels of the FAS within the region. Lower water levels in the aquifer create a potential for decreased water quality in the form of saltwater intrusion. Saltwater intrusion can occur from saltwater moving inland from the ocean (i.e., lateral intrusion) or from relic seawater migrating vertically (i.e., upconing).

An evaluation was conducted to assess the potential degradation of groundwater quality in the UFA from saltwater intrusion, resulting from groundwater withdrawals, which may constrain the availability of groundwater sources (see Appendix D for additional details). Saline water intrusion can affect the productivity of existing infrastructure, resulting in an increase in treatment costs and infrastructure costs. Although saline water intrusion poses a challenge for all affected water users, the issue is particularly acute for small public supply systems and self-supply water users that may have fewer options for infrastructure modifications.

The Florida Safe Drinking Water Act (sections 403.850 - 403.864, F.S.) directs DEP to develop rules that reflect national drinking water standards. Chapters 62-550, 62-555, and 62-560, F.A.C., were enacted to implement the requirements of the Florida Safe Drinking Water Act. More specifically, chapter 62-550, F.A.C., lists secondary drinking water standards (SDWS) for finished drinking water that include concentration limits for chloride (250 mg/L). Increasing trends in chloride concentrations can be an indicator of saline water intrusion because it is one of the principal chemical constituents in seawater and is unaffected by ion exchange.

Recent Chloride Concentration Map of the Upper Floridan Aquifer

A generalized map of 2016-2020 average chloride concentrations in the upper portions of the UFA was developed using all available SJRWMD and SRWMD (Districts) monitoring data and SJRWMD CUP production well water quality data (Figure 18).

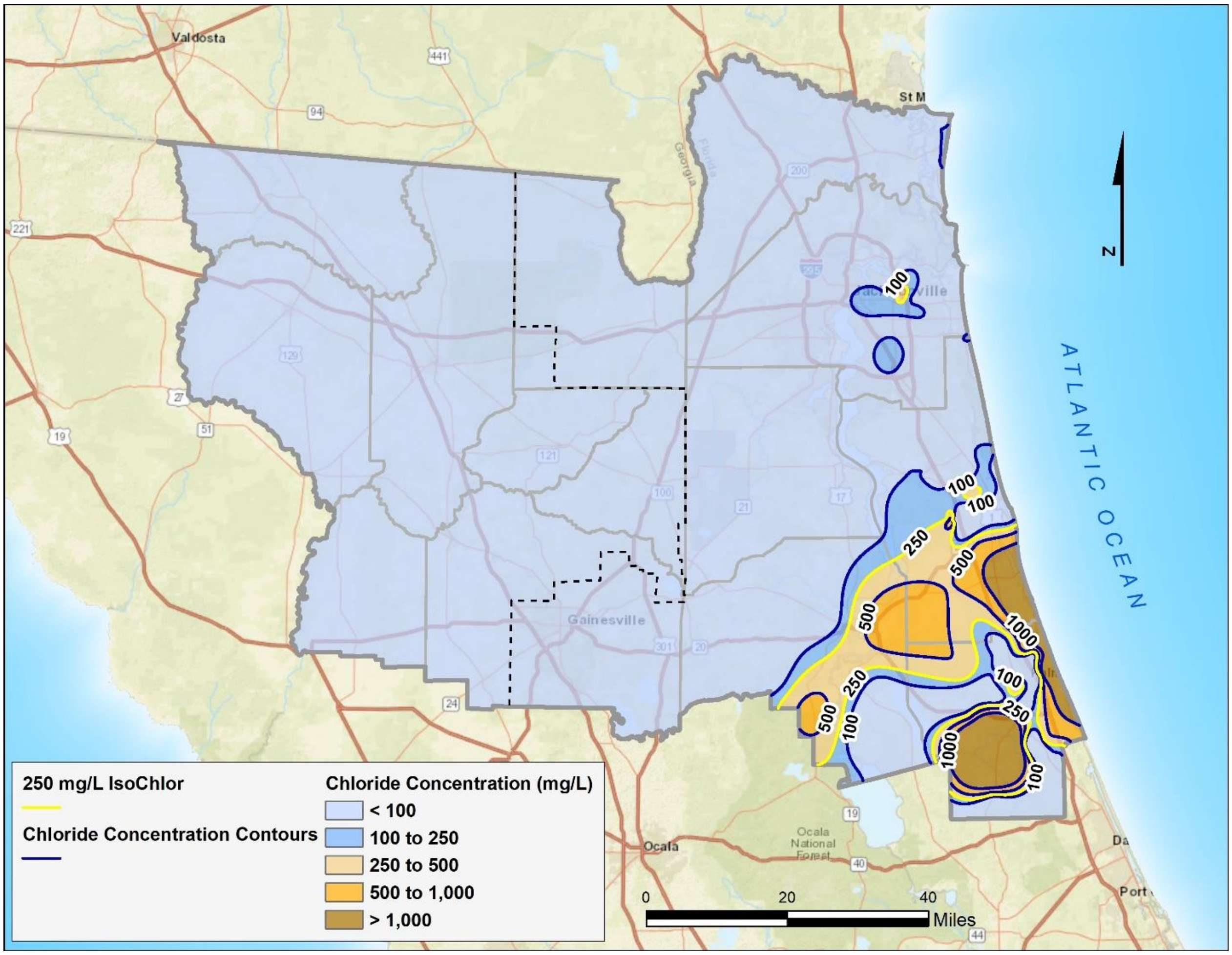

Figure 18. Average 2016-2020 chloride concentrations in UFA

Trends in Chloride Concentrations

In addition to the recent chloride concentration map of the region, which provides a regional representation of the current status of chloride concentrations in the UFA, trends in water quality data were also evaluated. Water quality trends indicate whether chloride concentrations are increasing or decreasing over time.

The movement of the saltwater interface was inferred by comparing the relative location of the 250 mg/L isochlor, a line of equal concentration, through time. Figure 19 below shows the average chloride concentration at five-year intervals from 2006 to 2020. The 250 mg/L isochlor is only present in the eastern portions of the NFRWSP area.

The status and trends in water quality were also considered using the Districts' 2021 annual assessment of groundwater quality from the regional monitoring well networks. The status and trends map shows the chloride concentration status in the UFA at the monitoring well locations (Figure 20).

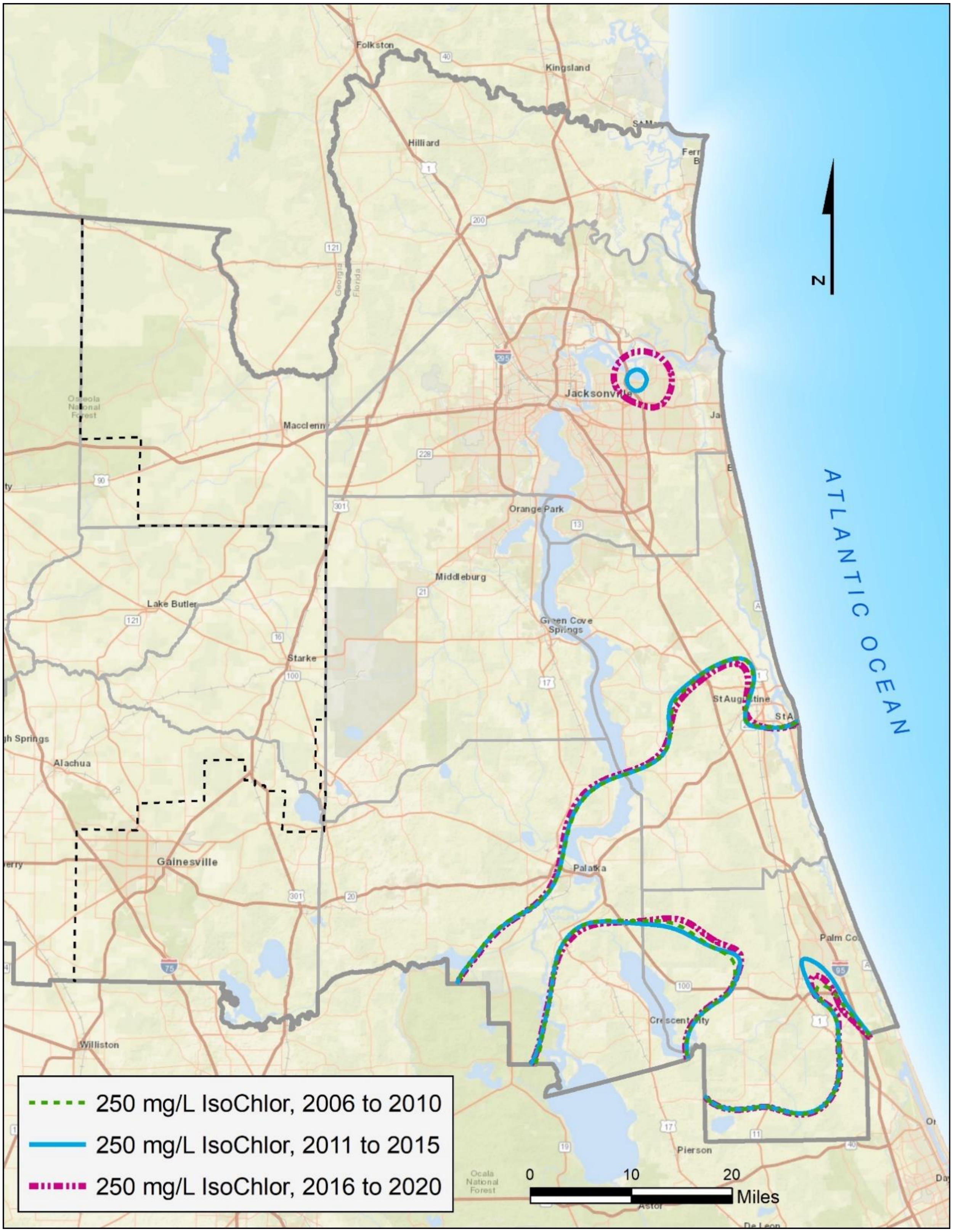

Figure 19. Movement of the saltwater interface in the UFA

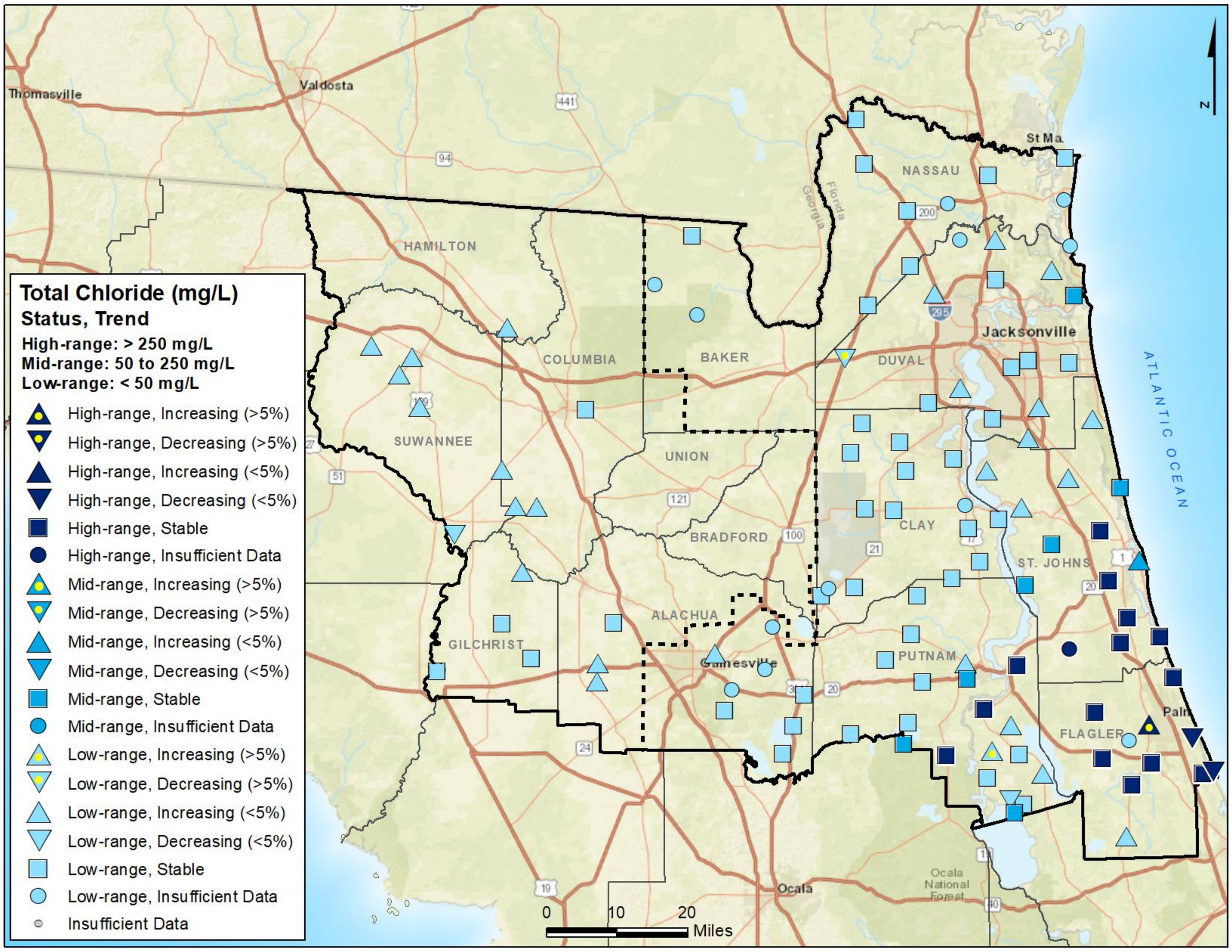

Figure 20. 2021 Annual assessment of Districts' monitoring networks – status and trends

Production Well Water Quality Assessment

Seventeen permitted production wells in the SJRWMD region were evaluated in the 2017 NFRWSP and were selected for reevaluation since they had shown statistically significant increasing trends in chloride concentrations.

Chloride concentrations from these wells were assessed over a period of record from 1998 to 2021. Of the 17 wells assessed, five wells showed an increasing trend, one well had a decreasing trend, and 11 wells were stable or showed no trend at all (Figure 21). Out of the five wells with increasing trends, four are located in central Duval County and one is located in southern Flagler County.

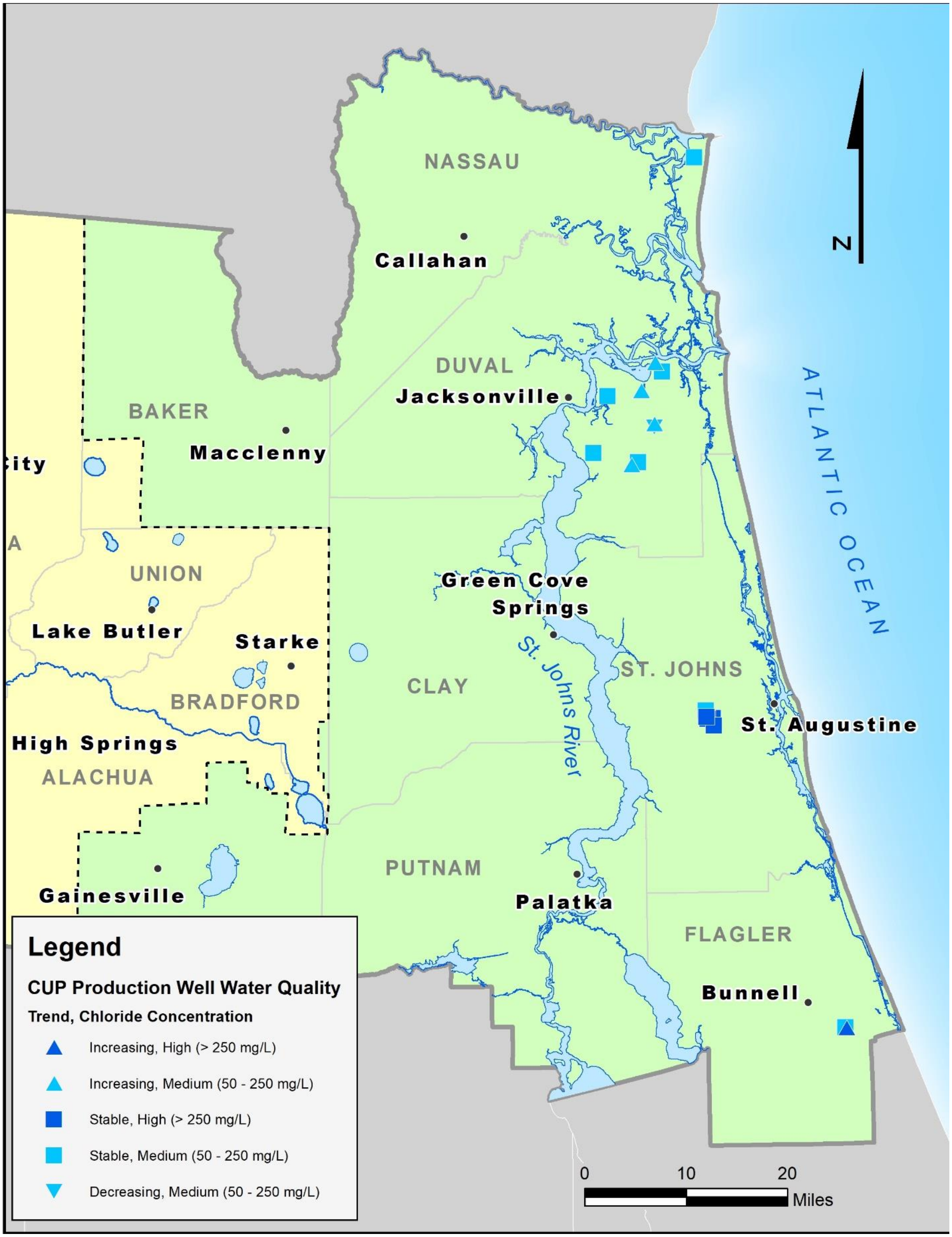

Figure 21. Production well water quality assessment – status and trends

Constraints and Recommendations

The results of the water quality assessment show that the majority of the NFRWSP area west of the St. Johns River had less than 100 mg/L of chloride and the majority of wells in the Districts' monitoring well networks showed no detectable change in chloride concentrations from 2006 to 2020. Areas of elevated chloride concentration were identified in the following counties: coastal Northeast Nassau, central Duval, southern St. Johns, eastern Putnam, and portions of Flagler. These areas of high chloride concentrations in the UFA are in areas of faulting and fracturing (Nassau and Duval counties) and areas of naturally occurring upward leakage of salty water through thin semi-confining units (St. Johns, eastern Putnam, and portions of Flagler counties) (Spechler, 2002).

A spatial analysis of movement of the 250 mg/L isochlor identified an area of potential upconing in central Duval County where isochlor results expanded from the 2011-2015 average as compared to the 2016-2020 average. Several CUP production wells in this region also showed increasing trends in chloride concentration which further suggests localized upconing. An assessment of the movement of the isochlor in southern St Johns, eastern Putnam and Flagler counties shows the isochlor has been stable since 2006 with no consistent movement in a landward direction near the coast. While the region is stable, one CUP production well in Flagler County showed an increasing trend in chloride concentrations.

When viewed in total, the primary conclusion of this analysis is that groundwater quality may constrain the availability of fresh groundwater in relatively limited geographic areas of the NFRWSP region east of the St. Johns River in portions of Duval, Nassau, St. Johns, Putnam, and Flagler counties. Results of the water quality analysis show that saltwater intrusion in Duval and St. Johns counties appeared to be localized due to upconing in response to withdrawals of groundwater from a single well and/or combined withdrawals from a wellfield. Flagler County showed indications of both localized upconing and possible lateral saltwater intrusion. Since the increasing chloride concentrations in Duval, St. Johns, and Flagler counties are at least partially related to upconing, these concerns are being managed through appropriate well construction, pumping operations, and reverse osmosis for treatment of brackish UFA water. The effectiveness of wellfield management is evident in the reassessment of the 17 CUP production wells that had increasing trends in the previous NFRWSP from 2017. Due to back-plugging and withdrawal reductions, only five of the 17 wells continue to have an increasing trend.

Wellfield management plans and the continued development of alternative water supplies such as reclaimed water, surface water, and brackish groundwater can reduce the potential for upconing and lateral intrusion. The SJRWMD Regulatory Program will continue to evaluate the potential for harmful upconing and lateral intrusion during CUP application review to ensure all permitting criteria are met prior to permit issuance. In addition, SJRWMD will investigate instances of unforeseen harmful water quality impacts potentially resulting from consumptive uses of water, and if verified, will require mitigation by the responsible permittee(s). Additionally, a density-dependent water quality model will be developed for this region to assess saltwater intrusion due to sea level rise (SLR) and other climate change impacts such as rainfall and evapotranspiration (ET).

Minimum Flows and Levels

Section 373.042, F.S., directs DEP or the districts to establish MFLs for surface watercourses, groundwater levels, and surface water levels. This encompasses rivers, springs, and lakes in the NFRWSP area. MFLs represent the flow(s) and/or level(s) at which further withdrawals would be significantly harmful to the water resources or ecology of the area. As such, MFLs provide quantitative metrics for water resource assessments and criteria for evaluating CUP/WUP applications. If analyses determine that a waterbody is not currently meeting its MFLs and/or is projected to fall below its MFLs during a 20-year planning horizon, that waterbody is said to be in recovery or prevention, respectively, with regards to its MFL. In both cases, the districts are required to "expeditiously adopt a recovery or prevention strategy" and either achieve recovery to the established MFL "as soon as practicable" or prevent the flow or level from falling below the established MFL (subsection 373.0421(2), F.S.).

Each district is required to submit to DEP an annual priority list and schedule for the establishment of MFLs (subsection 373.042(3), F.S.) (SRWMD, 2022; SJRWMD, 2022). The priority lists are based on the importance of waters to the state or region and the existence of, or potential for, significant harm to the water resources or ecology of the region.

Information on all the adopted MFLs within the Districts can be found in chapters 40B-8 and 40C-8, F.A.C., rule 62-42.300, F.A.C., and emergency rule 40BER-17-01, F.A.C. Within the NFRWSP area, SJRWMD assessed the status of 20 lakes with MFLs and SRWMD assessed the status of three lakes, four river gages, and 20 springs (see Appendix E for additional details).

MFLs were evaluated to determine whether adopted river or spring flows and/or lake levels would be achieved if all projected future demands are met with groundwater. The evaluation assessed waterbodies at CP which is the average of 2014-2018 water use, and projected groundwater withdrawals at the planning horizon (2045). Spring flow, river flow, the potentiometric surface or lake levels were used as appropriate to evaluate the changes between the PO, CP, and the 2045 projected groundwater withdrawal scenario. More detailed information on the methodology and results can be found in Appendix F.

Rivers and Springs with MFLs

In the SRWMD, the Upper Santa Fe River MFLs were established in 2007 (rule 40B-8.061, F.A.C.). The predicted reductions in flow between the PO and the 2045 projection at both MFL reaches of the Upper Santa Fe River were evaluated. These flow reductions were then compared to the available water as determined by the MFLs to determine whether the MFLs were achieved. The analysis indicates that the Upper Santa Fe River MFLs will be met at the 2045 planning horizon based on the projected increase in demand within the NFRWSP area (Table 3).

There are four OFS on the Suwannee River that are currently under an emergency rule (rule 40BER 17-01, F.A.C.) which went into effect in 2017. The springs covered under this emergency rule are Falmouth Spring, Lafayette Blue Spring, Peacock Springs, and Troy Spring. The existing emergency rule shows that these four MFLs are being met. The analysis conducted for the 2023 NFRWSP, identified that Lafayette Blue Spring and Falmouth Spring as being in prevention. However, these four OFS are on the SRWMD 2022 MFL Priority List, and technical work is underway to establish the updated MFLs (SRWMD, 2022). Upon finalization of the updated MFLs, the status of these OFS on the Suwannee River will be reassessed.

The minimum flows for the Lower Santa Fe and Ichetucknee Rivers and associated priority springs (LSFI) were evaluated in 2014 and ratified by the legislature in 2015. Based on that evaluation, the LSFI are in recovery (rule 62-42.300, F.A.C.). For planning purposes, the status as of 2015 for these MFL waterbodies is incorporated from the adopted Lower Santa Fe River Basin Recovery Strategy (LSFRB Recovery Strategy (Appendix L). Projected future demands, as indicated in the Sufficiency Analysis in Chapter 6, can be met with appropriate management, continued diversification of water supply sources, water conservation, and implementation of identified water supply and water resource development projects. The minimum flows for the LSFI are in the process of being reevaluated. The reevaluation may result in new or revised MFLs for the LFSI waterbodies which upon status assessment may be in prevention or recovery. In such a case, the project lists in the NFRWSP will be updated as appropriate, to include the projects identified in the newly adopted recovery or prevention strategy. Projects are continuing to be developed for implementation in the planning region.

The SJRWMD does not have any river or spring MFLs in the NFRWSP area.

Lakes with MFLs

There were 23 lakes with adopted MFLs assessed as part of this planning effort; three lakes are located in the SRWMD region, and 20 are located in the SJRWMD region. The analysis indicated that 20 of the lakes are currently meeting and are projected to meet their MFLs in 2045.

In the SRWMD, the Lake Butler MFL was established in 2021, and the Lake Hampton and Lake Santa Fe MFLs were established in 2023 (rule 40B-8.121, F.A.C.). The predicted reduction in water levels between PO to CP and PO to 2045 were evaluated. It was determined that all three lakes are currently meeting and are predicted to meet their MFLs in the future.

In the SJRWMD, Lakes Brooklyn and Geneva were determined to be in recovery in 2020 resulting in adoption of the Recovery Strategy for the Implementation of Lakes Brooklyn and Geneva Minimum Levels (B-G Recovery Strategy), in 2021 (Appendix M). The 10 mgd Black Creek WRD Project, identified in the B-G Recovery Strategy will provide regional water resource benefits in the NFRWSP area. The assessment of lakes with MFLs also shows that Lakes Brooklyn and Geneva will continue to be in recovery because they are currently not meeting their respective MFLs and are projected to not meet their MFLs in 2045. Lake Cowpen is in Prevention because although it is currently meeting its MFLs under the CP withdrawal condition, it is projected to not meet its MFLs by 2045. However, the impacts for Lakes Brooklyn, Geneva and Cowpen will be addressed by the Black Creek WRD Project, which is under construction. The remaining 17 lakes in the SJRWMD are meeting their MFLs and are projected to meet their MFLs in the future.

Table 3 shows a summary of the results of the MFLs assessment under the CP and 2045 withdrawal conditions. Figure 22 and Figure 23 below shows maps of the locations and names of the waterbodies assessed as well as the results for each waterbody.

Table 3. Status of assessed MFLs within the NFRWSP

Waterbody Type	Waterbody Name	County/Basin	WMD	Status at CP	Status in 2045
Lake	Banana	Putnam	SJR	Met	Met
Lake	Bell	Putnam	SJR	Met	Met
Lake	Brooklyn[2]	Clay	SJR	Recovery	Recovery
Lake	Broward	Putnam	SJR	Met	Met
Lake	Como	Putnam	SJR	Met	Met
Lake	Cowpen[2]	Putnam	SJR	Met	Prevention
Lake	Dream Pond	Putnam	SJR	Met	Met
Lake	Geneva[2]	Clay	SJR	Recovery	Recovery
Lake	Georges	Putnam	SJR	Met	Met
Lake	Gore	Flagler	SJR	Met	Met
Lake	Grandin	Putnam	SJR	Met	Met
Lake	Little Como	Putnam	SJR	Met	Met
Lake	Lochloosa	Alachua	SJR	Met	Met
Lake	Orio	Putnam	SJR	Met	Met
Lake	Silver	Putnam	SJR	Met	Met
Lake	Stella	Putnam	SJR	Met	Met
Lake	Swan	Putnam	SJR	Met	Met
Lake	Tarhoe	Putnam	SJR	Met	Met
Lake	Trone	Putnam	SJR	Met	Met
Lake	Tuscawilla	Alachua	SJR	Met	Met
Lake	Butler	Union	SR	Met	Met
Lake	Hampton	Bradford	SR	Met	Met
Lake	Santa Fe	Alachua	SR	Met	Met

Waterbody Type	Waterbody Name	County/Basin	WMD	Status at CP	Status in 2045
River	Ichetucknee River at U.S. Highway 27[1]	Ichetucknee River	SR	Recovery	Recovery
River	Santa Fe River at Worthington Springs	Upper Santa Fe River	SR	Met	Met
River	Santa Fe River near Ft. White[1]	Lower Santa Fe River	SR	Recovery	Recovery
River	Santa Fe River Near Graham	Upper Santa Fe River	SR	Met	Met
Spring	Blue Hole Spring (OFS)[1]	Ichetucknee River	SR	Recovery	Recovery
Spring	COL101974 – Unnamed Spring[1]	Lower Santa Fe River	SR	Recovery	Recovery
Spring	Devil's Ear Spring (OFS)[1]	Lower Santa Fe River	SR	Recovery	Recovery
Spring	Devil's Eye Spring (OFS)[1]	Ichetucknee River	SR	Recovery	Recovery
Spring	Falmouth Spring (OFS)	Middle Suwannee River	SR	Met	Prevention
Spring	Grassy Hole Spring (OFS)[1]	Ichetucknee River	SR	Recovery	Recovery
Spring	Hornsby Spring (OFS)[1]	Lower Santa Fe River	SR	Recovery	Recovery
Spring	Ichetucknee Headspring (OFS)[1]	Ichetucknee River	SR	Recovery	Recovery
Spring	July Spring[1]	Lower Santa Fe River	SR	Recovery	Recovery
Spring	Lafayette Blue Spring (OFS)	Middle Suwannee River	SR	Met	Prevention
Spring	Mill Pond Spring (OFS)[1]	Ichetucknee River	SR	Recovery	Recovery
Spring	Mission Spring (OFS)[1]	Ichetucknee River	SR	Recovery	Recovery
Spring	Peacock Springs (OFS)	Middle Suwannee River	SR	Met	Met
Spring	Poe Spring (OFS)[1]	Lower Santa Fe River	SR	Recovery	Recovery
Spring	Rum Island Spring[1]	Lower Santa Fe River	SR	Recovery	Recovery
Spring	Santa Fe River Rise[1]	Lower Santa Fe River	SR	Recovery	Recovery
Spring	Treehouse Spring (OFS)[1]	Lower Santa Fe River	SR	Recovery	Recovery
Spring	Troy Spring (OFS)	Middle Suwannee River	SR	Met	Met

[1]The status of the MFLs for the LSFI MFLs was incorporated from the recovery strategy adopted in 2015. All other MFL waterbodies were assessed using the PO, CP, and 2045 model scenarios.
[2]Impacts to Lakes Brooklyn, Geneva and Cowpen will be addressed by the Black Creek Project, which is under construction. When this project is fully implemented these lakes will no longer be in recovery or prevention, respectively.

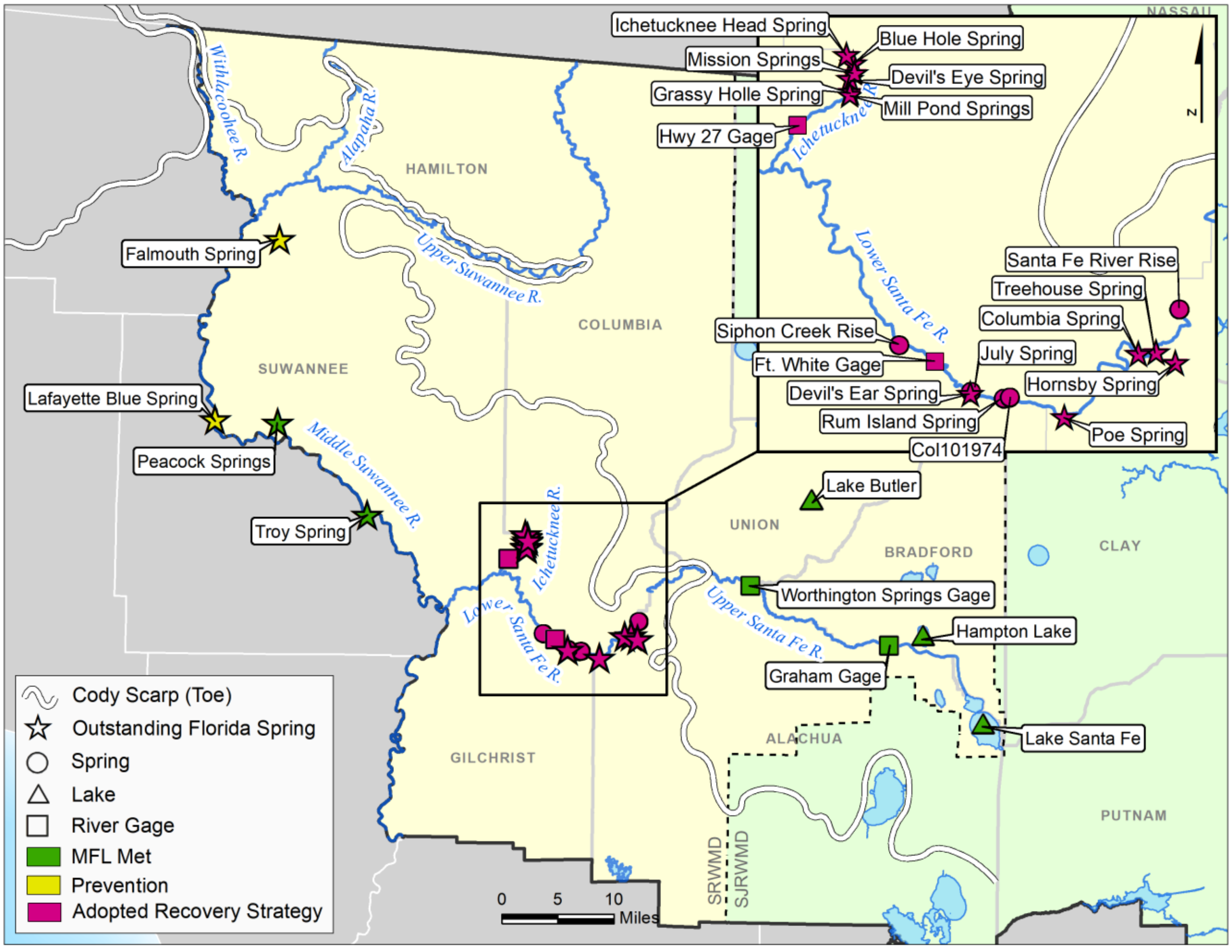

Figure 22. SRWMD MFL assessment results

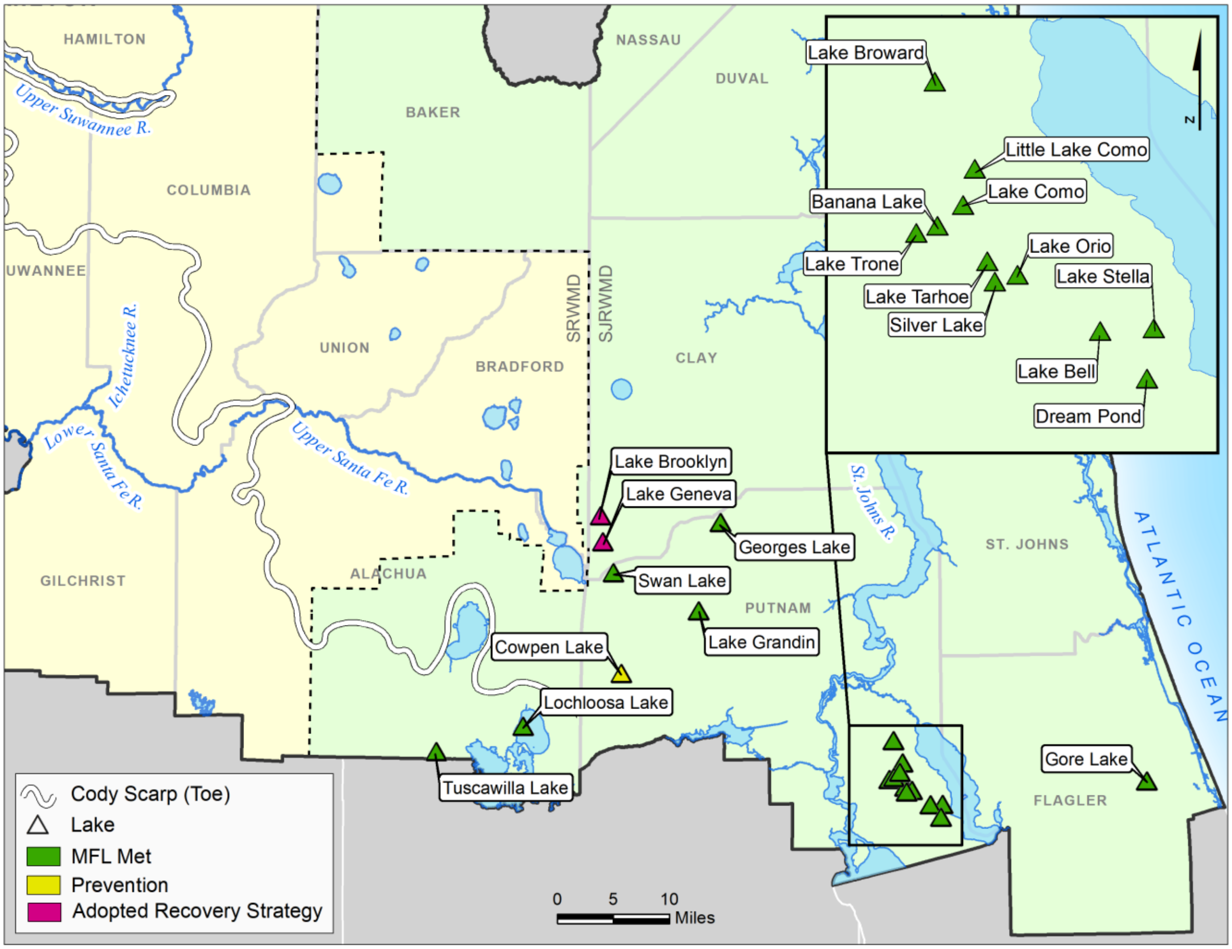

Figure 23. SJRWMD MFL assessment results

Minimum Flows and Levels Prevention and Recovery Strategies

Regional Water Supply Plans shall include prevention and recovery strategies which have been developed and approved pursuant to subsection 373.0421(2) and paragraph 373.709(2)(c), F.S.

The LSFRB Recovery Strategy was ratified by the Legislature in 2015 (rule 62-42.300 F.A.C.) (Appendix L). The minimum flows for the LSFI are in the process of being reevaluated. Upon completion of the reevaluation, any required recovery or prevention strategy will be appended to this Plan.

As mentioned above, the B-G Recovery Strategy, was approved by the SJRWMD Governing Board on July 13, 2021, and is included in Appendix M.

Waterbodies without Adopted Minimum Flows and Levels

The purpose of this assessment is to provide a screening evaluation of the potential for water resource impacts within the planning area where MFLs have not been adopted.

There are six river reaches and 36 springs assessed. More details on this analysis can be found in Appendix G.

Baseline conditions for the lakes, rivers and springs were calculated using the PO scenario. Flows and water levels under the baseline condition were compared to modeled flows and water levels under the 2045 scenario. If projected demands are met with groundwater, waterbodies that showed more than a 10% decrease in flow from a no-pumping condition were identified. The 10% reduction in flow does not necessarily correspond to an ecological threshold beyond which significant harm would occur, but it does highlight areas where resource constraints may occur. The MFL development process accounts for the unique hydrologic and ecological conditions of individual springs, and links changes in flow to a quantitatively significant harm threshold. Subsequent versions of the NFRWSP will include any newly adopted or reevaluated MFLs.

Rivers and Springs without Adopted MFLs

Of the 42 waterbodies assessed, there are 20 waterbodies that are meeting and 22 waterbodies that are exceeding the 10% screening criteria at 2045 (Table 4). Figure 24 & Figure 25 show the names and locations of the waterbodies assessed and displays the results of the assessment. Most of the waterbodies assessed in SRWMD are scheduled for MFL development. The timing of this development can be found in the most current, approved priority list (SRWMD, 2022).

In the SRWMD region, there are 15 springs and two river gages that are meeting the 10% screening criteria in 2045. Out of the 15 springs, 14 of the springs are located on the Middle Suwannee River system and one is on the Lower Santa Fe River. The two river gages are located on the Alapaha River and the Upper Suwannee River (Table 4).

Conversely, there are 16 springs and four river gages that exceed the screening criteria in 2045. Out of the 16 springs, 15 are located on the Suwannee River, with nine on the Upper Suwannee and six on the Middle Suwannee. There is one spring located on the Upper Santa Fe River. Three of the river gages are on the Suwannee River with one being on the Upper Suwannee and the other two located on the Middle Suwannee River. The fourth gage is located on the Lower Santa Fe River (Table 4).

Of the five springs assessed in the SJRWMD, three springs meet the screening criteria, which are Croaker Hole Spring, Satsuma Spring, and Welaka Spring. The two springs that exceed the screening criteria at 2045 are Beecher Spring and Green Cove Spring. The elevated spring pool levels resulting from retaining walls at both spring locations, coupled with limited discharge data, makes evaluation of impacts to these springs challenging (Rosenau et al., 1977 and Scott et al., 2004). During the implementation phase of the NFRWSP, additional investigations will be initiated to evaluate the impact of elevated spring pool levels on spring flows.

Lakes without Adopted MFLs

There were no lakes without adopted MFLs assessed in the NFRWSP area.

Table 4. Waterbodies without adopted MFLs assessment summary

Waterbody Type	Waterbody Name	County/Basin	WMD	Exceeds Screening Criteria at 2045
River	Alapaha River near Jennings	Alapaha River	SR	No
Spring	Alapaha River Rise	Upper Suwannee River	SR	Yes
Spring	Allen Mill Pond Springs	Middle Suwannee River	SR	No
Spring	Anderson Spring	Middle Suwannee River	SR	No
Spring	Beecher Spring	Putnam	SJR	Yes
Spring	Bell Spring	Middle Suwannee River	SR	No
Spring	Blue Sink Spring (Suwannee)	Upper Suwannee River	SR	Yes
Spring	Blue Spring at Boys Ranch	Upper Suwannee River	SR	Yes
Spring	Bonnet Spring	Middle Suwannee River	SR	No
Spring	Branford Spring	Middle Suwannee River	SR	Yes
Spring	Charles Spring	Middle Suwannee River	SR	Yes
Spring	Croaker Hole Spring	Putnam	SJR	No
Spring	Gilchrist Blue Spring	Lower Santa Fe River	SR	No
Spring	Green Cove Spring	Clay	SJR	Yes
Spring	Guaranto Spring	Middle Suwannee River	SR	Yes
Spring	Hamilton Unnamed Spring (Ham1023971)	Upper Suwannee River	SR	Yes
Spring	Hart Springs	Middle Suwannee River	SR	No
Spring	Holton Creek Rise	Upper Suwannee River	SR	Yes
Spring	Lime Sink Rise	Middle Suwannee River	SR	Yes
Spring	Lime Spring	Middle Suwannee River	SR	Yes
Spring	Little River Spring	Middle Suwannee River	SR	No
Spring	Otter Spring	Middle Suwannee River	SR	No
Spring	Pothole Spring	Middle Suwannee River	SR	No
Spring	Rock Bluff Springs	Middle Suwannee River	SR	No
Spring	Rock Sink Spring	Middle Suwannee River	SR	No
Spring	Royal Spring	Middle Suwannee River	SR	No
Spring	Ruth Spring	Middle Suwannee River	SR	No
River	Santa Fe River at US HWY 441 near High Springs	Lower Santa Fe River	SR	Yes
Spring	Santa Fe Spring	Upper Santa Fe	SR	Yes
Spring	Satsuma Spring	Putnam	SJR	No
Spring	Seven Sisters Spring	Upper Suwannee River	SR	Yes
Spring	Stevenson Spring	Upper Suwannee River	SR	Yes
Spring	Suwanacoochee Spring	Middle Suwannee River	SR	Yes
River	Suwannee River at Branford	Middle Suwannee River	SR	Yes

Waterbody Type	Waterbody Name	County/Basin	WMD	Exceeds Screening Criteria at 2045
River	Suwannee River at Ellaville	Middle Suwannee River	SR	Yes
River	Suwannee River at Suwannee Springs	Upper Suwannee River	SR	Yes
River	Suwannee River at White Springs	Upper Suwannee River	SR	No
Spring	Suwannee Springs	Upper Suwannee River	SR	Yes
Spring	Telford Spring	Middle Suwannee River	SR	No
Spring	Turtle Spring	Middle Suwannee River	SR	No
Spring	Welaka Spring	Putnam	SJR	No
Spring	White Sulphur Springs	Upper Suwannee River	SR	Yes

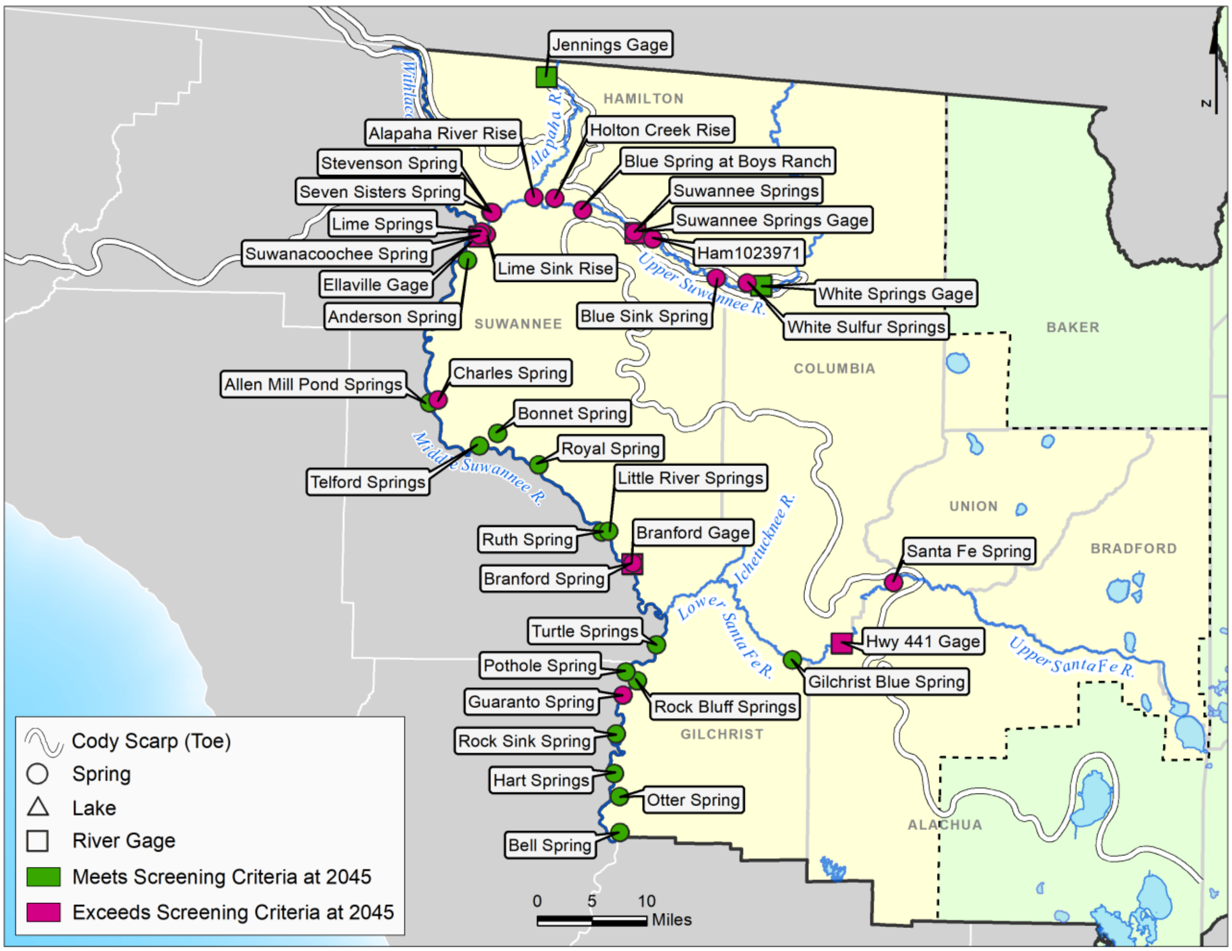

Figure 24. SRWMD waterbodies without adopted MFLs assessment results

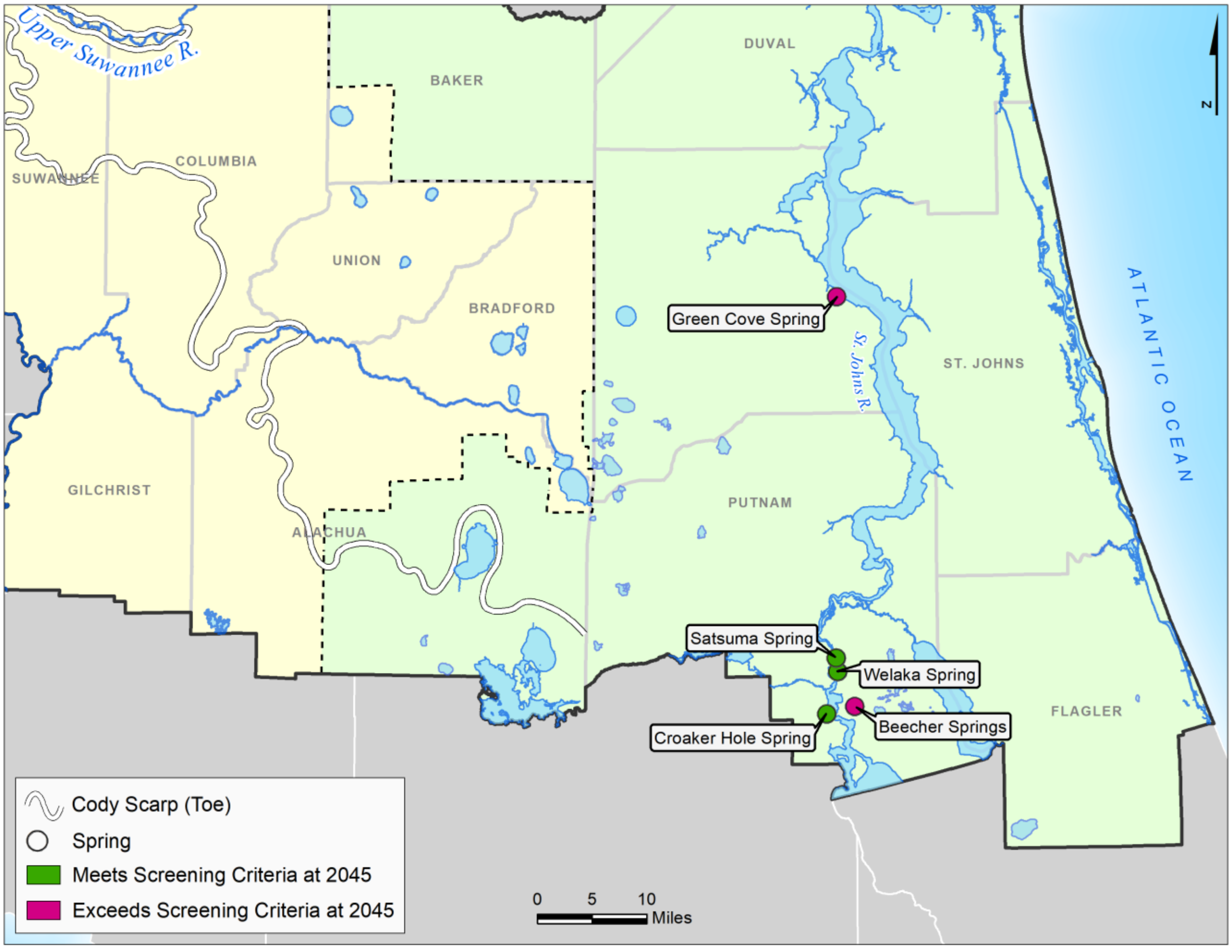

Figure 25. SJRWMD waterbodies without adopted MFLs assessment results

Wetlands

Wetland vegetative communities can be affected by water level changes in the SAS due to unique combinations of soil type, vegetation species and hydrogeology. The wetlands assessment estimated the potential for adverse change to wetlands that may occur due to the projected increase in groundwater withdrawal between CP and 2045 projections. Factors other than groundwater withdrawals (e.g. modification of surface water hydrology) can result in significant alterations of wetlands relative to predevelopment conditions, but this wetland analysis is focused exclusively on assessing the potential for adverse changes to existing wetlands resulting from projected increases in groundwater withdrawals. More information on this assessment can be found in Appendix H.

The potential for adverse change to wetlands in the NFRWSP was assessed using an updated version of the Kinser-Minno method (Kinser and Minno, 1995; Kinser et. al., 2003; Lort et. al., 2022). The Kinser-Minno method is a GIS-based model that forecasts the potential for adverse change to wetlands using soil permeability, sensitivities of plant communities to dewatering, depth to the UFA potentiometric surface (in unconfined areas), depth to the water table or surficial aquifer system (in confined areas), and a digital elevation model. This method categorizes the potential for adverse wetland change as low, moderate, or high, but only the moderate and high potentials for adverse change were considered in the analysis because the low potential for adverse wetland change classification indicates that plants are drought tolerant or that soils are not susceptible to dewatering (Kinser & Minno,1995).

Out of over 900,000 acres assessed in the NFRWSP area, the wetland assessment identified 8,129 acres with a moderate or high potential for adverse change if projected demands are met with groundwater based on changes in groundwater levels between CP and 2045 projected withdrawals (Figure 26, Table 5). Changes to wetlands from groundwater pumping are primarily addressed via the Districts' regulatory programs and through the development of WSD and WRD projects.

Table 5. Wetland acreage identified as having moderate or high potential for adverse change to wetland function between CP and 2045 projected pumping

County	District	Potential Adverse Wetland Change (acres)
Alachua	SJR	557
Alachua	SR	168
Baker	SJR	0
Baker	SR	0
Bradford	SJR	0
Bradford	SR	0
Clay	SJR	494
Columbia	SR	68
Duval	SJR	0
Flagler	SJR	4,201
Gilchrist	SR	1,288
Hamilton	SR	157
Nassau	SJR	62
Putnam	SJR	309
St. Johns	SJR	680
Suwannee	SR	147
Union	SR	0
Total	NA	**8,129**

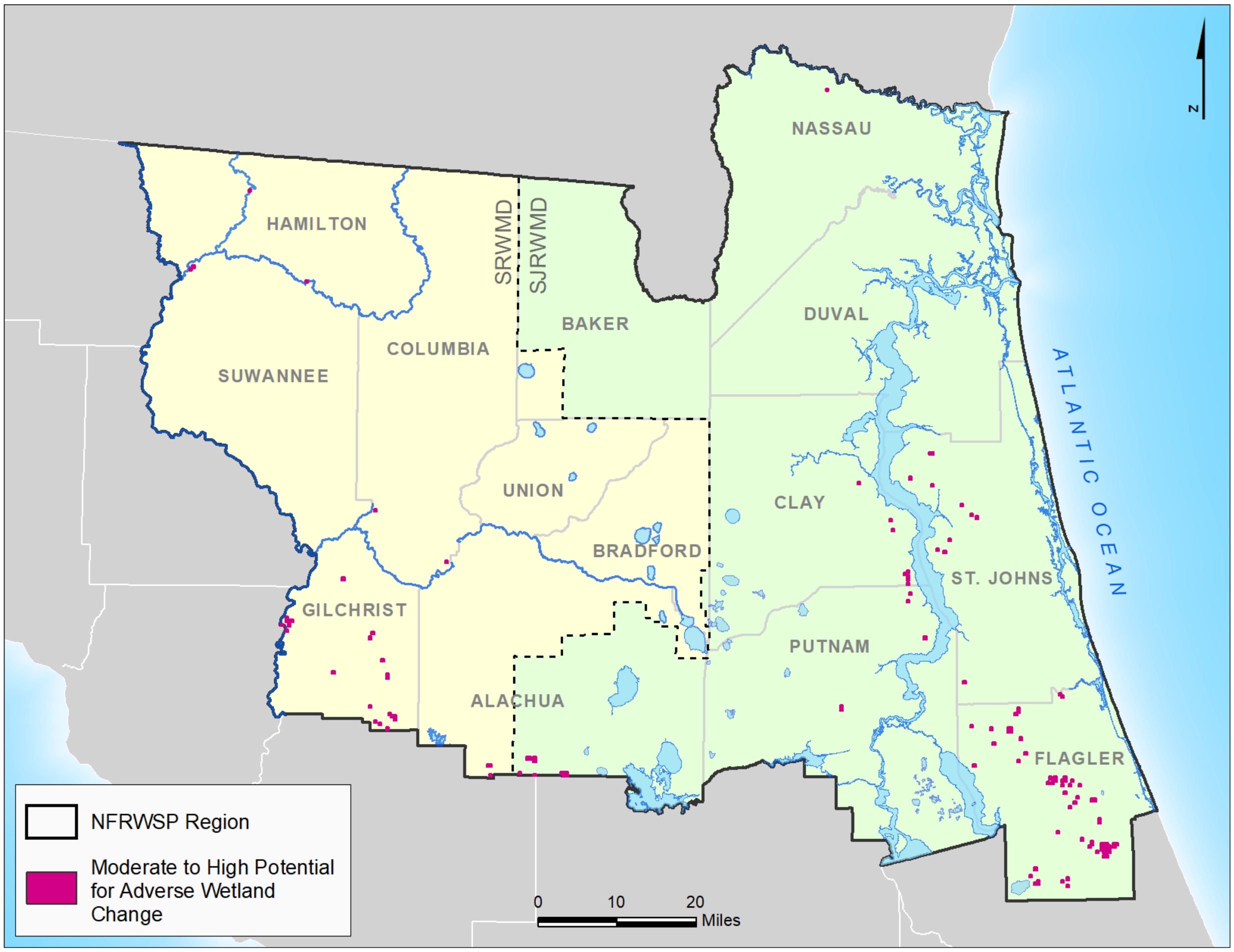

Figure 26. Locations with moderate to high potential for adverse change to wetlands

Reservations

Subsection 373.223(4), F.S., authorizes the Districts and DEP to reserve water from use by permit applicants for the protection of fish and wildlife or public health or safety. When a water reservation is in place, volume, and timing of water quantities at specific locations are protected and maintained for the natural system ahead of new consumptive uses. The only water reservation in the NFRWSP area was adopted by the SJRWMD Governing Board in 1994 (rule 40C-2.302, F.A.C.). A portion of flow in Prairie Creek was reserved to support fish and wildlife in Paynes Prairie. Historically, Prairie Creek discharged into Paynes Prairie. However, in the 1920’s flow into Paynes Prairie was diverted through Camps Canal into Orange Lake to provide better conditions for grazing cattle. When the State of Florida purchased Paynes Prairie in the 1970s, the Camps Canal dike was breached to allow flow back into Paynes Prairie in Alachua County. The water reservation was adopted to balance the need to restore flow to Paynes Prairie while also retaining a portion of flow that was being artificially diverted to Orange Lake through Camps Canal. Approximately half of the flow from Prairie Creek is reserved for Paynes Prairie with the remainder allowed to divert to Orange Lake. In 2019, the District managed a project to replace the old structure on Camps Canal that diverted water in Paynes Prairie. The new structure matches the capacity of the old structure and includes three new 54-inch aluminum culverts, gates, concrete headwalls and upgraded guardrails, handrails, and fencing.

Resiliency

Rising sea levels and changing climate pose a threat to natural and manmade systems, including infrastructure that supports access to fresh water. Florida is vulnerable to the effects of climate change and SLR due to its unique climate, hydrology, geology, topography, natural resources, and dense coastal populations. To better plan for the potential effects of these future changes, the Districts conducted a planning level assessment to determine if fresh water supplies in the NFRWSP region are likely to become constrained due to flooding from SLR throughout the planning horizon (Appendix I).

As noted previously in this chapter, localized saline water intrusion from upconing is already an issue for some coastal communities in North Florida. In the future, a density-dependent water quality model will be developed for the region to assess saltwater intrusion due to SLR and climate changes such as rainfall and evapotranspiration.

Based on guidance established in 2021 by the Resilient Florida Grant Program (section 380.093, F.S.), the assessment evaluated the effects of both intermediate-low and intermediate-high SLR projections reported by the National Oceanic and Atmospheric Administration (NOAA) for the year 2050 (Sweet et al., 2017). The spatial extent of mean higher high water (MHHW) surface inundation resulting from the two SLR scenarios, as modeled by the University of Florida's GeoPlan Center, was intersected with the locations of current water treatment plants (WTP), wastewater treatment plants (WWTP), and permitted consumptive use wells to identify vulnerable infrastructure (UF GeoPlan Center, 2020). A total of 2,591 wells, 518 WTPs, and 224 WWTPs were assessed in the counties with SLR projections.

The Resilient Florida Grant Program itself includes a selection of grants that are available to counties, municipalities, water management districts, flood control districts, and regional resilience entities. These grants are instrumental in addressing the challenges posed by flooding and SLR in the state. Eligible applicants have the opportunity to secure financial support for vulnerability assessments (VA) and the implementation of adaptation and mitigation projects (DEP, 2023e). It should be noted that each county in the region is developing a more detailed vulnerability assessment (VA) of critical infrastructure that includes WTPs and WWTPs. The assessments are a mandatory requirement for securing funding from the Resilient Florida Grant Program. Each VA will include a detailed analysis of each facility that considers compound flooding among other relevant factors.

In summary, eight CUP wells in the NFRWSP area may be affected by flooding due to SLR based on the intermediate-low and intermediate-high projections of SLR (Table 6-7 and Figure 27). At the intermediate-high SLR projection, an additional 11 CUP wells, for a total of 19 CUP wells, one WWTP, and two WTPs could be constrained if the facilities do not implement adaptation actions.

Table 6. Summary of infrastructure potentially affected by intermediate-low projections of SLR

County	Wells	WTPs	WWTPs
Clay	0	0	0
Duval	0	0	0
Flagler	0	0	0
Nassau	1	0	0
Putnam	4	0	0
St. Johns	3	0	0

Table 7. Summary of infrastructure potentially affected by intermediate-high projections of SLR

County	Wells	WTPs	WWTPs
Clay	0	0	0
Duval	2	0	0
Flagler	0	1	0
Nassau	4	1	0
Putnam	8	0	1
St. Johns	5	0	0

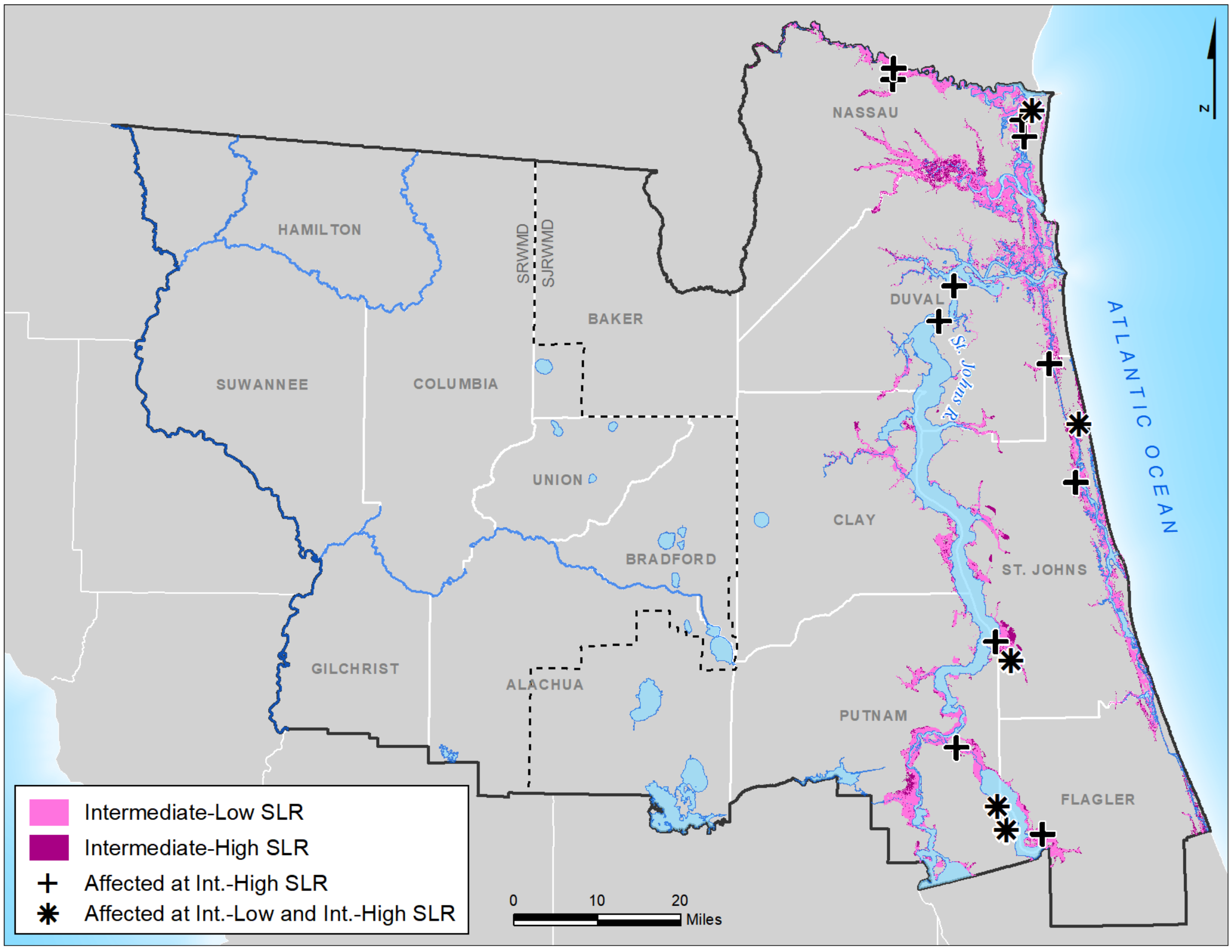

Figure 27. Water supply infrastructure in the NFRWSP that intersects with intermediate-low and intermediate-high SLR inundation surface projections

Based on this analysis, the Districts conclude that projected SLR may pose a challenge for existing or future water suppliers in coastal regions if adaptation actions are not taken. The timeframe and magnitude of enhanced management practices and/or infrastructure may need to be expedited to mitigate potential increases in SLR. Although solutions are available to some water suppliers experiencing the effects of SLR, such actions can increase the cost associated with providing potable water and wastewater treatment to existing and future users. Additionally, an increase in the intensity of rainfall events and the duration of drought are potential projected impacts of climate change that are of particular concern to water supply planning (IPCC, 2022).

Despite these challenges, many of the same practices that are implemented to address water resource constraints also mitigate the impacts of climate change. Some examples include:

- Decreased groundwater demand (e.g., increased utilization of reclaimed water; water conservation)

- Efficiency improvements (e.g., upgrade agricultural irrigation technology; replace aging public supply distribution systems to reduce losses)
- Improved infrastructure capacity and flexibility (e.g., interconnect water supply systems)
- Diversified water supply sources

Site-specific information can be used to determine the need for WSD or WRD projects to mitigate or prevent adverse impacts caused by projected SLR.

Collaboration will also be necessary to meet the challenges posed by climate change and provide reliable water supply for all water users. The State, through the DEP and The Florida Flood Hub, is providing money for adaptation planning and implementation to local governments and utilities, as well as providing Florida-specific data to better predict future challenges. The objectives of Florida Flood Hub, which is the State's scientific center for flood and resilience information and is located at the University of South Florida's College of Marine Sciences, are "to improve flood forecasting and inform science-based policy, planning, and management" (University of South Florida, 2023) The Flood Hub uses technical working groups and partnerships that consist of subject matter experts to research Florida-specific impacts of SLR and changes in rainfall patterns. Additionally, the Florida Water and Climate Alliance (FWCA) provides a venue for collaboration to address water supply challenges associated with climate change. The FWCA is a "stakeholder-scientist partnership committed to increase the relevance of climate science data and tools at relevant time and space scales to support decision-making in water resource management, planning and supply operations in Florida (floridawca.org)". FWCA collaborators include public water supply utilities, water management districts, academic institutions, and other stakeholders from throughout Florida. Collaborators share information, ideas, and current research that may help inform local and regional decisions regarding integration of climate science in water supply management. Although climate change poses significant challenges to water supply availability, local management actions and regional collaborations will help mitigate the associated impacts and enhance the continued reliability of water supply in North Florida.

Chapter 6: Alternative Water Supply Needs Assessment and Delineation of Water Resource Caution Areas (Sufficiency Analysis)

Purpose

Pursuant to subsection 373.709(2), F.S., a RWSP must include sufficient water supply development (WSD) and water resource development (WRD) project options to meet projected water demands while sustaining water resources and natural systems and must support MFLs recovery or prevention strategies. This chapter summarizes the approach used to demonstrate sufficiency of the NFRWSP project options and recovery strategies. In addition, this chapter identifies existing water resource caution areas (WRCAs) or water supply planning areas (WSPAs) pertinent to the NFRWSP (section 62-40.520(2), F.A.C.). The 2023 NFRWSP supports the continued designation of the Districts' portion of the NFRWSP area as a WRCA or WSPA.

Sufficiency Analysis

The water resource assessment discussed in Chapter 5 addressed the potential impacts of groundwater withdrawals with respect to wetlands, adopted MFLs (including OFSs), and waterbodies without MFLs in the NFRWSP area. The assessment identified existing and projected impacts to water resources in the NFRWSP area resulting from the 2015 base year groundwater use of 461 mgd and the 2045 projected groundwater demand scenario of 596 mgd. Groundwater demand is projected to increase by 135 mgd in the NFRWSP area. This projected increase is primarily due to growth in the public supply sector in the SJRWMD region and growth in the agricultural sector in the SRWMD region. While there are increases in surface water demand projected, the Districts determined that there are sufficient water sources to meet the projected demand since the majority of these increases are occurring in the LR water use category which typically utilizes on-site ponds to meet irrigation demand.

Since there are adopted recovery strategies for several MFL waterbodies in the NFRWSP area, the current distribution of groundwater use has already exceeded the fresh groundwater sustainable yield of the system. In addition, the analysis of waterbodies without MFLs, groundwater quality, and wetlands identified potential constraints on increased groundwater withdrawals during the planning horizon. Based on the results of the NFRWSP water resource assessment, the Districts determined that water supply planning pursuant to section 373.709, F.S., was necessary since traditional water sources alone cannot supply the projected 135 mgd increase in groundwater demand while at the same time sustaining water resources and related natural systems during the planning horizon.

Since traditional water sources alone are not sufficient to meet projected water demands through 2045, WSD and WRD projects must be developed and implemented.

The purpose of performing a sufficiency analysis is to determine whether the implementation of specific WSD and WRD project options will allow for projected water demands to be met while sustaining natural systems.

The Districts determined that the following options are sufficient to address the potential water resource constraints:

1) Associated projects and regulatory measures listed in the approved LSFRB Recovery Strategy and B-G Recovery Strategy;
2) Suite of potential project options identified in the 2023 NFRWSP which will create, replace, or save approximately 160 mgd.

Additionally, as part of the development of water use demand projections in Chapter 3, the Districts estimated a water conservation potential ranging from 60 to 83 mgd and a beneficial use of reclaimed water ranging from 55 to 103 mgd by 2045. While the water conservation or reclaimed water projects identified in options 1) or 2) above are included in these ranges, the water conservation and reclaimed water potential exceeds the estimated project benefits identified in Appendix K.

The reevaluation of the LSFI MFLs may result in new or revised MFLs, which upon status assessment may be in prevention or recovery. In such a case, the project lists in the NFRWSP will be updated as appropriate, to include the projects identified in the newly adopted recovery or prevention strategy.

Water Quality

The results of the water quality assessment showed areas of elevated chloride concentration, areas with potential for localized upconing and increasing chloride concentrations in several CUP production wells. Wellfield management plans that move withdrawals away from critical water resources and the further development of alternative water supplies such as reclaimed water, surface water, and brackish groundwater, will reduce the potential for upconing and lateral intrusion. Appropriate well construction, back-plugging and withdrawal reductions have already been effective in addressing increasing chloride concentrations in the areas identified above. Certain projects submitted for inclusion in the 2023 NFRWSP directly address potential water quality issues resulting from possible saltwater intrusion.

The SJRWMD Regulatory Program will continue to evaluate the potential for harmful upconing and lateral intrusion during CUP application review to ensure all permitting criteria are met prior to permit issuance. In addition, the SJRWMD will investigate instances of unforeseen harmful water quality impacts that potentially result from consumptive uses of water and, if verified, will require mitigation by the responsible permittee(s).

Minimum Flows and Levels

The MFLs evaluation determined that there are waterbodies that are currently not achieving and/or are projected to not achieve their MFLs during the planning horizon. Continued implementation of the approved LSFRB Recovery Strategy and B-G Recovery Strategy, along with the implementation of the projects summarized in Chapter 7 (and detailed in the Appendix K) are sufficient to ensure the achievement of the MFLs in the NFRWSP area at the 2045 planning horizon. As noted earlier, it is anticipated that the reevaluation and status assessment of LSFI MFLs will result in additional projects being developed in the NFRWSP area.

The LSFRB Recovery Strategy, as incorporated by rule 62-42.300, F.A.C., has important components that reference supplemental regulatory measures for the LSFI MFLs and specifically states that "Existing permitted uses shall be considered consistent with the Recovery Strategy provided the permittee does not exceed its permitted quantity. Such permits shall not be subject to modification during the term of the permit due to potential impacts to the MFL waterbodies unless otherwise provided for in rule revisions pursuant to paragraph 62-42.300(1)(e), F.A.C.". The minimum flows for the LSFI are in the process of being reevaluated. Upon completion, the constraints associated with these priority waterbodies will be updated and any associated recovery or prevention strategy will be appended to this Plan.

Additionally, the four OFS on the Suwannee River are under emergency rule. While the results of the constraints analysis identified Lafayette Blue Spring and Falmouth Spring as being in prevention, there is technical work underway to establish updated MFLs for all four OFS. Once finalized, the status of these waterbodies will be reassessed.

In the SJRWMD, Lakes Brooklyn and Geneva were determined to be in recovery and Lake Cowpen in prevention. The B-G Recovery Strategy, approved in 2021, includes the Black Creek Project. This project, which is currently under construction, will address the impacts to Lakes Brooklyn, Geneva and Cowpen.

Waterbodies without Adopted Minimum Flows and Levels

The assessment of waterbodies without MFLs determined that there are waterbodies that exceed the screening criteria at 2045. These waterbodies are either on a MFL Priority list or have been identified for additional investigations during the implementation phase of the NFRWSP. Projects are continuing to be developed that will provide options to address these constraints. Additional details regarding waterbodies without adopted MFLs is provided in Chapter 5.

Wetlands

The assessment identified wetlands with a moderate or high potential for adverse change; however, it is important to note that this analysis is meant to be a screening tool for regional planning purposes. Since the potential for adverse change does not necessarily correspond to realized adverse change, water supply and water resource project development did not focus on providing a benefit to wetlands with a moderate or high potential for adverse change identified in the NFRWSP area. Regardless, implementation of the projects specified in the NFRWSP can reduce the acreage of potentially adversely changed wetlands, although these benefits were not quantified as part of the plan.

The Districts' Regulatory Programs will continue to thoroughly evaluate the potential of harm to wetlands resulting from consumptive uses of water and will require mitigation where harm has occurred. Through their continued use of enhanced wetland assessment protocols in conjunction with the spatial review of wetland acreage identified in the NFRWSP, the Districts' regulatory staff will ensure the protection of wetland acreage throughout the planning region by preventing, or requiring mitigation for, adverse impacts to wetlands from both individual and cumulative permit-related groundwater withdrawals.

Water Resource Caution Areas

Water Resource Caution Areas (WRCA) are geographic areas identified by a district as having existing water resource problems or areas in which water resource problems are projected to develop during the next twenty years. WRCAs are established pursuant to section 62-40.520(2), F.A.C., which provides "[w]ithin one year of the determination that a regional water supply plan is needed for a water supply planning region, the region shall also be designated as a water resource caution area." Once a planning region is designated as a WRCA, domestic wastewater treatment facilities which are located within, serve a population located within, or discharge within a WRCA, shall be subject to the reuse requirements of section 403.064, F.S. These requirements mandate domestic wastewater treatment facilities to prepare detailed reuse feasibility studies, which help ensure the maximized reuse of reclaimed water in areas with limited traditional water supplies. Additionally, once a water supply planning region is identified as a WRCA for the purposes of section 403.064, F.S., affected parties may challenge the designation pursuant to section 120.569, F.S. Figure 28 below shows the WRCAs in the NFRWSP area.

SRWMD Water Resource Caution Areas

In the SRWMD, a WSPA meets the definition of a WRCA. The SRWMD's Eastern Planning Region, which is encompassed in the SRWMD portion of the NFRWSP area, was designated as a WSPA in the WSA 2015-2035. It was approved by the Governing Board in 2018 and became effective on December 4, 2019.

SJRWMD Water Resource Caution Areas

The 2017 NFRWSP designated the SJRWMD portion of the planning region as a WRCA (SJRWMD & SRWMD, 2017).

Since potential water resource constraints have been identified in the both the SRWMD and the SJRWMD portions of the NFRWSP area, including MFLs that are not being met and areas of potentially degrading water quality, the 2023 NFRWSP supports the continued designation of the Districts' portion of the NFRWSP area as a WRCA.

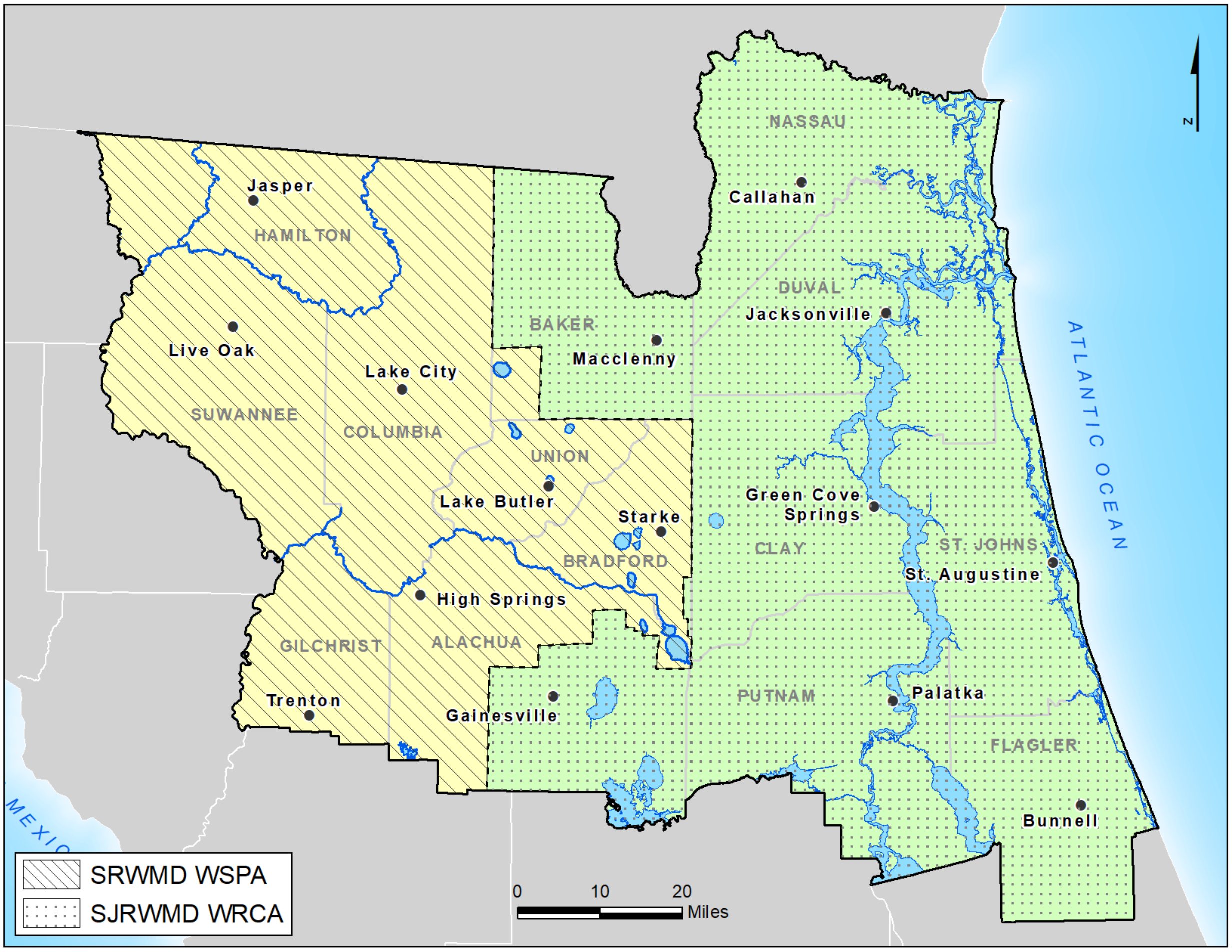

Figure 28. Existing WRCAs/WSPAs in the NFRWSP area

Chapter 7: Project Options

Purpose

An important part of the water supply planning process is to identify WSD and WRD project options that are necessary to meet current and future water demands. This chapter provides a progress update on projects that have been completed since the 2017 NFRWSP as well as an overview of the WSD, WRD, and water conservation projects and programs that are available to water users located within the NFRWSP area to avoid water resource impacts identified in Chapter 5. Where possible, planning-level estimates of the potential available yield for each source are provided. These estimates address a number of factors including consideration of any established MFLs, potential impacts to water and environmental resources, the results of previous water resource evaluations, permit feasibility, water source quality, consideration of existing legal uses, and known engineering limitations.

Groundwater demand for the NFRWSP area is projected to increase 29%, from 461 mgd in 2015 to an estimated 596 mgd in 2045. Because current and future groundwater withdrawals were found to be constrained due to environmental and resource concerns, development of AWS is necessary to meet water supply needs. Nontraditional or AWS sources in the NFRWSP area include brackish groundwater, surface water/stormwater, seawater, reclaimed water, and water stored in aquifer storage and recovery (ASR) systems and reservoirs, whereas fresh groundwater sources are considered the traditional water supply source. The NFRWSP focuses on water conservation and the implementation of AWS projects to meet future demand. The project options identified in this 2023 NFRWSP are sufficient and exceed current and projected water supply demands, providing numerous options for water users.

Progress Since 2017 NFRWSP

Following the approval of the 2017 NFRWSP, there have been intensive efforts to improve management of the water resources within the NFRWSP area. The Districts, DEP, FDACS, utilities, agricultural producers, and other stakeholders have collaboratively implemented numerous water supply initiatives to meet regional goals.

Table 8 and Figure 29 illustrate the scope of these efforts with approximately 1,294 completed projects that received cost-share funding from 2017 through 2022. Cumulatively, the Districts, DEP, FDACS, and the stakeholders in the region, have invested approximately $146.0 million in these projects (District/DEP cost-share funding $64.9 million and cooperating entity $81.1 million). This investment in projects has contributed to the availability or conservation of approximately 89.1 mgd of water within the NFRWSP area. It is important to note that the $146.0 million figure only includes projects that received cost-share funding, but entities also implement AWS and water conservation projects independent of cooperative funding programs. These investments were the most technically and economically feasible project options at the time they were funded. Future projects will be prioritized for funding as they are developed. These efforts show the dedication and commitment of all stakeholders to effectively manage the water resources of the region and to sustain the natural system into the future.

Table 8. Summary of projects completed since 2017

Type	Number of Projects	Estimated Benefit (mgd)	Estimated Total Cost ($M)
Agricultural AWS	21	0.3	$4.5
Agricultural Conservation	1,188	25.2	$25.9
Groundwater Recharge	5	10.6	$5.6
Other	4	0.0	$2.7
PS/CII Conservation	27	2.0	$9.7
Reclaimed Water	42	40.0	$89.8
Stormwater Harvesting	4	8.1	$4.3
Wellfield Management	3	2.8	$3.3
Total	**1,294**	**89.1**	**$146.0**

*SRWMD AG projects are compiled by the number of contract items that have been completed since FY 2017-2018. Benefits are derived from an estimating tool based on the conservation practice implemented.
**Totals may be slightly different due to rounding of individual values.

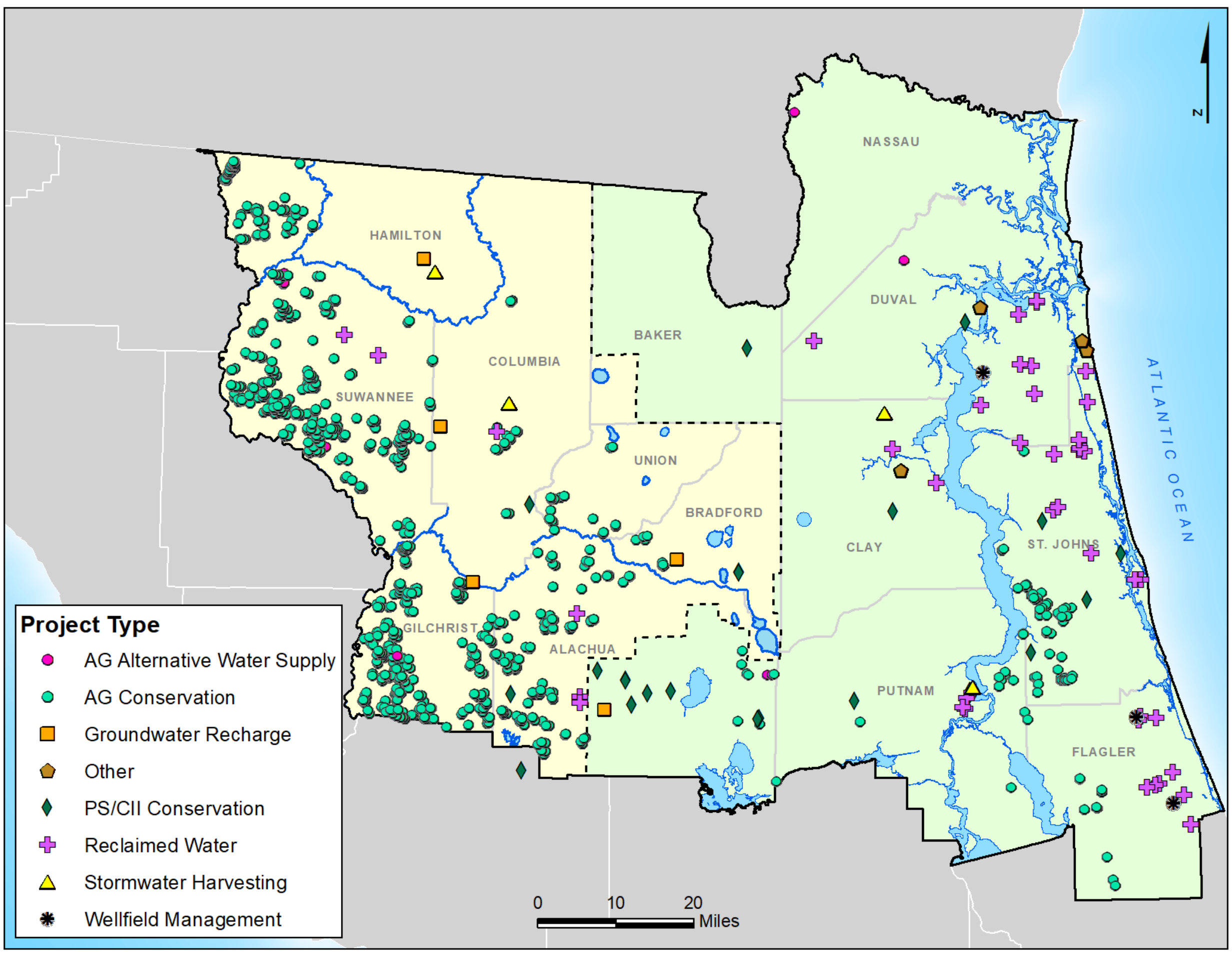

Figure 29. Completed cost-share projects in the NFRWSP area

2023 NFRWSP Potential Project Options

During the planning process, the Districts worked with stakeholders to update the status of project options listed in the 2017 NFRWSP and to identify new project options. When compiling the list of project options, there was consideration of how the public interest is served by the project or how the project will save costs overall by preventing the loss of natural resources or avoiding greater future expenditures for WRD or WSD. The development of projects will serve the public interest by providing, in an affordable manner, water to meet basic public health, safety, and welfare needs, water for agricultural, commercial/industrial/institutional, recreational, and other typical public supply system needs, and protection of the natural systems within the NFRWSP area.

Pursuant to subsection 373.709(7), F.S., nothing contained in the WSD component of a RWSP should be construed as a requirement for local governments, public or privately owned utilities, special districts, self-suppliers, regional water supply authorities, multi-jurisdictional entities, or other water suppliers to select an identified project merely because it was identified in the plan. If the projects identified in the NFRWSP are not selected by a water supplier, the entity will need to identify another AWS project option sufficient to meet its future needs and advise the Districts of the alternate project(s). In addition, the associated local government will need to include such project information in its water supply facilities work plan (see Chapter 2).

Water supply plans are not self-implementing. Projects included in this 2023 NFRWSP are options from which local governments, utilities, and other water users may choose in accordance with subsection 373.709(7), F.S. Budgetary constraints and uncertainties for both users and agencies also create hurdles to ensuring specific solutions will be economically feasible and affordable. Funding for the development of alternative water supplies is primarily the responsibility of water suppliers and users with potential funding assistance from the State of Florida and the Districts. This 2023 NFRWSP identifies sufficient funding mechanisms and sources to address the economic feasibility of projects in Chapter 8 (paragraphs 373.709(2)(b), 373.709(2)(d) and 373.709(6)(a)).

Project Cost and Volume Estimation Methodology

Pursuant to subparagraph 373.709(2)(a)2., F.S., the Districts considered the technical, financial, and permit feasibility of project options at a planning level when developing the 2023 NFRWSP. The projects that meet the criteria for inclusion in the NFRWSP are summarized into four categories: WSD, WRD, water conservation, and conceptual projects. The following information is provided for each project option identified:

- An estimate of the amount of water made available by the project;
- A timeframe for project implementation;
- An estimate of planning-level costs for capital investment and operating and maintaining the project; and

- Identification of the likely entity responsible for implementing each project.

The conceptual projects are included to provide additional potential project options. These projects may become feasible if they address environmental, technical, or permit criteria. Examples include projects where there was not an estimated water resource benefit, a fully developed cost estimate, or a timeline for implementation.

Table 9 presents a summary of project options aimed at addressing WSD, WRD, and water conservation efforts. There are 52 WSD projects with a total estimated benefit of 92.4 mgd and a total estimated cost of $1,061.4 million. For WRD projects, there are 23 projects with a total estimated benefit of 51.2 mgd and a total estimated cost of approximately $1,152.2 million. Notably, the WRD projects listed in the 2023 NFRWSP are proposed not only by the Districts, but also by multiple utilities, local governments, and other sponsoring agencies. Additionally, the 24 water conservation projects are estimated to have a total benefit of 16.8 mgd, incurring a total estimated cost of $57.5 million. The financial feasibility of an individual project option is inherently addressed during the development process. The estimated benefits and costs associated with project options are based on preliminary assessments and will be reviewed as projects are submitted for funding opportunities. Table 9 also includes 19 conceptual projects, where the estimated benefit and cost are yet to be determined (TBD). Because there are water resources showing constraints due to increased groundwater withdrawals, the Districts are continuing to develop conceptual project options that offset future water impacts.

Figure 30 displays the approximate locations of all project options, where locations were assigned during the project solicitation process. The locations of projects are not exact but are in general areas where projects are likely to be located. The projects that do not have locations assigned are not mapped. Indirect Potable Reuse (IPR) projects are shown at the location of the proposed IPR plant since the location of UFA recharge has not yet been determined.

Overall, these project options offer a comprehensive approach to water management and supply, providing 118 projects that lead to an estimated total benefit of 160.4 mgd and an estimated total cost of $2,271.1 million. There are sufficient project options for the development of water supplies to meet future demand while sustaining the natural systems in the NFRWSP area through 2045. Appendix K provides more detailed information on the listed project options.

Table 9. Summary of project options

Type	Number of Projects	Estimated Benefit (mgd)	Estimated Total Cost ($M)
Water Supply Development	52	92.4	$1,061.4
Water Resource Development	23	51.2	$1,152.2
Water Conservation	24	16.8	$57.5
Conceptual	19	TBD	TBD
Total	**118**	**160.4**	**$2,271.1**

*Totals may be slightly different due to rounding of individual values.

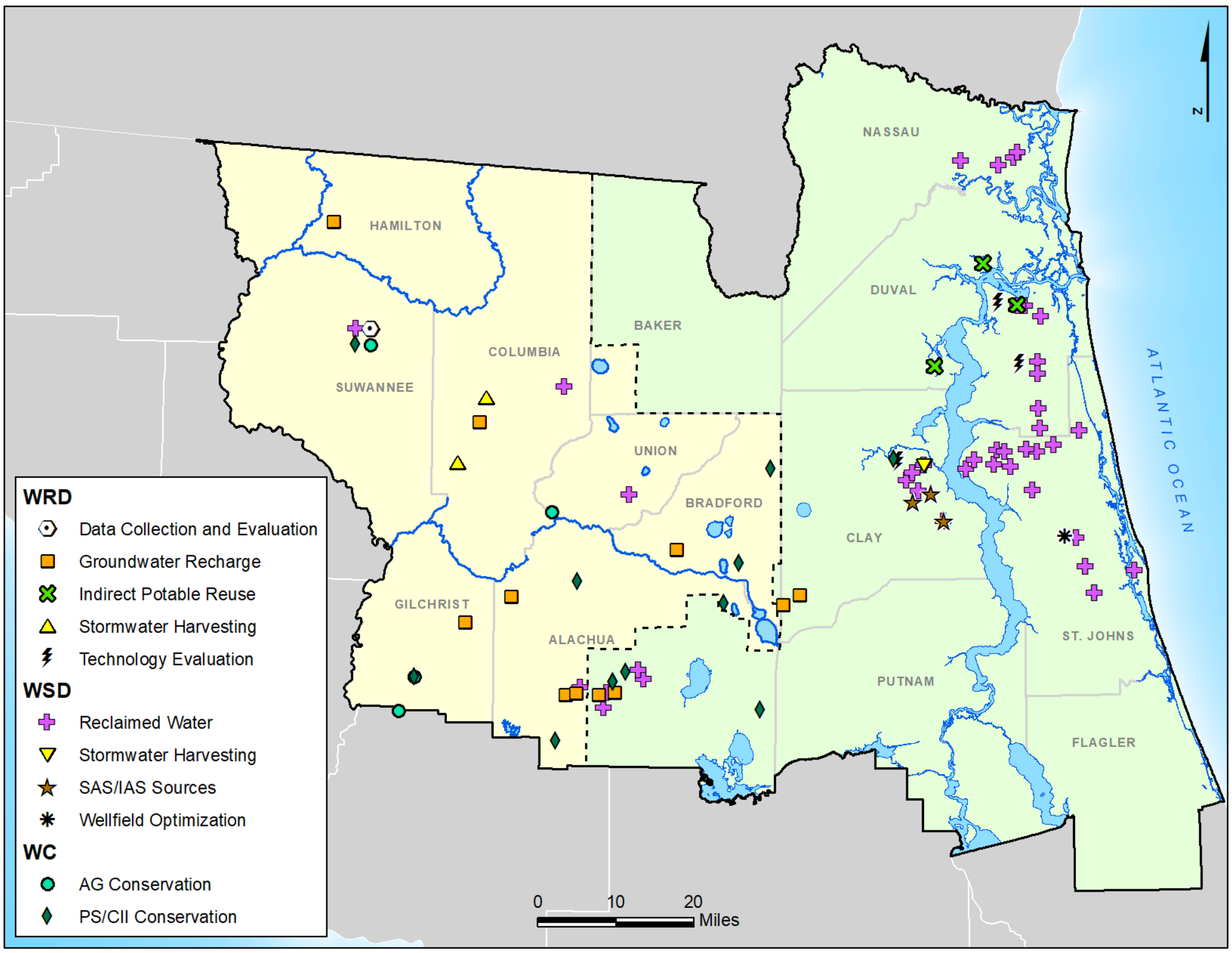

Figure 30. Project options in the NFRWSP area

Water Supply Development Project Options

Water supply development is defined in subsection 373.019(26), F.S., as the planning, design, construction, operation, and maintenance of public or private facilities for water collection, production, treatment, transmission, or distribution for sale, resale, or end use. Water supply development projects are generally the responsibility of water users, such as utilities or agricultural entities, to meet their needs (paragraph 373.705(1)(b), F.S.; section 62-40.531(4), F.A.C.).

An important part of the NFRWSP process is identifying WSD project options that are necessary to meet the anticipated water needs of the planning area through 2045 planning horizon. While water users are not limited to the projects listed in the NFRWSP plan, the list represents a set of projects that, if implemented, could supply a sufficient quantity of water to meet the projected water demands, if implemented.

Table 10, below, identifies 52 WSD project options for the NFRWSP area, which include reclaimed water (46 projects), SAS/IAS water sources (four projects), stormwater (one project), and wellfield optimization (one project) (Appendix K, Table K-2). The estimated benefit listed in the table expresses the project's ability to deliver "new" water as a result of project construction. The total estimated benefit from these projects amounts to 92.4 mgd. While there are no project options listed for aquifer storage and recovery or brackish groundwater, shown as "NA", their inclusion indicates the potential for these project options in the future. The listed projects have a total estimated cost of $1,018.2 million. Notably, the reclaimed water projects are estimated to contribute up to 87.2 mgd to the overall benefit.

Table 10. Summary of WSD project options

Type	Number of Projects	Estimated Benefit (mgd)	Estimated Total Cost ($M low range)
Aquifer Storage and Recovery	NA	NA	NA
Brackish Groundwater	NA	NA	NA
Reclaimed Water	46	87.2	$1,018.2
SAS/IAS Water Sources	4	5.0	$29.9
Surface Water	NA	NA	NA
Stormwater	1	0.2	$2.9
Wellfield Optimization	1	0.0	$10.5
Total	**52**	**92.4**	**$1,061.4**

*Totals may be slightly different due to rounding of individual values.

Aquifer Storage and Recovery

Aquifer storage and recovery (ASR) is the underground injection and storage of water into an acceptable aquifer (typically the FAS). This water is stored for withdrawal at a later date to meet demands when traditional supplies are insufficient to meet demands. The aquifer acts as an underground reservoir for the injected water. ASR provides for storage of large quantities of water for both seasonal and long-term storage and ultimate recovery that would otherwise be unavailable due to land limitations, loss to tides, or evaporation. While ASR is not in itself a new supply source, it provides for system reliability allowing for increased development of other sources of water. Some sources of supply, including many surface water supply options, can be intermittent and therefore unreliable. Other supply options such as reclaimed water have variable demand issues but have relatively consistent supply. In these instances, ASR systems play an important role to store large quantities of water for distribution in cases where the source or demand is variable. While there are no proposed ASR projects listed in the NFRWSP plan, this could be a potential option that may help meet future water demands.

Brackish Groundwater

Brackish groundwater, for AWS purposes, is generally defined as water with a TDS concentration of greater than 500 mg/L. Brackish groundwater exists in the FAS in portions of the NFRWSP area, specifically in coastal areas and near the St. Johns River Brackish groundwater is currently used to meet current water demands and could be expanded to meet future demands. The use of brackish groundwater may require treatment by methods such as low-pressure reverse osmosis (RO), or electrodialysis reversal (EDR). Treatment of brackish groundwater generally requires disposal of concentrate or reject water. Both RO and EDR treatment costs are higher than the treatment costs of fresh water sources. Additionally, the hydrologic connection between the brackish and fresh portions of the local aquifer horizons requires evaluation, and there may not be sufficient hydrologic confinement to protect overlying aquifer systems from possible drawdown and saline water intrusion. Currently, there are no brackish groundwater project options listed in the NFRWSP, however it could be a potential AWS source.

Reclaimed Water

Reclaimed water is wastewater that has received at a minimum secondary treatment and basic disinfection and is reused after leaving a domestic WWTF. Reuse is the deliberate application of reclaimed water, in compliance with DEP and the Districts' rules, for beneficial purposes. Reclaimed water utilization is a key component of water resource management in the NFRWSP area. Reclaimed water is used for non-potable purposes such as landscape irrigation, agricultural irrigation (where applicable), aesthetic uses, groundwater recharge, industrial uses, environmental enhancement, and fire protection purposes. Reclaimed water can also be utilized for potable reuse, which is the process of purifying reclaimed water to state and federal drinking water standards so that it can be utilized for recharge such as IPR or recycled for potable water supply uses, also referred to as direct potable reuse (DPR). Although DPR is not currently being implemented in the Districts, this method is being investigated in Florida and is being used in other states and countries to meet potable water demands.

Surficial Aquifer System/Intermediate Aquifer Water Sources

Historically, the UFA has been the traditional water source for public supply uses in the NFRWSP area. However, water resource constraints are projected to limit the availability of UFA withdrawals as water demand continues to increase as a result of population and agricultural growth. Water users may decide to pursue alternative sources as a means to meet increased future demand and avoid or lessen their impacts to water resources.

Surface Water

Opportunities exist for the development of water supplies from lakes and rivers in the NFRWSP area that could help supplement traditional groundwater supplies. Smaller, local lakes are generally considered a limited resource and often provide the local landowners with water for irrigation purposes. The capture and storage of water from river/creek systems and runoff can supply significant quantities of water which could be a component of multi-source WSD or WRD projects. Larger lakes may represent an opportunity for development of supplies, as they have larger, regional drainage basins to buffer the effects of withdrawals.

Stormwater

Section 62-40.210(37), F.A.C., defines “stormwater recycling” as the capture of stormwater for irrigation or other beneficial use. The DEP and the districts define stormwater as the flow of water which results from, and which occurs immediately following, a rainfall event and is normally captured in ponds, swales, or similar areas for water quality treatment or flood control. (See section 62-40.210(34), F.A.C.). Development of the natural landscape can result in significant changes to the characteristics of stormwater flows. When captured stormwater runoff can provide considerable volumes of water that can result in water supply, aquifer recharge, water quality, and natural system benefits. The reliability of stormwater can vary considerably depending upon climatic conditions and storage capability. Therefore, the feasibility of effectively using stormwater as an AWS source often relies on the ability to use it in conjunction with another source (or sources), in order to decrease operational vulnerability to climatic variability (i.e., conjunctive use) or implementing seasonal storage. Stormwater represents a potentially viable AWS at the local level, particularly for irrigation water uses. A major potential project opportunity is the ability for local governments and utilities to partner with the Florida Department of Transportation (FDOT) on stormwater capture and harvesting projects. Additionally, SJRWMD staff have been working with builders and consultants in Northeast Florida to promote stormwater harvesting in the design of surface water management systems for new developments and as a retrofit in existing developments where feasible.

Wellfield Optimization

Utilities employ different strategies to manage and optimize wellfield performance with the objective of maximizing water production while minimizing water losses or resource impacts. Examples of these strategies include well rotation, well deepening/back-plugging, and blending to maintain water quality.

Water Resource Development Project Options

The intent of WRD projects is to increase the amount of water available for water supply (subsection 373.019(24), F.S.). WRD projects include regional projects designed to create traditional or alternative sources from an identifiable and quantifiable supply of water for existing and/or future reasonable-beneficial uses. While WRD projects are typically, but not always, implemented directly by the Districts or by the Districts in conjunction with other agencies or local governments (paragraph 373.705(1)(a), F.S.), there are multiple WRD projects included in this NFRWSP that are proposed by utilities or other entities (see Appendix K, Table K-2, Column G). WRD projects also encompass data collection and analysis activities that support WSD by local governments, utilities, regional water supply authorities, and others. This includes programs that collect and analyze data for natural system monitoring, groundwater monitoring, water supply planning, feasibility studies for new technologies, and ongoing regional water conservation programs.

The NFRWSP identifies a total of 22 WRD project options which are summarized in Table 11 (Appendix K, Table K-2). The projects include data collection and evaluation (one project), groundwater recharge (13 projects), IPR (four projects), stormwater/surface water (two projects), and technology evaluation (three projects). While there are no project options listed for reservoirs and seawater (shown as "NA") their inclusion indicates the potential for these project options in the future. The listed project options have an estimated total water supply benefit of 51.2 mgd. The estimated total cost for implementing these projects amounts to $1,152.2 million. Notably, groundwater recharge and IPR projects contribute significantly to the overall benefit, accounting for 32.7 mgd ($265.0 million) and 17.4 mgd ($788.3 million), respectively. The utility-led groundwater recharge and IPR projects are also typically reflected in the sponsoring utility's integrated water resource plans and/or their plans to eliminate non-beneficial surface water discharge per Florida Senate Bill 64 (Florida Senate, 2021).

Table 11. Summary of WRD project options

Type	Number of Projects	Estimated Benefit (mgd)	Estimated Total Cost ($M)
Data Collection and Evaluation	1	0.0*	$4.0
Groundwater Recharge	13	32.7	$265.0
Indirect Potable Reuse	4	17.4	$788.3
Reservoirs	NA	NA	NA
Seawater	NA	NA	NA
Stormwater/Surface water	2	0.03	$11.1
Technology Evaluation	3	1.0	$83.9
Total	**23**	**51.2**	**$1,152.2**

*Estimated benefits of projects that provide storage capacity of stormwater capture are not included in the estimated benefit.
**Totals may be slightly different due to rounding of individual values.

Data Collection and Evaluation

Data collection and evaluation projects include, but are not limited to, conducting AWS feasibility studies, which incorporates the analysis of various project options such as treatment wetlands, reclaimed water alternatives, and water/wastewater collection and distribution systems. Projects under this category are funded to evaluate alternatives to address water supply and wastewater treatment needs, investigate the viability of the project, and determine if the project may be cost-effective. Additionally, these feasibility studies take into consideration natural resource concerns. An example of such project would involve studying the feasibility of constructing a regional water or advanced WWTF to address the needs of communities in a specific study area.

Groundwater Recharge

Groundwater recharge projects can be used to increase the amount of water in an aquifer to help offset declines caused by groundwater withdrawals. There are several methods that can be used for aquifer recharge including land application in a high recharge area, direct injection via recharge wells, or other recharge techniques such as rapid infiltration basins (RIBs), treatment wetlands, or changes in land management practices. Sources of water for aquifer recharge can include surface water, reclaimed water, or stormwater. For recharge through injection wells, stringent construction, operation, and permitting regulations must be adhered to as required by Florida's Aquifer Protection Program. In addition, if the water is injected into zones of an aquifer designated as an underground source of drinking water, additional treatment may be required to meet state and federal drinking water standards.

The 10 mgd Black Creek WRD Project, identified in the B-G Recovery Strategy, is the most feasible and best option to provide regional water resource benefits in the NFRWSP area. The project is in Southwest Clay County. The primary purpose is to recharge the UFA using environmentally sustainable flows from Black Creek. The project provides a secondary benefit to water levels in lakes Brooklyn and Geneva, which will help support their MFLs. The major construction phases of the Project are: 1) the pump station and intake structure at Black Creek, 2) the pipeline along State Roads 16 and 21, and 3) a treatment system in proximity to the recharge area.

At its July 2022 meeting, the SJRWMD Governing Board approved a bid of approximately $15.9 million for the construction of Phase 1. At the September 2022 meeting, the SJRWMD Governing Board approved a contract for $39.8 million for construction of Phase 2. Phase 3, the treatment system, which is located in proximity to the recharge area is being procured in two parts. The first part, the direct purchase of the treatment media for $23.2 million, was approved at the April 2023 SJRWMD Governing Board meeting. The second part of Phase 3, the contract for construction of the treatment system totaling $16,988,000, was approved at the August 2023 SJRWMD Governing Board meeting.

Funding for this project is comprised of a variety of sources. First, funding was provided in the St. Johns River and Keystone Heights Lake Region Projects legislative appropriations. The total appropriation was more than $48 million, of which nearly $43.4 million was allocated to the Black Creek project. Additionally, North Florida utilities are contributing $19.2 million toward the project through participation agreements that were approved by the Governing Board in July 2021. Those utilities include Clay County Utility Authority, Gainesville Regional Utilities, St. Johns County Utilities, and JEA. The remaining balance will be provided from SJRWMD funds. Resolution 2022-04 to Commit Fund Balance was approved by the SJRWMD Governing Board at its July 2022 meeting. This action allowed for the allocation of funds to the Black Creek WRD Project in the amount of $56.1 million. In summary, there is approximately $118.7 million committed to the project to date.

Indirect Potable Reuse

Indirect potable reuse is the planned delivery or discharge of purified reclaimed water to ground or surface waters for the development of, or to supplement, potable water supply. This method has been implemented in Florida, nationally, and internationally. The potential for IPR via groundwater recharge in the NFRWSP area is significant, and interest in IPR implementation is growing among utilities in the area.

Reservoirs

Surface water reservoirs provide storage of water, primarily during wet weather conditions, which can be used in the dry season. Water is typically captured, pumped from rivers, canals, reclaimed water sources or stormwater, and stored in above or in-ground reservoirs. Small-scale (local) reservoirs/ponds that can hold several hundred thousand gallons or more are used by farms and golf courses to store recycled irrigation water or collect local stormwater runoff. These reservoirs may also provide water quality treatment before off-site discharge. Large-scale (regional) reservoirs may hold up to several billion gallons and are used for stormwater attenuation, water quality treatment in conjunction with stormwater treatment areas, and storage of seasonally available water for use during dry periods. The potential yield of such reservoirs is directly related to the size of the reservoir and the size of the surface water capture area. While the NFRWSP does not currently list any reservoir project options, they could be considered in the future as a potential option.

Seawater

The use of desalinated seawater from the Atlantic Ocean is an additional water source option in the NFRWSP area, although there are no proposed projects listed. Seawater is essentially an unlimited source of water. However, desalination is required before seawater can be used for water supply purposes, and the concentrate resulting from the desalination process must be managed to meet regulatory and environmental criteria. In addition to treatment facilities, pump stations and pipelines would be required to transport finished water from the coast to the interior portions of the NFRWSP area. The use of seawater to meet public supply demands requires advanced treatment of the water by desalination technologies, which include distillation, RO, or EDR as options. Significant advances in treatment and efficiencies in seawater desalination have occurred over the past decade. While seawater treatment costs are decreasing and capital costs are becoming competitive with above ground reservoir options, operational costs remain moderately higher than other viable water supply options within the region. The costs associated with seawater projects can be higher than other alternative water supply options and, therefore, proposed seawater projects would benefit from partnerships with other water suppliers, Districts, and/or other state agencies.

Stormwater/Surface water

As mentioned above, there are opportunities to develop water supplies from stormwater harvesting to supplement reclaimed water sources or reduce groundwater demand through WRD or WSD projects.

Technology Evaluation

Interest in advanced treatment technologies has grown as traditional water supplies become limited. Research is being conducted on emerging technologies, such as Carbon-Based Advanced Treatment (CBAT) systems; Micro-Filtration and Reverse Osmosis (MFRO); and Ozone and Biologically Activated Carbon (Ozone-BAC), to treat reclaimed water to potable standards. CBAT is comprised of biologically activated carbon (BAC) filtration, ultrafiltration, granular activated carbon (GAC), and ultraviolet light (UV) disinfection. In addition to these pilot studies, demonstration facilities are being constructed to educate the public on the safety of these new technologies and to showcase the implementation of projects, such as IPR, that would utilize these technologies.

District Water Resource Management Programs

Each District maintains a variety of long-term programs and initiatives that provide for the protection, conservation, and development of water resources. Water resource management programs support activities such as MFL development, well plugging, and well abandonment. Each District maintains an annual Five-Year Water Resource Development Work Program (WRDWP) which fully details the various WRD programs operated by each District. These activities are integral components of each District in achieving their mission; however, they may vary in scope and magnitude of implementation between Districts. Some programs and/or initiatives that are important to ongoing NFRWSP WRD efforts include:

- Abandoned Well Plugging Program: The SJRWMD’s abandoned artesian well plugging program assists property owners in properly abandoning or back-plugging unused, free-flowing wells, or substandard wells that impact groundwater quality. This program helps to conserve groundwater resources and improve groundwater quality. Since 1983, the SJRWMD has abandoned 440 wells in the NFRWSP area. The are no free-flowing wells in the SRWMD portion of the NFRWSP area.

- Conservation Program: The Districts have increased focus on water conservation by implementing programs to provide outreach and education to permit holders and other stakeholders to maximize conservation potential. To further this effort, the Districts have collaborated with DEP, the University of Florida’s (UF) Institute of Food and Agricultural Sciences (IFAS), and other state agencies on the quantification of conservation and the expansion of cost-share opportunities.

- Groundwater Modeling: Groundwater flow models are used to support the District's core missions of protecting water supply and related natural systems through regional water supply planning, MFLs, and for regulatory evaluation. NFSEG v1.1 was used to support development of the 2023 NFRWSP.

- Data Collection & Analysis: The data collection and analysis activities conducted by the Districts support the health of natural systems and the development of water supplies. Data collection programs allow the Districts to monitor the status of water resources, observe trends, identify and analyze existing or potential resource issues, and develop programs to support water resource projects that will assist in correcting existing problems and preventing future problems.

Water Conservation Project Options

Water conservation is an important element of water supply planning because it contributes to the sustainability of water supply sources. Subparagraph 373.709(2)(a)2, F.S., requires that water conservation be accounted for when determining if the total capacity of the WSD project options included in RWSPs exceeds the increase in projected water demands for the planning horizon. The Florida Legislature recognizes the importance of water conservation and declared the goal of water conservation for the state to be the prevention and reduction of the "wasteful, uneconomical, impractical, or unreasonable use of water resources" (section 373.227, F.S.). Water conservation includes any action that reduces the demand for water, including those that prevent or reduce wasteful or unnecessary uses and those that improve efficiency of use. All consumptive/water use permits must include a detailed water conservation plan. Utility water conservation plans must also analyze system water loss and remediation if the loss exceeds 10%. A water conserving rate structure is another required component for utility water conservation plans. These plans provide a structure for regional water use efficiency programming and are updated with each renewal of the permit. Achieving long-term improvements in water use efficiency will require a combination of advanced technologies, best management practices (BMPs) and behavioral changes. Education, outreach, and public engagement are essential for accomplishing a measurable increase in water conservation and maintaining a lasting commitment to efficient water use in North Florida.

Effective water conservation efforts have been implemented in the NFRWSP area, and the benefits of which are reflected in decreased historical 5-year average gross per capita use from 132 gpcd (2010-2014 average) to 122 gpcd (2014-2018 average). It should be noted that differences in population determination methodology, increased use of reclaimed water that offsets potable use, climate, the economy, and other factors are also expected to have contributed to this decreasing trend in gross per capita. Significant achievements are also evident in the efforts of the North Florida Utility Coordination Group (NFUCG) member utilities and other utilities in the NFRWSP area.

Through a combination of both cost-share and self-funded water conservation and reclaimed water projects, the NFUCG utilities have collectively experienced a reduction in water demand even while experiencing growth in their customer base. Continued investment in water conservation is critical to help the NFRWSP area meet its future water needs and avoid unacceptable water resource impacts.

Conservation strategies and projects are recognized as being the most economically feasible to help meet future growth and reduce existing demand Implementing projects to meet the high conservation potential for all water use categories (an additional 83 mgd of savings) as described in Chapter 3, Table 2, will likely be a more cost-effective option than implementing some of the WSD and WRD projects discussed above. As more AWS becomes available, efficient use of those more expensive sources makes water conservation critical to the region. Transitioning to better implementation of programs and messaging will help user groups in upcoming years. The Districts anticipate that a conservation-only strategy will not completely offset the predicted shortfall in fresh groundwater supplies, however conservation still needs to be part of the water supply solution for North Florida.

Table 12 provides a summary of water conservation projects submitted (Appendix K, Table K-3). In total, there are 24 projects, with 18 projects dedicated to PS/CII conservation and six projects focused on agricultural conservation. The total estimated benefit for these projects is 16.8 mgd, and the total cost for implementation is estimated to be $57.5 million.

Table 12. Summary of water conservation project options

Type	Number of Projects	Estimated Benefit (mgd)	Estimated Total Cost ($M low range)
Agricultural Conservation	6	9.4	$16.5
PS/CII Conservation	18	7.4	$41.0
Total	**24**	**16.8**	**$57.5**

*Totals may be slightly different due to rounding of individual values.

Public Supply & Commercial/Industrial/Institutional Water Conservation

In the public water supply category, a notable advancement in water conservation is the access to granular water use data through programs like advanced metering infrastructure (AMI) and the UF Water Savings, Analytics, and Verification (H_2OSAV) tool built by the Program for Resource Efficient Communities/Center for Land Use Efficiency (UF/IFAS Center for Land Use Efficiency, n.d.). These tools allow utilities to focus on high water users and to accurately measure the quantity of water saved over time resulting from conservation practices.
Water use data analysis allows direct notification to customers of high-water use along with rebate opportunities for irrigation system retrofit. Utility funded irrigation evaluations by several utilities have offered significant opportunities to increase efficiency by educating customers on scheduling irrigation, installing smart controllers, and locating irrigation leaks. Advanced metering infrastructure and H_2O SAV are essential tools to

implement targeted conservation programming for both new and existing customers. Outdoor water use (irrigation) remains the prime target for demand reduction, as 50–70% of newer home water use is for irrigation (Taylor, 2023).

The districts collaborate closely with the DEP-funded Florida Friendly Landscaping™ (FFL) program to assist in informing the public of the conservation message. The SJRWMD Florida Water Star™ (FWS) program has recently partnered with FFL on a Gold version that essentially blends both programs. In addition to data analysis, SJRWMD facilitates regional utility conservation coordinator training events where experts present all aspects of conservation and utility conservation coordinators share their successes and failures, so others may learn. SJRWMD has also launched a conservation program specifically for Homeowner Association Community Association Managers (HOA CAMs). These licensed professionals manage landscape irrigation maintenance contracts for hundreds of irrigated acres in North Florida. The training is focused on efficient irrigation system maintenance and provides free Continuing Education Units (CEU's) to all attending CAMs.

The SRWMD has partnered with Alachua County, with funding from the AWS program, on a Turf SWAP (Save Water Add Plants) project to reduce impacts from urban landscapes and focus on irrigation tune-ups or other methods to reduce water use on landscape irrigation. The goal of the Turf Swap Program is to encourage water savings through FFL and reducing or improving irrigation systems (The Master's Lawn Care, n.d.).

The following water conservation strategies have been, are, or can be implemented within the NFRWSP area by non-agricultural water providers:

- Tiered public supply billing rates: Tiered rates are an essential aspect of any successful program as they provide direct and clear feedback to individual water users who can then take action to improve efficiency. Analyses of historical billing rates and per capita use in North Florida demonstrate a reduction in gross and residential per capita use after implementation of tiered rate structures.

- Implementation of landscape irrigation restrictions: Local governments in both Districts have adopted ordinances to enforce the irrigation restrictions contained in chapter 40C-2, F.A.C. This local action encourages outdoor water conservation and provides for more consistent implementation of the rule. SJRWMD is in year three of a campaign called WaterLess which has the goal to increase awareness of the restrictions, especially with new residents. Email newsletters, social media posts, event handouts, new reporting apps, and irrigation industry trainings are all part of this campaign. Campaign materials are provided for use by water suppliers and local governments to expand the reach of this important effort. The SRWMD continues to highlight water conservation in the month of April and throughout the year utilizing social media, videos, graphics, handouts, and other traditional media sources. The SJRWMD recently launched an overwatering reporting and education program to inform homeowners, especially newcomers to Florida, on the irrigation restriction rule.

- Landscape and irrigation design codes: Many jurisdictions in the NFRWSP area have land development codes with provisions that encourage efficient outdoor water use. As industry design and approaches evolve, District staff work to encourage updates to these design codes to maximize opportunities to reduce outdoor water use. Some examples include limiting in-ground irrigation to specific landscape areas, implementing efficient design with technologies like smart irrigation controllers and adherence to restrictions, managing an irrigation water budget through utility oversight and billing data, requiring compost for new landscapes to minimize establishment irrigation, retrofitting existing systems with homeowner education and enforcement, and amending landscape soils with compost to potentially reduce irrigation requirements (Bean & Radovanovic, 2021).

- Outreach and Education: Water conservation outreach is common throughout the NFRWSP area for both indoor and outdoor water use. Water conservation outreach occurs via websites, utility bill stuffers, events, and other approaches implemented by local governments, utilities, the Districts, and other partners. Outreach messages include general recommendations for efficient water use as well as advertising for existing programs such as FFL, FWS, and the Florida Green Building Coalition. Each year the districts partner with the Florida Section of the American Water Works association to mark April as Water Conservation month and to encourage water efficiency during one of the driest months of the year.

- Water use audits for residential and commercial customers: This strategy has been very effective in this region when employed by a public supply utility because it provides customized recommendations, includes direct contact with landowners, and can be targeted to water users with the greatest potential for savings. The UF H_2OSAV program has quantified that certain outdoor practices can yield meaningful water savings (Taylor, 2023). If such programs are implemented broadly, then the region could approach a per capita goal to reduce more expensive AWS options (Table 13).

Table 13. UF H_2OSAV quantified outdoor practices

Conservation Measure	Average Savings
Enforcing Irrigation Restrictions	36–44 gallons per day per property
Smart Irrigation Controllers	95–100 gallons per day per property
Irrigation Evaluations	50–155 gallons per day per property

- Meter reading technology: Automatic meter reading (AMR) and AMI are used by several utilities in the NFRWSP area to identify high-water users or unusual increases in water use relative to historical patterns for individual customers. This technology provides a significant opportunity for water conservation savings. It has been used to identify individual homeowners/businesses that public supply utility staff can contact to provide technical assistance in identifying and resolving the cause(s) of high-water use and/or unusual increases. Referenced above, the UF H_2OSAV tool is another granular tool to assist in meaningful demand reduction.

- Water conservation rebate programs: This strategy offers customers either a reduced price or free replacement of a variety of indoor plumbing fixtures and outdoor irrigation devices (e.g., replacement rain sensors, smart irrigation controllers). Water savings is achieved one of two ways; either when the replacement fixtures and devices are more efficient than the older fixtures or when broken/malfunctioning fixtures and devices are replaced. Fixture replacement occurs in both residential households and commercial facilities.

- Innovative practices: Public supply utilities are also experimenting with utilization of new technology as well as data-driven approaches for targeted implementation of existing programs and technology to maximize their effectiveness.

Agricultural Water Conservation

In addition to the PS/CII water conservation programs and practices described above, water savings can also be gained by improving agricultural irrigation efficiency. This includes rainwater harvesting, tailwater recovery, center pivot and irrigation drain tile retrofits, and other irrigation efficiency practices and technologies. Throughout the NFRWSP area, there are agricultural operations enrolled in applicable FDACS BMP programs. In addition to water quality benefits, many BMPs implemented through the FDACS program also improve irrigation efficiency. For more information see fdacs.gov.

Within the SJRWMD region, the Tri-County Agricultural Area (TCAA) Water Management Partnership (WMP) consists of funding partners including SJRWMD, DEP and FDACS. UF IFAS and the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) provide technical assistance to help growers implement projects to conserve water and reduce nutrient run-off. Growers within the TCAA, a row crop production region, continue to convert their seepage irrigation systems to more efficient irrigation methods such as center pivot and irrigation drain tile. These irrigation methods have been shown to reduce irrigation by up to 60% compared to seepage. Soil moisture sensors and weather stations are also becoming more widely adopted in this area and efforts to improve soil health and increase organic matter are expected to further increase conservation. In addition, 414 agricultural operations (91,610 acres) within the SJRWMD region are currently enrolled in applicable FDACS BMP programs.

The SRWMD is taking proactive steps to promote sustainable agricultural practices through its Agricultural Cost-Share Program. This program emphasizes the adoption of various water conservation measures to ensure responsible water use in the agricultural sector. Examples of supported conservation practices are center pivot retrofits, variable rate irrigation, soil moisture probes, end gun shutoffs, remote controlling equipment, weather stations, and variable frequency drives (VFD). These enable producers to optimize their water efficiency and reduce overall water use. Additionally, Precision Agriculture Cost-Share incentivizes the implementation of grid soil sampling, variable rate nutrient application, and use of side dressing equipment to minimize nutrients and reduce water use. Currently, there are 657 agricultural producers with approximately 312,037 acres that are enrolled in FDACS BMP programs in the Eastern Planning Region.

The Suwannee River Partnership (SRP) was established in 1999 and is comprised of a diverse range of stakeholders from government entities at various levels, as well as farmers, residents, and environmental associations. The SRP works together to advocate for water quality and conservation to preserve the water resources in the Suwannee River Basin and Coastal Rivers Basin. The mission centers on implementing research-based solutions that protect and conserve the water resources, including voluntary and incentive-driven programs. More information on the SRP can be found at suwanneeriverpartnership.com.

Conceptual Project Options

The Districts are continuing to develop project options that offset future demands while protecting the natural systems because there are waterbodies with MFLs that are in prevention or recovery and waterbodies without MFLs that are showing constraints. The conceptual project options listed in the NFRWSP do not have water supply benefit estimates or cost evaluations. However, they may offer innovative approaches to address future water demands and ensure sustainable water supplies. The conceptual projects are included to provide more options of potential projects that may become feasible if they address and satisfy environmental, technical, or permit criteria.

The conceptual projects listed encompass a variety of options, such as enhancing aquifer recharge for silvicultural lands, utilizing surplus surface water, stormwater, or reclaimed water for groundwater recharge, and identifying locations for storage ponds to enhance groundwater recharge or serve as alternative water sources. Additionally, conceptual projects focus on implementing silvicultural management practices on forested lands to reduce forest evapotranspiration, leading to increased aquifer recharge, spring flows, and water yield to nearby streams and wetlands. These projects represent smaller-scale, potentially cost-effective ideas that could be implemented on a large scale to provide alternative water supplies and offset future water demands in the NFRWSP region. Table 14 provides a summary of conceptual project options (Appendix K, Table K-4).

Table 14. Summary of conceptual project options

Type	Number of Projects
Groundwater Recharge	16
Agricultural Conservation	1
PS and CII Conservation	2
Total	**19**

Mining Operation Land Reclamation Variances

Upon completion of mining operations, mines may provide an opportunity for WSD or WRD projects through the process of land reclamation (paragraphs 373.709(2)(j), 378.212(1)(g), and subsection 378.404(9), F.S.). These projects facilitate the development of water storage or recharge sites and may have the potential to contribute to MFLs prevention or recovery strategies. Mining operations and reclamation opportunities can be discussed with mining operators for mines whose locations may be advantageous for WRD or WSD.

The Districts completed a preliminary screening analysis to identify current mining sites in the NFRWSP area (Appendix J). This analysis did not consider the technical or financial feasibility of using mining sites for WSD or WRD projects. In summary, there were 112,823 acres of mining lands identified in the NFRWSP area. Individual mining sites will be evaluated, as needed, in areas where WSD or WRD projects may provide an improvement in water availability in the basin and do not cause adverse impacts to water resources. For these sites, the Districts may review the mine's Conceptual Reclamation Plan to understand the potential timeframe for ceasing mining operations and conceptual reclamation plans. Conceptual plans for reclaimed mining sites will be discussed with the DEP for WRD or WSD projects having the support of both the Districts and the mining operator or owner.

Chapter 8: Funding

Purpose

Subparagraph 373.709(2)(a)3.c., F.S., requires districts to include an analysis of the funding needs and to identify possible sources of funding for the projects in RWSPs. This chapter addresses potential funding sources for water supply and water resource development projects.

Florida water law identifies two types of projects to assist in ensuring an adequate water supply for reasonable and beneficial uses and to ensure that natural systems are protected. The two types of projects are WRD projects and WSD projects. Water resource development projects are generally the responsibility of districts, while water supply development projects are generally the responsibility of the local entities and/or water suppliers. However, there are multiple WRD projects included in this NFRWSP that are proposed by utilities or other entities (see Appendix K, Table K-2, Column G). Currently, the districts provide funding for both water resource and water supply development projects. In addition, the districts also provide funding for water conservation projects and strategies.

Water Supplier and User Funding Options

Funding for WSD and sponsor led WRD is the primary responsibility of water suppliers and users. Cost-share funding from water management districts, state, and federal funding programs can contribute to financing the cost of water supply development. Typically, the cost of water supply for water suppliers and users is included in the operation and maintenance program for producing the specific commodity and are generally reflected and recovered in the price and sale of the commodity. For water and sewer service, there are a variety of ways that have been implemented to recover costs, which are summarized below.

Water Utility Revenue Funding Sources

In general, increased water demand results from new customers which in turn can help finance source development through impact fees and utility bills. The financial structure of utility fees can be highly variable and reflect the needs of each utility. Water utilities draw from a number of revenue sources such as connection fees, tap fees, impact fees, base and minimum charges, and volume charges. Connection and tap fees generally do not contribute to water supply or water resource development or treatment capital costs; rather these fees recover the actual costs of tapping water mains and installing water service connection piping and water meters. Impact fees are restricted to the cost of designing and constructing new water resource components, treatment costs, and transmission facilities. Impact fees cannot be utilized for replacement and rehabilitation of existing facilities. Base charges generally contribute to fixed customer costs such as billing and meter replacement. However, a base charge (or a minimum charge), which also covers the cost of the number of gallons of water used, may contribute to replacement and rehabilitation, source development (such as groundwater recharge or IPR), treatment costs, and transmission construction-cost debt service. Base charges are frequently established at amounts greater than the billing and meter replacement cost in order to ensure that the utility maintains a steady revenue stream that is not overly sensitive to seasonal demand variations. Volume charges contribute to both source development/treatment/transmission debt service and operation and maintenance.

Community development districts and special water supply and/or sewer districts may also develop non-ad valorem assessments for system improvements to be paid at the same time as property taxes. Community development districts and special district utilities generally serve a planned development in areas not served by a government-run utility. In general, all utilities have the ability to issue and secure construction bonds backed by revenues from fees, rates, and charges.

Regional water supply authorities are wholesale water providers to utilities. An authority's facilities are funded through fixed and variable charges to the utilities they supply, which are in turn paid for by the retail customers of the utilities. Funding is also obtained through state appropriations, federal and state grants, and funding from water management districts. As set forth in subsection 373.7313(1), counties, municipalities, and special districts have the legislative ability to create regional water supply authorities in a manner that is cost effective and reduces the environmental effects of concentrated groundwater withdrawals. Regional water supply authorities are granted multiple rights and privileges including the ability to levy taxes, issue bonds, and incur debt to develop water supplies. Authorities may also receive preferred funding assistance from the state and water management districts for the capital costs of new alternative water supplies and regional infrastructure.

Water Management District Funding Options

The districts provide financial assistance for water conservation, WSD, and WRD projects through cooperative (or cost-share) funding programs. Financial assistance is provided primarily to governmental entities, but private entities are also eligible to participate in these programs. Funding options and programs for the Districts are described below.

SRWMD Funding Options

The SRWMD promotes water conservation and the implementation of measures that produce significant water savings beyond those required in a CUP/WUP. Additionally, the SRWMD provides cost-share funding for projects that foster its core missions. The Regional Initiative Valuing Environmental Resources (RIVER) cost-share program provides funding assistance to water supply and/or wastewater utilities, government entities, and local entities for projects that decrease water consumption, implement water savings programs, provide AWS, protect water supply, improve water quality, restore natural systems, and provide flood protection.

The SRWMD partners with other agencies and associations as part of the SRP to provide cost-share funding to agriculture producers to help implement BMPs that protect and conserve water. Cost-share funding is available to producers to maximize irrigation system efficiency, for tools to manage irrigation scheduling, and for irrigation system remote monitoring and control. The SRWMD also provides funding, along with FDACS, to support mobile irrigation lab services that deliver technical assistance to producers for evaluating system efficiency and make recommendations for improvements (SRWMD, 2023).

In addition, the Rural Economic Development Initiative (REDI) was established to better serve Florida's economically distressed rural communities (section 288.0656, F.S.). Counties or communities facing economic challenges are entitled to seek a "Match Waiver or Reduction" in relation to job or wage criteria, eligible company criterion, incentive prerequisites, and grant funding. The eligibility for a match waiver in grant programs is determined by individual state agencies, taking into account their yearly budget allocations and adherence to federal and state regulations (Florida Department of Economic Opportunity, n.d.). In the SRWMD's Eastern Planning Region, there are seven REDI counties (Baker, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, and Union), which qualify for match waivers.

Water Resource Development Work Program

Annually, the SRWMD prepares and updates a Five-Year WRDWP following the approval of the annual budget. This WRDWP describes the implementation strategy and funding plan for WRD, WSD, and AWS components.

SJRWMD Funding Options

The SJRWMD primarily provides funding assistance through a competitive cost-share program, which is administered annually and supports AWS, WRD, water conservation, and agricultural related projects. Water resource development projects may also be funded solely by the SJRWMD or in cooperative arrangement with a local partner. When available, state funds can complement SJRWMD cost-share awards. In addition to the general cost-share program, funding opportunities have been available for innovative projects (i.e., projects that use emerging technologies or proven technologies in a unique way) and projects submitted by REDI communities. Since 2014, the SJRWMD has provided over $329 million in incentive-based funding assistance for a variety of AWS, water conservation, and other projects (agricultural and water quality) districtwide (SJRWMD, 2023b).

Water Resource Development Work Program

The SJRWMD annually updates its 5-year WRDWP, which describes the implementation strategy and funding plan for water resource, water supply, and AWS development components. The following projects are identified for potential funding opportunities: artesian well plugging, investigation of the augmentation of public supply systems with local surface water/stormwater sources, RWSP, Upper St. Johns River Basin Project, water conservation programs, water resource development components of WSD projects, WRD, MFLs prevention/recovery strategy projects, and water resources information.

State Funding Options

Agricultural Conservation

The FDACS' Office of Agricultural Water Policy (OAWP) works with multiple partners, including the Natural Resources Conservation Services (NRCS), DEP, water management districts, and Soil and Water Conservation Districts (SWCD), to provide funds that assist farmers in implementing BMPs. Cost-share programs through the FDACS OAWP vary regionally based upon the resource concerns and appropriate practices. Funds are provided to cost-share irrigation system efficiency improvements, and irrigation system management tools like soil moisture sensors.

The TCAA WMP is a collaborative effort between FDACS, DEP and SJRWMD as funding partners and UF/IFAS and NRCS as technical experts to address water quality and supply in the row crop growing regions of Putnam, Flagler, and St. Johns counties through cost-share funding (SJRWMD, 2023a).

Springs Protection

Since Fiscal Year (FY) 2014, the SJRWMD partnered with DEP, local governments, and public supply utilities to collectively invest approximately $373 million in over 169 springs protection and restoration projects districtwide. During this same period, the SRWMD received $135 million in 62 projects to help protect and restore natural systems districtwide.

These projects address either water quality or water quantity, although many often provide dual benefits. Typical water quality projects include WWTF upgrades, conversion of septic systems to central sewer and enhanced stormwater treatment. Typical water quantity projects include water conservation, reclaimed water system enhancements or expansions, and AWS development. The springs protection category also includes funding from DEP for crop, dairy, and nursery irrigation system efficiency improvements and enhanced water recycling components for dairies.

The future of springs funding looks particularly bright given the passage of the 2016 Legacy Florida legislation that earmarks $50 million per year from the Land Acquisition

Trust Fund for springs restoration for the next 20 years. It is anticipated that the districts, local governments, and public supply utilities will continue to partner with the state of Florida through DEP to aggressively implement projects well into the future (DEP, 2023a).

State of Florida Alternative Water Supply and Development Program

Since FY 2020, the governor and Florida Legislature have allocated funding statewide for WRD and WSD projects to help protect the state's water resources and ensure the needs of existing and future users are met. The funding supported the implementation of water conservation programs, AWS projects, and WRD projects. Priority funding was considered for regional projects in areas that were determined to have water resource constraints and that provide the greatest resource benefit. Projects in SJRWMD were awarded more than $30 million from this program, and projects in SRWMD were awarded almost $15 million, however future funding is not guaranteed (DEP, 2023b).

Drinking Water State Revolving Fund Program

The Drinking Water State Revolving Fund Program provides low interest loans to eligible entities for planning, designing, and constructing public water facilities. Cities, counties, authorities, special districts, and other privately owned, investor-owned, or cooperatively held public water systems that are legally responsible for public water services are eligible for loans. Loan funding is based on a priority system, which takes into account public health considerations, compliance, and affordability. Affordability includes the evaluation of median household income, the population affected, and consolidation of very small public water systems that serve a population of 500 people or fewer.

Funds are made available for pre-construction loans to rate-based public water systems, construction loans of a minimum of $75,000, and pre-construction grants and construction grants to small, financially disadvantaged communities. The loan terms include a 20-year (30-year for financially disadvantaged communities) amortization and low interest rates. Community assistance is available for small communities having populations less than 10,000. Fifteen percent of the annual funds are reserved exclusively for small communities. In addition, small communities may qualify for loans from the unreserved 85 percent of the funds (DEP, 2023d).

Florida Forever Program

The Florida Forever program is an initiative aimed at conserving and protecting natural areas and wildlife habitats throughout the state of Florida. The primary goal of Florida Forever is to acquire and manage critical lands including wetlands, forests, beaches, rivers, and other important ecological areas to ensure their long-term preservation. The program is administered by DEP and receives funding through the Florida Forever Trust Fund. The trust fund is primarily financed through a portion of the state's documentary stamp tax revenues, which are generated from real estate transactions. Subject to annual appropriation, the Florida Forever Program could be a source of project funding (DEP, 2023c).

Water and Land Conservation Amendment

In 2014, the Water and Land Conservation Amendment was approved by voters to be added to the Florida Constitution. This amendment requires one third of documentary stamp revenue to be placed into the Land Acquisition Trust Fund. These funds are allocated for the acquisition/restoration of conservation lands, management of existing conservation lands, and the restoration of water resources, such as wetlands, springs, and rivers. Since 2016, the Legacy Florida legislation has allocated funds for springs protection in SJRWMD and SRWMD consistent with the Water and Land Conservation amendment (Florida Senate, 2015).

Resiliency Funding

In May 2021, Governor DeSantis signed Senate Bill 1954 into law creating the Resilient Florida Program to address statewide flooding and SLR. This comprehensive legislation ensures a coordinated approach to Florida's coastal and inland resilience. The program enhances the State's efforts to protect inland waterways, coastlines, and shores, which serve as invaluable natural defenses against SLR and flooding. The legislation is the largest investment in Florida's history with more than $100M annually, to prepare communities for the impacts of climate change, SLR, intensified storms, and flooding.

The Resilient Florida Program provides two separate grant opportunities, one for planning and the other for implementation of resilience projects that address flooding and SLR (DEP, 2023e). Resilient Florida Planning Grants provide 100% funding to local governments to complete comprehensive planning requirements related to flooding; VAs to identify or address risks of flooding and SLR; and develop projects, plans and policies to prepare or adapt to effects of flooding and SLR. The Statewide Flooding and Sea Level Rise Resilience Plan, known as the Resilience Plan, consists of ranked projects that address the risk of flooding and SLR to coastal and inland communities for critical assets, as defined in statute. Critical assets must be previously identified in a local or state developed VA. The DEP is required to submit the list of projects to the Legislature by December 1 annually for consideration of funding in the next state fiscal year. Projects included in the Resilience Plan will receive 50% cost-share funding from the State.

Federal Funding

Environmental Quality Incentive Program

The United States Department of Agriculture's NRCS provides technical and financial assistance to agricultural producers through the Environmental Quality Incentive Program (EQIP) for the installation or implementation of structural and management practices to improve environmental quality on agricultural lands. Water supply and nutrient management through detention/retention or tailwater recovery ponds can also be implemented through this program (USDA, 2023).

State and Tribal Assistance Grants

Another partnership with states involves funding assistance through cooperative agreements, referred to as State and Tribal Assistance Grants. These funds are available through the Environmental Protection Agency, which historically required 45 percent in matching funds from local government cooperators (EPA, 2023b).

Water Infrastructure Finance and Innovation Act

The Water Infrastructure Finance and Innovation Act (WIFIA) established a new financing mechanism to accelerate investment in our nation’s water infrastructure. The WIFIA program provides loans for up to 49 percent of eligible project costs for projects that cost at least $20 million for large communities and $5 million for small communities (population of 25,000 or less) (EPA, 2023a).

Public-Private Partnerships, Cooperatives and Other Private Investment

Public-private partnerships are gaining popularity as a potential source of funding to reduce the financial burden for public entities. However, these partnerships can require technical expertise and financial risk beyond the expertise and risk tolerance of many utilities and water supply authorities. There are a range of public/private partnership options that may provide the required expertise and reduce the financial risks. These options range from all-public ownership to all-private ownership of facility design, construction, and operation. Additionally, competition among private firms desiring to fund, build, or operate WSD projects with assistance from government entities could reduce project costs, potentially resulting in lower customer charges.

Summary of Funding Mechanisms

There are many potential institutions and sources of funding for water resource and water supply development, although some past sources are currently limited by economic conditions. A continuing challenge will be identifying cost-effective and economically efficient methods of meeting the needs of existing REDI communities and new self-supplied users (whose ability to pay ranges widely) when the traditional, lower cost sources of water are no longer readily available. Public supply utilities and water supply authorities will likely have the least difficulty in securing funding due to their large and readily identifiable customer bases and associated revenue streams to service any debt. Funding mechanisms are already established for many of the districts’ water supply and water resource development projects. Ongoing investment in funding options for water resource development and water supply development projects will be required to meet projected future demands while sustaining natural systems.

Chapter 9: Conclusions

Summary

This 2023 NFRWSP was prepared by the Districts in coordination with stakeholders and is consistent with the water supply planning requirements of chapter 373, F.S. The NFRWSP concludes that fresh groundwater alone cannot supply the projected demand during the planning horizon without causing unacceptable impacts to water resources and related natural systems. Groundwater demands in all water use categories are projected to increase from 461 mgd in 2015 to approximately 596 mgd in 2045 (135 mgd increase). There are waterbodies that have adopted recovery strategies, which indicates the current distribution of groundwater use has already exceeded the fresh groundwater sustainable yield of the system. In addition, the analysis of waterbodies without MFLs, groundwater quality, and wetlands identified potential constraints on increased groundwater withdrawals during the planning horizon.

To meet current and future water demands while protecting water resources, the 2023 NFRWSP identifies water conservation, WSD, and WRD project options. With these project options, the Districts have identified 160 mgd of estimated benefit that is potentially available to offset the projected increase in groundwater demand of approximately 135 mgd by 2045. The breakdown of projects by type includes:

- 92.4 mgd of WSD
- 51.2 mgd of WRD
- 16.8 mgd of water conservation

The NFRWSP also recognizes the ongoing implementation of the LSFRB Recovery Strategy and the B-G Recovery Strategy for these MFL waterbodies. The Districts are continuing to develop conceptual project options that can be used to protect waterbodies with MFLs in prevention or recovery and those waterbodies without MFLs that are showing constraints.

Challenges in water resource development and natural resource protection require concerted efforts to monitor, characterize, and analyze current and projected hydrologic conditions. Successful implementation of the NFRWSP requires close coordination with regional and local governments, utilities, stakeholders in the agriculture, commercial, and industrial fields, and other water users. Collaboration among stakeholders is essential for implementing the recommendations and guidance in the NFRWSP. Public and private partnerships can ensure that water resources in the NFRWSP area are prudently managed and available to meet future demands.

Limited localized opportunities may exist for additional traditional groundwater withdrawals to meet future water demands through 2045. The few opportunities for increased traditional groundwater withdrawals generally include local areas where groundwater withdrawals have not been fully optimized. Options for obtaining new water supplies to meet existing and future water demands from both conventional and alternative sources must comply with applicable CUP/WUP rules and conditions. While the NFRWSP may not be used in the review of CUPs/WUPs, the Districts are allowed to use data or other information used to establish the plan in reviewing CUPs/WUPs.

The primary solutions identified in the Plan to meet the future water demands include enhanced water conservation, groundwater recharge efforts, and the additional use and implementation of reclaimed water, surface water, and stormwater projects. The projects provided in this water supply plan were developed as a planning level assessment to show that sufficient options are available to address potential water resource impacts in the NFRWSP area. With appropriate management, continued diversification of water supply sources, water conservation, and implementation of identified water supply and water resource development projects, the 2023 NFRWSP concludes that the future demands can be met through the 2045 planning horizon while sustaining the water resources and related natural systems.

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Appendix A

NFRWSP Comment Number	Commenter and Association Entity	Date Received and Manner of Submittal	Comment As Received	NFRWSP Response
1	Pat Welch, Save Our Lakes Organization, Inc (SOLO)	11/16/2021 Technical Methods SJRWMD Workshop Verbal Comment	Mr. Welch asked the following questions: 1. Will the projects from the 2017 NFRWSP be considered for the current Plan? 2. Will there be a presentation of the drawdown in the Upper Floridan aquifer?	11/16/21 Verbal response: 1. This workshop is for the technical methods for projections. The need for projects will be determined later in the planning process. 2. We have not completed the modeling work yet. That information will be presented at a later workshop.
2	Vivian Katz-James, Save Our Lakes Organization, Inc (SOLO)	11/16/2021 Technical Methods SJRWMD Workshop Verbal Comment	Ms. Katz-James asked the following question: SOLO submitted several projects last time. Do we need to resubmit projects, or will you review them for validity for inclusion in the new plan?	11/16/21 Verbal response: After we perform the impact assessment, there will be outreach and a new project solicitation process with stakeholders in the region.
3	North Florida Utility Coordination Group (NFUCG)	11/18/2021 thru 1/13/2022 via multiple emails, phone calls, and meetings	During the development of technical methods for population projections of the 2023 NFRWSP, feedback was provided regarding projections for utilities in the North Florida Utility Coordination Group (NFUCG).	Stakeholder feedback resulted in adjustments to population projections for the utilities as detailed in the May 23, 2022, Technical Memorandum “Documentation and Methodologies for Updating St. Johns River Water Management District 2020-2045 North Florida Regional Water Supply Plan Projections Resulting from Stakeholder Feedback”. This Technical Memorandum has been added to Appendix B.
4	Stacie Greco, Alachua Environmental Protection Department	6/14/2022 via email	Good afternoon. 1. I have viewed the website and the spreadsheets. I find the information difficult to follow in the current format. Are there plans to do presentations or reports to provide some narrative to accompany	6/16/22 Email Response Sent (Note: To facilitate review, the responses below are numbered to correspond with the questions in the email.) Thank you for your questions and comments.

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			the information? If so, will there still be opportunities for stakeholder input at that point? 2. My initial questions are about the conservation scenarios. It seems that the First Conservation Scenario is based on 2020 CFWI estimates. Could you please provide additional information as to what that means? The Second Conservation Scenario - Public supply is based on "savings achieved if each Part 2014-2018 average gross per capita rate was met by respective utilities". Could you please expand upon what that means. The projected water conservation varies greatly between these two scenarios and I am trying to understand what is driving that difference.	1. We apologize for the difficulties you are having navigating the North Florida Regional Water Supply Partnership webpage and associated data. Two Technical Methods workshops were held in November 2021, at which the methods for developing the population and water demand projections were presented. Comments regarding the methodologies were received through December 17, 2021. There are no plans to hold additional methodology workshops on the population and water demand projections. In addition to these workshops, the population and water demand projections were provided to stakeholders for review and where appropriate, feedback was incorporated. Included with this response is an attachment of the presentation that was given at both of the Technical Methods Workshops. If you are interested, the Technical Methods Workshops were also recorded, and this can be provided as well. Of note, there will be a separate Technical Methods Workshop, most likely fall/winter this year, which will discuss the modeling, evaluation criteria, and constraints, as well as a brief overview of the corresponding methodologies. In addition, a Regional Water Supply Planning Workshop will be held next year which will

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				discuss the results, projects, and potential solutions for meeting future water demands. Both of these workshops, which are required by Florida Statute, will provide the opportunity for stakeholder comments. If you would like detailed information regarding the methodologies for developing the population and water demand projections, as well as future reclaimed water supply and potential conservation estimates, a link to Appendix A (Population and Water Demand Projections) has been provided below. Also included in Appendix A, is the methodology for the spatial distribution of projected groundwater withdrawals that will be used in the groundwater flow model scenarios. https://www.northfloridawater.com/watersupplyplan/documents/Appendix-A.pdf 2. As noted above, Appendix A includes the methodology used to develop the estimates of water conservation potential. A detailed explanation of the two conservation scenarios can be found on pages 15 and 16 of Appendix A. In summary, the First Scenario estimates potential conservation for all water use categories, except agricultural water use, using the approved 2020 CFWI RWSP

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				estimated water conservation potential (which is based on implementing best management practices) as a percent reduction. The FSAID VII Final Report (FDACS 2020) was used to estimate potential agricultural conservation savings. Additional information regarding these methods can be found on the respective websites below. CFWI Regional Water Supply Plan (cfwiwater.com) Agricultural Water Supply Planning / Water / Agriculture Industry / Home - Florida Department of Agriculture & Consumer Services (fdacs.gov) To provide a potential range of conservation for Public Supply and Domestic self-supply, the Second Scenario was developed, which reduces demand to reflect a gross per capita rate of no greater than the NFRWSP and District specific average 2014-2018 gross per capita rate. I hope this information helps to clarify your questions. Please do not hesitate to contact me if you have additional questions.
5	Rob Denis, North Florida Utility Coordinating Group	6/16/2022 and 6/17/2022 via email	On behalf of the North Florida Utilities Coordinating Group, I would like to request an additional two weeks, until July 8, 2022, to review and provide comments or corrections on the newly published NFRWSP information	6/23/22 Email Response Sent In follow-up to our conversation last week, the timeframe to review and provide comment on the newly published NFRWSP information has

NFRWSP Comment Number	Commenter and Association Entity	Date Received and Manner of Submittal	Comment As Received	NFRWSP Response
			cited below. Upon notification via your e-mail, we started reviewing this information and quickly determined that there is a significant amount of new information that merits additional time for a detailed review. For example, review of the well geodatabase file is a significant and important undertaking that by itself requires more than the allotted 2-week review period. The time constraint is compounded since newly published reuse and conservation estimates must also be reviewed concurrently. We appreciate your consideration of this request. Please give me call with any questions. Is documentation for the methodology used to develop the draft water reuse projections and water conservation scenarios available? It would be helpful to understand the basis for the data/projections in the spreadsheets that were posted and to provide additional context as we review the materials. Thanks.	been extended to July 8, 2022. We would appreciate feedback on any discrepancies found as they are discovered to facilitate our review of the geodatabase. And as we discussed, Appendix A includes the methodologies used to develop the draft water reuse projections and water conservation scenarios. Per our discussion, the documentation for water reuse projections and water conservation scenario methodologies can be found in Appendix A (link below). Included with this response is an attachment of the presentation that was given at the November 2021 Technical Methods Workshops. *https://www.northfloridawater.com/watersupplyplan/documents/Appendix-A.pdf*
6	Tom Ridgik, City of Alachua Public Services	6/22/2022 via email	We have attempted to update our projected water demand, but have some reservations to updating the applicable tables. This is because our projections are at large variance with the projected flows as shown on the table. As per your table (sorry, I don't know the table #), the City of Alachua actual water flow for 2020 is 1.24 MGD whereas the projected	6/27/22 Email Response Sent Thank you for your interest in reviewing our estimates and projections for the upcoming North Florida Regional Water Supply Plan (NFRWSP). We take your comments very seriously and intend to consider all feedback in a timely manner to meet our deadlines, therefore I would like to provide some

NFRWSP Comment Number	Commenter and Association Entity	Date Received and Manner of Submittal	Comment As Received	NFRWSP Response
			2045 flow is 1.44 MGD, which is only a 15% increase. GRU is the biggest utility in the area - for comparison, their analogous data for 2020 and 2045 are 22.06 & 27.29 MGD, respectively, which is a 23% increase. Our most recent water master plan provides City of Alachua flow projections. For 2020 & 2045, flows are 1.5 & 3.4 MGD, respectively, which is a large 126% increase! We hesitate to update the tables with these numbers, as there must be some sort of major difference in methodologies. Please contact us should you wish to discuss	clarification on the planning process and address your concerns. The base year estimates for the NFRWSP are 2014-2018 with projection estimates from 2020-2045, therefore the water use associated with year 2020 and beyond is a projection estimate. It is calculated by applying the average per capita rate from 2014-2018 to the projected population. The detailed methodology of how the 2014-2018 population was estimated is in Appendix A and starts on page 17. The Suwannee River Water Management District met with the City of Alachua in February 2021 to discuss the draft population estimates and projections and how they were compiled. The projected growth estimates are consistent with the Alachua County medium projected growth as published in the "Projections of Florida Population by County, 2020-2045, with Estimates for 2019" report from Bureau of Economic and Business Research (BEBR). This was the best available information at the time that the data was compiled (https://i-mail.bebr.ufl.edu/population/population-data/projections-florida-population-county-2020%E2%80%932045-estimates-2019). It was also discussed that if the City could submit a report, such as a Comprehensive Plan, to substantiate a higher growth rate or higher projection estimates than what was

NFRWSP Comment Number	Commenter and Association Entity	Date Received and Manner of Submittal	Comment As Received	NFRWSP Response
				currently estimated, we could take that into consideration when making revisions. This is consistent with our Regional Water Supply Plan Format and Guidelines. No follow up information from the City was received by the District to update these estimates. It is important to recognize that this information is being used in the five-year update to a regional water supply plan. For our planning purposes, we are trying to get a broad regional projection of what growth looks like for this area. Your utility will have additional opportunities during the consumptive use permitting or minimum flow or minimum levels prevention and recovery processes to provide more detailed information and request adjustments to the data. If there are concerns about the permitting process, you can reach out to David King, whom I have copied on this email. If you are interested in discussing in greater detail, I would be happy to sit down and go through the data.
7	Tom Bartol, Jacksonville Electric Authority and Rob Denis, North Florida Utility Coordinating Group	6/29/2022 and 7/11/2022 via email	Our observations/comments: • In review of the spreadsheet, SJRWMD projections were found to be lower than JEA's (Table 1 below) • The main attributor to the difference in projected demand between JEA and SJRWMD is gallons per capita	7/1/22 and 7/8/22 Email Response Sent You noted in your email that there are differences between SJRWMD projections and JEA projected demand. In reviewing your comments, it became apparent you were referencing projections posted last year and not the projections posted on June 9, 2022,

NFRWSP Comment Number	Commenter and Association Entity	Date Received and Manner of Submittal	Comment As Received	NFRWSP Response
			• JEA's method to calculate projected demand is based on trends from historical active service connections and gallons per connection for each water grid, SJRWMD projected demand is based on population projections and regional gallon per capita data • From the attached spreadsheet, the SJRWMD gallon per capita is based on "an average from 2014 - 2018 and is calculated as (Total Water Use / Total Estimated Population)", no more information is given regarding the source of data • In 2021 the JEA average system wide gallon per capita number was 164 (Table 2 below), calculated using actual system demand and estimated population (source BEBR) at each active service point using geospatial analysis; in comparison the SJRWMD gallon per capita overall average for the JEA service area was calculated to be 129 (Table 3 below) • SJRWMD applies the same gallon per capita factor to historical populations, which comes out to a lower demand than was recorded and reported in the EN50 **Table 1 - Comparison of SJRWMD and JEA Water Demand Projections**	that were revised in response to stakeholder comment ("Projections-20220425_edited" spreadsheet). The updated projections may address many of the concerns you identified. The methodology being used to develop the population and water demand projections for the North Florida Regional Water Supply Plan was presented in two Technical Methods workshops held in November 2021. Details on this methodology is described in Appendix A "Population and Water Demand Projections" which can be found on the North Florida Regional Water Supply Partnership (NFRWSP) webpage at: www.northfloridawater.com. Feedback, provided by utilities in the North Florida Utility Coordination Group, was incorporated into the methodology as described in the May 23, 2022, Technical Memorandum "Documentation and Methodologies for Updating St. Johns River Water Management District 2020-2045 North Florida Regional Water Supply Plan Projections Resulting from Stakeholder Feedback". This Technical Memorandum has been added to Appendix A. In addition, data sources and pertinent information for utility water demand projections is also included in the footnotes of Table 5 and Table 5a of the "Projections-20220425_edited" spreadsheet, also located on the NFRWSP webpage. The water demand projections presented for the 2023 NFRWSP have taken into consideration

NFRWSP Comment Number	Commenter and Association Entity	Date Received and Manner of Submittal	Comment As Received	NFRWSP Response
			(see comment text below)	(see response text below)

Comment As Received:

Table 1 - Comparison of SJRWMD and JEA Water Demand Projections

	SJRWMD Projection			JEA	
	GW[1]	Other[2]	Total	Projection[3]	Difference
2015	106.88		106.88	109.32	-2.44
2020	113.14	4.66	117.80	122.88	-5.08
2025	118.66	7.71	126.37	130.26	-3.89
2030	123.79	11.14	134.93	140.54	-5.61
2035	128.93	14.56	143.49	150.00	-6.51
2040	134.06	17.99	152.05	159.66	-7.61
2045	139.19	21.39	160.58	166.71	-6.13

[1]GW = groundwater

[2]Other = alternative sources

[3]2015 and 2020 JEA are historical system demands, 2025-2045 from 2022 JEA Water Demand Projections

[4]units in mgd

Table 2 - JEA 2021 System Summary

Grid	Estimated Population[1]	Connections	Water Demand, mgd	Gallons per Connection	Gallons per Capita	
North	320,455	158,375	47.759	302	149	
South	398,844	210,993	68.846	326	173	
Nassau	17,576	12,009	3.651	304	208	
Mayport	400	132	0.056	423	140	
Ponte Vedra	4,214	2,345	1.034	441	245	
Ponce de Leon	1,679	1,031	0.383	371	228	
Total	743,169	384,885	121.727	316	164	Average

[1]Population estimated from active service points and BEBR using a geospatial analysis

[2]Table is sourced from JEA 2021 system demands

Table 3 - SJRWMD Projection

	Duval			St Johns			Nassau			Clay			Overall		
	Population	gpcd	Demand	Population	gpcd	Demand	Population	gpcd	Demand	Population	gpcd	Demand	Population	Demand	gpcd
2020	800,004	129	103.20	74,203	129	9.57	24,921	138	3.44	12,306	129	1.59	911,434	117.80	129
2025	839,785	129	108.33	90,552	129	11.68	31,799	138	4.39	15,268	129	1.97	977,404	126.37	129
2030	879,566	129	113.46	106,819	129	13.78	38,676	138	5.34	18,229	129	2.35	1,043,290	134.93	129
2035	919,348	129	118.60	123,055	129	15.87	45,558	138	6.29	21,191	129	2.73	1,109,147	143.49	129
2040	959,128	129	123.73	139,216	129	17.96	52,430	138	7.24	24,152	129	3.12	1,174,926	152.05	129
2045	998,910	129	128.86	155,377	129	20.04	59,307	138	8.18	27,114	129	3.50	1,240,708	160.58	129

We believe the allocation of some of JEA's future water demand to "Other" is inappropriate.

I understand that the SJRWMD's positon is that JEA's current CUP and the amount of prevention/recovery credit of 142.26 mgd (with specific wellfield limits) is some sort of "cap" on JEA's groundwater use. However, this is inaccurate, unfounded and inconsistent with previous RWSP processes.

NFRWSP Response:

feedback from stakeholders and are now considered final for the 2023 NFRWSP.

Regarding your comments concerning localized wellfield limits, District staff distributed projected groundwater demand based on specific wellfield allocations and sent these distributions out for stakeholder review on June 9, 2022. In your review of the revised projections and geodatabase, it should be noted that groundwater withdrawals were distributed to those counties within JEA's grid where it was available based on wellfield allocation limits. As such, the "Other" source is not needed anywhere in JEA's service area until 2035 and that is within Duval County.

I hope this information is helpful and we look forward to working together through the NFRWSP. Please do not hesitate to contact me if you have additional questions.

As we discussed yesterday, the North Florida planning region is distinct in that it is the only planning region where permittees voluntarily entered into a cost participation agreement for a water resource development project to address their respective impact to a Minimum Flows and Levels (MFLs) water body by purchasing "lift" and capping their groundwater allocations. As part of the terms of the Participation Agreement, JEA elected to participate in the Black Creek Water Resource Development project to address their impact

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			Furthermore, even if the use of the “Other” source was acceptable, the way the “Other” source is applied is unreasonable. Instead of assuming that JEA could fully use it’s currently permitted allocation before an “Other” source was required, the projections assume that this “Other” source will be utilized as soon as 2020 in Clay and St. Johns Counties and 2025 in Nassau County due to localized wellfield limits. The application of these local limits is not appropriate since JEA may choose regulatory changes to address them. Furthermore, the use of localized limits results in JEA not fully utilizing its current allocation through the 2045 planning horizon, which is clearly not correct. As a follow-up, can you please further explain the use of the “Other” source category for JEA? It does not appear that this category is used for any other water supplier or use type. I thought that the NFRWSP is supposed to estimate reasonable beneficial demands (regardless of source) for users in the region. Then the plan will evaluate, at a high level, if sufficient sources are generally available to meet those regional demands. As a result, I am unclear why a portion of JEA’s demands (and only JEA) were categorized as Other since that seems like a supply-side evaluation more suited for the regulatory arena.	to the MFLs for Lakes Brooklyn and Geneva. The extent to which JEA elected to participate addressed their proportionate share of impact from JEA’s 2014 – 2018 average water use for the existing recovery needed and also to address impact from JEA’s use over and above its 2014 – 2018 average water use based on a total allocation and distribution of groundwater withdrawals of 142.26 mgd. Since JEA elected to only offset their impacts resulting from the 142.26 mgd groundwater withdrawal, any estimated water demand greater than that is categorized for planning purposes as the “Other” source. We will include a definition of the “Other” category in Appendix A. These projections are for regional water supply planning purposes and do not limit JEA from pursuing regulatory options to satisfy additional demands above 142.26 mgd. The other participants are within their agreed upon demand, as outlined in their individual participation agreement, and therefore do not have a need to have any of their demand placed in the “Other” category. I hope this explanation is helpful.

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			Any additional information you can provide on the application of the "Other" source category for demand projections would be helpful. Thanks in advance	
8	Rob Denis, North Florida Utility Coordinating Group	7/7/2022 and 7/28/2022 via email	On behalf of the North Florida Utilities Coordinating Group (NFUCG), we have reviewed the recently published "Appendix A – Population and Water Demand Projections," "NFRWSP Water Reuse Estimates and Projections" and "NFRWSP Water Conservation Scenarios" posted to www.northfloridawater.com. I am providing the comments below which are intended to improve the North Florida Regional Water Supply Plan by adding clarifications and providing better context to the results of these analyses. I'd appreciate an update on how the comments will be addressed once the water management districts have had a chance to review them. In the meantime, please let me know if you have any questions. Comments on "Appendix A – Population and Water Demand Projections," "NFRWSP Water Reuse Estimates and Projections" and "NFRWSP Water Conservation Scenarios" 1. On page 11 of Appendix A, please include a narrative to indicate that the "beneficial reuse" definition being used for the NFRWSP differs from the FDEP's definition of reuse. A note to this effect is included in the tables of the NFRWSP Water Reuse Estimates and Projections,	7/27/22 and 9/26/22 Email Response Sent (Note: To facilitate review, the responses below are numbered to correspond with the questions in the email.) Thank you for your comments. Two Technical Methods workshops were held in November 2021, at which the methods for developing the water conservation potential and reuse estimates were presented. These comments and responses will be included in a "NFRWSP Comment/Response" appendix that will be made part of the 2023 NFRWSP. 1. The following text will be included in Appendix A. The Florida Department of Environmental Protection (FDEP) regards several applications of reclaimed water as reuse that the St. Johns and Suwannee River Water Management Districts (Districts) do not. Therefore, it is common for the Districts' beneficial reuse quantities to be lower than that of FDEP. The Districts require the application to achieve a water resource benefit in order to qualify as reuse. Reuse must take the place of an existing or potential use of higher-quality water or be used to grow useful crops,

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			but is not readily apparent to the reader. This is an important clarification because one of the reuse projection methods relies on information on reuse from a FDEP document which utilizes different assumptions than those used by the St. Johns River and Suwannee River Water Management Districts (collectively, Districts). 2. Please provide a page citation in the FDEP report for the statement, "The FDEP has a statewide reuse utilization goal of 75 percent." This statement is found on page 11 of Appendix A. 3. Based on the tabulated information in the NFRWSP Water Reuse Estimates and Projections, the Districts estimate that an additional 56.81 mgd to 102.57 mgd of "reclaimed water for reuse" could be made available by 2045. We request that the NFRWSP include estimated costs for achieving these rates of additional reuse. Inclusion of the costs, even at a high-level or conceptual basis, would provide for a more complete picture of the feasibility of the projected reuse flowrates and document the financial investment required to make such flows available. 4. It appears that the first water conservation method to estimate potential water use reductions by public supply customers was based on data from another part of	restore or maintain adopted minimum flows and/or levels of a river, lake, or wetland, or effectively recharge a useable aquifer. An application that does not meet any of these criteria is considered by the Districts to be disposal. Reclaimed water applications considered to be reuse by FDEP but disposal by the Districts are underground injection, absorption fields and rapid infiltration basins located in discharge areas, surface water augmentation where not required, spray fields, and artificial wetlands. Reclaimed water applications for underground injection, absorption fields and rapid infiltration basins will be considered beneficial if they are located in recharge areas, as identified via studies or through consumptive use permitting. 2. The following citation will be included in Appendix A. FDEP. 2003. Water Reuse for Florida: Strategies for Effective Uses of Reclaimed Water. FDEP, Tallahassee, FL. Available from: *http://www.dep.state.fl.us/water/reuse/docs/valued_resource_FinalReport.pdf* 3. The expansion of reclaimed water use will be a critical component in the sustainability of the water resources in the North Florida region. Typically for planning purposes, the amount of WWTF

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			the state (Central Florida Water Initiative [CFWI] area) and not local analysis specific to the Partnership area. These data should be used with caution as CFWI analysis found that conservation estimates were highly dependent on the specific housing characteristics of a county or region. In addition, the second method described appears to be more of a "what-if" type analysis, and less of an analysis to define a feasible amount of water conservation. Specifically this analysis assessed WHAT would be the regional reduction in water use if all public supply utilities with a gross per capita greater than the average 2014-2018 gross per capita, reduced their use to reflect their respective Districts' average 2014-2018 gross per capita. While this may be possible, no analysis is provided to justify the feasibility. These methods may be reasonable for a water supply plan only if paired to an estimated cost to achieve these levels of conservation. The 2015 CFWI RWSP documents identified a cost of $122,170,000 to achieve 27.91 mgd of public supply water conservation. We request that the NFRWSP include estimated costs for achieving public water supply	flow in the baseline year not being utilized beneficially is multiplied by 75 percent and this amount is considered as potential existing additional reclaimed water that could be used for beneficial reuse. When determining how much WWTF flow can be utilized, it is recognized that each WWTF is unique and items such as system upgrades and treatment, additional storage, expansion of system, customer availability, the cost-benefit of reuse as compared to developing other alternative water supplies, and other factors have to be taken into consideration. The Districts will continue to work with stakeholders through the planning process to identify feasible reclaimed water projects (and their associated costs) for inclusion in the 2023 NFRWSP. 4. Continued investment in water conservation is critical to help the North Florida regional water supply planning area meet its future water needs and avoid unacceptable water resource impacts. The Districts used two methods to gauge the future benefit of effective conservation in the North Florida planning area. The First Scenario was based on the low-end estimates of potential conservation (based on implementing widely used best management practices) for all water use categories, except agricultural water use, using the approved

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			conservation at the estimated 20.15 mgd to 38.91 mgd. Furthermore, we do not believe that these methods are appropriate for use in regulatory or rulemaking actions to determine the amount of water conservation which may be feasible for a public supply utility. In that case, specific analysis is required to determine a feasible amount of water conservation. --- Thanks Lori. I appreciate your efforts to provide these responses and will forward them on. I have a quick follow-up on question #2 because we have the FDEP document. However, the original question was on what page in that document is the “statewide reuse utilization goal of 75 percent” found? We can’t find it and have been asked.	2020 CFWI RWSP. To provide a potential range of conservation for Public Supply and Domestic self-supply, Scenario 2 was developed, which reduces demand to reflect a gross per capita rate of no greater than the District specific average 2014-2018 gross per capita rate for the NFRWSP. Achieving actual long-term improvements in water use efficiency will require a combination of water conserving irrigation and landscape designs, advanced technologies, best management practices, and other water conservation measures. Water conservation programs often are among the lowest cost solutions to meet future water demands and can reduce costs over the long term if properly planned and implemented. The Districts will continue to work with stakeholders through the planning process to identify feasible conservation projects (and their associated costs) for inclusion in the 2023 NF RWSP. --- Thanks for reaching out. We are still working on assessing the water resource constraints for the region and plan to have draft results to share with stakeholders later this fall. The schedule on the NFRWSP webpage is still accurate. I also want to apologize for not getting back with you sooner on a previous question you had on what page in the document is

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				the “statewide reuse utilization goal of 75 percent” found. The 75% statewide reuse utilization goal and projections methodology for potential reclaimed water flows to be made available for potential projects has been used in multiple stakeholder and Governing Board Approved Regional Water Supply Plans and associated appendices. Pages 39 to 41 of the 2003 FDEP report, which recognize “Southwest Florida Water Management District’s Activities – A Model” / “The Southwest Florida Water Management District has been a leader in the water reuse arena…” and from which the goal being used is derived as a strategy for the effective use of reclaimed water and water reuse for Florida. The citation to the 2003 FDEP report has been included on page 11 of Appendix A. *https://floridadep.gov/water/domestic-wastewater/documents/water-reuse-florida-strategies-effective-use-reclaimed-water* This goal is also referenced in FDEP’s 1991 guidelines for reuse feasibility studies that are required for facilities located within a designated Water Resource Caution Area - “Guidelines for Preparation of Reuse Feasibility Studies for Applicants Having Responsibility for Wastewater Management”. The 75% goal is listed as a condition of a master plan that makes it acceptable in lieu of

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				the requirement for a reuse feasibility study (page 1). *https://floridadep.gov/water/domestic-wastewater/content/reuse-feasibility*
9	Dennis Price, Resident White Springs, Florida	11/16/2023 SJRWMD Constraint Workshop Verbal Comment	Mr. Price asked the following questions: 1. Do we take into account the current condition of wetlands in our assessment? 2. Who receives the project solicitation letters? 3. How do we justify new water use along the coast by JEA in Nassau County? 4. He also commented that the region needs major aquifer recharge projects.	1. The purpose of the wetlands assessment performed in support of the NFRWSP is to evaluate the potential for adverse change due to projected increases in groundwater withdrawals. Current conditions of wetlands are caused by a multitude of factors and are evaluated as part of Consumptive Use Permit application review. 2. Project solicitation letters were sent to permittees in the North Florida planning area. Additionally, emails were sent to over 250 stakeholders in region and details of project submission were posted on the NFRWSP webpage. 3. Applications for new uses of water must ensure there is no interference with other water use permit holders (Chapter 40C-2, F.A.C.). Most utilities have existing allocations within their permits that provide for growth within their service area. 4. Several aquifer recharge projects were submitted for inclusion in the NFRWSP (see Appendix K)

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10	Rob Denis, North Florida Utility Coordinating Group	1/30/2023 via email	We agree with the primary conclusion that potential water quality degradation is a localized issue that has been effectively addressed by wellfield management. However, we would suggest additional clarification regarding the text on page 13, which states, "It should be noted that the major public supply utilities in Flagler and Duval counties have developed or are proposing to develop additional wellfields in less susceptible areas further inland." We would suggest that the statement be clarified because, as written, it could be inferred that all major public supply utilities in those counties have or are developing such wellfields to reduce the potential for water quality degradation. We do not know how many water users have completed or are contemplating such actions, but if it is very few, additional context should be added to the sentence. We would also suggest elimination of the term "major public supply utility" since its meaning is unclear and the use of a term like "water user" or "CUP permittee" would be clearer.	Language has been added to Appendix D to clarify that not all public supply utilities are developing additional wellfields.
11	Rob Denis, North Florida Utility Coordinating Group	1/30/2023 via email	The memo describes an analysis to quantify the potential for adverse changes to wetlands due solely to model predicted groundwater level changes associated with projected pumping. However, throughout the document, there are several locations that could give the reader a misleading impression about the analysis. We recommend rewording in several locations to ensure that the analysis and its	Language has been added to the Introduction Section of the 2022 Kinser-Minno Wetland Assessment Tool to clarify that the analysis assesses the potential for adverse change to existing wetlands only due to predicted changes in groundwater levels resulting from projected increases in groundwater demand.

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			results are accurately described. We have provided some suggested edits in underline and strikethrough as follows: Page 2, Introduction: “Therefore, this analysis focused exclusively on assessing the potential for adverse change to existing wetlands due solely to projected increases in groundwater demand without consideration of other factors.” Page 2, Background: “The Kinser-Minno method provides an estimation of the magnitude (acres), degree (high vs. low), and spatial distribution of the potential future adverse change to wetlands throughout the District due solely to projected groundwater pumping. The GIS model conducts a matrix analysis utilizing conditional statements dependent on soil permeability, sensitivities of plant communities to dewatering, and ~~projected~~modeled declines in the surficial aquifer (SA) due to projected pumping to estimate the potential adverse change to individual plant communities ~~that may occur if future water demands were met with traditional sources~~. The GIS model does not incorporate numerous other factors that could increase or decrease the potential for adverse impacts to wetlands.” Page 3, Results of the CP to 2045 Assessment: “The analysis identified a total of 8,067 acres of wetlands with a moderate to high potential for adverse change based	

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			solely on increased groundwater withdrawals between CP and the 2045 projection"	
12	Stacie Greco and Stephen Hofstetter, Alachua County Environmental Protection Department	1/30/2023 via email	Water use projections and estimates do not include water use from landscape irrigation wells for properties that fall within public supply service areas. EPD analyzed a GIS layer of wells (2010 and up) within the SRWMD portion of Alachua County. Well data was combined with water use data to identify single family parcels that have a well in addition to water service provided from Gainesville Regional Utilities within the SRWMD. Just in this small area alone we suspect there are close to 150 landscape irrigation wells that are currently in use and not accounted for in the water supply plan and projections. Additional unaccounted use is likely occurring within the service areas of the other utilities with the MFL boundary area.	This comment has been taken into account. The Districts are working with the University of Florida to estimate water use due to landscape irrigation in the GRU service area. In preparation for the next update to the NFRWSP, the Districts will use the information from this study to evaluate the impacts caused by landscape irrigation wells.
13	Stacie Greco and Stephen Hofstetter, Alachua County Environmental Protection Department	1/30/2023 via email	Additionally, the UF Program for Resource Efficient Communities has aggregated 2021 household water use data for GRU customers by the year the house was built (Figure 1). The figure shows that houses built since the 1990s, when installation of permanent in-ground irrigation systems became the norm, had significantly higher 2021 water use compared to homes built prior to the nineties, therefore prior to the widespread use of irrigation systems. New homes are using on average almost 400 gallons per day compared to the historic ~150 gallons per day for houses built before 1995. EPD reviews applications	The SRWMD met with utilities to discuss population projections and future water demand. The goal of these meetings was to capture the best estimate of future population growth within the public supply service areas. The information provided by utilities was incorporated into the projected population estimates. Additionally, for the NFRWSP, the Districts based the water demand projections for public suppliers on the most recent five-year average gross per capita rate (2014-2018). This was to account for annual variations in water use due

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			for new irrigation systems and it is now common for new construction in Newberry, Alachua, and High Springs to also include permanent in-ground irrigation. It is likely that similar trends are occurring in Lake City and in other urbanizing areas within the basin. If these utilities are projecting future water use based on historic use, they are likely underpredicting use.	to climate variations and implementation of water conservation programs. The use of gross per capita is recognized as a national standard methodology for water supply planning. However, this practice assumes that past water use is predictive of future water use and incorporates the current economic conditions and current rates of reclaimed water use and water conservation into the future projections. Many factors such as water conservation measures, landscape irrigation, and increases in multifamily housing occupancy can affect the gross per capita rates. These factors that affect gross per capita rates and public supply water demands will be captured during future water supply plan updates
14	Stacie Greco and Stephen Hofstetter, Alachua County Environmental Protection Department	1/30/2023 via email	The NFRWSP and MFL Prevention and Recovery Plans rely heavily on projects to restore flow. Projects can be unpredictable and often underperform. Strong water conservation requirements and regulatory strategies are needed, as demonstrated by the sheer fact that we have 73 adopted MFLs in the planning area, many of which continue to not meet the goals of the program. This is especially important since items 1 and 2 above illustrate how water use may be underestimated.	The Districts agree that water conservation is a priority. The planning process includes water conservation projects. Regulatory measures associated with an MFL recovery would be included in the Recovery Strategy which is appended to the water supply plan.
15	Stacie Greco and Stephen	1/30/2023 via email	Appendix E lists the MFLs in the water supply planning area. Lake Wauberg was not	Lake Wauberg was classified as having insufficient data due to the need for surface

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	Hofstetter, Alachua County Environmental Protection Department		included in the NFRWSP because of “insufficient data.” Please expand on what data is needed to incorporate this water body in the NFRWSP. Lake Wauberg provides important recreation opportunities in Alachua County with access at UF’s Lake Wauberg facility and Paynes Prairie Preserve State Park. Alachua County EPD may be able to assist with obtaining necessary data. Appendix E also states that Col101974 and Gil1012973 were not included in the NFRWSP. Why were these springs left out of the plan?	water model development or update. Given the location of Lake Wauberg within an area of projected UFA drawdown, this system will be prioritized for model development before completion of the next NFRWSP. Note that Lake Wauberg is in an area of similar projected UFA drawdown to nearby systems that are being assessed, helping ensure protection of this region from consumptive use impacts. Language has been added to Appendix E indicating that these waterbodies will be prioritized for model development before completion of the next NFRWSP. Pg. 3 of Appendix E: “Additionally, COL101974 – Unnamed and GIL1012973 (Siphon Creek Rise) were not assessed because they are resurgences.” This error has been corrected to read that Columbia Spring was not assessed because it is a resurgence. COL101974 was assessed based on the adopted Lower Santa Fe Recovery Strategy.
16	Stacie Greco and Stephen Hofstetter, Alachua County Environmental Protection Department	1/30/2023 via email	Appendix F states that the adopted Prevention and Recovery Plan for the Lower Santa Fe and Ichetucknee will be incorporated into the Water Supply Plan, as it includes actions for recovery. Almost nine years have passed since this plan was published (April 2014). It would be prudent to evaluate the projects from Appendix A to determine the effectiveness of completed projects and to determine the feasibility and expected effectiveness of projects that have not been completed.	The Districts reviewed projects completed to date in support of the LSFI recovery strategy as a part of the water supply plan update. This information is presented in Chapter 7.

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17	Paul Still, Bradford Soil and Water Conservation District	1/31/2023 via email	The MFLs for the Upper Santa Fe River were established in 2007 with levels set at the Graham and Worthington Springs gauges on the Upper Santa Fe River. The Upper Santa Fe River was determined to be in Recovery. In 2007 there was no statutory requirement to adopt a Recovery or Prevention plan at the time of the adoption of the Upper Santa Fe River MFL and it therefore does not have a Recovery Plan.	The Upper Santa Fe River was not determined to be in Recovery, according to the MFL set in 2007.
18	Paul Still, Bradford Soil and Water Conservation District	1/31/2023 via email	The determination that the Upper Santa Fe River MFLs were not being met resulted in the determination that the Upper Santa Fe Basin is in a Water Resource Caution Area. This designation places restrictions on water use permits in the Upper Santa Fe Basin and adds costs to potential and future water users.	The designation of the Upper Santa Fe Basin as a Water Resource Caution Area is based on regional constraints including the Lower Santa Fe and Ichetucknee Rivers and Lakes Brooklyn and Geneva.
19	Paul Still, Bradford Soil and Water Conservation District	1/31/2023 via email	The current Constraints Document indicates the Upper Santa Fe River MFLS at Graham and Worthington Springs are being met and will be meet. How was this determination made? If it is correct the Water Resource Caution Area designation should be removed. The impact of the finding that the Upper Santa	The determination was made by assessing flow changes in the NFSEG model. See Appendix F for more details. The Water Resource Caution Area designation was made because there are other water resource constraints in the NFRWSP area.
20	Paul Still, Bradford Soil and Water Conservation District	1/31/2023 via email	The BSWCD request that the significance of the finding that the Santa Fe River MFLs are being meet be addressed in the Constraints Document. The BSWCD also request that fact that the Upper Santa Fe MFLs have not be revised since their adoption in 2007 be addressed in the Constraints Document.	The status of the Upper and Lower Santa Fe River MFLs have not changed with this planning document. The SRWMD's MFL priority list is updated and approved annually by the Governing Board, which would be an appropriate time to request MFL re-evaluation for specific waterbodies.

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				The priority list is based on the importance of the waters to the state or region and the potential for significant harm to the water resources per statute. MFLs are typically considered for re-evaluation when new data and analytical techniques would allow for an improved MFL evaluation.
21	Paul Still, Bradford Soil and Water Conservation District	1/31/2023 via email	Flow from the Sampson River contributes about 20% of the flow at Worthington Springs. The MFLs for Lakes Sampson, Crosby, and Rowell provide a way to assure the flow from the Sampson River. The MFLs for Lakes Sampson, Crosby, and Rowell were to be established in 2016. The establishments date was later moved to 2018. The 2019-2020 MFL Lists indicates the MFLs for Lakes Sampson, Crosby, and Rowell to be adopted after 2022. Three waterbodies planned to have new MFLs established after 2023 were removed from the Priority List. These waterbodies are Lake Crosby, Lake Rowell, and Lake Sampson all located in Bradford County. Structural modifications are being investigated by the United States Army Corps of Engineers that may impact water levels and will not be completed in the next five years. The logic in the September 30, 2020, Memo appears to be the reverse of what should have been done because any plans the United	The SRWMD's MFL priority list is updated and approved annually by the Governing Board, which would be an appropriate time to request MFL re-evaluation for specific waterbodies. The priority list is based on the importance of the waters to the state or region and the potential for significant harm to the water resources per statute.

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			States Army Corps of Engineers would have proposed would have to be evaluated for their impact on the MFLs for the three lakes. The completion of the MFLs should have been advanced not deleted. The United States Army Corps of Engineers limited study has been completed and no structural modifications appear to have been recommended. The end result of the memo is the MFLs for the three lakes are not on the priority list. There is a water level control structure at Sampson that controls the level of the 3 connected lakes. That control structure has an operation plan that dictates when the structure can be operated. That plan was supposed to be revaluated when the MFL for Lake Sampson was adopted. The operation and maintenance of the control structure by Bradford County determines the flow down the Sampson River. It is not clear if a normal highwater level has been set for Lake Sampson. The MFL and the control structure operation plan are critical elements in determining the normal highwater level. The BSWCD requests that The Constraint Document should include a discussion about the lack of MFLs for Lakes Sampson, Crosby, and Rowell and request the MFLs for the	

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			three lakes be established as soon as possible.	
22	Chris Farrell, Audubon Florida	1/31/2023 via email	Appendix D discusses water quality concerns from saltwater intrusion. There should also be a discussion of how decreased water levels may impact water quality around springs. This includes altered water quality in surface waters due to reduced spring flow as well as possible impacts to aquifers from reverse flow if springs run dry and allow surface water to enter the aquifer.	The SRWMD is actively investigating this. There is ongoing work with the University of Florida to evaluate the relationship between water quality and spring flow.
23	Chris Farrell, Audubon Florida	1/31/2023 via email	Appendix E states that only 20 of the 48 lakes with MFLs in the SJRWMD portion of the study were assessed for potential impacts. 4 do not have a strong connection to the Floridan aquifer, leaving 24 lakes that are unable to assessed properly with current data and tools. This is a significant number, and we advise taking a conservative approach when considering these MFLs as a constraint since the actual impact may be greater than anticipated due to the incomplete analysis.	As stated in the Appendix E, many of the non-assessed lakes are located in one relatively small area in southern Putnam County. Many of these non-assessed systems are adjacent to assessed waterbodies, helping to provide regional protection from consumptive use impacts. This approach is considered conservative because MFLs systems being assessed are in areas with higher projected UFA change, and the majority of those systems are meeting their MFLs. Also, many of the MFLs waterbodies that are not assessed are in areas of similar projected UFA drawdown with those that are assessed and meeting their MFLs. However, some systems that are not assessed are in areas of high projected change and do not have adjacent assessed MFLs systems. Language has been added to Appendix E indicating that these waterbodies will be prioritized for model

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				development before completion of the next NFRWSP.
24	Chris Farrell, Audubon Florida	1/31/2023 via email	Appendix F shows many river and spring locations that are anticipated to be in "recovery" status in 2045. Several of the springs are Outstanding Florida Springs and are locations of great social and natural significance. Recovery of these systems depends not only on the elimination of further groundwater withdrawals but the implementation of projects to restore historic groundwater levels.	The Regional Water Supply Planning effort addresses this. We are seeing that current and future water demands are not sufficient, therefore projects identified in Chapter 7 and Appendix K will meet future demands.
25	Chris Farrell, Audubon Florida	1/31/2023 via email	Appendix H is also very concerning, showing over 20 springs and rivers that exceed the 10% reduction in flow screening criterion and would likely suffer significant harm from anticipated groundwater withdrawals. Further, many of these water bodies already experience reduced flows; care is needed to avoid thinking a reduction below 10% is acceptable when the "current condition" baseline has changed over the years. In the revised draft it would be useful to show the actual reduction in flows expected for each water body beyond a simple "yes" or "no" evaluation of exceeding the criterion.	This comment has been addressed. See Appendix G for details. Project options identified in Chapter 7, as well as the adopted Recovery Strategies are meant to address the impacts of these waterbodies.
26	Chris Farrell, Audubon Florida	1/31/2023 via email	It is also noteworthy that MFL discussions are based on the concept of "significant harm." Lowered water levels that produce harmful impacts (those that take less than 2 years to	Section (s.) 373.042, F.S., directs that MFLs be set to prevent significant harm. The planning process has project options,

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			recover from) are also undesirable and planning efforts should work to avoid making these conditions more frequent among waterbodies in the region.	identified in Chapter 7 that could be implemented to avoid significant harm.
27	Chris Farrell, Audubon Florida	1/31/2023 via email	Appendix I indicates that over 8,000 acres of wetlands have a moderate to high potential for impacts under future demands and that acreages scoring “low” were not presented. The revised draft should explain the differences between the categories and what they represent (i.e., what does a “moderate” or “high” potential for adverse change mean?). Do these results speak just to the potential for change or to the severity? It would also be interesting to include the results for the “pumps off” to “current pumping” scenario to explore the idea of cumulative impacts that wetlands face from groundwater withdrawals. In any case, greater than 8,000 acres of wetlands having a moderate or better potential for adverse change is another constraint that emphasizes the need for alternatives to groundwater pumping.	Appendix H was clarified to address these comments. The purpose of this appendix (Appendix H) was to look at the potential for adverse change, therefore the past scenario was not the focus of the document. The focus is to plan for future change.
28	Chris Farrell, Audubon Florida	1/31/2023 via email	Taken together, the constraints of chlorine levels, MFL conditions, and wetland function provide convincing data that groundwater withdrawals are no longer a feasible method for meeting future water needs. Instead, the updated water supply plan should emphasize the necessity for conservation and alternative water supply projects. Groundwater may seem like the least costly alternative, but the externalized costs to our water resources,	Yes, this is why we have regional planning in this area.

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			tourism-based economy, real estate values, and wildlife make it the least sustainable alternative.	
29	John Quarterman, Suwannee Riverkeeper/WWALS	1/31/2023 via email	I have some issues with another level. I noticed repeated assertions in the public meeting that demand or projected demand are just taken as givens. So basically anybody who wants to build a golf course, or start another titanium mine, or plant almond trees that need lots of water, that's just a given, that's demand. It seems strange. You've gone to a great deal of trouble to compile a water budget in the sense of here's evapotranspiration, here's aquifer recharge, and so forth. But all we see for a plan to deal with that is changing MFLs. Which seems to translate to lowering the limits for the water levels.	The projected future water demands are intended to capture the complete picture of the amount of water that is needed to meet future water demands.
30	John Quarterman, Suwannee Riverkeeper/WWALS	1/31/2023 via email	I didn't see anything about planning to limit or review use permits for water withdrawal. I hope that there may be some change in course possible at this point. Because I really wouldn't want all your hard work to just go towards further reducing MFLs and decreasing water levels for the springs and rivers.	Regulatory measures associated with an MFL recovery would be included in the Recovery Strategy which is appended to the water supply plan. See Appendix L. The Districts reviewed projects completed to date in support of the LSFI recovery strategy as a part of the water supply plan update.

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			I know I heard something about, well, that's the regulatory arm. But this plan includes aquifer recharge projects, such as I believe there's a 48-inch pipe planned to go from the Suwannee River to recharge the Ichetucknee headsprings. See Appendix J from 2016. https://northfloridawater.com/watersupplyplan/documents/draft/Appendix_J.pdf More detail: https://wwals.net/?p=15981 Four years later, SRWMD added a plan for another such pipe, from Branford. https://wwals.net/?p=55981 There are much simpler ways to recharge the aquifer than these very expensive water pipelines, as Practicing Geologist Dennis J. Price pointed out back in 2016. https://wwals.net/?p=54126 Drill wells at the bottom of planted pine ditches. Planning aquifer recharge water pipelines is a policy. A bad policy, but still a policy. Limiting permits is also a policy. Limiting new withdrawal permits and phasing down quantities of older permits should be in this plan. I brought this up six years ago, as did many other people, and it was basically shrugged off. Both districts just proceeded to pass the plan as is.	

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31	Vivian Katz, Save Our Lakes Organization, Inc. (SOLO)	3/7/2023 via e-mail	SOLO participated in current North Florida Water Supply Plan. In that process, we submitted several (12 or 13) projects. Those projects should still be in your system. Are any of these project options being considered?	Given the construction of the Black Creek Water Resource Development Project, previous SOLO projects are not being considered for inclusion in the 2023 NFRWSP.
32	Robert L. Knight, Howard T. Odum Florida Springs Institute	4/13/2023 via email	The Florida Springs Institute would be happy to save you the time, effort, and expense of preparing an updated water supply plan. It really only needs to include three essential elements: 1. Mandatory monitoring and reporting of all groundwater extractions in the District. 2. A cap on future groundwater withdrawals in the District with a minimum of 50% reduction of existing permitted groundwater pumping to allow a recovery of healthy surface water resources, including springs, rivers, and lakes in the District. 3. An equitable fee on all groundwater withdrawals with all proceeds utilized for conservation of natural landscapes in the District. I can assure you these simple measures will go a long way to solving your current and future water supply challenges. If you wish to discuss, feel free to call.	Section (s.) 373.709, F.S., provides that the districts shall conduct water supply planning for a water supply planning region within the district identified in the appropriate district water supply plan under s. 373.036, F.S., where it determines that existing sources of water are not adequate to supply water for all existing and future reasonable-beneficial uses and to sustain the water resources and related natural systems for the planning period. Any regulatory measures, such as monitoring, reporting, restricting withdrawals, etc., would be included in a recovery strategy. Recovery Strategies that are adopted in the NFRWSP area are appended to the water supply plan. See Appendix L and M.
33	Jim Gross, Florida Defenders of the Environment	4/13/2023 via email in response to Robert Knight	It would appear we abandoned the Three Prong Test quite some time ago.	See NFRWSP response to Robert Knight, Comment No. 32 above.

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34	John Martin; City Manager, Hawthorne	9/20/2023 Draft 2023 NFRWSP SJRWMD Workshop Verbal Comment	Summary: • Thanked staff for work on the Plan • Intends to get City of Hawthorne more involved in the planning process • Has proposed projects that may help with goals of the Plan • Expressed that Hawthorne wants to be a steward of natural resources, including water, but that the means to do so are not always available	Thank you for your comment, the Districts appreciate the continued collaboration from the City of Hawthorne in the North Florida Regional Water Supply Plan process. Projects that have a water supply component will be considered for inclusion in the plan. The project submitted by the City has been included in the plan.
35	Merrilee Jipson; riparian owner on the Sante Fe River; board member of Our Santa Fe River	9/20/2023 Draft 2023 NFRWSP SJRWMD Workshop Verbal Comment	Summary: • Concerned that O'leno Sink is being used as a recharge component for upstream activities. • Described atypical flooding on the lower Santa Fe River due to upstream influences, which may include releases of wastewater from holding ponds during storm events by Chemours and other companies. • Flooding occurred on the Santa Fe River before 2012; the river experienced some of the highest flooding on record in 2012 and 2017. • Flooding on the Santa Fe River during the hurricane of 2017 almost shut down I-75 and it was learned that large amounts of water were being released upstream • Described that water goes underground at O'leno Sink, but that we don't know where the water really goes.	Thank you for your comments. The 2023 NFRWSP is the result of a regional water supply planning effort and does not address possible atypical flooding events or the sufficiency of surface water / groundwater quality treatment programs. The Districts have robust environmental resource and consumptive/water use permitting programs to address construction and water use. The Florida Department of Environmental Protection has the authority to issue National Pollutant Discharge Elimination System (NPDES) permits and is the state agency that is responsible for ensuring water quality standards are met.

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			• People living near O'leno Sink are developing autoimmune disorders and cancer. • Water quality or surface and groundwater needs to be addressed with projects due to health concerns; water need to be treated to drinking water standards. • We do not need more polluted stormwater being released into NPDES holding situations or other natural systems.	
36	Rick Hutton; GRU and North Florida Utility Coordinating Group	9/20/2023 Draft 2023 NFRWSP SJRWMD Workshop Verbal Comment	Summary: • Thanked staff for the work done on the Plan. • Looks forward to working with the Districts and other stakeholders.	Thank you for your comment, the Districts appreciate the continued collaboration.
37	Christy Carter; resident near Cecil Field and Camp Blanding	9/20/2023 Draft 2023 NFRWSP SJRWMD Workshop Verbal Comment	Summary: • Concerned about development of 17,000 houses near Trail Ridge dump and nearby mines. • Lives in a cancer cluster with multiple family members that have died or are afflicted by different types of cancer. • Has been to Chemours mine and seen acid being dumped into the water to make it clear. • Development of 5,000 acres of wetlands will directly affect North Fork Black Creek and Black Creek.	Thank you for your comments. The 2023 NFRWSP is the result of a regional water supply planning effort and does not address possible atypical flooding events or the sufficiency of surface water/groundwater quality treatment programs. The Districts have robust environmental resource and consumptive/water use permitting programs to address construction and water use. The Florida Department of Environmental Protection has the authority to issue National Pollutant Discharge Elimination System (NPDES) permits and is the state agency that

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			• Trees were cut down at the dump that affected eagle habitat. • Endangered Black Creek crayfish were found dead in subdivision built near wetlands. • A lot coming to the community that is not being done in the right way. • Mining is out of control.	is responsible for ensuring water quality standards are met.
38	Merrilee Jipson; riparian owner on the Sante Fe River; board member of Our Santa Fe River	9/21/2023 Draft 2023 NFRWSP SRWMD Workshop Verbal Comment	Summary: • Concerned about projects that might bring water into the lower Santa Fe river through O'leno State Park through O'leno sink. • On September 11th there was a huge spike at the Santa Fe River gage at Alligator Creek, and now seeing a lot of water coming into the upper/lower Santa Fe River • 2010, 2012, and 2017 hurricane events produced flooding from the upper Santa Fe River that we have never had before. • Locals say that the flooding always came from the Suwannee River, but now we are seeing it coming downstream from the upper part of the river. • Concludes that water is being released – possibly from mining interests on the ridge. Chemours and Dupont have been known to release water during storm events. In 2017, 40 or 70 million gallons of water were released, and I-75 was almost flooded	Thank you for your comments. The 2023 NFRWSP is the result of a regional water supply planning effort and does not address possible atypical flooding events or the sufficiency of surface water/groundwater quality treatment programs. The Districts have robust environmental resource and consumptive/water use permitting programs to address construction and water use. The Florida Department of Environmental Protection has the to issue National Pollutant Discharge Elimination System (NPDES) permits and is the state agency that is responsible for ensuring water quality standards are met.

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			due to excessive water on the upper Santa Fe River. • An unexpected flooding spike was observed one month ago. • Through projects, if water is released in the Starke area, the New River, or Lake Sampson, water should be treated because we don't want the polluted water. • We are seeing health issues associated around the mining interests, including cancer near Clay Hill and Maxville (Black Creek project area). There is a cancer cluster in a generational family area here (near Gum Branch NPDES). • Is polluted water that is observed on Gum Branch waterway what we are seeing on the Santa Fe River? • The water that comprises the lower Santa Fe River three and a half miles from O'leno is not the same water that goes into the ground at O'leno. • Areas upstream of the O'leno system are treating the O'leno like deep well injection. O'leno should not be treated like a deep well injection. • Reiterated health concerns for people drinking potentially polluted groundwater from the O'leno system.	
39	Richard Baker, Ph.D.; Pelican Island Audubon	9/14/2023 via email	Why not pass a law that only20% of your yard can be in turfgrass. 64% of our drinking water goes on lawn. 84% in summer. Also need to save our trees.	The 2023 NFRWSP is a regional planning level effort and not a regulatory approach to define specific water conservation strategies. The Districts recognize the importance of

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				water conservation and promote best management practices through our planning, cost-share, education and outreach, and regulatory programs. Outdoor residential water use (irrigation) remains a prime target for demand reduction, which includes efforts to reduce irrigated areas. The Districts work with local governments and utilities in North Florida to implement programming that best suits their area for reducing outdoor water use.
40	Jacqueline Carey	9/17/2023 via email	As more and more subdivisions are built and more people move in to our state I get more concerned about the quality and quantity of our available water. I think it should be a requirement that all new homes must put down artificial turf instead Of sod. This will stop the runoff of fertilizer etc. and cut down on water consumption.	The 2023 NFRWSP is a regional planning level effort and not a regulatory approach to define specific water conservation strategies. The Districts recognize the importance of water conservation and promote best management practices through our planning, cost-share, education and outreach, and regulatory programs. Outdoor residential water use (irrigation) remains a prime target for demand reduction, which includes efforts to reduce irrigated areas. The Districts work with local governments utilities in North Florida to implement programming that best suits their area for reducing outdoor water use.
41	Charles Shinn; Florida Farm Bureau Federation	9/28/2023 via email	On behalf of Florida Farm Bureau Federation and our 132,000 member families, many of whom live and farm in the boundaries of the North Florida Regional Water Supply Plan (NFRWSP) area, we appreciate the opportunity to comment on the draft version of the 2023 NFRWSP.	The Districts appreciate the feedback and continued collaboration with Florida Farm Bureau Federation and its members. The FSAID model incorporates both agronomic and economic factors that affect irrigation demand, which has enhanced the

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			We are pleased to read that the districts (SJRWMD and SRWMD) are collaborating on this plan to supply the projected increase of 135 mgd using non-traditional sources such as reclaimed water, SAS/IAS water sources, stormwater, and wellfield optimization. As technology improves during this time horizon, the cost per unit of water should certainly decrease. We also appreciate the effort by the districts to identify and cost-share water resource development projects by all sectors of water users. Utilizing the scientific basis developed by the University of Florida and other institutions, agriculture will continue to do their part to conserve and increase efficiency of water resources. It is important to note that water use in agriculture is entirely dependent on the climate and market conditions. Agriculture only needs to utilize water resources when the climatic conditions are not sufficient to meet the water demand by the crop. It is also important to note that during periods of excess climate conditions, all agricultural lands provide net recharge to the surface and aquifers, and it is important for this to be recognized in any water supply plan. Finally, cropping (varieties and timing) is fully dependent on marketing conditions that are beyond the scope of control by the farmer. A farmer must remain a state of profitability to remain on the land and they are only able to do so by producing and selling a crop for more than the cost of production. It should be noted	estimate of future irrigation demands. More details can be found in the FSAIDVII final report. Additionally, the FSAID product estimated future water demand for dry years (1-in-10). Water demand for 2045 during a 1-in-10 year drought is also included in Appendix B, Table B-7.

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			here that the cost of production includes any cost associated with irrigation and as such, irrigation efficiency is critical to profitability. We welcome any questions or comments and look forward to the continued collaboration as this plan is finalized.	
42	Stacie Greco and Stephen Hofstetter; Alachua County Environmental Protection Department	10/2/2023 via email	Alachua County is committed to protecting groundwater resources and continues to provide input on the North Florida Water Supply Plan and the Lower Santa Fe and Ichetucknee rivers Minimum Flows and Levels (MFLs). Below is a summary of our concerns with the NFRWSP materials that were released September 2023. 1. The projected increase of 94.1 MGD in public supply for the St Johns River Planning area is unsustainable and illustrates the need to re-evaluate our current consumptive use permitting process and the definition of the Public Interest and Beneficial Use. The public supply increase of 4.5 MGD in the SRWMD portion of the planning region seems underestimated in light of the growth in these areas and the recent increase in the City of Newberry's consumptive use permit. Many of the stakeholder comments in Appendix A echo our shared concern with the assumption that all future uses will be accommodated with little restrictions or demand reduction. 2. Public supply water use projections and estimates do not include water use from	1. Regional water supply plans are not regulatory documents, therefore the review of the consumptive use permitting process is not in the scope of a regional water supply plan. Any regulatory measures would be addressed in recovery or prevention strategies. Based on current pumping conditions, constraints on the water resources in the North Florida region dictate that future use of groundwater may be more limited. A suite of projects, including water conservation, alternative water supply and aquifer recharge projects, were developed as part of this planning process to address this deficit in groundwater availability. In addition to implementation of projects, the District's regulatory programs take into account these constraints when evaluating water use/consumptive use permits. The SJRWMD Water Use Regulation staff have worked with applicants and permittees in the North Florida region who submitted Consumptive Use Permit (CUP) applications achieve a net reduction of 30.0 mgd in permitted UFA

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			landscape irrigation wells for properties that fall within public supply service areas. While staff responded in Appendix A that this additional withdrawal from the aquifer will be included in the next update to the NFRWSP, it seems prudent and necessary to estimate this use now and account for it in this current plan before further damage occurs. The proposed study could then be used to refine this estimate in the future plan. On page 31 the plan discusses several factors that decrease per capita use and failed to mention the substitution of landscape irrigation wells for public supply irrigation. This important point should be included in the main document and on page 6 of Appendix B. 3. While the Landscape Irrigation/Recreation category is not the biggest use in this region, it should be scrutinized during the consumptive use permitting (CUP) process and the next iteration of this plan. The plan shows a projected increase of 63% in this category, which is greater than the percent increase in agricultural and public supply demand. Alachua County EPD staff has reviewed several CUPs for landscape irrigation for commercial areas and does not see how this use is in the public interest. These landscapes tend to be established and can survive on rainfall alone. Public supply could be used for occasional watering needs in extreme droughts. Additionally, it is unclear if this category includes metered data and how accurate these projections are.	groundwater allocations since 2015. Additionally, the SRWMD staff has reduced groundwater allocations in the NFRWSP area by over 10 mgd since 2015, which is when the LSFI recovery strategy was adopted. Permits will continue to be evaluated to determine whether existing allocations can be reduced. Typically, this evaluation occurs upon application for a CUP permit renewal or permit modification, or if recovery strategies require reevaluation of the permit at an earlier date. Additionally, the Districts met with utilities to review their projection estimates and revisions were made from the feedback received. Projects have been developed to address all future demands. The data used for the NFRWSP illustrates the best available information at the time the projections were developed. Any increases in population and water demand will be included in the next 5-year update to the NFRWSP. 2. This comment has been acknowledged. The Districts have an active contract with the University of Florida to analyze usage patterns where irrigation wells are known, estimate the number of wells and quantity of water for areas with and without irrigation wells, and provide recommendations on how the data can be extrapolated to other areas. In

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			4. In January 2023, Alachua County pointed out that based on data from the UF Program for Resource Efficient Communities, new homes are using on average almost 400 gallons per day compared to the historic ~150 gallons per day for houses built before 1995. This means that utilities are projecting future water use based on historic use and are likely underestimating projected demand. In Appendix A staff recognized this issue and stated that the factors that influence public supply use will be incorporated in the future plan. Appendix M Brooklyn and Geneva Recovery Strategy relies on “passive water conservation” as plumbing fixtures get replaced with more efficient models. However, this concept does not hold true for outdoor water use which represents a large portion of public supply water use. Again, it is necessary to apply a buffer to allow for this uncertainty in water use projections so we don’t over allocate water in this region, as has happened in Central Florida. 5. The NFRWSP and MFL Prevention and Recovery Plans rely heavily on projects to restore flow. Projects can be unpredictable, often underperform, and are dependent on limited funding. Several of the projects in the plan are infiltrating recharge wetlands which seem to not account for loss of water to evapotranspiration. While Alachua County supports recharge via infiltrating wetlands, we	preparation for the next update to the NFRWSP, the Districts will use the information from this study to evaluate the impacts caused by landscape irrigation wells. 3. Regional water supply plans are not regulatory documents, therefore the review of the consumptive use permitting process is not in the scope of a regional water supply plan. The purpose of the water use regulatory program is to ensure that those water uses permitted by the District are reasonable-beneficial, will not interfere with any presently existing legal uses of water, and are consistent with the public interest pursuant to Section 373.223, F.S. The process requires efficient utilization of water for the intended purpose to prevent and reduce wasteful, uneconomical, impractical, or unreasonable use of water resources. In addition, all economically and technically feasible alternatives to the use of traditional sources are considered, including, but not limited to, brackish water, reclaimed water, stormwater, and aquifer storage and recovery. Each District has adopted rules for regulating the consumptive use of water. The majority of the increase in Landscape Irrigation/Recreation (LR) category occurs within the SJRWMD

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			do not want the benefits to be overestimated in light of pressures on the aquifer. 6. Strong water conservation requirements and regulatory strategies are needed in addition to projects. In response to such, staff references Appendix L Prevention and Recovery Plan in Appendix A. This plan was adopted almost a decade ago (2014) and the MFL is still not being met. Additional regulatory measures are needed and are much more reliable and cost effective compared to projects. For example, Appendix M Brooklyn and Geneva Recovery Strategy largely relies on the $81 million dollar Black Creek project to achieve 10.0 MGD of recharge. Applying and enforcing once a week year-round irrigation restrictions would conserve more water at a fraction of the cost. 7. Alachua County is in the process of completing a Climate Vulnerability Analysis for Alachua County. The data will be shared with your agencies and should be incorporated in this effort and future efforts to the greatest extent feasible. While most of the counties in this region will not have comparable data, it is likely that some of the results from Alachua could be extrapolated to incorporate the impacts of climate change on our water supplies. We appreciate the opportunity to share our concerns about these water resources that are vital to our local economy, ecology, and	(10.9 mgd or 96% of the increase). Of this, almost 74% of the projected increase in LR water demand is expected to come from surface water, not a public water supply system. Additionally, some of the increased demand can be met with reclaimed water. Regardless of source water, surface water or potable water, all uses are required to use water in the most efficient manner feasible. The water use estimates included metered data, however if there is not a reporting requirement, data is estimated based on information provided in the permit. More details have been added on page 2 in Appendix B to outline the Districts permitting requirements. 4. As stated previously, the projected future demands were developed with utilities based on the best available information at the time. The use of gross per capita is recognized as a national standard methodology for water supply planning. The Districts based the water demand projections for public suppliers on the most recent five-year average gross per capita rate (2014-2018). The data used to develop the average regional gross per capita rate used for this plan was not indicative of the increase in water use by new homes. Water conservation and implementation of reclaimed water, occurring within utility service area

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			water supply. Please contact Stacie Greco, Water Resources Program Manager, at Sgreco@alachuacounty.us or 352-264-6829 for additional information.	boundaries, are resulting in reductions and offsets of residential irrigation from the potable supply, respectively. However, the trends of increased water use in new homes are of concern and additional water conservation strategies are being pursued such as working with UF/IFAS on more drought tolerant turf grass cultivars and promoting stormwater reuse in new developments. However, it is acknowledged that the projection methodology assumes past water use is predictive of future water use and other factors affecting per capita usage, such as newer homes using more water than older homes, are not immediately reflected in the five-year average. Projections will be reevaluated during the next 5-year update at which time any change of trends in water use patterns will be taken into account. 5. Your comment has been noted. The Districts will continue to refine benefit estimates as projects are developed. 6. The NFRWSP recognizes the importance of water conservation to help meet future demand, however regional water supply plans are not regulatory documents. Any regulatory measures would be addressed in updated recovery or prevention strategies.

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				7. The Districts do recognize that climate change poses uncertainty in water supply availability, and that local management actions and regional collaborations will help mitigate the associated impacts and enhance the continued reliability of water supply in the NFRWSP planning area. To plan and prepare for climate change, the Districts conducted a planning level assessment to determine if fresh water supplies in the NFRWSP region are likely to become constrained due to flooding from Sea Level Rise throughout the 20-year planning horizon consistent with the DEP's "Format and Guidelines for Regional Water Supply Planning" (a statement referencing these guidelines has been added to the plan). Individual entities, such as Alachua County, are conducting more detailed vulnerability assessments of their facilities that consider compound flooding and other relevant factors. Additional text was added to Chapter 5 of the plan to highlight the detailed analyses being conducted by local entities through their vulnerability assessment of critical infrastructure.
43	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	The Bradford Soil and Water Conservation District's (BSWCD) comments are focused on Bradford County and the Upper Santa Fe Basin which includes almost all of Bradford County. A very small part of southeastern	This comment is acknowledged. The Districts have provided responses to the subsequent comments, which are related to these concerns.

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			Bradford County is in the Upper Etonia Creek Basin. The BSWCD has three major concerns related to the Draft 2023 North Florida Regional Water Supply Plan (2020–2045) (Draft 2023 NFRWSP). 1. The MFLs for the Upper Santa Fe River 2. The MFLs for Lakes Sampson, Crosby, and Rowell have not been established 3. The methods used in the Draft 2023 NFRWSP to determine the impacts of mining.	
44	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	**The MFLs for the Upper Santa Fe River** The methods used to first establish the MFLs for the Upper Santa Fe Basin and the methods used to determine if the MFLs are being met have very serious flaws. These flaws need to be addressed by reevaluating the Upper Santa Fe MFL adopted in FAC 40B-8.061 in 12-10-07 and revising the method used to determine if the MFLs are being met currently and will be met in the future.	The SRWMD's MFL priority list is updated and approved annually by the Governing Board, which would be an appropriate time to request MFL re-evaluation for specific waterbodies.
45	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	Establishing MFLs The current method of establishing MFLs for small streams has a significant problem because the flow in small streams can be reduced by trees falling across the stream, debris trapped on the fallen trees, and sediment accumulation. The reduced flows	Your comment has been acknowledged.

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			result in higher water levels up stream. If the flow reduction is near the measuring gauge the data collected from that gauge would not accurately reflect the level and flow of the river below the point where flow is being obstructed. For a small stream like the Upper Santa Fe River at and above Worthington Springs water levels may provide a better choice than flow for setting MFLs. Level data is also easier to collected so more sampling points on a stream could be developed.	
46	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	Determining the Status of MFLs FAC 40B-8.061 is vague because it fails to define how you determine if the established MFL is being met. The set MFLs are based on a historic flow duration curve for a period of record. It is not clear from the Technical Document for the Upper Santa Fe River MFL what the dates were for the period of record. The end dates appear to have been between 2000 and 2004. To determine current conditions a flow duration curve needs to be developed. FAC 40B-8.061 fails to establish what the time period for the evaluation flow duration should be. There are several possibilities: 1. Flow data could be added to the flow duration curve in the rule. 2. A flow duration curve could be created with data collected after the end of the period of record in FAC 40B-8.061 flow duration curve.	The Upper Santa Fe River was evaluated as part of the water resource assessment. Details on the methodology used can be found in Appendix F.

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			3. A flow duration curve could be created for a set time period such as 10 years with new data added and data older than 10 years deleted. FAC 40B-8.061 makes no reference to Pumps Off, Current Pumping, the NFSEG Model, and Reference Criteria used in Appendix F Table F1 to determine if MFLs are and will be met. The BSWCD contends the information presented in the Draft 2023 NFRWSP fails to support the claim the Draft 2023 NFRWSP makes in Table 3 on page 57 that the MFLS for the Upper Santa Fe River are being met.	
47	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	If the Final 2023 NFRWSP indicates the MFLs for the Upper Santa Fe River are being met and will be met in 2045 the WRCA of the NRWSP needs to be revised to remove Bradford and Union Counties from the WRCA that became effective December 4, 2019.	The designation of the Upper Santa Fe Basin as a Water Resource Caution Area is based on regional constraints including the Lower Santa Fe and Ichetucknee Rivers and Lakes Brooklyn and Geneva. The Water Resource Caution Area designation was made because there are other water resource constraints in the NFRWSP area. The source of water for Bradford and Union counties is the Floridan aquifer, and the impact of those groundwater withdrawals influence the waterbodies that are constrained.
48	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	The MFLs for Lakes Sampson, Crosby, and Rowell have not been established Water flows from Lakes Crosby and Rowell through dug canals into Lake Sampson and	The priority list is based on the importance of the waters to the state or region and the potential for significant harm to the water resources due to withdrawals, per statute.

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			then out of Lake Sampson via a dug canal to the Sampson River that flows into the Upper Santa Fe River downstream of the Graham gauge and up stream of the Worthington Springs gauge. Flows from the three lakes make up a significant part of the 20% flow at Worthington Springs that comes from the Sampson River. The drainage basin for the three lakes and the Sampson River is almost 43,000 acres. Not evaluating the role of the three lakes in the Draft 2023 NFRWSP would raise serious questions about the methodology used in the Draft 2023 NFRWSP when much smaller lakes with much smaller drainage basins are included in the Draft 2023 NFRWSP. Establishing the minimum level for Lakes Sampson, Crosby, and Rowell is a critical step in the water assessment process and reducing the flooding of homes around Lakes Sampson and Crosby.	The SRWMD's MFL priority list is updated and approved annually by the Governing Board, which would be an appropriate time to request MFL re-evaluation for specific waterbodies.
49	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	The methods used in the NFRWSP to determine the impacts of mining. How is gpcd related to the CII/MD category? How was Commercial/Industrial/Institutional and Mining/Dewatering historic water use determined? Mining operations use water not related to mine dewatering. The Draft 2023 NFRWSP should refer to all water used for mining.	The CII category consists of commercial, industrial, and institutional use, which can be influenced by increases in population. The relationship between gpcd and the CII/MD category is that there is an expected proportional increase with the growth of population and the demand for water, both in its consumption for the manufacturing of commercial and industrial products and in its utilization for institutional purposes.

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			Mine dewatering also can include the removal of groundwater from the surficial aquifer. Mining also is done in the Floridan Aquifer resulting in evaporation losses from both the exposed water surface and the wet mined materials.	CII/MD historic water use is reported to the District based on the monitoring requirement outlined in the permit. Appendix B on page 3: "The MD category consists of water use associated with mining (extraction and processing of subsurface materials and minerals) **and** long-term dewatering (removal of water to control surface or groundwater levels during construction or excavation activities)." Appendix B on page 10: “For this NFRWSP, surface water use by mining operations represents 5% of total surface water use, to account for the loss of water in mining products and evaporation. The remaining surface water was assumed to be recirculated in the mining process and, therefore, is considered non consumptive."
50	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	Table B-9 does not appear to be included in Appendix B.	Table B-9 is included in Appendix B and is on page B-9.
51	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	Who is included in the 1-in-10 year Drought Subcommittee of the WPCG? What data was used to determine that drought would not impact mining water losses?	The Drought Subcommittee consisted of staff from all five water management districts as well as DEP. A list of the staff members can be found in the Final Report, which is listed in the references section in Appendix B. Appendix B on page 10: "The 1-in-10 year Drought Subcommittee of the WPCG, as

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				stated in their final report, determined that drought events do not have significant effects on water use in the CII/MD category. Water use for the CII category is related primarily to processing and production needs and therefore, the average water demands, and 1-in-10 water demands are assumed to be equal. Water use for the MD category is also not expected to increase during drought conditions." Additionally, commercial/industrial products are typically market driven, not climate or weather driven, depending on the product.
52	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	Figure 3 of Appendix M: Lakes Brooklyn and Geneva Recovery Strategy indicates that Mining Dewatering accounts for 7% of the change in Upper Floridan Aquifer levels. How much of the 7% comes from the pre 2023 DuPont/Chemours mining operations? What are the expected changes from the Chemours Trail Ridge South mining operation which began in Clay County near Blue Pond in October 2022. If dewatering was required for the mined area, the removed water would likely have been discharged into the Upper Santa Fe Basin. The issue of evaluating mine dewatering needs to be addressed in the Water Assessment because the dewatering and mined area stormwater management moves	The 2023 NFRWSP is a regional planning effort and does not address the specific assessments used in support of the Lakes Brooklyn and Geneva Recovery Strategy that was approved by the SJRWMD Governing Board in 2021. The Districts acknowledge this is a planning level effort and refer to the Districts' robust environmental resource and consumptive/water use permitting programs to address the potential for harm when redirecting surface water from one location to another. The surface water used for heavy mineral sands mining is largely recirculatory in nature and the amount of water that is consumptively used is very small. In addition, new dry mine technologies, which keep water used in the mining process within the mining footprint are closed-loop systems and are not considered a consumptive use. Therefore,

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			water between water management districts and water basins. Requiring consumptive use permits for all mine dewatering and processing operations should be required so the impact of mining on surface water flows and aquifer levels can be assessed.	new mining operations that employ dry mine technology are not required to obtain a consumptive use permit.
53	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	The period 2020 to2045 would be 25 years. The BSWCD suggests changing the words “20-year planning period through 2045” be changed to 25-year planning period through 2045.	The projections made for the NFRWSP were developed using the best available information at the time developed. Planning projections are updated at least once every five years to take into account improved data and methodologies. Section 373.709 (2) F.S. states that a RWSP must be based on **at least** a 20-year planning period.
54	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	*While there are increases in surface water demand projected, the Districts determined that there are sufficient water sources to meet the projected demand.* BSWCD Comment What data supports this claim?	The majority of increases in surface water demand occur in the Landscape / Recreational Self-Supply category which typically utilizes on-site ponds to meet irrigation demand. Clarification to support this claim has been added. See chapter 6, page 72.
55	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	*Figure 3. Watersheds (8-digit hydrologic unit code) in the NFRWSP region (USGS, 2023) BSWCD Comment* We suggest adding the 8-digit hydrologic unit code to the legend.	Figure 3 has been updated.

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56	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	Draft 2023 NFRWSP Page 20 &21 *Groundwater Resources: Groundwater resources in the NFRWSP area include the Surficial aquifer system* (SAS)*, the Floridan aquifer system* (FAS)*and, where present,* ~~*the intermediate confining unit/*~~ *intermediate aquifer system* (IAS)*. A brief description of these aquifer systems is listed below:* • ~~*Surficial Aquifer System (SAS):*~~ *The SAS is the uppermost aquifer system, generally unconfined, and comprised primarily of unconsolidated beds of sand, shelly sand, shell, and clay.* • ~~*Intermediate Confining Unit (ICU)/Intermediate Aquifer System*~~ (IAS): *The* ~~*ICU/*~~*IAS* is in the intermediate confining unit *which separates the underlying* ~~*Floridan aquifer system*~~ FAS *from the overlying SAS throughout a large portion of the planning region. In some areas, the* ~~*Floridan aquifer system*~~ FAS *is unconfined due to the absence of the ICU, such as in the lower Suwannee River basin in the SRWMD. In other areas within the planning region, the ICU is quite thick. In Duval and Nassau counties, the ICU is hundreds of feet thick.*	Updates have been incorporated in Chapter 1.
57	Paul Still; Bradford Soil and Water	10/4/2023 via email	*Floridan Aquifer System (FAS): The FAS within the planning area is comprised primarily of carbonate rocks. In much of its extent, the*	Updates have been made to Chapter 1 on page 21 to reference the NFSEG v1.1 Final Report.

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	Conservation District		*FAS is comprised of an upper aquifer, the Upper Floridan aquifer (UFA) and lower aquifer, the Lower Floridan aquifer (LFA). The two aquifers are separated by a semi-confining unit referred to as the middle confining unit (MCU). Regionally, the MCU varies in lithologic and hydraulic characteristics and the degree of confinement of the MCU can vary significantly. In Northeast Florida, the LFA is further subdivided into an upper zone, referred to as the upper zone of the Lower Floridan aquifer and a lower zone, the Fernandina permeable zone. The upper zone of the Lower Floridan aquifer is separated from the Fernandina permeable zone by the lower semi-confining unit.* The above language fails to acknowledge that for parts of the Draft 2023 NFRWSP area there is no MCU. Without a MCU you cannot have a UFA and a LFA. The BSWCD suggests referencing the information copied below from page 3-17 of the NFSEGv1.1 Final Report page 3-17. "Layer 3 Layer 3 is used primarily to represent the Upper Floridan aquifer. Where the Upper Floridan aquifer is not present as a separate hydrogeologic unit (i.e., where the middle confining unit is effectively absent), Layer 3 represents a shallower section of the Floridan aquifer system (Zone 1 of the present study, as noted in Table 2.2)."	

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			The BSWCD suggests adding Figure 2-13 from the NFSEGv1.1 Final Report to demonstrate where the MCU does not exist.	
58	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	*Traditional Water Sources:* *Current water sources in the NFRWSP area include groundwater (fresh and brackish), reclaimed water, surface water, and stormwater. The majority of water use in 2015 in the NFRWSP area was fresh groundwater (Appendix B, Table B-2). Given this consistent pattern of historical and current utilization of fresh groundwater, the Districts recognize fresh groundwater as the only traditional water supply source in the NFRWSP area and designate all other water sources to be nontraditional (i.e., alternative water supply; (subsection 373.019(1), F.S.).* While fresh groundwater may be the source of majority of water use in the 2015 in the Draft 2023 NFRWSP it is important to acknowledge where other sources of water are used. In Bradford County surface water is used by heavy mineral sands mining operations. The actual use of surface water in heavy mineral sands mining operations in Bradford, Clay, and Baker Counties appears to have been discounted possibly because mine operators have not been required to obtain consumptive use permits for their use of surface water.	As noted earlier, the surface water used for heavy mineral sands mining is largely recirculatory in nature and the amount of water that is consumptively used is very small. In addition, new dry mine technologies, which keep water used in the mining process within the mining footprint are closed-loop systems and are not considered a consumptive use. Therefore, new mining operations that employ dry mine technology are not required to obtain a consumptive use permit.

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59	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	*In addition, beginning in February 2023, District staff held many focused stakeholder meetings with local governments, regional organizations, agricultural entities, and other stakeholders in the NFRWSP area. The purpose of these meetings was to share an overview of the NFRWSP process, provide background information of interest to stakeholders, and answer questions.* BSWCD Comment Please provide information (when, where, participants) about who was included in the "many stakeholder meetings". How were the participants in the meetings selected?	Updates were made in Chapter 2 to provide more details on the noticed workshops and stakeholder comment period. In addition to these noticed meetings, various methods and forums were used to notify and solicit input from stakeholders.
60	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	*Purpose The Districts develop water demand projections to determine existing legal uses, anticipated future needs, and existing and reasonably anticipated sources of water and water conservation efforts.* It would be helpful to identify what data presented is actual use data and what data is estimated use. It would also be helpful to show data from 2015 to the most current year with actual use data in a table and in the graphs included on pages 26 to 39.	At the time the data for the NFRWSP was developed, the most current year of water use data had not yet been reported, therefore the data in the tables in Appendix B were the best available data at that time.
61	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	*For this NFRWSP, two percent of total surface water use by PG facilities is considered consumptive, to account for water loss due to evaporation.*	See page 10 in Appendix B: "surface water use by mining operations represents 5% of total surface water use, to account for the loss of water in mining products and evaporation."

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			BSWCD Comment Why is the loss 2% for power generation when it was 5% for mining?	Power generation water use does not have product associated with it. See page 11 of Appendix B: "Surface water use by PG facilities represents 2% of total surface water withdrawals to account for the loss of water due to evaporation."
62	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	Draft 2023 NFRWSP Page 44 *Figure 17. Changes in UFA water levels from CP to 2045 within the NFRWSP area* BSWCD Comment A Figure showing the area where the middle confining unit is known to occur should be added. Is there an UFA if there is no middle confining unit?	Information regarding the MCU, along with a figure, can be found in Chapter 2 of the NFSEG v1.1 Final Report.
63	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	Draft 2023 NFRWSP Page 64 Resiliency *Rising sea levels and changing climate pose a threat to natural and manmade systems, including infrastructure that supports access to fresh water. Florida is vulnerable to the effects of climate change and SLR due to its unique climate, hydrology, geology, topography, natural resources, and dense coastal populations. To better plan for the potential effects of these future changes, the*	Section 373.709 (2) F.S. states that a RWSP must be based on **at least a** 20-year planning period. The Districts do recognize that climate change poses uncertainty in water supply availability, and that local management actions and regional collaborations will help mitigate the associated impacts and enhance the continued reliability of water supply in the NFRWSP planning area. To plan and prepare for climate change, the Districts conducted a planning level assessment to determine if

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			Districts conducted a planning level assessment to determine if fresh water supplies in the NFRWSP region are likely to become constrained due to flooding from SLR throughout the 20-year planning horizon (Appendix I). Appendix I Resiliency Assessment Page 2 *Purpose The Districts conducted a planning level assessment to determine if fresh water supplies in the NFRWSP area are constrained or likely to become constrained due to flooding from sea level rise (SLR) throughout the 20-year planning horizon.* The planning horizon is 25 years. Shane Williams from the Alachua County Environmental Protection Department made a presentation at the September 28, 2023, Santa Fe River Springs Protection Forum titled Alachua County Vulnerability Analysis. That analysis is near completion and some parts are complete. The information presented in the presentation clearly demonstrated that a resiliency assessment should go beyond sea level rise. The BSWCD contends that the impacts of climate change noted in the Alachua County analysis should be included in the NFRWSP that covers a period to 2045. The impacts are so significant the approval of the 2023	fresh water supplies in the NFRWSP region are likely to become constrained due to flooding from Sea Level Rise throughout the 20-year planning horizon consistent with the DEP "Format and Guidelines for Regional Water Supply Planning" (a statement referencing these guidelines has been added to the plan). Individual entities, such as Alachua County, are conducting more detailed vulnerability assessments of their facilities that consider compound flooding and other relevant factors. Additional text was added to Chapter 5 of the plan to highlight the detailed analyses being conducted by local entities through their vulnerability assessment of critical infrastructure.

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			NFRWSP should be delayed until climate change impacts can be included in the 2023 NFRWSP even if it the plans has to become the 2024 NFRWSP.	
64	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	The 2007 Upper Santa Fe Technical Document stated that that 0% water was available at both the Graham and Worthington gauges at the 75%, 90%, and 95% exceedance amounts. One would have to assume that no additional withdrawals have occurred after the end of the period of record used to create the Flow Duration Curve for the 2007 technical report. It is unclear what the end date was for the two river gauges but it appears it was between 2000 and 2004.	Supplemental Comment Received Your comment has been acknowledged.
65	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	The Upper Santa Fe MFL was established in FAC 40B-8.061. There is no reference in FAC 40B-8.061 to the NFSEG model or Reference Criterion used to demonstrate the Upper Santa Fe MFLs are being met. FAC 40B-8.061 is based on the Flow Duration Curves for the two gauges.	Supplemental Comment Received The Upper Santa Fe River was evaluated as part of the water resource assessment. Details on the methodology used can be found in Appendix F.
66	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	The MFLs were not changed. The change is in the determination 2010 assessment that the low flow frequencies at Worthington Springs would not met in the future to the determination in the 2017 plan and the Draft 2023 NFRWSP that low flow levels would be met in the future. Flows from the three lakes make up a significant part of the 20% flow at Worthington Springs that comes from the Sampson River.	Supplemental Comment Received The status of the Upper and Lower Santa Fe River MFLs have not changed with this planning document. The SRWMD's MFL priority list is updated and approved annually by the Governing Board, which would be an appropriate time to request MFL re-evaluation for specific waterbodies.

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			The drainage basin for the three lakes and the Sampson River is almost 43,000 acres. This should establish the importance of the three lakes. The additional flow and level data from 2000 to the present and the development of the NFSEG model would appear to meet the stated criteria for the reevaluation of Upper Santa Fe MFL.	
67	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	Establishing the minimum level for Lakes Sampson, Crosby, and Rowell is a critical step in the water assessment process and reducing the flooding of homes around Lakes Sampson and Crosby. Effective planning for use of existing flood control structures requires these MFLs to be established.	Supplemental Comment Received The priority list is based on the importance of the waters to the state or region and the potential for significant harm to the water resources due to withdrawals, per statute.
68	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	What is the meaning of “calibrated hydrologic conditions” in this statement? How do the observed levels for all the aquifers in 2018 compare to the model predictions for 2018? Have the model results been compared to any actual data for any year after 2018? What data was used to update the CP and 2045 data for the Georgia part of the model? What would the figures look like if you run the comparisons with the Georgia data in the pumps off mode?	The “calibrated hydrologic conditions” refers to pumps off conditions as simulated by the 2009 version of the NFSEG v1.1. The NFSEG model and well files are publicly available for the execution of these scenarios, however, these scenarios are not essential in the planning process for the water resource assessment. More information on the scenarios ran for the water resource assessment can be found in Appendix F and G. Appendix B on page 18 discusses the updated Georgia water use data and projections.

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			What would the figures look like if you run the comparisons with the Georgia and SJRWMD in the pumps off mode? Can the model be run with individual counties in the Pumps Off mode?	
69	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	*Water use estimates used as inputs to the NFSEG were updated from the 2017 NFRWSP and vetted through a thorough public review process.* What date was the water use estimates updated to? When was the public review process done and how was it done?	Water use data and updates are detailed in Chapter 3 and Appendix B. Clarification has been provided in Chapter 2.
70	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	Appendix C Page 6 and 7 Figures C 3 and C 4 What information was used to establish that there is a middle confining unit in the Floridan Aquifer in Bradford County west of SR 100? There are no figures for “no pumps off to 2045” for the Hsurficial and Lower Floridan aquifers? And the intermediate aquifers.	Chapter 2 of the NFSEG Final Report discusses the middle confining unit. (Durden et al., 2019) The figures referenced are not essential in the planning process, which assessed changes from current pumping to 2045. More detailed information regarding the figures can be found in Appendix C.
71	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	*Figure 2. A portion of the District showing the updated integrated soils and vegetation layer. Three indicates high potential for adverse change to wetlands, two for moderate potential, and one for low potential.*	“Attachment A – 2022 Kinser-Minno Wetland Assessment Tool 20221209” is a separate technical report describing recent improvements made within the geoprocessing tool last updated by the SJRWMD in 2008.

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			Figure 2 of Attachment 2 does not show the NFRWSP area. The Draft 2023 NFRWSP should have a Figure with the information in Figure 2 for the NFRWSP area. The results from the Attachment A 2022 Kinser-Minno Wetland Assessment Tool 12/9/22 Update appear to significantly reduce the area and locations of impacted wetlands identified in the draft 2023 NFRWSP when compared to the 2015-2035 NFRWSP. The information in the draft 2023 NFRWSP needs to ne checked and if the information is correct an explanation of why the reduction occurred.	Since the Kinser-Minno GIS method is used to estimate the future potential for adverse change to wetlands **throughout** the District, Figure 2 of the technical report is included to provide an **example** of the updated integrated soils and vegetation layer. A separate figure of this layer for the North Florida region was not provided in the 2023 NFRWSP as this is an interim product generated as part of the geoprocessing workflow within the ModelBuiler tool. The wetland assessment performed in support of the 2015-2035 NFRWSP used the 2008 Kinser-Minno method. The wetland assessment performed in support of the 2023 NFRWSP used the 2022 Kinser-Minno method. The 2022 Kinser-Minno method includes updates to the soils data, vegetation layer, and the Digital Elevation Model (DEM) data. Another screening parameter, depth to water table or Surficial aquifer system (SAS), was also introduced for the areas where the UFA is confined. This additional step of incorporating the depth to water table in the areas of confined UFA provides further screening to ensure the area is hydraulically connected to the SAS and therefore, would or would not be influenced by changes in SAS levels. A combination of the 2022 updates made to Kinser-Minno method, use of an updated groundwater flow model and updated groundwater demand and projections, all of which are based on best available information, resulted in the reduction in wetland acreage

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				with a moderate to high potential for change as noted from the previous plan. As noted in Chapter 5 of the plan, changes to wetlands from groundwater pumping are primarily addressed via the Districts' regulatory programs and through the development of WSD and WRD projects.
72	Paul Still; Bradford Soil and Water Conservation District	10/4/2023 via email	Reevaluation of the NFRWSP Process The BSWCD would like to suggest that the NFRWSP process may not the best and most efficient way to address our areas future water needs. The area covered by the plan is too large and the geology, hydrogeology, and water use of the area covered too different. The NFRWSP was initiated in part because of SRWMD concern that SJRWMD withdrawals were impacting groundwater levels in the SRWMD. Does the current model generated data support that concern? If it does what parts of the SJRWMD responsible for most of the impacts? Having the NFRWSP focused on the primary impact areas of the SJRWMD would make the process more productive and efficient.	Section 373.709, F.S., provides that the districts shall conduct water supply planning for a water supply planning region within the district identified in the appropriate district water supply plan under s. 373.036, F.S., where it determines that existing sources of water are not adequate to supply water for all existing and future reasonable-beneficial uses and to sustain the water resources and related natural systems for the planning period. The formation of the Partnership was a response to the recognition that groundwater withdrawals in both SRWMD and SJRWMD have impacts on the natural systems, thereby necessitating a collaborative approach to address these impacts.
73	Jeremy D. Johnston; Clay County Utility Authority, on behalf of The North Florida	10/6/2023 via email	Please accept these comments on behalf of the North Florida Utilities Coordinating Group (NFUCG) and its members, 1 regarding the draft 2023 North Florida Regional Water Supply Plan (the Plan). NFUCG and its members have been active participants and	The Districts appreciate the feedback and participation of the North Florida Utility Coordination Group in the North Florida planning process.

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	Utility Coordinating Group		contributors throughout the Water Management Districts' Plan development process. We appreciate the opportunity to collaborate with District staff and stakeholders regarding this important aspect of achieving shared goals of protecting our water resources and assuring that sufficient water supplies exist to meet our region's water needs. NFUCG supports the joint approval of the Plan by the Suwannee and St. Johns River Water Management Districts. **Significant Achievements in Conservation and Reuse** NFUCG and its members would like to take this opportunity to commend both Districts for their commitment to encouraging the sustainability of our region's water resources. As the draft Plan recognizes, two critical components of this sustainability are continued commitment to conservation and the use of reclaimed water. The Plan correctly recognizes that public water suppliers expect to achieve even greater water conservation and greater reuse of reclaimed water over the 20-year planning period. However, we recommend the Plan recognize the significant achievements that the Districts, public water suppliers and other users have already realized in both conservation and reclaimed water use. As reflected in the figure below, since 2006, the population served by NFUCG members	Additional language has been included in Chapter 7 to recognize the work of the NFUCG in the region. The Districts and DEP look forward to continued collaboration with NFUCG in the future as work on LSFIR strategies progresses.

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			has increased by almost 200,000 people, from approximately 1.09 to 1.26 million. However, during the same time period, actual water use by NFUCG members declined from 192 million gallons per day (mgd) to 173 mgd. This water savings can be directly linked to water conservation and water reuse efforts undertaken by NFUCG members, our customers, and the Districts. If not for these efforts, water use would have risen during this period up to approximately 223 mgd, which is 50 mgd greater than the actual demand of 173 mgd. We consider this an important point for the Plan to recognize these past successes, such as the NFUCG's 50 mgd reduction in water use, since the ongoing emphasis and investment in conservation significantly reduced the amounts of water necessary to meet future demand. Similarly, NFUCG members, frequently in coordination with the Districts' cost-share programs, made significant investments in the increased use of reclaimed water. Since 2000, NFUCG members invested over $150 million on beneficial reclaimed water projects, resulting in over a 100% increase in both reclaimed water use and reclaimed water capacity. This commitment to the reuse of reclaimed water provided significant benefits to the region, by allowing public suppliers and other users to reduce or eliminate the use of potable water for irrigation purposes providing direct environmental benefits. As	

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			reflected in the draft Plan, NFUCG members remain committed to even greater expansion of all feasible reclaimed water use in the future, however we believe the Plan should also recognize the significant achievements that have already been realized by the Districts, public suppliers, and other water users. **Financial Commitment to Implement Regional Water Resources Projects** In addition to the commitment and investment in conservation and water reuse, we appreciate the opportunity to participate in Regional Water Resource Development Projects which increase the sustainability of our water supply while addressing potential impacts. We hold the Black Creek Water Resources Development Project as one such project which will provide benefits across the NFRWSP area. In the previous 2015-2035 NFRWSP adopted in 2017, the Black Creek Project was identified as a potential project option with a timeframe for completion of 2035. However due to cooperation between SJRWMD and stakeholders like NFUCG's members, the Black Creek Project is nearing completion and slated to provide significant benefits to the region in the near future. As noted in the draft Plan, four NFUCG member utilities entered into agreements to fund the construction and operation of this project as a way to address their proportionate share of impacts to several water bodies. NFUCG	

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			members committed to contribute a combined total of approximately $19.2 million toward the Project. The NFUCG looks forward to continuing to collaborate as additional Regional Water Resource Development Projects are identified to address potential impacts to other water bodies. These types of projects can be an equitable way to address regional water resources while allowing all users to address their proportionate share of impacts. **Public Suppliers' Participation** in **the Process** Finally, we appreciate the opportunities the Districts' have provided to us and other stakeholders to participate in the Plan development process. We consider this participation important in allowing the public to stay informed regarding the Districts' planning initiatives and allowing stakeholders to contribute their own resources and technical expertise supporting the Districts' efforts. In the case of the draft Plan, in addition to being active participants in the Plan review and development process, NFUCG members identified 86.6 mgd of the 87.9 mgd (99%) of alternative water supply project options included in the Plan, at a total estimated cost of over $800 million. In addition, when factoring in water resources development and water conservation project	

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			options, NFUCG members identified 122 mgd of the 15 8 mgd (77%) of all project options included in the Plan, at a total estimated cost of over $ 1.8 billion. In other words, the contributions of NFUCG and its members are essential to the development of a successful Plan, and will remain central to the successful implementation of the objectives identified in the Plan. Given the critical role NFUCG and it members will continue play in working with the Districts and other stakeholders in achieving these goals, we look forward to continuing to closely coordinate with the Districts regarding future planning, modeling, and regulatory efforts. In particular, we look forward to working with District staff regarding the further development of the minimum flow and level prevention and recovery plan for the Lower Santa Fe and Ichetucknee Rivers to ensure the sustainability of water supply while meeting the needs of these water bodies. We also look forward to working with District staff in the setting and evaluation of minimum flows and levels for the Suwannee River. Each of these endeavors serve key aspects of ensuring protection of the region's water resources and while providing reliable and affordable sources of water for our region's needs. Thank you for your consideration of these comments and we look forward to continuing to work with the Districts on these important issues.	

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74	Chris Farrell; Audubon Florida – Northeast Florida Program	10/5/2023 via email	Audubon Florida appreciates the opportunity to comment on the draft North Florida Regional Water Supply Plan. Strong leadership by the two water management districts involved is imperative to ensure adequate protection of our natural resources as demands for water increase. North Florida has challenges ahead as its population is projected to increase by almost 50% by 2045, accompanied by a 32% increase in water demands. Water supply plans – and the resulting discussions and local planning efforts – will have profound implications on the future economy and quality of life of the region. Below are several suggestions that will help decision-makers and the public identify strategies that are most likely to produce cost-effective, sustainable solutions that will produce more resilient communities. **Reduced Outdoor Irrigation Can Eliminate Much of Future Water Demand with Added Benefits** Outdoor irrigation is arguably the most important single issue that should be addressed to alleviate the increase in demand for groundwater moving forward. H2OSAV data show that single-family residences in Florida routinely use 50% or more of their water on outdoor irrigation. Much of this water is high-quality groundwater that is treated and intended for human consumption. Additionally,	The Districts recognize the importance of water conservation and promote best management practices through our planning, cost-share, education and outreach, and regulatory programs. The Districts maintain extensive conservation programs that have resulted in significant water savings within all water use categories. Chapter 7 of the 2023 NFRWSP highlights outdoor residential water use (irrigation) as a prime target for demand reduction. The 2023 NFRWSP is a regional planning level effort and does not define specific project benefits, such as 50% reduction in irrigation for new homes. However, these types of regional benefit analyses are conducted in the development of prevention/recovery strategies. While the Districts agree that additional benefits, such as reduced energy and water pollution, can be gained with the efficient use of outdoor irrigation, water supply plans are developed to identify sustainable water supplies for all existing and anticipated water uses while protecting water resources and related natural systems.

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			changes that reduce outdoor irrigation (mainly reduced use of turfgrass) provide numerous benefits that help address additional challenges that are negatively impacting Floridians. We appreciate the discussion of the Turf Swap Program in Alachua County and encourage the districts to vigorously pursue similar programs throughout North Florida. There are many high-quality, existing resources to help homeowners transition to more sustainable yards including Audubon's Plants for Birds program (https://www.audubon.org/plantsforbirds) which connects homeowners to local resources to ensure their success. Additionally, the plan would provide additional insight to local governments if it included an analysis of the benefits associated with limits on outdoor irrigation (e.g., what if demands for irrigation were reduced by 50% in all new development). Such a discussion should consider all benefits including reduced energy use, water pollution, and more.	
75	Chris Farrell; Audubon Florida – Northeast Florida Program	10/5/2023 via email	In addition, the plan highlights provisions for "watering efficiently" and the landscape irrigation restrictions of 40C-2, F.A.C. However, these measures only curtail wasteful, excessive use of water by allowing users to put tens of thousands of gallons of water on turfgrass each month. The plan should explain that following these guidelines only serves to avoid harmful levels of	The Districts agree that water conservation is a priority because it contributes to the sustainability of water supply sources. Conservation strategies and projects are recognized as typically being the most economically feasible and are likely be a more cost-effective option than implementing water supply development and water resource development projects. The Districts continue

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			overwatering and should be considered a minimum level of restriction rather than a true conservation measure. The plan should take more time to explore landscape approaches that meaningfully reduce the water demand.	to work with water users and multiple agencies throughout the state to identify innovative strategies to further reduce water demand. Additional strategies to reduce demand have been added to the Chapter 7 discussion on water conservation.
76	Chris Farrell; Audubon Florida – Northeast Florida Program	10/5/2023 via email	Also discussed in the plan are tiered rate structures for water users. Audubon supports this measure and suggests that the plan discuss the ramifications of tiered rate structures including the number of users that switch to their own private irrigation wells. Local governments need to be aware that public use numbers may decline with higher rates (the intended goal), but many users may be switching to water sources that are not currently tracked sufficiently to understand their impact. The plan could suggest the type of reporting or permitting that would enable Florida governments to better evaluate the impact of thousands of private wells being drilled to various depths across the district.	The 2023 NFRWSP is a regional planning level effort and not a regulatory approach to define specific management strategies. The installation and use of water from landscape irrigation wells are regulated in accordance with 40C-3 and 40C-2.042, F.A.C., which limits the water use for landscape irrigation “to only that necessary for efficient utilization.” The landscape irrigation rules in 40C-2.042 F.A.C. are applicable whether that water is supplied by a utility or an individual irrigation well. Additional regulatory measures associated with an MFL recovery would be included in the Recovery Strategy. The Districts have an active contract with the University of Florida to analyze usage patterns where irrigation wells are known, estimate the number of wells and quantity of water for areas with and without irrigation wells, and provide recommendations on how the data can be extrapolated to other areas. In preparation for the next update to the NFRWSP, the Districts will use the information from this study to evaluate the impacts caused by landscape irrigation wells.

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77	Chris Farrell; Audubon Florida – Northeast Florida Program	10/5/2023 via email	**Water Reuse is an Important Tool in the Toolbox, but it Must be Used Correctly** Groundwater is already pumped beyond sustainable levels in many areas of the state. The plan states that many water bodies are already in recovery and that additional wetlands, lakes, and rivers could be harmed further by additional pumping. Wastewater reuse should prioritize methods with the most benefit and least potential for unintended harm. Audubon Florida recommends a focus on projects that involve groundwater recharge of water that meets advanced wastewater treatment standards. Rather than focusing on reuse for outdoor irrigation which is energetically demanding and a potential non-point source of pollution, we encourage the Districts to consider other projects. For example, many recharge projects have used treatment wetlands to cost-effectively achieve impressive nutrient reductions while providing wildlife habitat, recreation, and tourism benefits.	The Districts support groundwater recharge projects that meet all permitting criteria. The 2023 NFRWSP identifies a suite of water supply and water resource development project options from which utilities can select projects to help meet our future water demands. Included in this suite of projects are multiple groundwater recharge projects using reclaimed water treated to appropriate standards. See the Water Resource Development table (Table K-2) in Appendix K Project Options. Many of these groundwater recharge projects using treated reclaimed water are treatment wetlands. See Project numbers 2023_20 and 59 GRU Groundwater Recharge Wetlands; Project No. 59 City of High Springs Infiltrative Wetlands; and Project No. 2675 Lake City Recharge Wetland for some examples.
78	Chris Farrell; Audubon Florida – Northeast Florida Program	10/5/2023 via email	**The Large Scope of our Water Challenges Requires a New Approach** We ask that the plan include a more robust discussion of various approaches to meeting water supply needs. A more holistic analysis of our water problems and solutions will assist local governments as they update their comprehensive plans in response to the water supply plan findings. Specifically, it would be	Using the authority given to the Districts, a holistic approach is employed to meet water supply needs in the North Florida region which includes water supply planning, regulatory programs, MFLs development, recovery and prevention strategies, and other resource protection measures. Water supply plans do not address the value of green vs grey infrastructure (impacts to habitat, energy use,

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			helpful to include some discussion on the different values associated with green versus grey infrastructure (impacts to habitat, energy use, greenhouse gasses, etc.), potential opportunities for harm when redirecting surface water from one location to another, and the value of reducing demand rather than continuing to allocate more water from natural systems to our built environment. Thank you for considering our comments. Please contact us if you have any questions.	greenhouse gasses, etc.) because it is not within their scope of review. The Districts acknowledge this is a planning level effort and refer to the Districts' robust environmental resource and consumptive/water use permitting programs to address the potential for harm when redirecting surface water from one location to another. The Districts recognize the value of reducing water demand and the plan identifies conservation strategies and projects as being a more cost-effective option than implementing some water supply and water resource development projects. The Districts also maintain extensive conservation programs that have resulted in significant water savings within all water use categories. Based on current pumping conditions, constraints on the water resources in the North Florida region dictate that future use of groundwater may be more limited. A suite of projects, including water conservation, alternative water supply and aquifer recharge projects, were developed as part of this planning process to address this deficit in groundwater availability. In addition to implementation of projects, the Districts' regulatory programs take into account these constraints when evaluating water use/consumptive use permits. The SJRWMD Water Use Regulation staff have worked with

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				applicants and permittees in the North Florida region who submitted Consumptive Use Permit (CUP) application to achieve a net reduction of 30.0 mgd in permitted UFA groundwater allocations since 2015. Additionally, the SRWMD staff has reduced groundwater allocations in the NFRWSP area by over 10 mgd since 2015, which is when the LSFI recovery strategy was adopted. Permits will continue to be evaluated to determine whether existing allocations can be reduced. Typically, this evaluation occurs upon application for a CUP permit renewal or permit modification, or if recovery strategies require reevaluation of the permit at an earlier date.

Appendix B

Population and Water Demand Projections

Introduction

This Appendix contains information on the methodology and data developed for use in the development of the water demand estimates and projections for the 2023 Joint North Florida Regional Water Supply Plan (NFRWSP) for six water use categories, as well as future reclaimed water supply and estimates of potential conservation. It also describes the methodologies used to determine the spatial distribution of projected groundwater withdrawals used in the groundwater flow model scenarios.

The North Florida Southeast-Georgia (NFSEG) groundwater flow model extends beyond the NFRWSP area into the Northwest and Southwest Florida Water Management Districts (NWFWMD/SWFWMD), Georgia, and South Carolina. This Appendix also includes sources and information pertaining to the water use data and demand projections within the NFSEG model boundary outside of the NFRWSP area.

Background and Water Use Categories

The planning horizon for the 2023 NFRWSP is 2020 to 2045. Population and water demand estimates and projections are a cornerstone for assessing the water needs and availability in regional water supply planning. The St. Johns River Water Management District (SJRWMD) and Suwannee River Water Management District (SRWMD) (Districts) develop water demand projections to evaluate “existing legal uses, anticipated future needs, and existing and reasonably anticipated sources of water and conservation efforts,” as set forth in subparagraph 373.036(2)(b)4a, Florida Statutes (F.S.). The Districts’ goals are to project water demands that are reasonable and based on the best information available at the time the projections were developed.

The baseline year, 2015 for the NFRWSP, is the year that acts as the starting point for water demand projections and is based on the best available data of reported and estimated water use. Water use in the baseline year is not a projection, but rather actual or estimated use. Both the SRWMD and the SJRWMD have specific requirements for monitoring and reporting of permitted withdrawals. For SRWMD, these requirements apply to wells with a primary casing inside diameter of eight inches or greater, as well as surface water pumps with a cumulative intake diameter of six inches or greater. The SJRWMD requires monitoring and reporting for average annual daily withdrawal equal to or exceeding 100,000 gallons per day on an average annual basis or withdrawals equipment or other facilities which have a capacity equal to or exceeding 1,000,000 gallons per day.

Five-Year Interval Intermediate Water Use Projections as required by subsection 62-40.531(1)(a), Florida Administrative Code (F.A.C.), must include water demand projections for five-year intervals during the planning period. The interval years should end on five or zero (e.g., 2020, 2025, 2030, etc.) as directed by the state format and guidelines for regional water supply planning (DEP 2019).

Water demands for this 2023 NFRWSP are estimated in 5-year increments (subsection 62-40.531(1)(a), F.A.C.) for the following six water use categories established by the Florida Department of Environmental Protection (DEP) and the state's five water management districts:

1. **Public Supply (PS)** - This category includes water provided by any municipality, county, regional water supply authority, special district, public or privately-owned water utility, or multijurisdictional water supply authority for human consumption and other purposes with average annual permitted quantities of 0.1 million gallons per day (mgd) or greater.
2. **Domestic Self-supply and Small Public Supply Systems (DSS)**
    a. The DSS category consists of residential dwellings that are self-supplied water from a dedicated, on-site well and are not connected to a central utility.
    b. The DSS category also includes centralized Small Public Supply Systems (SPSS) that provide water for human consumption with average annual permitted quantities of less than 0.1 mgd.
3. **Agricultural (AG)** - The AG category consists of water use associated with the irrigation of crops and other miscellaneous water uses associated with agricultural production (e.g., aquaculture, livestock).
4. **Landscape/Recreational (LR)** - The LR category consists of self-supplied water use associated with the irrigation, maintenance, and operation of golf courses, cemeteries, parks, medians, attractions, common areas in residential areas, and other large green areas. This category also includes water use associated with ornamental or decorative purposes, such as fountains and waterfalls.
5. **Commercial/Industrial/Institutional (CII) and Mining/Dewatering (MD)**
    a. The CII category consists of self-supplied water use associated with the production of goods or provisions of services by CII establishments (e.g., general businesses, office complexes, commercial cooling and heating, bottled water, food and beverage processing, restaurants, gas stations, hotels, car washes, churches, hospitals, and prisons).
    b. The MD category consists of water use associated with mining (extraction and processing of subsurface materials and minerals) and long-term dewatering (removal of water to control surface or groundwater levels during construction or excavation activities).
6. **Power Generation (PG)** - The PG category consists of self-supplied water use associated with power plant and power generation facilities, including but not limited to water for steam generation, cooling, and replenishment of cooling reservoirs.

Other than the PS category, all other water use categories obtain water from dedicated, on-site wells and pumps and are not connected to a central utility. In addition to the six water use categories listed above, projections are developed for future reclaimed water flows that could potentially be used to partially offset water demand. Reclaimed water is treated domestic wastewater that has received at least secondary treatment and basic disinfection and is reused for a beneficial purpose. Water demands, reclaimed water flows, and estimates of potential conservation are expressed in average million gallons per day unless otherwise noted.

Data for the baseline year consists of reported and estimated water usage for 2015, whereas data for the years 2020 through 2045 are projected water demands. Water use estimates and demand projections for the six water use categories were calculated for the years 2015, 2020, 2025, 2030, 2035, 2040, and 2045 based on average rainfall conditions, in addition to a 1-in-10 year drought event for 2045. The 1-in-10 year drought event is defined as a year in which rainfall occurs at below normal levels whose frequency has a 10% probability of occurring in any given year. These below normal rainfall conditions result in an increase in water demands for four of the six water use categories. Future reclaimed water flows and estimates of potential conservation were also calculated for the year 2045.

Methodology

Data and Information Sources

The methodology to develop population and water demand estimates and projections uses many data sources such as:

1. Finished water supplied by PS and SPSS collected by DEP through Monthly Operating Reports (MORs).

2. Water use estimates reported by permittees to the Districts through the respective Consumptive Use Permit (CUP) programs.

3. The Districts published annual water use reports (SJRWMD 2015-2016, 2017a, 2018b, 2019; SRWMD 2019, 2020a, 2020b, 2020c).

4. Agricultural water use estimates from the Florida Department of Agriculture and Consumer Services (FDACS) (FDACS 2017, 2020).

5. Permitted quantities and percentages of water use as reported in CUPs.

6. University of Florida's Bureau of Economic and Business Research (BEBR) publications (BEBR 2015-2016, 2017a, 2017b, 2018).

7. DEP Annual Reuse Inventory Report (DEP 2019a).

8. Power Plant 10-Year Site Plans collected by the Public Service Commission (PSC).

PS and DSS Population Estimates and Projections

In developing RWSPs, the Districts must consider BEBR medium population projections pursuant to subparagraph 373.709(2)(a)1a, F.S. The population projections developed by BEBR are commonly used in planning efforts throughout Florida. These projections are made at the county-level only (Rayer, S. and Y. Wang. 2020) and require distribution among PS (and SPSS) service area boundaries (PSABs) and parcels and DSS parcels.

SJRWMD

The SJRWMD has developed a model that distributes BEBR county-level estimates and projections to the individual parcel level (SJRWMD 2021). Using this model, the SJRWMD aggregated the parcel level population to each PS (and SPSS) service area in the NFRWSP area. This effort provided historic, future, and build-out permanent resident populations for each PS and SPSS. Because of the service area boundary characteristics, the estimated historic service area population may differ from estimates of utility population served. This difference can occur when a service area includes self-supplied populations that may be currently unserved by the respective utility. Stakeholder feedback resulted in adjustments to population projections for the utilities detailed in the attached Technical Memorandum “Documentation and Methodologies for Updating St. Johns River Water Management District 20202045 North Florida Regional Water Supply Plan Projections Resulting from Stakeholder Feedback” (SJRWMD, 2022).

DSS population was the population for all parcels outside of PS and SPSS PSABs, aggregated in five-year increments from 2015 to 2045. In some cases, a DSS population within PS and SPSS PSABs was identified through previously submitted account level billing data and well completion reports; this population was attributed to the DSS category. The DSS population by county (after adding the total population for each SPSS for each respective county) is shown in Table B-6.

SRWMD

The SRWMD used BEBR county-level population estimates for 2014-2018. These estimates were distributed within the county based on data provided by PS and SPSS utilities, correctional institutions, and parcel level data (SRWMD, 2021). The SRWMD applied the population model created by the SJRWMD to distribute projected future population within the county (SJRWMD 2021). This population model also estimated the projected future served populations within PSABs. After meeting with utilities, estimates and projections were revised to include any feedback that was received.

The DSS population for 2014-2018 and projected years (2020-2045) was estimated by taking the total BEBR county-wide population estimate and subtracting institutional population, PS residential served population, and the SPSS residential served population (SRWMD, 2021). The DSS and small public supply population by county is shown in Table B-6.

PS Water Demand

Gross Per Capita Water Use

For PS and SPSS, the gross per capita water use is defined as the total raw water withdrawn (including residential and non-residential uses) for each individual permittee or system divided by its respective service area residential population expressed in average gallons per capita per day (gpcd).

A PS/SPSS specific gross gpcd was applied to each respective PS/SPSS service area projected residential population to calculate future average-year water demands. The source of the data varied (metered/surveyed data or raw water withdrawals and MOR data or finished water withdrawals), however most of the treatment methods currently used in the NFRWSP area have minimal treatment losses and any differences are assumed to be negligible. Water demand projections were based on the most recent five-year (2014-2018) average gross per capita rate (at the time the projections were developed), which accounts for annual variations in water use with respect to rainfall and recent implementation of conservation programs. In cases where water use data were not available from the sources identified, the Districts estimated values from historical data and trends.

For this NFRWSP, it is assumed that current levels of water conservation and use of reclaimed water will continue through the year 2045 planning horizon; additional conservation and the use of additional reclaimed water will be effective in reducing future water demands.

The Districts have observed a reduction in per capita water use over the last decade that may be attributed to a variety of factors, including economic conditions, indoor and outdoor conservation, and source substitution with reclaimed water. The use of a five-year average gross per capita accounts for some variability in these factors.

Estimated and projected water demand for each individual PS is shown in Table B-5a (and by county in Table B-5) and includes five-year increments from 2015 to 2045. A water demand projection for 2045 during a 1-in-10 year drought is also shown. Water demand for SPSS (individually listed in Table B-6a) was aggregated for each county and was added to the respective county demand for the DSS category (shown in Table B-6).

To calculate the 1-in-10 year water demand projections, the average year water demands were multiplied by 1.06 (corresponding to a six percent increase). The 1-in-10 year Drought Subcommittee of the Water Planning Coordination Group (WPCG) concluded that a six percent increase in water demand would occur in such an event for the PS water use category (WDPS 1998).

Spatial Groundwater Distribution

For groundwater modeling purposes, the projected groundwater demand and associated location of withdrawal needed to be determined. For example, there is one PS utility within the NFRWSP area that has surface water withdrawals (Manufactured Home Communities in Flagler County). For this CUP with surface water withdrawals, groundwater demand was estimated as the total water demand minus the permitted surface water withdrawal. The projected groundwater demand, specific to each PS and SPSS, was distributed evenly to their respective active or proposed wells/stations contained in their CUP. For those PS systems with multiple wellfields and/or specific wellfield allocations, the associated water demand was divided proportionally amongst the respective wellfields and then further to the wellfields' respective wells/stations.

DSS Water Demand

As stated above, water demand and population projections for SPSS are calculated individually but are combined with the DSS category for reporting purposes at the county level.

Residential Per Capita Water Use

For DSS, the residential per capita water use (also referred to as household) is defined as the water use for solely residential (indoor and outdoor) purposes. The residential gpcd was estimated from the county level residential population served and residential water use. To achieve this, the total water use for each year (2014-2018) for each PS and SPSS was reduced to reflect only the indoor and outdoor residential portion of the total PS and SPSS water use. This was calculated using data reported directly from PS and SPSS systems, as well as the percent of residential water use identified in a CUP. The resulting residential water use values for each PS and SPSS system were summed to the county level and divided by the total PS service area population (at county level) to obtain the county-level average 2014-2018 residential gpcd. The average 2014-2018 county level residential gpcd was then multiplied by the projected 2020, 2025, 2030, 2035, 2040, and 2045 DSS population (by county).

The DSS estimated and projected water demand by county (after adding the total water demand for SPSS) is shown in Table B-6 and includes five-year increments from 2015 to 2045. A water demand projection for 2045 during a 1-in-10 year drought is also included. Identical to PS, to calculate the 1-in-10 year water demand projections for DSS, the average year water demands were multiplied by 1.06.

Spatial Groundwater Distribution

Each SPSS future groundwater demand and location of withdrawal was spatially distributed as defined in the PS section.

Outside of PS and SPSS service areas, parcels with residential housing units were identified using FDOR data; for these parcels a point was added to the centroid of each identified parcel to represent a well/station. Within PS and SPSS service areas, where available, account level billing data and well completion reports were used to determine DSS within those respective PSABs. For these parcels a point was added to the centroid of each identified parcel to represent a well/station. The DSS water demand for each five-year increment was then distributed evenly among the identified DSS parcels, for each county respectively. For counties located in more than one water management district (e.g., Alachua County), the projected DSS water demand specific to each of the Districts was only applied to the DSS parcels identified within the respective Districts' portion of the county.

Agricultural Water Demand

Section 570.93, F.S., directs the FDACS to develop annual statewide agricultural acreage and water demand projections based on the same planning horizon used in water supply planning. Pursuant to paragraph 373.709(2)(a), F.S., the Districts are required to consider AG water demand projections produced by FDACS and that any adjustment or deviation from data provided by FDACS must be fully described, and the original data must be presented along with the adjusted data. FDACS publishes 20-year AG acreage and associated water demand projections in the annual Florida Statewide Agricultural Irrigation Demand (FSAID) reports, through a contract with The Balmoral Group. The fourth annual report (referred to as FSAID IV), which was published in June 2017 (FDACS 2017), was used for 2015 AG acreage estimates for the Districts and for 2015 AG water use in the SRWMD. The seventh annual report (referred to as FSAID VII), which was published in June 2020 (FDACS 2020), contains estimated and projected agricultural acreage and water demand projections for the State of Florida for five-year increments from 2020 to 2045, as well as a water demand projection for 2045 during a 1-in-10 year drought. Detailed methodology can be found in the FSAID VII Report.

Acreage

As noted above, the 2015 acreage estimates and 2020-2045 acreage projections were taken directly from FSAID IV and FSAID VII, respectively. The estimated and projected irrigated agricultural acreage by county is shown in Table B-7 in five-year increments from 2015 to 2045. Acreage by crop type is included in Table B-7a.

Demand

As stated above, water use estimates and water demand projections were taken directly from FSAID IV and FSAID VII, respectively. One exception for 2015 AG water use is where SJRWMD supplemented FSAID IV water use data with metered data for CUPs. Of note, for SJRWMD, 2015 was the second wettest year in the ten-year average of 2012-2021 (50.08") at 55.13". 2015 was 10.01% above the ten-year average. The estimated and projected agricultural water demand by county is shown in Table B-7 in five-year increments from 2015 to 2045. Water demand for 2045 during a 1-in-10 year drought is also included. Water demand by crop type and miscellaneous type uses are included in Tables B-7a and B-7b.

Spatial Groundwater Distribution

The FSAID IV and FSAID VII (FDACS 2017, 2020) deliverable contains the location, in polygon format, of all estimated future agricultural water demand in the five-year increments necessary for groundwater modeling. SJRWMD used the FSAID IV and FSAID VII (FDACS 2017, 2020) deliverables and refined the data to account for those agricultural areas using surface water and converted the delivered polygon layer to a point layer (tied to CUP station location) for use in groundwater modeling. Detailed methodology regarding the conversion of polygon water demands to point water demands and the conversion of total water demands to reflect groundwater and surface water demands is available from SJRWMD (SJRWMD 2018a).

Landscape/Recreational Water Demand

Water demand for the LR category was projected at the county level using a respective historic LR average gpcd. The county specific LR average gpcd was calculated from LR average water use for 2014-2018 and BEBR estimates of county population for 2014-2018 (BEBR 2015-2016, 2017a, 2017b, 2018).

The average LR gpcd was applied to the additional population projected by BEBR (Rayer, S. and Y. Wang. 2020) for each five-year increment and the associated water demand was added to the 2015 baseline year water use.

The estimated and projected LR water demand by county is shown in Table B-8 in five-year increments from 2015 to 2045. Water demand for 2045 during a 1-in-10 year drought is also included.

The 1-in-10 year Drought Subcommittee of the WPCG, as stated in their final report, determined that values using agricultural (irrigation) models, historic data, and net irrigation ratios are acceptable when calculating the 1-in-10 year water demand projection. A factor was developed for each county, using the highest year water use from 2014-2018 and the percent increase from the 2014-2018 LR water use. For example, if water use in 2016 was X percent higher than the 2014-2018 five-year average, X percent was applied to the average 2045 water demand to project a 2045 1-in-10 year water demand.

Spatial Groundwater Distribution

The projected water demand for the LR category is only estimated at the county level. For groundwater modeling purposes, the groundwater demand and associated location of withdrawal needed to be determined. Several LR CUPs have surface water withdrawals; future groundwater demand for the respective future years at the county level was calculated using the 2015 percent split between groundwater and surface water (via reported CUP data and the SJRWMD's published report (SJRWMD 2016)). The county level groundwater demand for future year scenarios was then distributed to the CUP level using a percent share method of permitted allocation. For example, if an LR CUP's groundwater allocation represented 10% of the county's total groundwater allocation in 2015, then the LR CUP allocation also maintained 10% of the county groundwater allocation in 2045. The estimated projected groundwater demand specific to each LR CUP was then distributed evenly to their respective active or proposed stations. For counties located in more than one District (e.g., Alachua County), the projected LR water demand specific to each District was only applied to the respective LRA CUPs and stations identified within the respective Districts' portion of the county. While future land use and potential new locations of LR polygons was not taken into consideration, the method applied is generally accepted as a valid method for regional planning purposes.

Commercial/Industrial/Institutional and Mining/Dewatering Water Demand

Water demands for the CII/MD category were projected at the county level using a respective historic CII/MD average gpcd. The county specific CII/MD average gpcd was calculated from CII/MD average water use for 2014-2018. CII/MD historic water use and water demand consists of only consumptive uses; recycled surface water and non-consumptive uses were removed. For this NFRWSP, surface water use by mining operations represents 5% of total surface water use, to account for the loss of water in mining products and evaporation. The remaining surface water was assumed to be recirculated in the mining process and, therefore, is considered non consumptive. For clarification, consumptive use for planning purposes is defined by the Districts as any use of water that reduces the supply from which it is withdrawn or diverted.

The CII/MD average gpcd was applied to the additional population projected by BEBR (Rayer, S. and Y. Wang. 2020) for each five-year increment and the associated water demand added to the 2015 baseline year water use. Three counties in the NFRWSP and one county in the western part of SRWMD have large CII users (e.g., paper and pulp mills) that are not impacted by population increases (Nassau, Putnam, Hamilton, and Taylor counties). The water use associated with these permits were removed from the average per capita calculations for future CII/MD water demands.

The estimated and projected CII/MD water demand by county is shown in Table B-9 in five-year increments from 2015 to 2045.

The 1-in-10 year Drought Subcommittee of the WPCG, as stated in their final report, determined that drought events do not have significant effects on water use in the CII/MD category. Water use for the CII category is related primarily to processing and production needs and therefore, the average water demands, and 1-in-10 water demands are assumed to be equal. Water use for the MD category is also not expected to increase during drought conditions.

Spatial Groundwater Distribution

See the LR spatial groundwater distribution explanation above. The methodology for spatial distribution of future groundwater for the CII/MD category for modeling purposes is the same, using the projected CII/MD future groundwater demands.

Power Generation Water Demand

Water demand was calculated for each PG facility and then summed to the county level for consumptive uses of water only; recycled surface water and non-consumptive uses were removed. Surface water use by PG facilities represents 2% of total surface water withdrawals to account for the loss of water due to evaporation and is included in the water demand projections. An example of this is surface water used for once-through cooling for power plants, which is recycled or returned to the withdrawal source.

The PSC requires that each PG facility produce detailed ten-year site plans for each of its facilities. These plans include planned facilities and generating capacity expansion. The 2020 ten-year site plans for each PG facility within the NFRWSP area were downloaded from the PSC website (http://www.psc.state.fl.us) and were used in developing the PG water demand projections.

In order to project future water demand, the NFRWSP utilized a methodology that incorporated historic and projected customers, historic and projected megawatts, and the average daily gallon per megawatt use for 2014-2018. Each ten-year site plan contains information regarding historic and projected customers and megawatts, as well as planned capacity expansions or facility closures. The majority of the ten-year site plans extended through year 2029. The average customer growth rate was used to extrapolate projected customers beyond the ten-year site plans through the planning period of 2045. Using the last year data in each ten-year site plan, a megawatt use per customer was calculated and then applied to the future customers to project future megawatts. Future groundwater demand for 2030-2045 was calculated by applying the (2014-2018) average gallons used per historic megawatt to the projected megawatts specific to each PG facility.

Water demands are very specific to each PG facility, as PG facilities are among the most efficient of freshwater users. The Districts contacted each PG facility located in the NFRWSP area to determine if the methodology employed and described above produced projections reflective of their future water needs. The Districts received responses back from both Duke and JEA; resulting in a reduction of the demand projections initially developed.

The estimated and projected PG water demand by county is shown in Table B-10 in five-year increments from 2015 to 2045. The projections for individual PG facilities is included in Table B-10a.

The 1-in-10 year Drought Subcommittee of the WPCG, as stated in their final report, determined that drought events do not have significant effects on water use in the PG category. Water use for this category is related primarily to processing and cooling needs and therefore, the average water demands and 1-in-10 water demands are assumed to be equal.

Spatial Groundwater Distribution

Similar to the PS category, future water demand was projected in five-year increments through 2045 for each PG facility in the NFRWSP area. However, groundwater and surface water were projected separately for each facility based on the five-year (2014-2018) average gallons used per historic megawatt. The future groundwater demand, specific to each PG facility, was distributed evenly to their respective active or proposed wells/stations in their CUP or DEP power plant siting act plan.

Review of Population and Water Demand Projections

Water provider specific water use estimates and water demand projections were distributed to each water provider for review and comment. Changes and comments have been incorporated where appropriate. Because this is a long-term planning effort, methodology changes based on short-term trends were not incorporated. However, additional refinements in the future may be considered as population and water use is continually monitored. Comments and suggested changes may be taken into consideration if they are justifiable, defensible, based on historical regression data and long-term trends, and supported by complete documentation.

Summary of Population and Water Demand Projections

The methodologies for calculating population and water demand projections for the six water use categories, as well as future reclaimed water flows and conservation potential (described below) are consistent with the specific plans of major water users at the time projections were made. The projections in this NFRWSP assume that the current levels of water conservation efforts and the use of reclaimed water will continue through the year 2045 planning horizon. If water conservation efforts and the use of reclaimed water within the NFRWSP area are implemented at rates higher than historic rates, then 2045 actual water use will be less than projected under average climatic conditions.

2045 Reclaimed Water Projections

Projections of future reclaimed water flows were made for domestic wastewater treatment facilities (WWTF) with 2018 permitted wastewater treatment capacities equal to or greater than 0.1 mgd (DEP 2019a).

Existing Flows

The 2018 flows were separated by total WWTF flow and beneficial reuse. For this NFRWSP, beneficial reuse was considered to be only those uses in which reclaimed water takes the place of an existing or potential use of higher quality water for which reclaimed water is suitable, such as water used for landscape irrigation. Generally, delivery of reclaimed water to sprayfields, absorption fields, and rapid infiltration basins (RIBs) are not considered beneficial reuse, unless located in recharge areas (Table B-1 and Figure B-1).

Table B-1. Facilities in the NFRWSP area with reuse and disposal flows

Map ID	Facility	Total Treated Flow (mgd)	Actual Utilization (mgd)	Disposal Flow (mgd)
1	Plantation Bay WWTF	0.13	0.13	0.00
2	Green Cove Springs, City of - South WWTF	0.29	0.00	0.29
3	Sawgrass WWTF	0.81	0.37	0.44
4	Flagler Beach, City of WWTF	0.69	0.00	0.69
5	Hilliard, Town of WWTF	0.33	0.00	0.33
6	Matanzas Shores WWTF	0.11	0.00	0.11
7	Fleming Island Regional WWTF	5.68	5.06	0.62
8	Newberry, City of WWTF	0.21	0.21	0.00
9	Trenton WWTF	0.09	0.09	0.00
10	Southwest Water Reclamation	12.42	0.37	12.05
11	Ponce De Leon WWTF	0.04	0.00	0.04
12	SR - 6/I-75 WWTF	0.03	0.03	0.00
13	Northwest Wastewater Treatment Plant	1.61	1.61	0.00
14	Neptune Beach, City of WWTF	0.68	0.00	0.68
15	Hawthorne, City of WWTF	0.14	0.14	0.00
16	St. Augustine, City of - #1 WWTF	4.21	0.25	3.96
17	Jacksonville Beach WWTP	2.84	0.54	2.30
18	US Naval Station Mayport	0.69	0.00	0.69
19	Crescent City, City of WWTF	0.11	0.11	0.00
20	Nassau Regional WWTF	1.65	0.81	0.84
21	Fernandina Beach, City of WWTF	1.67	0.00	1.67
22	Bunnell, City of WWTF	0.55	0.39	0.16
23	Florida State Prison WWTF	1.01	1.01	0.00
24	SR-207 WWTF	0.17	0.17	0.00
25	Jasper, City of - WWTF	0.63	0.00	0.63
26	Anastasia Island WWTF	2.73	0.16	2.57
27	Hastings, Town of WWTF	0.11	0.00	0.11
28	Lake City, City of - WWTF	2.76	2.71	0.05
29	Orange Park, Town of - WWTF	0.99	0.00	0.99
30	Marsh Landing WWTF	0.56	0.23	0.33
31	Amelia Island WWTF	0.67	0.67	0.00
32	Baldwin WWTF	0.30	0.00	0.30
33	Columbia Correctional Institution WWTF	0.41	0.41	0.00

Map ID	Facility	Total Treated Flow (mgd)	Actual Utilization (mgd)	Disposal Flow (mgd)
34	GRU - Kanapaha WRF	11.63	11.63	0.00
35	Bulow Plantation	0.04	0.00	0.04
36	Buckman RMF	29.82	3.65	26.17
37	Jennings, Town of WWTF	0.14	0.14	0.00
38	Dunes Community Development District	2.09	2.09	0.00
39	Palm Coast Wastewater Treatment Facility	7.96	6.72	1.24
40	Lake Butler, City of WWTF	0.54	0.54	0.00
41	North Beach Utilities WWTF	0.28	0.00	0.28
42	GRU - Main St WRF	11.63	11.63	0.00
43*	Beach Haven WWTF	0.00	0.00	0.00
44	Innlet Beach WWTF	0.24	0.21	0.03
45	Palatka, City of WWTF	2.00	1.66	0.34
46	Green Cove Springs Harbor Road WWTF	0.50	0.25	0.25
47	Live Oak, City of WWTF	0.95	0.94	0.01
48	NAS Jacksonville WWTF	0.66	0.11	0.55
49	Fang - Camp Blanding WWTF	0.13	0.00	0.13
50	Blacks Ford WRF	35.63	11.34	24.29
51	High Springs, City of WWTF	0.16	0.16	0.00
52	Alachua, City of - AWRF	0.72	0.69	0.03
53	Branford, Town of WWTF	0.06	0.06	0.00
54	University of Florida WWTF	1.74	0.94	0.80
55	Normandy Village WWTF	0.35	0.00	0.35
56	Baker Correctional WWTF	0.21	0.21	0.00
57	Lancaster Correctional Institution WWTF	0.10	0.10	0.00
58	Macclenny, City of WWTF	0.87	0.00	0.87
59	Players Club South WWTF	0.43	0.15	0.28
60	Callahan, Town of WWTF	0.14	0.00	0.14
61	Advent Christian Village WWTF	0.04	0.04	0.00
62	District 2 Water Reclamation	5.79	1.34	4.45
63	Monterey WRF	1.64	0.00	1.64
64*	Peter's Creek WWTF (Green Cove West)	0.00	0.00	0.00
65*	Keystone Heights WWTF	0.00	0.00	0.00
66	Starke, City of WWTF	0.75	0.16	0.59
67	Atlantic Beach, City of - WWTF	1.81	0.00	1.81
68	East Putnam County RO WTP	0.14	0.00	0.14
69	White Springs, Town of WWTF	0.06	0.06	0.00
70	Ponte Vedra Water Reclamation Facility [WRF]	0.30	0.26	0.04
71	River Park Mobile Home Park WWTF	0.03	0.03	0.00
72	Spencer WWTF	2.99	0.00	2.99

*Facilities with a total treated flow of zero mgd are not represented in Figure B-1.

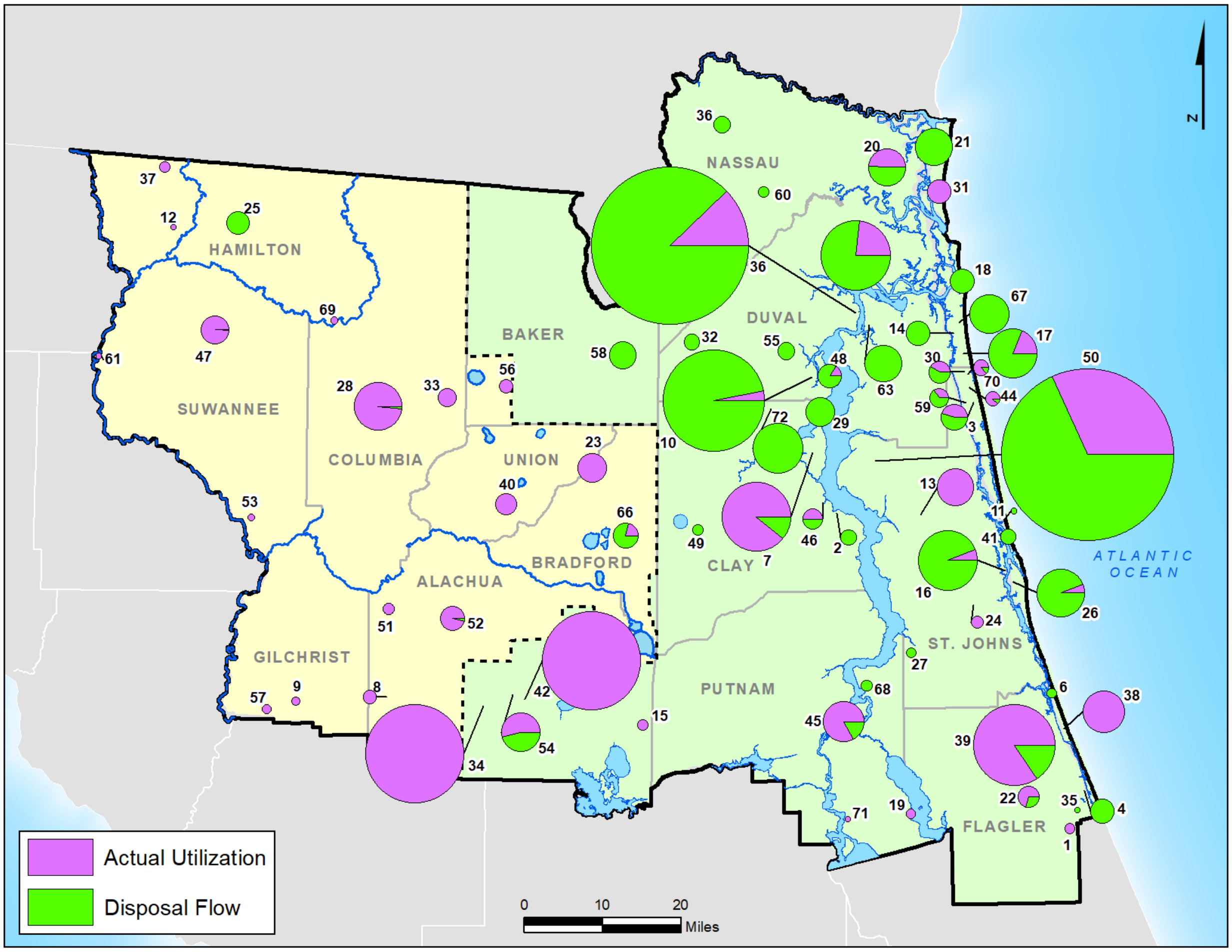

Figure B-1. Summary of 2018 WWTF reclaimed water and disposal flows in the NFRWSP area

The DEP regards several applications of reclaimed water as reuse that the Districts do not. Therefore, it is common for the Districts' beneficial reuse quantities to be lower than that of DEP. The Districts require the application to achieve a water resource benefit in order to qualify as reuse. Reuse must take the place of an existing or potential use of higher-quality water or be used to grow useful crops, restore or maintain adopted minimum flows and/or levels of a river, lake, or wetland, or effectively recharge a useable aquifer. An application that does not meet any of these criteria is considered by the Districts to be disposal. Reclaimed water applications considered to be reuse by DEP, but disposal by the Districts are underground injection, absorption fields and RIBs located in discharge areas, surface water augmentation where not required, spray fields, and artificial wetlands. Reclaimed water applications for underground injection, absorption fields and rapid infiltration basins will be considered beneficial if they are located in recharge areas, as identified via studies or through consumptive use permitting.

The DEP has a statewide reuse utilization goal of 75% (DEP 2003). Typically for planning purposes, the amount of WWTF flow in the baseline year not being utilized beneficially is multiplied by 75% and this amount is considered as potential existing additional reclaimed water that could be used for beneficial reuse. When determining how much WWTF flow can be utilized, it is recognized that each WWTF is unique and items such as system upgrades and treatment, additional storage, expansion of system, customer availability, and other factors have to be taken into consideration. Although 2015 is recognized as the base year, the Districts evaluated existing beneficial flows as of 2018 (DEP 2019a) because this was the most recent year of data that was within the scope of the plan. It was noted that many utilities in the NFRWSP area have implemented reclaimed water projects.

Future Flows

Using PSABs and CUPs, the Districts identified areas that have the potential to be connected to central sewer systems as a result of population growth. The 2018-2045 increase in population associated for each WWTF service area identified was obtained using the parcel-level projections, as described above. It was assumed that 95% of the identified population increase will receive sewer service and thereby return wastewater for treatment to a WWTF. It is acknowledged that the percentage of population growth and resulting wastewater flows will vary for individual service providers due to a number of factors.

According to empirical sources, increased population will generate approximately 73 gpcd of wastewater flows to the local WWTF. The 73 gpcd represents an average of 58.6 gpcd of wastewater generated by residential customers (indoor use; AWWA, 2016, Vickers 2001, Mayer, P and W. DeOreo, 1999), and 15 gpcd of wastewater return flows for employees at a commercial/industrial facility according to chapter 64E-6, F.A.C., "Standards for Onsite Sewage Treatment and Disposal Systems", rule 64E-6.008 System Size Determinations, section (1)(B) Table I (effective date 6/25/2009) - System Design.

For the purposes of the NFRWSP, the Districts also created a future reclaimed water scenario using the 2018 percent beneficial reuse utilization for existing and future flows, which assumes that no changes to current treatment processes are made (e.g., WWTF upgrade).

Only a portion of the existing and future wastewater treated for reuse is actually used to offset water demands that would otherwise require the use of fresh groundwater. The amount of potable offset that is typically achieved utility-wide is approximately 65% to 75%; however, the potable offset can range from 50% to as much as 100%, depending on the type of use being replaced. While the amount of potable offset that is achieved by reuse is dependent upon the demographics of a particular WWTF's service area, the projected wastewater flows do not represent an amount equal to the water demand reduction due to system losses and inefficiencies of reuse by customers.

Reclaimed water systems are unique to each utility and the potential WWTF flow estimated for this NFRWSP may not necessarily represent the amount of reclaimed water that could be used in projects. Current treatment processes, WWTF capacities, storage and infrastructure, and inflow and infiltration reduction programs should be considered and could potentially impact the utilization cost of additional or currently available reclaimed water. Likewise, future and existing reclaimed water utilization may be higher than the scenarios presented if the WWTF provided reclaimed water for reuse to more efficient customers. In addition, potential future wastewater flows could be less if additional residential indoor water conservation is achieved. For example, AWWA has identified on their website (www.Drinktap.org) that if residences installed, for every instance, more efficient water fixtures and regularly checked for leaks, daily indoor water use (and associated wastewater flow) could potentially be reduced to 45.2 gpcd (Vickers 2001).

Detailed flows and projections for 2018 and 2045 for each identified WWTF and county are included in Tables B-13 to B-15.

Spatial Distribution

The Districts did not attempt to identify where future reclaimed water flows or beneficial reuse will occur.

2045 Estimated Water Conservation Potential

Current water conservation potential for the 2023 NFRWSP area was calculated in order to gauge the future benefit of effective water conservation. For the 2023 NFRWSP, all categories of water use, except agriculture, utilized the results in the 2020 Central Florida Water Initiative (CFWI) Regional Water Supply Plan (RWSP) as the basis for estimating water conservation potential (CFWI 2020). Table 1 is excerpted from page 50 of the 2020 CFWI RWSP which was developed in partnership with stakeholders and is based on an in-depth assessment of the conservation potential from implementing best management practices. More detailed information on how water conservation estimates were developed in the CFWI can be found can be found at https://cfwiwater.com/waterconservation.html and in the 2020 CFWI RWSP (CFWI 2020).

Table 1. CFWI projected 2040 water demand and water conservation savings

Category	Projected 2040 Water Demand (mgd)	Projected 2040 Water Conservation Savings (mgd)
Public Supply	592.28	41.50 – 44.16
Domestic and Small Public Supply	24.59	0.86
Agriculture	163.49	4.19
Landscape/Recreational	46.96	2.22
Commercial/Industrial/Institutional	69.00	1.55 – 4.40
Power Generation	11.27	1.55 – 4.40
Total	907.59	50.32 – 55.83

For agriculture, water conservation savings were estimated from the FDACS - FSAID VII Final Report (FDACS 2020). Additionally, a second scenario of water conservation potential based on per capita rates was estimated for the public supply and domestic self-supply (DSS) water use categories.

For the first water conservation scenario, the Districts used the low-end estimates from the 2020 CFWI RWSP plus the FSAID VII estimates (Table B-16). For the 2023 NFRWSP, the resulting percentage savings derived from the 2020 CFWI RWSP in Table 1 will be applied to all of the water use categories (except agriculture). See Table 2 for the estimated percentage savings.

Table 2. Percentage Savings Calculated from the 2020 CFWI RWSP

Category	Estimated Percent Savings
Public Supply	7.0
Domestic Self Supply and Small Public Supply	3.5
Agriculture*	N/A*
Landscape/Recreational	4.7
Commercial Industrial/Institutional	2.2
Power Generation	13.8

*For agriculture, FSAID VII will be used to estimate water conservation potential.

The second water conservation scenario involved the public supply and DSS water use categories. For these two water use categories, the Districts calculated the average 2014-2018 gross per capita rates for the SJRWMD and SRWMD portions of the NFRWSP area (Table B-17 and B-18). If a public supply utility gross per capita was greater than the average 2014-2018 gross per capita, it was revised to reflect the demand based on the respective Districts' average 2014-2018 gross per capita multiplied by the public supply utility's 2045 population projections. This revised demand represents the water conservation potential for the public supply utility based on meeting the lower gross per capita average. For DSS, the corresponding percent reduction in the total public supply water demand by county using the per capita rate average was then applied to DSS 2045 water demand, resulting in the second scenario of DSS water conservation.

NWFWMD and SWFMWD Water Use and Projections

The NWFWMD and SWFWMD provided their water use estimates and projections. These data were incorporated into the 2023 NFRWSP geodatabase. Details concerning the development of the NWFWMD and SWFWMD data and projections should be directed back to the respective water management districts.

Georgia and South Carolina Water Use

Districts obtained water use data and projections through 2050 from the Georgia Environmental Protection Division (GEPD). The data were spatially distributed by staff and provided to GEPD for review. In June 2021, GEPD staff provided comments concerning surface water distribution which were addressed, and the resulting distribution was incorporated into the 2023 NFRWSP geodatabase. Additional information on the Georgia data and projections can be obtained from the GEPD at: Georgia Water Planning. South Carolina data was obtained from the US. Geological Survey at: ScienceBase Catalog Home. Details on how the data were distributed can be found in the *Methodology for the Spatial Distribution of Historic Water Use and Projected Water Demand for Georgia and South Carolina* (SJRWMD 2020).

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Table B-1. Population Estimates for 2015 and Population Projections for 2020-2045, by County, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	District	2015 BEBR County Population	2015 BEBR County Population less Institutional	2015 District Population	2015 Public Supply Population	2015 Domestic and Small Public Supply Systems Population	2020 BEBR County Population	2020 BEBR County Population less Institutional	2020 District Population	2020 Public Supply Population	2020 Domestic and Small Public Supply Systems Population
Alachua	SJRWMD	N/A	N/A	203,104	193,618	9,486	N/A	N/A	210,430	200,674	9,756
Alachua	SRWMD	N/A	N/A	51,364	22,595	28,769	N/A	N/A	58,905	25,652	33,253
Alachua	**Total**	**254,893**	**253,603**	**254,468**	**216,213**	**38,255**	**269,800**	**269,800**	**269,335**	**226,326**	**43,009**
Baker	SJRWMD	N/A	N/A	26,556	6,865	19,691	N/A	N/A	27,440	7,045	20,395
Baker	SRWMD	N/A	N/A	503	0	503	N/A	N/A	521	0	521
Baker	**Total**	**27,017**	**24,919**	**27,059**	**6,865**	**20,194**	**28,500**	**26,661**	**27,961**	**7,045**	**20,916**
Bradford	SJRWMD	N/A	N/A	2,289	115	2,174	N/A	N/A	2,475	122	2,353
Bradford	SRWMD	N/A	N/A	20,751	7,462	13,289	N/A	N/A	21,094	8,843	12,251
Bradford	**Total**	**27,310**	**24,384**	**23,040**	**7,577**	**15,463**	**28,800**	**26,878**	**23,569**	**8,965**	**14,604**
Clay	SJRWMD	201,277	201,277	202,600	137,842	64,758	219,000	219,000	220,871	156,111	64,760
Columbia	SRWMD	68,163	64,037	64,037	18,767	45,270	70,500	66,323	66,323	19,425	46,898
Duval	SJRWMD	905,574	905,574	851,884	693,374	158,510	985,500	985,500	1,027,320	863,174	164,146
Flagler	SJRWMD	101,353	101,353	99,769	94,805	4,964	113,400	113,400	113,387	107,845	5,542
Gilchrist	SRWMD	16,839	16,158	16,158	2,125	14,033	18,000	17,214	17,214	2,220	14,994
Hamilton	SRWMD	14,630	12,141	12,141	5,076	7,065	14,600	12,081	12,081	5,212	6,869
Nassau	SJRWMD	76,536	76,536	77,817	69,384	8,433	86,900	86,900	68,650	59,112	9,538
Putnam	SJRWMD	72,756	72,756	77,620	21,222	56,398	73,300	73,300	78,189	21,894	56,295
St. Johns	SJRWMD	213,566	213,566	216,513	173,216	43,297	263,900	263,900	300,530	248,420	52,110
Suwannee	SRWMD	44,452	41,532	41,532	7,491	34,041	45,900	43,899	43,899	8,125	35,774
Union	SRWMD	15,918	11,015	11,015	1,742	9,273	15,500	10,624	10,767	1,850	8,917
SJRWMD Region 1 Total		**N/A**	**N/A**	**1,758,152**	**1,390,441**	**367,711**	**N/A**	**N/A**	**2,049,292**	**1,664,397**	**384,895**
SRWMD NFRWSP Total		**N/A**	**N/A**	**217,501**	**65,258**	**152,243**	**N/A**	**N/A**	**230,804**	**71,327**	**159,477**
NFRWSP Total		**2,040,284**	**2,018,851**	**1,975,653**	**1,455,699**	**519,954**	**2,233,600**	**2,215,480**	**2,280,096**	**1,735,724**	**544,372**

County	District	2025 BEBR County Population	2025 BEBR County Population less Institutional	2025 District Population	2025 Public Supply Population	2025 Domestic and Small Public Supply Systems Population	2030 BEBR County Population	2030 BEBR County Population less Institutional	2030 District Population	2030 Public Supply Population	2030 Domestic and Small Public Supply Systems Population
Alachua	SJRWMD	N/A	N/A	220,210	210,090	10,120	N/A	N/A	231,023	219,025	11,998
Alachua	SRWMD	N/A	N/A	60,825	26,022	34,803	N/A	N/A	60,095	27,674	32,421
Alachua	**Total**	**281,500**	**281,500**	**281,035**	**236,112**	**44,923**	**291,600**	**291,600**	**291,118**	**246,699**	**44,419**
Baker	SJRWMD	N/A	N/A	28,838	7,309	21,529	N/A	N/A	30,026	7,833	22,193
Baker	SRWMD	N/A	N/A	549	0	549	N/A	N/A	573	0	573
Baker	**Total**	**29,900**	**28,061**	**29,387**	**7,309**	**22,078**	**31,100**	**29,261**	**30,599**	**7,833**	**22,766**
Bradford	SJRWMD	N/A	N/A	2,872	145	2,727	N/A	N/A	3,069	155	2,914
Bradford	SRWMD	N/A	N/A	21,097	9,029	12,068	N/A	N/A	21,120	9,181	11,939
Bradford	**Total**	**29,200**	**27,278**	**23,969**	**9,174**	**14,795**	**29,500**	**27,578**	**24,189**	**9,336**	**14,853**
Clay	SJRWMD	236,800	236,800	247,378	182,502	64,876	252,500	252,500	275,396	210,459	64,937
Columbia	SRWMD	73,500	69,323	69,323	19,986	49,337	76,000	71,823	71,823	20,551	51,272
Duval	SJRWMD	1,051,900	1,051,900	1,073,631	904,898	168,733	1,104,300	1,104,300	1,117,321	946,901	170,420
Flagler	SJRWMD	126,500	126,500	126,488	120,892	5,596	138,300	138,300	137,761	130,769	6,992
Gilchrist	SRWMD	18,900	18,114	18,114	2,486	15,628	19,700	18,914	18,914	2,710	16,204
Hamilton	SRWMD	14,800	12,281	12,281	5,255	7,026	14,900	12,381	12,381	5,278	7,103
Nassau	SJRWMD	95,800	95,800	78,852	67,336	11,516	103,100	103,100	88,870	76,515	12,355
Putnam	SJRWMD	73,600	73,600	78,461	22,161	56,300	73,700	73,700	78,596	22,292	56,304
St. Johns	SJRWMD	309,300	309,300	348,452	296,645	51,807	347,600	347,600	385,610	334,151	51,459
Suwannee	SRWMD	48,300	46,299	46,299	8,961	37,338	50,400	48,399	48,399	9,527	38,872
Union	SRWMD	15,600	10,724	10,867	1,885	8,982	15,600	10,724	10,867	1,885	8,982
SJRWMD Region 1 Total		**N/A**	**N/A**	**2,205,182**	**1,811,978**	**393,204**	**N/A**	**N/A**	**2,347,672**	**1,948,100**	**399,572**
SRWMD NFRWSP Total		**N/A**	**N/A**	**239,355**	**73,624**	**165,731**	**N/A**	**N/A**	**244,172**	**76,806**	**167,366**
NFRWSP Total		**2,405,600**	**2,387,480**	**2,444,537**	**1,885,602**	**558,935**	**2,548,300**	**2,530,180**	**2,591,844**	**2,024,906**	**566,938**

County	District	2035 BEBR County Population	2035 BEBR County Population less Institutional	2035 District Population	2035 Public Supply Population	2035 Domestic and Small Public Supply Systems Population	2040 BEBR County Population	2040 BEBR County Population less Institutional	2040 District Population	2040 Public Supply Population	2040 Domestic and Small Public Supply Systems Population
Alachua	SJRWMD	N/A	N/A	237,903	225,905	11,998	N/A	N/A	245,027	231,938	13,089
Alachua	SRWMD	N/A	N/A	61,797	29,142	32,655	N/A	N/A	61,849	29,640	32,209
Alachua	**Total**	**300,200**	**300,200**	**299,700**	**255,047**	**44,653**	**307,400**	**307,400**	**306,876**	**261,578**	**45,298**
Baker	SJRWMD	N/A	N/A	30,922	7,998	22,924	N/A	N/A	31,667	8,030	23,637
Baker	SRWMD	N/A	N/A	591	0	591	N/A	N/A	609	0	609
Baker	**Total**	**32,000**	**30,161**	**31,513**	**7,998**	**23,515**	**32,900**	**31,061**	**32,276**	**8,030**	**24,246**
Bradford	SJRWMD	N/A	N/A	3,069	155	2,914	N/A	N/A	3,234	155	3,079
Bradford	SRWMD	N/A	N/A	21,351	9,301	12,050	N/A	N/A	21,282	9,398	11,884
Bradford	**Total**	**29,800**	**27,878**	**24,420**	**9,456**	**14,964**	**30,000**	**28,078**	**24,516**	**9,553**	**14,963**
Clay	SJRWMD	265,000	265,000	306,470	241,460	65,010	275,600	275,600	322,769	257,818	64,951
Columbia	SRWMD	78,000	73,823	73,823	21,134	52,689	79,700	75,523	75,523	21,730	53,793
Duval	SJRWMD	1,148,700	1,148,700	1,159,034	988,155	170,879	1,185,300	1,185,300	1,200,741	1,031,118	169,623
Flagler	SJRWMD	148,400	148,400	146,696	139,582	7,114	157,300	157,300	152,470	145,212	7,258
Gilchrist	SRWMD	20,400	19,614	19,614	2,863	16,751	20,900	20,114	20,114	2,880	17,234
Hamilton	SRWMD	14,900	12,381	12,381	5,278	7,103	14,900	12,381	12,381	5,278	7,103
Nassau	SJRWMD	109,100	109,100	96,828	83,392	13,436	114,300	114,300	104,742	90,431	14,311
Putnam	SJRWMD	73,900	73,900	78,825	22,515	56,310	74,100	74,100	79,058	22,741	56,317
St. Johns	SJRWMD	379,400	379,400	420,358	369,247	51,111	408,100	408,100	453,570	402,807	50,763
Suwannee	SRWMD	52,100	50,099	50,099	10,012	40,087	53,500	51,499	51,499	10,265	41,234
Union	SRWMD	15,700	10,824	10,967	1,905	9,062	15,700	10,824	10,967	1,905	9,062
SJRWMD Region 1 Total		**N/A**	**N/A**	**2,480,105**	**2,078,409**	**401,696**	**N/A**	**N/A**	**2,593,278**	**2,190,250**	**403,028**
SRWMD NFRWSP Total		**N/A**	**N/A**	**250,623**	**79,635**	**170,988**	**N/A**	**N/A**	**254,224**	**81,096**	**173,128**
NFRWSP Total		**2,667,600**	**2,649,480**	**2,730,728**	**2,158,044**	**572,684**	**2,769,700**	**2,751,580**	**2,847,502**	**2,271,346**	**576,156**

County	District	2045 BEBR County Population	2045 BEBR County Population less Institutional	2045 District Population	2045 Public Supply Population	2045 Domestic and Small Public Supply Systems Population	District Population Percent Change 2015-2045
Alachua	SJRWMD	N/A	N/A	251,193	236,675	14,518	24%
Alachua	SRWMD	N/A	N/A	61,558	29,934	31,624	20%
Alachua	**Total**	**313,300**	**313,300**	**312,751**	**266,609**	**46,142**	**23%**
Baker	SJRWMD	N/A	N/A	32,394	8,030	24,364	22%
Baker	SRWMD	N/A	N/A	623	0	623	24%
Baker	**Total**	**33,600**	**31,761**	**33,017**	**8,030**	**24,987**	**22%**
Bradford	SJRWMD	N/A	N/A	3,418	155	3,263	49%
Bradford	SRWMD	N/A	N/A	20,956	9,542	11,414	1%
Bradford	**Total**	**30,300**	**28,378**	**24,374**	**9,697**	**14,677**	**6%**
Clay	SJRWMD	285,100	285,100	338,510	273,618	64,892	67%
Columbia	SRWMD	81,200	77,023	77,023	22,346	54,677	20%
Duval	SJRWMD	1,216,200	1,216,200	1,238,401	1,070,918	167,483	45%
Flagler	SJRWMD	165,200	165,200	157,026	149,355	7,671	57%
Gilchrist	SRWMD	21,400	20,614	20,614	2,880	17,734	28%
Hamilton	SRWMD	15,000	12,481	12,481	5,312	7,169	3%
Nassau	SJRWMD	118,900	118,900	112,428	97,308	15,120	44%
Putnam	SJRWMD	74,300	74,300	79,317	22,993	56,324	2%
St. Johns	SJRWMD	434,900	434,900	487,953	437,538	50,415	125%
Suwannee	SRWMD	54,700	52,699	52,699	10,438	42,261	27%
Union	SRWMD	15,700	10,824	10,967	1,905	9,062	0%
SJRWMD Region 1 Total		**N/A**	**N/A**	**2,700,640**	**2,296,590**	**404,050**	**54%**
SRWMD NFRWSP Total		**N/A**	**N/A**	**256,921**	**82,357**	**174,564**	**18%**
NFRWSP Total		**2,859,800**	**2,841,680**	**2,957,561**	**2,378,947**	**578,614**	**50%**

Notes:
1.) Rounding errors account for nominal discrepancies.
2.) 2015 county population projections were obtained from BEBR Florida Estimates of Population 2015, Published April 2015.
3.) 2020 - 2045 county population projections were obtained from BEBR Population Projections: Volume 53, Bulletin 186, Published January 2020.
4.) Population projections shown here are permanent population projections only and do not include any factors such as seasonal residents, tourist population or net commuter population.
5.) Public water supply utility service areas often include residences that derive their water supply from privately owned (domestic self-supply) wells. Typically, these domestic self-supply water uses existed prior to their locations becoming part of public water supply service areas. For public water supply service areas, the Districts do not have sufficient information to separate the population served by public supply systems from those served by domestic self-supply wells. Therefore, public water supply population estimated by the Districts often include some domestic self-supply population. In certain counties the domestic self-supply population is projected to decrease.
6.) BEBR County Population includes institutional, District Population in SRWMD only includes public supply and domestic self-supplied.
7.) For SRWMD, BEBR County Population less Institutional was derived from annual BEBR reports; 2018 inmate population was held constant through 2045.
8.) Although the GRU service area encompasses both Districts, the full population of GRU is reported under SJRWMD.

Table B-2. Water Use for 2015 and 5-in-10 Year Total Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045, by Category of Use, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

Category	District	Water Use			Demand Projections (5-in-10)																								Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045					2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Public Supply	SJRWMD	179.92	0.07	179.99	198.84	0.03	0.00	198.87	218.06	0.03	0.00	218.09	233.66	0.03	0.00	233.69	247.01	0.03	1.51	248.55	251.63	0.03	10.07	261.73	255.42	0.03	18.60	274.05	52%	287.48	0.03	29.09	288.92
Public Supply	SRWMD	9.32	0.00	9.32	10.13	0.00	0.00	10.13	12.63	0.00	0.00	12.63	13.05	0.00	0.00	13.05	13.41	0.00	0.00	13.41	13.64	0.00	0.00	13.64	13.83	0.00	0.00	13.83	48%	14.67	0.00	0.00	14.67
Public Supply	**Total**	**189.24**	**0.07**	**189.31**	**208.97**	**0.03**	**0.00**	**209.00**	**230.69**	**0.03**	**0.00**	**230.72**	**246.71**	**0.03**	**0.00**	**246.74**	**260.42**	**0.03**	**1.51**	**261.96**	**265.27**	**0.03**	**10.07**	**275.37**	**269.25**	**0.03**	**18.60**	**287.88**	**52%**	**302.15**	**0.03**	**29.09**	**303.59**
Domestic Self-supply and Small Public Supply Systems	SJRWMD	30.94	0.00	30.94	33.60	0.00	0.00	33.60	34.47	0.00	0.00	34.47	35.04	0.00	0.00	35.04	35.35	0.00	0.00	35.35	35.47	0.00	0.00	35.47	35.58	0.00	0.00	35.58	15%	37.71	0.00	0.00	37.71
Domestic Self-supply and Small Public Supply Systems	SRWMD	9.33	0.00	9.33	9.79	0.00	0.00	9.79	10.20	0.00	0.00	10.20	10.33	0.00	0.00	10.33	10.55	0.00	0.00	10.55	10.70	0.00	0.00	10.70	10.84	0.00	0.00	10.84	16%	11.39	0.00	0.00	11.39
Domestic Self-supply and Small Public Supply Systems	**Total**	**40.27**	**0.00**	**40.27**	**43.39**	**0.00**	**0.00**	**43.39**	**44.67**	**0.00**	**0.00**	**44.67**	**45.37**	**0.00**	**0.00**	**45.37**	**45.90**	**0.00**	**0.00**	**45.90**	**46.17**	**0.00**	**0.00**	**46.17**	**46.42**	**0.00**	**0.00**	**46.42**	**15%**	**49.10**	**0.00**	**0.00**	**49.10**
Agricultural Irrigation Self-supply	SJRWMD	45.35	2.66	48.01	57.93	3.57	0.00	61.50	58.47	3.65	0.00	62.12	58.88	3.63	0.00	62.51	59.39	3.65	0.00	63.04	59.80	3.69	0.00	63.49	60.22	3.68	0.00	63.90	33%	85.99	3.59	0.00	89.58
Agricultural Irrigation Self-supply	SRWMD	88.93	0.00	88.93	88.14	0.00	0.00	88.14	93.13	0.00	0.00	93.13	97.13	0.00	0.00	97.13	101.79	0.00	0.00	101.79	106.56	0.00	0.00	106.56	111.50	0.00	0.00	111.50	25%	141.90	0.00	0.00	141.90
Agricultural Irrigation Self-supply	**Total**	**134.28**	**2.66**	**136.94**	**146.07**	**3.57**	**0.00**	**149.64**	**151.60**	**3.65**	**0.00**	**155.25**	**156.01**	**3.63**	**0.00**	**159.64**	**161.18**	**3.65**	**0.00**	**164.83**	**166.36**	**3.69**	**0.00**	**170.05**	**171.72**	**3.68**	**0.00**	**175.40**	**28%**	**227.89**	**3.59**	**0.00**	**231.48**
Landscape / Recreational Self-supply	SJRWMD	4.22	11.20	15.42	4.91	13.46	0.00	18.37	5.43	14.96	0.00	20.39	5.83	16.23	0.00	22.06	6.19	17.38	0.00	23.57	6.52	18.42	0.00	24.94	6.80	19.48	0.00	26.28	70%	9.30	24.84	0.00	33.64
Landscape / Recreational Self-supply	SRWMD	2.72	0.00	2.72	2.91	0.00	0.00	2.91	2.99	0.00	0.00	2.99	3.03	0.00	0.00	3.03	3.10	0.00	0.00	3.10	3.14	0.00	0.00	3.14	3.17	0.00	0.00	3.17	17%	3.46	0.00	0.00	3.46
Landscape / Recreational Self-supply	**Total**	**6.94**	**11.20**	**18.14**	**7.82**	**13.46**	**0.00**	**21.28**	**8.42**	**14.96**	**0.00**	**23.38**	**8.86**	**16.23**	**0.00**	**25.09**	**9.29**	**17.38**	**0.00**	**26.67**	**9.66**	**18.42**	**0.00**	**28.08**	**9.97**	**19.48**	**0.00**	**29.45**	**62%**	**12.76**	**24.84**	**0.00**	**37.10**
Commercial / Industrial / Institutional Self-supply	SJRWMD	52.30	25.16	77.46	54.97	25.40	0.00	80.37	55.83	25.49	0.00	81.32	56.65	25.56	0.00	82.21	57.40	25.64	0.00	83.04	58.14	25.72	0.00	83.86	58.81	25.79	0.00	84.60	9%	58.81	25.79	0.00	84.60
Commercial / Industrial / Institutional Self-supply	SRWMD	28.56	17.19	45.75	28.82	17.19	0.00	46.01	29.04	17.19	0.00	46.23	29.23	17.19	0.00	46.42	29.40	17.19	0.00	46.59	29.52	17.19	0.00	46.71	29.61	17.19	0.00	46.80	2%	29.61	17.19	0.00	46.80
Commercial / Industrial / Institutional Self-supply	**Total**	**80.86**	**42.35**	**123.21**	**83.79**	**42.59**	**0.00**	**126.38**	**84.87**	**42.68**	**0.00**	**127.55**	**85.88**	**42.75**	**0.00**	**128.63**	**86.80**	**42.83**	**0.00**	**129.63**	**87.66**	**42.91**	**0.00**	**130.57**	**88.42**	**42.98**	**0.00**	**131.40**	**7%**	**88.42**	**42.98**	**0.00**	**131.40**
Power Generation Self-supply	SJRWMD	7.33	12.48	19.81	6.05	13.40	0.00	19.45	6.24	13.78	0.00	20.02	6.50	14.35	0.00	20.85	6.95	15.44	0.00	22.39	7.43	16.59	0.00	24.02	7.93	17.83	0.00	25.76	30%	7.93	17.83	0.00	25.76
Power Generation Self-supply	SRWMD	1.87	0.06	1.93	1.83	0.05	0.00	1.88	1.74	0.05	0.00	1.79	1.78	0.05	0.00	1.83	1.85	0.05	0.00	1.90	1.93	0.05	0.00	1.98	2.00	0.05	0.00	2.05	6%	2.00	0.05	0.00	2.05
Power Generation Self-supply	**Total**	**9.20**	**12.54**	**21.74**	**7.88**	**13.45**	**0.00**	**21.33**	**7.98**	**13.83**	**0.00**	**21.81**	**8.28**	**14.40**	**0.00**	**22.68**	**8.80**	**15.49**	**0.00**	**24.29**	**9.36**	**16.64**	**0.00**	**26.00**	**9.93**	**17.88**	**0.00**	**27.81**	**28%**	**9.93**	**17.88**	**0.00**	**27.81**
SJRWMD Region 1 Total		**320.06**	**51.57**	**371.63**	**356.30**	**55.86**	**0.00**	**412.16**	**378.50**	**57.91**	**0.00**	**436.41**	**396.56**	**59.80**	**0.00**	**456.36**	**412.29**	**62.14**	**1.51**	**475.94**	**418.99**	**64.45**	**10.07**	**493.51**	**424.76**	**66.81**	**18.60**	**510.17**	**37%**	**487.22**	**72.08**	**29.09**	**560.21**
SRWMD NFRWSP Total		**140.73**	**17.25**	**157.98**	**141.62**	**17.24**	**0.00**	**158.86**	**149.73**	**17.24**	**0.00**	**166.97**	**154.55**	**17.24**	**0.00**	**171.79**	**160.10**	**17.24**	**0.00**	**177.34**	**165.49**	**17.24**	**0.00**	**182.73**	**170.95**	**17.24**	**0.00**	**188.19**	**19%**	**203.03**	**17.24**	**0.00**	**220.27**
NFRWSP Total		**460.79**	**68.82**	**529.61**	**497.92**	**73.10**	**0.00**	**571.02**	**528.23**	**75.15**	**0.00**	**603.38**	**551.11**	**77.04**	**0.00**	**628.15**	**572.39**	**79.38**	**1.51**	**653.28**	**584.48**	**81.69**	**10.07**	**676.24**	**595.71**	**84.05**	**18.60**	**698.36**	**32%**	**690.25**	**89.32**	**29.09**	**780.48**

Notes:

1.) All water use is shown in million gallons per day.

2.) Rounding errors account for nominal discrepancies.

3.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-3. Total Water Use for 2015 and 5-in-10 Year Water Demand Projections for 2020-2045, and 1-in-10 Year Water Demand Projections for 2045 by County in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	District	Water Use			Demand Projections (5-in-10)																								Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045					2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Alachua	SJRWMD	26.89	0.08	26.97	28.22	0.08	0.00	28.30	29.44	0.09	0.00	29.53	30.72	0.09	0.00	30.81	31.71	0.09	0.00	31.80	32.65	0.09	0.00	32.74	33.37	0.10	0.00	33.47	24%	37.11	0.17	0.00	37.28
Alachua	SRWMD	19.25	0.00	19.25	19.02	0.00	0.00	19.02	19.28	0.00	0.00	19.28	19.43	0.00	0.00	19.43	19.97	0.00	0.00	19.97	20.27	0.00	0.00	20.27	20.60	0.00	0.00	20.60	7%	24.32	0.00	0.00	24.32
Alachua	**Total**	46.14	0.08	46.22	47.24	0.08	0.00	47.32	48.72	0.09	0.00	48.81	50.15	0.09	0.00	50.24	51.68	0.09	0.00	51.77	52.92	0.09	0.00	53.01	53.97	0.10	0.00	54.07	17%	61.43	0.17	0.00	61.60
Baker	SJRWMD	3.50	0.47	3.97	3.81	0.43	0.00	4.24	3.99	0.45	0.00	4.44	4.16	0.46	0.00	4.62	4.27	0.47	0.00	4.74	4.37	0.49	0.00	4.86	4.47	0.49	0.00	4.96	25%	4.74	0.52	0.00	5.26
Baker	SRWMD	0.26	0.00	0.26	0.28	0.00	0.00	0.28	0.29	0.00	0.00	0.29	0.30	0.00	0.00	0.30	0.31	0.00	0.00	0.31	0.33	0.00	0.00	0.33	0.34	0.00	0.00	0.34	31%	0.33	0.00	0.00	0.33
Baker	**Total**	3.76	0.47	4.23	4.09	0.43	0.00	4.52	4.28	0.45	0.00	4.73	4.46	0.46	0.00	4.92	4.58	0.47	0.00	5.05	4.70	0.49	0.00	5.19	4.81	0.49	0.00	5.30	25%	5.07	0.52	0.00	5.59
Bradford	SJRWMD	0.17	0.00	0.17	0.22	0.00	0.00	0.22	0.26	0.00	0.00	0.26	0.28	0.00	0.00	0.28	0.28	0.00	0.00	0.28	0.29	0.00	0.00	0.29	0.31	0.00	0.00	0.31	82%	0.33	0.00	0.00	0.33
Bradford	SRWMD	4.72	0.00	4.72	4.86	0.00	0.00	4.86	4.84	0.00	0.00	4.84	4.84	0.00	0.00	4.84	4.89	0.00	0.00	4.89	4.88	0.00	0.00	4.88	4.86	0.00	0.00	4.86	3%	5.50	0.00	0.00	5.50
Bradford	**Total**	4.89	0.00	4.89	5.08	0.00	0.00	5.08	5.10	0.00	0.00	5.10	5.12	0.00	0.00	5.12	5.17	0.00	0.00	5.17	5.17	0.00	0.00	5.17	5.17	0.00	0.00	5.17	6%	5.83	0.00	0.00	5.83
Clay	SJRWMD	20.71	0.33	21.04	20.48	0.36	0.00	20.84	25.28	0.41	0.00	25.69	27.70	0.45	0.00	28.15	30.41	0.50	0.00	30.91	31.74	0.52	0.00	32.26	32.91	0.55	0.00	33.46	59%	34.51	1.01	1.41	36.43
Columbia	SRWMD	11.75	0.00	11.75	11.72	0.00	0.00	11.72	15.31	0.00	0.00	15.31	16.51	0.00	0.00	16.51	17.66	0.00	0.00	17.66	19.01	0.00	0.00	19.01	20.36	0.00	0.00	20.36	73%	23.47	0.00	0.00	23.47
Duval	SJRWMD	143.35	17.82	161.17	155.28	18.92	0.00	174.20	165.36	19.48	0.00	184.84	175.26	20.22	0.00	195.48	183.57	21.46	1.51	206.54	184.88	22.79	10.07	217.74	185.75	24.16	18.60	228.51	42%	214.39	25.28	27.68	239.67
Flagler	SJRWMD	16.38	1.89	18.27	21.87	2.29	0.00	24.16	23.01	2.45	0.00	25.46	24.01	2.59	0.00	26.60	24.85	2.71	0.00	27.56	25.30	2.77	0.00	28.07	25.80	2.82	0.00	28.62	57%	30.88	3.43	0.00	34.31
Gilchrist	SRWMD	20.76	0.00	20.76	20.86	0.00	0.00	20.86	21.62	0.00	0.00	21.62	22.36	0.00	0.00	22.36	23.20	0.00	0.00	23.20	23.97	0.00	0.00	23.97	24.82	0.00	0.00	24.82	20%	30.67	0.00	0.00	30.67
Hamilton	SRWMD	40.69	17.19	57.88	38.65	17.19	0.00	55.84	39.40	17.19	0.00	56.59	40.08	17.19	0.00	57.27	40.82	17.19	0.00	58.01	41.58	17.19	0.00	58.77	42.28	17.19	0.00	59.47	3%	47.35	17.19	0.00	64.54
Nassau	SJRWMD	42.62	1.69	44.31	44.07	1.51	0.00	45.58	44.67	1.72	0.00	46.39	45.14	1.92	0.00	47.06	45.45	2.08	0.00	47.53	45.71	2.25	0.00	47.96	45.95	2.41	0.00	48.36	9%	46.98	2.92	0.00	49.90
Putnam	SJRWMD	25.01	24.90	49.91	25.84	25.77	0.00	51.61	26.85	25.85	0.00	52.70	27.79	25.88	0.00	53.67	28.65	25.91	0.00	54.56	29.57	25.97	0.00	55.54	30.52	26.01	0.00	56.53	13%	39.46	25.66	0.00	65.12
St. Johns	SJRWMD	41.43	4.39	45.82	56.51	6.50	0.00	63.01	59.64	7.46	0.00	67.10	61.50	8.19	0.00	69.69	63.10	8.92	0.00	72.02	64.48	9.57	0.00	74.05	65.68	10.27	0.00	75.95	66%	77.65	11.78	0.00	89.43
Suwannee	SRWMD	40.55	0.06	40.61	43.42	0.05	0.00	43.47	45.97	0.05	0.00	46.02	47.86	0.05	0.00	47.91	49.97	0.05	0.00	50.02	52.00	0.05	0.00	52.05	54.12	0.05	0.00	54.17	33%	66.94	0.05	0.00	66.99
Union	SRWMD	2.75	0.00	2.75	2.81	0.00	0.00	2.81	3.02	0.00	0.00	3.02	3.17	0.00	0.00	3.17	3.28	0.00	0.00	3.28	3.45	0.00	0.00	3.45	3.57	0.00	0.00	3.57	30%	4.29	0.00	0.00	4.29
SJRWMD Region 1 Total		320.06	51.57	371.63	356.30	55.86	0.00	412.16	378.50	57.91	0.00	436.41	396.56	59.80	0.00	456.36	412.29	62.14	1.51	475.94	418.99	64.45	10.07	493.51	424.76	66.81	18.60	510.17	37%	486.05	70.77	29.09	557.73
SRWMD NFRWSP Total		140.73	17.25	157.98	141.62	17.24	0.00	158.86	149.73	17.24	0.00	166.97	154.55	17.24	0.00	171.79	160.10	17.24	0.00	177.34	165.49	17.24	0.00	182.73	170.95	17.24	0.00	188.19	19%	202.87	17.24	0.00	220.11
NFRWSP Total		460.79	68.82	529.61	497.92	73.10	0.00	571.02	528.23	75.15	0.00	603.38	551.11	77.04	0.00	628.15	572.39	79.38	1.51	653.28	584.48	81.69	10.07	676.24	595.71	84.05	18.60	698.36	32%	688.92	88.01	29.09	777.84

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-4. Public Supply Population Served and Water Use for 2015, Public Supply Population and 5-in-10 Year Water Demand Projections for 2020-2045, and 1-in-10 Year Water Demand Projections for 2045 by County in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	District	Population Served	Population Projections						Water Use		
									2015		
		2015	2020	2025	2030	2035	2040	2045	Ground	Surface	Total
Alachua	SJRWMD	193,618	200,674	210,090	219,025	225,905	231,938	236,675	22.44	0.00	22.44
Alachua	SRWMD	22,595	25,652	26,022	27,674	29,142	29,640	29,934	2.35	0.00	2.35
Alachua	Total	216,213	226,326	236,112	246,699	255,047	261,578	266,609	24.79	0.00	24.79
Baker	SJRWMD	6,865	7,045	7,309	7,833	7,998	8,030	8,030	0.92	0.00	0.92
Baker	SRWMD	0	0	0	0	0	0	0	0.00	0.00	0.00
Baker	Total	6,865	7,045	7,309	7,833	7,998	8,030	8,030	0.92	0.00	0.92
Bradford	SJRWMD	115	122	145	155	155	155	155	0.04	0.00	0.04
Bradford	SRWMD	7,462	8,843	9,029	9,181	9,301	9,398	9,542	0.94	0.00	0.94
Bradford	Total	7,577	8,965	9,174	9,336	9,456	9,553	9,697	0.98	0.00	0.98
Clay	SJRWMD	137,842	156,111	182,502	210,459	241,460	257,818	273,618	12.89	0.00	12.89
Columbia	SRWMD	18,767	19,425	19,986	20,551	21,134	21,730	22,346	3.32	0.00	3.32
Duval	SJRWMD	693,374	863,174	904,898	946,901	988,155	1,031,118	1,070,918	106.34	0.00	106.34
Flagler	SJRWMD	94,805	107,845	120,892	130,769	139,582	145,212	149,355	8.98	0.07	9.05
Gilchrist	SRWMD	2,125	2,220	2,486	2,710	2,863	2,880	2,880	0.22	0.00	0.22
Hamilton	SRWMD	5,076	5,212	5,255	5,278	5,278	5,278	5,312	0.91	0.00	0.91
Nassau	SJRWMD	69,384	59,112	67,336	76,515	83,392	90,431	97,308	6.92	0.00	6.92
Putnam	SJRWMD	21,222	21,894	22,161	22,292	22,515	22,741	22,993	2.18	0.00	2.18
St. Johns	SJRWMD	173,216	248,420	296,645	334,151	369,247	402,807	437,538	19.21	0.00	19.21
Suwannee	SRWMD	7,491	8,125	8,961	9,527	10,012	10,265	10,438	1.32	0.00	1.32
Union	SRWMD	1,742	1,850	1,885	1,885	1,905	1,905	1,905	0.26	0.00	0.26
SJRWMD Region 1 Total		1,390,441	1,664,397	1,811,978	1,948,100	2,078,409	2,190,250	2,296,590	179.92	0.07	179.99
SRWMD NFRWSP Total		65,258	71,327	73,624	76,806	79,635	81,096	82,357	9.32	0.00	9.32
NFRWSP Total		1,455,699	1,735,724	1,885,602	2,024,906	2,158,044	2,271,346	2,378,947	189.24	0.07	189.31

County	District	Demand Projections (5-in-10)											
		2020				2025				2030			
		Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total
Alachua	SJRWMD	23.57	0.00	0.00	23.57	24.68	0.00	0.00	24.68	25.71	0.00	0.00	25.71
Alachua	SRWMD	2.68	0.00	0.00	2.68	2.71	0.00	0.00	2.71	2.87	0.00	0.00	2.87
Alachua	Total	26.25	0.00	0.00	26.25	27.39	0.00	0.00	27.39	28.58	0.00	0.00	28.58
Baker	SJRWMD	0.95	0.00	0.00	0.95	0.99	0.00	0.00	0.99	1.06	0.00	0.00	1.06
Baker	SRWMD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Baker	Total	0.95	0.00	0.00	0.95	0.99	0.00	0.00	0.99	1.06	0.00	0.00	1.06
Bradford	SJRWMD	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01
Bradford	SRWMD	1.04	0.00	0.00	1.04	1.05	0.00	0.00	1.05	1.07	0.00	0.00	1.07
Bradford	Total	1.05	0.00	0.00	1.05	1.06	0.00	0.00	1.06	1.08	0.00	0.00	1.08
Clay	SJRWMD	13.72	0.00	0.00	13.72	18.33	0.00	0.00	18.33	20.64	0.00	0.00	20.64
Columbia	SRWMD	3.47	0.00	0.00	3.47	5.74	0.00	0.00	5.74	5.84	0.00	0.00	5.84
Duval	SJRWMD	115.27	0.00	0.00	115.27	124.03	0.00	0.00	124.03	132.85	0.00	0.00	132.85
Flagler	SJRWMD	10.26	0.03	0.00	10.29	11.42	0.03	0.00	11.45	12.42	0.03	0.00	12.45
Gilchrist	SRWMD	0.22	0.00	0.00	0.22	0.25	0.00	0.00	0.25	0.27	0.00	0.00	0.27
Hamilton	SRWMD	1.03	0.00	0.00	1.03	1.03	0.00	0.00	1.03	1.03	0.00	0.00	1.03
Nassau	SJRWMD	7.85	0.00	0.00	7.85	8.05	0.00	0.00	8.05	8.24	0.00	0.00	8.24
Putnam	SJRWMD	2.11	0.00	0.00	2.11	2.12	0.00	0.00	2.12	2.13	0.00	0.00	2.13
St. Johns	SJRWMD	25.10	0.00	0.00	25.10	28.43	0.00	0.00	28.43	30.60	0.00	0.00	30.60
Suwannee	SRWMD	1.45	0.00	0.00	1.45	1.61	0.00	0.00	1.61	1.73	0.00	0.00	1.73
Union	SRWMD	0.24	0.00	0.00	0.24	0.24	0.00	0.00	0.24	0.24	0.00	0.00	0.24
SJRWMD Region 1 Total		198.84	0.03	0.00	198.87	218.06	0.03	0.00	218.09	233.66	0.03	0.00	233.69
SRWMD NFRWSP Total		10.13	0.00	0.00	10.13	12.63	0.00	0.00	12.63	13.05	0.00	0.00	13.05
NFRWSP Total		208.97	0.03	0.00	209.00	230.69	0.03	0.00	230.72	246.71	0.03	0.00	246.74

County	District	Demand Projections (5-in-10)												Percent Change	Demand Projections (1-in-10)			
		2035				2040				2045					2045			
		Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	2015-2045	Ground	Surface	Other	Total
Alachua	SJRWMD	26.53	0.00	0.00	26.53	27.23	0.00	0.00	27.23	27.78	0.00	0.00	27.78	24%	29.45	0.00	0.00	29.45
Alachua	SRWMD	3.04	0.00	0.00	3.04	3.10	0.00	0.00	3.10	3.13	0.00	0.00	3.13	33%	3.33	0.00	0.00	3.33
Alachua	Total	29.57	0.00	0.00	29.57	30.33	0.00	0.00	30.33	30.91	0.00	0.00	30.91	25%	32.78	0.00	0.00	32.78
Baker	SJRWMD	1.08	0.00	0.00	1.08	1.09	0.00	0.00	1.09	1.09	0.00	0.00	1.09	18%	1.15	0.00	0.00	1.15
Baker	SRWMD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	0.00	0.00	0.00	0.00
Baker	Total	1.08	0.00	0.00	1.08	1.09	0.00	0.00	1.09	1.09	0.00	0.00	1.09	18%	1.15	0.00	0.00	1.15
Bradford	SJRWMD	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	-75%	0.01	0.00	0.00	0.01
Bradford	SRWMD	1.08	0.00	0.00	1.08	1.09	0.00	0.00	1.09	1.11	0.00	0.00	1.11	18%	1.17	0.00	0.00	1.17
Bradford	Total	1.09	0.00	0.00	1.09	1.10	0.00	0.00	1.10	1.12	0.00	0.00	1.12	14%	1.18	0.00	0.00	1.18
Clay	SJRWMD	23.22	0.00	0.00	23.22	24.47	0.00	0.00	24.47	25.57	0.00	0.00	25.57	98%	26.10	0.00	1.41	27.51
Columbia	SRWMD	5.94	0.00	0.00	5.94	6.05	0.00	0.00	6.05	6.16	0.00	0.00	6.16	86%	6.53	0.00	0.00	6.53
Duval	SJRWMD	140.04	0.00	1.51	141.55	140.37	0.00	10.07	150.44	140.37	0.00	18.60	158.97	49%	168.51	0.00	27.68	168.51
Flagler	SJRWMD	13.23	0.03	0.00	13.26	13.76	0.03	0.00	13.79	14.30	0.03	0.00	14.33	58%	15.15	0.03	0.00	15.18
Gilchrist	SRWMD	0.28	0.00	0.00	0.28	0.28	0.00	0.00	0.28	0.28	0.00	0.00	0.28	27%	0.30	0.00	0.00	0.30
Hamilton	SRWMD	1.03	0.00	0.00	1.03	1.03	0.00	0.00	1.03	1.03	0.00	0.00	1.03	13%	1.09	0.00	0.00	1.09
Nassau	SJRWMD	8.24	0.00	0.00	8.24	8.26	0.00	0.00	8.26	8.26	0.00	0.00	8.26	19%	8.60	0.00	0.00	8.60
Putnam	SJRWMD	2.15	0.00	0.00	2.15	2.16	0.00	0.00	2.16	2.18	0.00	0.00	2.18	0%	2.31	0.00	0.00	2.31
St. Johns	SJRWMD	32.51	0.00	0.00	32.51	34.28	0.00	0.00	34.28	35.86	0.00	0.00	35.86	87%	36.20	0.00	0.00	36.20
Suwannee	SRWMD	1.79	0.00	0.00	1.79	1.84	0.00	0.00	1.84	1.87	0.00	0.00	1.87	42%	1.98	0.00	0.00	1.98
Union	SRWMD	0.25	0.00	0.00	0.25	0.25	0.00	0.00	0.25	0.25	0.00	0.00	0.25	-4%	0.27	0.00	0.00	0.27
SJRWMD Region 1 Total		247.01	0.03	1.51	248.55	251.63	0.03	10.07	261.73	255.42	0.03	18.60	274.05	52%	287.48	0.03	29.09	288.92
SRWMD NFRWSP Total		13.41	0.00	0.00	13.41	13.64	0.00	0.00	13.64	13.83	0.00	0.00	13.83	48%	14.67	0.00	0.00	14.67
NFRWSP Total		260.42	0.03	1.51	261.96	265.27	0.03	10.07	275.37	269.25	0.03	18.60	287.88	52%	302.15	0.03	29.09	303.59

Notes:

1.) All water use is shown in million gallons per day.

2.) Rounding errors account for nominal discrepancies.

3.) 1-in-10 rainfall year demand for 2045 calculated as an additional 6 percent of 2045 average demand.

4.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-5. Public Supply Population Served and Water Use for 2015 and Public Supply Population Projections for 2020-2045, 5-in-10 Year Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045 by County and Utility, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	Utility	CUP Number	Population Served 2015	Population Projections 2020	2025	2030	2035	2040	2045	Buildout	Percent Change 2015-2045
Alachua - SJRWMD	City of Hawthorne	1674	1,508	1,530	1,530	2,136	2,136	2,409	2,426	5,653	61%
	Gainesville Regional Utilities (includes SRWMD)	11339	189,400	196,495	205,855	213,935	220,815	226,575	231,295	244,351	22%
	Kincaid Hills Water Company	11343	620	620	654	654	654	654	654	665	5%
	Town of Micanopy	11356	824	824	824	1,073	1,073	1,073	1,073	1,330	30%
	Arredondo Utility Co / Aqua Source Utilities	11364, 132141	1,266	1,205	1,227	1,227	1,227	1,227	1,227	2,037	-3%
	SJRWMD Alachua Total		**193,618**	**200,674**	**210,090**	**219,025**	**225,905**	**231,938**	**236,675**	**254,036**	**22%**
Alachua - SRWMD	City Of Newberry	216450	5,026	6,905	7,188	7,427	7,631	7,811	7,973	15,186	59%
	City Of Archer	216647	1,273	1,304	1,304	1,304	1,304	1,576	1,576	6,303	24%
	City Of High Springs Water Plant	216833	5,684	6,221	6,221	7,213	7,230	7,230	7,230	14,137	27%
	City Of Waldo	217300	947	960	960	1,230	1,230	1,230	1,230	3,654	30%
	City Of Alachua	220667	9,665	10,262	10,349	10,500	11,747	11,793	11,925	49,112	23%
	SRWMD Alachua Total		**22,595**	**25,652**	**26,022**	**27,674**	**29,142**	**29,640**	**29,934**	**88,392**	**32%**
Baker - SJRWMD	City of Macclenny	15	6,430	6,591	6,807	7,331	7,496	7,528	7,528	30,803	17%
	Town of Glen St Mary	24	435	454	502	502	502	502	502	589	15%
	SJRWMD Baker Total		**6,865**	**7,045**	**7,309**	**7,833**	**7,998**	**8,030**	**8,030**	**31,392**	**17%**
Bradford - SJRWMD	Clay County Utility Authority	431	115	122	145	155	155	155	155	181	35%
	SJRWMD Bradford Total		**115**	**122**	**145**	**155**	**155**	**155**	**155**	**181**	**35%**
Bradford - SRWMD	City of Starke	216650	6,585	7,954	8,140	8,292	8,412	8,509	8,653	14,573	31%
	City of Lawtey	218998	877	889	889	889	889	889	889	1,866	1%
	SRWMD Bradford Total		**7,462**	**8,843**	**9,029**	**9,181**	**9,301**	**9,398**	**9,542**	**16,439**	**28%**
Clay - SJRWMD	Clay County Utility Authority	416, 431, 137335	115,456	126,966	149,238	173,816	201,719	214,888	227,726	410,001	97%
	Town of Orange Park	453	9,042	10,076	10,076	10,076	10,076	10,076	10,076	10,076	11%
	City of Green Cove Springs	499	6,500	6,763	7,920	8,338	8,474	8,702	8,702	10,348	34%
	JEA (Also in Duval, Nassau, St. Johns)	88271	6,844	12,306	15,268	18,229	21,191	24,152	27,114	10,851	296%
	SJRWMD Clay Total		**137,842**	**156,111**	**182,502**	**210,459**	**241,460**	**257,818**	**273,618**	**441,276**	**99%**
Columbia - SRWMD	City of Lake City	217754	18,697	19,350	19,898	20,461	21,040	21,636	22,252	59,148	19%
	Columbia County Board of Commissioners	220704	70	75	88	90	94	94	94	465	34%
	North Florida Mega Industrial Park Wellfield	239112	0	0	0	0	0	0	0	0	0%
	SRWMD Columbia Total		**18,767**	**19,425**	**19,986**	**20,551**	**21,134**	**21,730**	**22,346**	**59,613**	**19%**
Duval - SJRWMD	CSWR - Florida Utility Operating Company, LLC	756	1,015	1,015	1,015	1,015	1,015	1,015	1,015	1,015	0%
	City of Baldwin	784	1,385	1,419	1,462	2,085	2,085	2,260	2,260	5,578	63%
	City of Jacksonville Beach	793	23,279	24,555	24,555	24,555	24,555	26,195	26,195	26,195	13%
	Atlantic Beach Utility	810	22,674	25,670	27,474	29,055	30,509	31,857	31,857	26,370	41%
	City of Neptune Beach	842	7,270	7,193	7,211	7,229	7,247	7,265	7,283	7,723	0%
	St Johns County Utilities / Intercoastal (Also in St. Johns)	1142	36	83	83	83	83	85	85	85	136%
	Normandy Villages Utilities	50293	3,200	3,235	3,313	3,313	3,313	3,313	3,313	3,313	4%
	JEA (Also in Clay, Nassau, St. Johns)	88271	634,515	800,004	839,785	879,566	919,348	959,128	998,910	1,295,621	57%
	SJRWMD Duval Total		**693,374**	**863,174**	**904,898**	**946,901**	**988,155**	**1,031,118**	**1,070,918**	**1,365,900**	**54%**
Flagler - SJRWMD	City of Flagler Beach	59	4,621	4,677	4,677	7,044	7,044	7,044	7,044	8,327	52%
	City of Palm Coast	1947	79,819	92,294	105,320	112,734	121,325	125,272	125,437	365,388	57%
	Plantation Bay Utility Company (Also in Volusia)	1960	1,532	1,617	1,617	1,617	1,617	1,773	1,784	4,076	16%
	City of Bunnell	1982	2,875	3,004	3,025	3,025	3,025	4,207	8,174	136,594	184%
	Manufactured Home Communities	2002	1,284	1,284	1,284	1,284	1,284	1,284	1,284	1,284	0%
	City of Ormond Beach (Also in Volusia)	8932	239	398	398	398	398	622	622	3,518	160%
	Volusia County Utilities (Also in Volusia)	50157, 50659, 86278	418	418	418	459	459	459	459	495	10%
	Dunes Community Development District	51136	4,017	4,153	4,153	4,208	4,430	4,551	4,551	4,588	13%
	SJRWMD Flagler Total		**94,805**	**107,845**	**120,892**	**130,769**	**139,582**	**145,212**	**149,355**	**524,270**	**58%**
Gilchrist - SRWMD	City of Trenton Water Treatment Plant	216453	2,040	2,117	2,363	2,559	2,695	2,710	2,710	15,316	33%
	Fanning Springs (Also in Dixie and Levy)	220310	85	103	123	151	168	170	170	1,110	100%
	SRWMD Gilchrist Total		**2,125**	**2,220**	**2,486**	**2,710**	**2,863**	**2,880**	**2,880**	**16,426**	**36%**
Hamilton - SRWMD	Town of Jennings	216567	699	699	699	699	699	699	699	1,222	0%
	Town of White Springs	216651	754	777	820	843	843	843	877	1,347	16%
	Hamilton County Water Facilities	220443	0	0	0	0	0	0	0	0	N/A
	City of Jasper	220463	3,623	3,736	3,736	3,736	3,736	3,736	3,736	8,392	3%
	SRWMD Hamilton Total		**5,076**	**5,212**	**5,255**	**5,278**	**5,278**	**5,278**	**5,312**	**10,961**	**5%**
Nassau - SJRWMD	City of Fernandina Beach	122	18,661	19,705	20,476	20,476	20,476	20,476	20,476	20,540	10%
	Town of Callahan	922	1,609	1,719	2,097	2,861	2,861	2,861	2,861	4,247	78%
	Town of Hilliard	948	3,000	3,189	3,189	4,727	4,727	4,889	4,889	9,716	63%
	Nassau Amelia Utilities	50087	9,242	9,578	9,775	9,775	9,775	9,775	9,775	9,775	6%
	JEA (Also in Clay, Duval, St. Johns / Old 942)	88271	36,872	24,921	31,799	38,676	45,553	52,430	59,307	224,737	61%
	SJRWMD Nassau Total		**69,384**	**59,112**	**67,336**	**76,515**	**83,392**	**90,431**	**97,308**	**269,015**	**40%**
Putnam - SJRWMD	Town of Interlachen	1624, 8150	935	959	959	959	959	959	959	2,205	3%
	City of Crescent City	1627	1,800	1,805	1,805	1,805	1,805	1,805	1,805	4,238	0%
	Melrose Water Association	7961	1,286	1,398	1,398	1,448	1,503	1,575	1,650	616	28%
	River Park Utilities Management Assoc.	7981	1,000	1,001	1,001	1,001	1,001	1,001	1,001	1,881	0%
	City of Palatka	8114	11,941	12,053	12,053	12,053	12,053	12,053	12,053	24,916	1%
	Town of Welaka	8168	1,781	1,821	2,088	2,169	2,337	2,491	2,668	3,282	50%
	Putnam County BOCC	92165	2,479	2,857	2,857	2,857	2,857	2,857	2,857	5,691	15%
	SJRWMD Putnam Total		**21,222**	**21,894**	**22,161**	**22,292**	**22,515**	**22,741**	**22,993**	**42,829**	**8%**
St. Johns - SJRWMD	North Beach Utilities	157	3,295	3,885	5,077	5,077	5,077	5,077	5,077	5,077	54%
	Wildwood Water Company	324	858	891	933	933	933	933	933	933	9%
	St. Johns County Utilities / Intercoastal (Also in Duval)	1142	25,274	24,438	26,889	28,933	30,705	32,273	33,776	29,784	34%
	St. Johns County Utilities	1198	70,395	110,376	131,372	149,531	165,973	180,958	195,538	409,267	178%
	St. Johns County Utilities	1392	682	708	1,108	2,144	2,790	2,862	2,862	3,389	320%
	City of St. Augustine Utilities	50299	28,207	33,919	40,714	40,714	40,714	41,488	43,975	52,019	56%
	JEA (Also in Clay, Duval, Nassau)	88271	44,505	74,203	90,552	106,819	123,055	139,216	155,377	115,091	249%
	SJRWMD St. Johns Total		**173,216**	**248,420**	**296,645**	**334,151**	**369,247**	**402,807**	**437,538**	**615,560**	**153%**
Suwannee - SRWMD	Town of Wellborn	216507	483	490	490	490	548	613	613	613	27%
	Town of Branford	216658	664	700	700	727	927	927	927	937	40%
	Advent Christian Village	219527	563	793	1,308	1,566	1,566	1,566	1,579	9,304	180%
	City of Live Oak	220612	5,781	6,142	6,463	6,744	6,971	7,159	7,319	11,659	27%
	SRWMD Suwannee Total		**7,491**	**8,125**	**8,961**	**9,527**	**10,012**	**10,265**	**10,438**	**22,513**	**39%**
Union - SRWMD	City of Lake Butler	220148	1,742	1,850	1,885	1,885	1,905	1,905	1,905	6,558	9%
	SRWMD Union Total		**1,742**	**1,850**	**1,885**	**1,885**	**1,905**	**1,905**	**1,905**	**6,558**	**9%**
SJRWMD Region 1 Total			**1,390,441**	**1,664,397**	**1,811,978**	**1,948,100**	**2,078,409**	**2,190,250**	**2,296,590**	**3,544,459**	**65%**
SRWMD NFRWSP Total			**65,258**	**71,327**	**73,624**	**76,806**	**79,635**	**81,096**	**82,357**	**220,902**	**26%**
NFRWSP Total			**1,455,699**	**1,735,724**	**1,885,602**	**2,024,906**	**2,158,044**	**2,271,346**	**2,378,947**	**3,765,361**	**63%**

Utility	Water Use 2015 GW	2015 SW	2015 Total	Demand Projections (5-in-10) 2020 GW	2020 SW	2020 Other	2020 Total	2025 GW	2025 SW	2025 Other	2025 Total	2030 GW	2030 SW	2030 Other	2030 Total
City of Hawthorne	0.14	0.00	**0.14**	0.13	0.00	0.00	**0.13**	0.13	0.00	0.00	**0.13**	0.19	0.00	0.00	**0.19**
Gainesville Regional Utilities (includes SRWMD)	22.06	0.00	**22.06**	23.19	0.00	0.00	**23.19**	24.29	0.00	0.00	**24.29**	25.24	0.00	0.00	**25.24**
Kincaid Hills Water Company	0.09	0.00	**0.09**	0.10	0.00	0.00	**0.10**	0.11	0.00	0.00	**0.11**	0.11	0.00	0.00	**0.11**
Town of Micanopy	0.06	0.00	**0.06**	0.06	0.00	0.00	**0.06**	0.06	0.00	0.00	**0.06**	0.08	0.00	0.00	**0.08**
Arredondo Utility Co / Aqua Source Utilities	0.09	0.00	**0.09**	0.09	0.00	0.00	**0.09**	0.09	0.00	0.00	**0.09**	0.09	0.00	0.00	**0.09**
SJRWMD Alachua Total	**22.44**	**0.00**	**22.44**	**23.57**	**0.00**	**0.00**	**23.57**	**24.68**	**0.00**	**0.00**	**24.68**	**25.71**	**0.00**	**0.00**	**25.71**
City Of Newberry	0.52	0.00	**0.52**	0.73	0.00	0.00	**0.73**	0.75	0.00	0.00	**0.75**	0.78	0.00	0.00	**0.78**
City Of Archer	0.14	0.00	**0.14**	0.12	0.00	0.00	**0.12**	0.12	0.00	0.00	**0.12**	0.12	0.00	0.00	**0.12**
City Of High Springs Water Plant	0.46	0.00	**0.46**	0.52	0.00	0.00	**0.52**	0.52	0.00	0.00	**0.52**	0.61	0.00	0.00	**0.61**
City Of Waldo	0.06	0.00	**0.06**	0.07	0.00	0.00	**0.07**	0.07	0.00	0.00	**0.07**	0.09	0.00	0.00	**0.09**
City Of Alachua	1.17	0.00	**1.17**	1.24	0.00	0.00	**1.24**	1.25	0.00	0.00	**1.25**	1.27	0.00	0.00	**1.27**
SRWMD Alachua Total	**2.35**	**0.00**	**2.35**	**2.68**	**0.00**	**0.00**	**2.68**	**2.71**	**0.00**	**0.00**	**2.71**	**2.87**	**0.00**	**0.00**	**2.87**
City of Macclenny	0.89	0.00	**0.89**	0.92	0.00	0.00	**0.92**	0.95	0.00	0.00	**0.95**	1.02	0.00	0.00	**1.02**
Town of Glen St Mary	0.03	0.00	**0.03**	0.03	0.00	0.00	**0.03**	0.04	0.00	0.00	**0.04**	0.04	0.00	0.00	**0.04**
SJRWMD Baker Total	**0.92**	**0.00**	**0.92**	**0.95**	**0.00**	**0.00**	**0.95**	**0.99**	**0.00**	**0.00**	**0.99**	**1.06**	**0.00**	**0.00**	**1.06**
Clay County Utility Authority	0.04	0.00	**0.04**	0.01	0.00	0.00	**0.01**	0.01	0.00	0.00	**0.01**	0.01	0.00	0.00	**0.01**
SJRWMD Bradford Total	**0.04**	**0.00**	**0.04**	**0.01**	**0.00**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**
City of Starke	0.75	0.00	**0.75**	0.84	0.00	0.00	**0.84**	0.85	0.00	0.00	**0.85**	0.87	0.00	0.00	**0.87**
City of Lawtey	0.19	0.00	**0.19**	0.20	0.00	0.00	**0.20**	0.20	0.00	0.00	**0.20**	0.20	0.00	0.00	**0.20**
SRWMD Bradford Total	**0.94**	**0.00**	**0.94**	**1.04**	**0.00**	**0.00**	**1.04**	**1.05**	**0.00**	**0.00**	**1.05**	**1.07**	**0.00**	**0.00**	**1.07**
Clay County Utility Authority	11.00	0.00	**11.00**	11.65	0.00	0.00	**11.65**	16.07	0.00	0.00	**16.07**	18.32	0.00	0.00	**18.32**
Town of Orange Park	0.89	0.00	**0.89**	0.98	0.00	0.00	**0.98**	0.98	0.00	0.00	**0.98**	0.98	0.00	0.00	**0.98**
City of Green Cove Springs	1.00	0.00	**1.00**	1.09	0.00	0.00	**1.09**	1.28	0.00	0.00	**1.28**	1.34	0.00	0.00	**1.34**
JEA (Also in Duval, Nassau, St. Johns)	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
SJRWMD Clay Total	**12.89**	**0.00**	**12.89**	**13.72**	**0.00**	**0.00**	**13.72**	**18.33**	**0.00**	**0.00**	**18.33**	**20.64**	**0.00**	**0.00**	**20.64**
City of Lake City	3.28	0.00	**3.28**	3.42	0.00	0.00	**3.42**	3.52	0.00	0.00	**3.52**	3.62	0.00	0.00	**3.62**
Columbia County Board of Commissioners	0.04	0.00	**0.04**	0.05	0.00	0.00	**0.05**	0.06	0.00	0.00	**0.06**	0.06	0.00	0.00	**0.06**
North Florida Mega Industrial Park Wellfield	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	2.16	0.00	0.00	**2.16**	2.16	0.00	0.00	**2.16**
SRWMD Columbia Total	**3.32**	**0.00**	**3.32**	**3.47**	**0.00**	**0.00**	**3.47**	**5.74**	**0.00**	**0.00**	**5.74**	**5.84**	**0.00**	**0.00**	**5.84**
CSWR - Florida Utility Operating Company, LLC	0.08	0.00	**0.08**	0.08	0.00	0.00	**0.08**	0.08	0.00	0.00	**0.08**	0.08	0.00	0.00	**0.08**
City of Baldwin	0.22	0.00	**0.22**	0.23	0.00	0.00	**0.23**	0.24	0.00	0.00	**0.24**	0.34	0.00	0.00	**0.34**
City of Jacksonville Beach	2.49	0.00	**2.49**	2.63	0.00	0.00	**2.63**	2.63	0.00	0.00	**2.63**	2.63	0.00	0.00	**2.63**
Atlantic Beach Utility	2.18	0.00	**2.18**	2.52	0.00	0.00	**2.52**	2.69	0.00	0.00	**2.69**	2.85	0.00	0.00	**2.85**
City of Neptune Beach	0.94	0.00	**0.94**	0.91	0.00	0.00	**0.91**	0.91	0.00	0.00	**0.91**	0.91	0.00	0.00	**0.91**
St Johns County Utilities / Intercoastal (Also in St. Johns)	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
Normandy Villages Utilities	0.28	0.00	**0.28**	0.29	0.00	0.00	**0.29**	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**
JEA (Also in Clay, Nassau, St. Johns)	100.15	0.00	**100.15**	108.61	0.00	0.00	**108.61**	117.18	0.00	0.00	**117.18**	125.74	0.00	0.00	**125.74**
SJRWMD Duval Total	**106.34**	**0.00**	**106.34**	**115.27**	**0.00**	**0.00**	**115.27**	**124.03**	**0.00**	**0.00**	**124.03**	**132.85**	**0.00**	**0.00**	**132.85**
City of Flagler Beach	0.65	0.00	**0.65**	0.67	0.00	0.00	**0.67**	0.67	0.00	0.00	**0.67**	1.01	0.00	0.00	**1.01**
City of Palm Coast	7.07	0.00	**7.07**	8.12	0.00	0.00	**8.12**	9.27	0.00	0.00	**9.27**	9.92	0.00	0.00	**9.92**
Plantation Bay Utility Company (Also in Volusia)	0.17	0.00	**0.17**	0.22	0.00	0.00	**0.22**	0.22	0.00	0.00	**0.22**	0.22	0.00	0.00	**0.22**
City of Bunnell	0.33	0.00	**0.33**	0.39	0.00	0.00	**0.39**	0.40	0.00	0.00	**0.40**	0.40	0.00	0.00	**0.40**
Manufactured Home Communities	0.07	0.07	**0.14**	0.08	0.03	0.00	**0.11**	0.08	0.03	0.00	**0.11**	0.08	0.03	0.00	**0.11**
City of Ormond Beach (Also in Volusia)	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
Volusia County Utilities (Also in Volusia)	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
Dunes Community Development District	0.69	0.00	**0.69**	0.78	0.00	0.00	**0.78**	0.78	0.00	0.00	**0.78**	0.79	0.00	0.00	**0.79**
SJRWMD Flagler Total	**8.98**	**0.07**	**9.05**	**10.26**	**0.03**	**0.00**	**10.29**	**11.42**	**0.03**	**0.00**	**11.45**	**12.42**	**0.03**	**0.00**	**12.45**
City of Trenton Water Treatment Plant	0.22	0.00	**0.22**	0.22	0.00	0.00	**0.22**	0.25	0.00	0.00	**0.25**	0.27	0.00	0.00	**0.27**
Fanning Springs (Also in Dixie and Levy)	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
SRWMD Gilchrist Total	**0.22**	**0.00**	**0.22**	**0.22**	**0.00**	**0.00**	**0.22**	**0.25**	**0.00**	**0.00**	**0.25**	**0.27**	**0.00**	**0.00**	**0.27**
Town of Jennings	0.14	0.00	**0.14**	0.15	0.00	0.00	**0.15**	0.15	0.00	0.00	**0.15**	0.15	0.00	0.00	**0.15**
Town of White Springs	0.04	0.00	**0.04**	0.05	0.00	0.00	**0.05**	0.05	0.00	0.00	**0.05**	0.05	0.00	0.00	**0.05**
Hamilton County Water Facilities	0.07	0.00	**0.07**	0.13	0.00	0.00	**0.13**	0.13	0.00	0.00	**0.13**	0.13	0.00	0.00	**0.13**
City of Jasper	0.66	0.00	**0.66**	0.70	0.00	0.00	**0.70**	0.70	0.00	0.00	**0.70**	0.70	0.00	0.00	**0.70**
SRWMD Hamilton Total	**0.91**	**0.00**	**0.91**	**1.03**	**0.00**	**0.00**	**1.03**	**1.03**	**0.00**	**0.00**	**1.03**	**1.03**	**0.00**	**0.00**	**1.03**
City of Fernandina Beach	2.96	0.00	**2.96**	3.33	0.00	0.00	**3.33**	3.46	0.00	0.00	**3.46**	3.46	0.00	0.00	**3.46**
Town of Callahan	0.16	0.00	**0.16**	0.18	0.00	0.00	**0.18**	0.22	0.00	0.00	**0.22**	0.30	0.00	0.00	**0.30**
Town of Hilliard	0.23	0.00	**0.23**	0.24	0.00	0.00	**0.24**	0.24	0.00	0.00	**0.24**	0.35	0.00	0.00	**0.35**
Nassau Amelia Utilities	1.31	0.00	**1.31**	1.41	0.00	0.00	**1.41**	1.44	0.00	0.00	**1.44**	1.44	0.00	0.00	**1.44**
JEA (Also in Clay, Duval, St. Johns / Old 942)	2.26	0.00	**2.26**	2.69	0.00	0.00	**2.69**	2.69	0.00	0.00	**2.69**	2.69	0.00	0.00	**2.69**
SJRWMD Nassau Total	**6.92**	**0.00**	**6.92**	**7.85**	**0.00**	**0.00**	**7.85**	**8.05**	**0.00**	**0.00**	**8.05**	**8.24**	**0.00**	**0.00**	**8.24**
Town of Interlachen	0.08	0.00	**0.08**	0.08	0.00	0.00	**0.08**	0.08	0.00	0.00	**0.08**	0.08	0.00	0.00	**0.08**
City of Crescent City	0.17	0.00	**0.17**	0.17	0.00	0.00	**0.17**	0.17	0.00	0.00	**0.17**	0.17	0.00	0.00	**0.17**
Melrose Water Association	0.15	0.00	**0.15**	0.13	0.00	0.00	**0.13**	0.13	0.00	0.00	**0.13**	0.13	0.00	0.00	**0.13**
River Park Utilities Management Assoc.	0.10	0.00	**0.10**	0.07	0.00	0.00	**0.07**	0.07	0.00	0.00	**0.07**	0.07	0.00	0.00	**0.07**
City of Palatka	1.31	0.00	**1.31**	1.28	0.00	0.00	**1.28**	1.28	0.00	0.00	**1.28**	1.28	0.00	0.00	**1.28**
Town of Welaka	0.10	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.11	0.00	0.00	**0.11**	0.12	0.00	0.00	**0.12**
Putnam County BOCC	0.27	0.00	**0.27**	0.28	0.00	0.00	**0.28**	0.28	0.00	0.00	**0.28**	0.28	0.00	0.00	**0.28**
SJRWMD Putnam Total	**2.18**	**0.00**	**2.18**	**2.11**	**0.00**	**0.00**	**2.11**	**2.12**	**0.00**	**0.00**	**2.12**	**2.13**	**0.00**	**0.00**	**2.13**
North Beach Utilities	0.45	0.00	**0.45**	0.53	0.00	0.00	**0.53**	0.69	0.00	0.00	**0.69**	0.69	0.00	0.00	**0.69**
Wildwood Water Company	0.06	0.00	**0.06**	0.06	0.00	0.00	**0.06**	0.06	0.00	0.00	**0.06**	0.06	0.00	0.00	**0.06**
St. Johns County Utilities / Intercoastal (Also in Duval)	4.02	0.00	**4.02**	3.53	0.00	0.00	**3.53**	3.93	0.00	0.00	**3.93**	4.36	0.00	0.00	**4.36**
St. Johns County Utilities (1198)	6.90	0.00	**6.90**	10.60	0.00	0.00	**10.60**	12.61	0.00	0.00	**12.61**	14.35	0.00	0.00	**14.35**
St. Johns County Utilities (1392)	0.08	0.00	**0.08**	0.08	0.00	0.00	**0.08**	0.08	0.00	0.00	**0.08**	0.08	0.00	0.00	**0.08**
City of St. Augustine Utilities	3.23	0.00	**3.23**	3.80	0.00	0.00	**3.80**	4.56	0.00	0.00	**4.56**	4.56	0.00	0.00	**4.56**
JEA (Also in Clay, Duval, Nassau)	4.47	0.00	**4.47**	6.50	0.00	0.00	**6.50**	6.50	0.00	0.00	**6.50**	6.50	0.00	0.00	**6.50**
SJRWMD St. Johns Total	**19.21**	**0.00**	**19.21**	**25.10**	**0.00**	**0.00**	**25.10**	**28.43**	**0.00**	**0.00**	**28.43**	**30.60**	**0.00**	**0.00**	**30.60**
Town of Wellborn	0.04	0.00	**0.04**	0.04	0.00	0.00	**0.04**	0.04	0.00	0.00	**0.04**	0.04	0.00	0.00	**0.04**
Town of Branford	0.07	0.00	**0.07**	0.08	0.00	0.00	**0.08**	0.08	0.00	0.00	**0.08**	0.09	0.00	0.00	**0.09**
Advent Christian Village	0.14	0.00	**0.14**	0.16	0.00	0.00	**0.16**	0.26	0.00	0.00	**0.26**	0.31	0.00	0.00	**0.31**
City of Live Oak	1.07	0.00	**1.07**	1.17	0.00	0.00	**1.17**	1.23	0.00	0.00	**1.23**	1.29	0.00	0.00	**1.29**
SRWMD Suwannee Total	**1.32**	**0.00**	**1.32**	**1.45**	**0.00**	**0.00**	**1.45**	**1.61**	**0.00**	**0.00**	**1.61**	**1.73**	**0.00**	**0.00**	**1.73**
City of Lake Butler	0.26	0.00	**0.26**	0.24	0.00	0.00	**0.24**	0.24	0.00	0.00	**0.24**	0.24	0.00	0.00	**0.24**
SRWMD Union Total	**0.26**	**0.00**	**0.26**	**0.24**	**0.00**	**0.00**	**0.24**	**0.24**	**0.00**	**0.00**	**0.24**	**0.24**	**0.00**	**0.00**	**0.24**
SJRWMD Region 1 Total	**179.92**	**0.07**	**179.99**	**198.84**	**0.03**	**0.00**	**198.87**	**218.06**	**0.03**	**0.00**	**218.09**	**233.66**	**0.03**	**0.00**	**233.69**
SRWMD NFRWSP Total	**9.32**	**0.00**	**9.32**	**10.13**	**0.00**	**0.00**	**10.13**	**#REF!**	**#REF!**	**0.00**	**12.63**	**#REF!**	**#REF!**	**0.00**	**13.05**
NFRWSP Total	**189.24**	**0.07**	**189.31**	**208.97**	**0.03**	**0.00**	**209.00**	**#REF!**	**#REF!**	**0.00**	**230.72**	**#REF!**	**#REF!**	**0.00**	**246.74**

Utility	2035 GW	2035 SW	2035 Other	2035 Total	2040 GW	2040 SW	2040 Other	2040 Total	2045 GW	2045 SW	2045 Other	2045 Total	Percent Change 2015-2045	2014-2018 Avg Gross GPCD	Demand Projections (1-in-10) 2045 GW	2045 SW	2045 Other	2045 Total
City of Hawthorne	0.19	0.00	0.00	**0.19**	0.21	0.00	0.00	**0.21**	0.21	0.00	0.00	**0.21**	50%	88	0.22	0.00	0.00	**0.22**
Gainesville Regional Utilities (includes SRWMD)	26.06	0.00	0.00	**26.06**	26.74	0.00	0.00	**26.74**	27.29	0.00	0.00	**27.29**	24%	118	28.93	0.00	0.00	**28.93**
Kincaid Hills Water Company	0.11	0.00	0.00	**0.11**	0.11	0.00	0.00	**0.11**	0.11	0.00	0.00	**0.11**	22%	161	0.12	0.00	0.00	**0.12**
Town of Micanopy	0.08	0.00	0.00	**0.08**	0.08	0.00	0.00	**0.08**	0.08	0.00	0.00	**0.08**	33%	71	0.08	0.00	0.00	**0.08**
Arredondo Utility Co / Aqua Source Utilities	0.09	0.00	0.00	**0.09**	0.09	0.00	0.00	**0.09**	0.09	0.00	0.00	**0.09**	0%	74	0.10	0.00	0.00	**0.10**
SJRWMD Alachua Total	**26.53**	**0.00**	**0.00**	**26.53**	**27.23**	**0.00**	**0.00**	**27.23**	**27.78**	**0.00**	**0.00**	**27.78**	**24%**	**N/A**	**29.45**	**0.00**	**0.00**	**29.45**
City Of Newberry	0.80	0.00	0.00	**0.80**	0.82	0.00	0.00	**0.82**	0.84	0.00	0.00	**0.84**	62%	105	0.89	0.00	0.00	**0.89**
City Of Archer	0.12	0.00	0.00	**0.12**	0.15	0.00	0.00	**0.15**	0.15	0.00	0.00	**0.15**	7%	95	0.16	0.00	0.00	**0.16**
City Of High Springs Water Plant	0.61	0.00	0.00	**0.61**	0.61	0.00	0.00	**0.61**	0.61	0.00	0.00	**0.61**	33%	84	0.65	0.00	0.00	**0.65**
City Of Waldo	0.09	0.00	0.00	**0.09**	0.09	0.00	0.00	**0.09**	0.09	0.00	0.00	**0.09**	50%	71	0.10	0.00	0.00	**0.10**
City Of Alachua	1.42	0.00	0.00	**1.42**	1.43	0.00	0.00	**1.43**	1.44	0.00	0.00	**1.44**	23%	121	1.53	0.00	0.00	**1.53**
SRWMD Alachua Total	**3.04**	**0.00**	**0.00**	**3.04**	**3.10**	**0.00**	**0.00**	**3.10**	**3.13**	**0.00**	**0.00**	**3.13**	**33%**	**N/A**	**3.33**	**0.00**	**0.00**	**3.33**
City of Macclenny	1.04	0.00	0.00	**1.04**	1.05	0.00	0.00	**1.05**	1.05	0.00	0.00	**1.05**	18%	139	1.11	0.00	0.00	**1.11**
Town of Glen St Mary	0.04	0.00	0.00	**0.04**	0.04	0.00	0.00	**0.04**	0.04	0.00	0.00	**0.04**	33%	74	0.04	0.00	0.00	**0.04**
SJRWMD Baker Total	**1.08**	**0.00**	**0.00**	**1.08**	**1.09**	**0.00**	**0.00**	**1.09**	**1.09**	**0.00**	**0.00**	**1.09**	**18%**	**213**	**1.15**	**0.00**	**0.00**	**1.15**
Clay County Utility Authority	0.01	0.00	0.00	**0.01**	0.01	0.00	0.00	**0.01**	0.01	0.00	0.00	**0.01**	-75%	95	0.01	0.00	0.00	**0.01**
SJRWMD Bradford Total	**0.01**	**0.00**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**-75%**	**N/A**	**0.01**	**0.00**	**0.00**	**0.01**
City of Starke	0.88	0.00	0.00	**0.88**	0.89	0.00	0.00	**0.89**	**0.91**	**0.00**	**0.00**	**0.91**	**21%**	105	0.96	0.00	0.00	**0.96**
City of Lawtey	0.20	0.00	0.00	**0.20**	0.20	0.00	0.00	**0.20**	0.20	0.00	0.00	**0.20**	5%	221	0.21	0.00	0.00	**0.21**
SRWMD Bradford Total	**1.08**	**0.00**	**0.00**	**1.08**	**1.09**	**0.00**	**0.00**	**1.09**	**1.11**	**0.00**	**0.00**	**1.11**	**18%**	**N/A**	**1.17**	**0.00**	**0.00**	**1.17**
Clay County Utility Authority	20.88	0.00	0.00	**20.88**	22.09	0.00	0.00	**22.09**	23.19	0.00	0.00	**23.19**	111%	95	23.58	0.00	1.41	**24.99**
Town of Orange Park	0.98	0.00	0.00	**0.98**	0.98	0.00	0.00	**0.98**	0.98	0.00	0.00	**0.98**	10%	97	1.04	0.00	0.00	**1.04**
City of Green Cove Springs	1.36	0.00	0.00	**1.36**	1.40	0.00	0.00	**1.40**	1.40	0.00	0.00	**1.40**	40%	161	1.48	0.00	0.00	**1.48**
JEA (Also in Duval, Nassau, St. Johns)	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	129	0.00	0.00	0.00	**0.00**
SJRWMD Clay Total	**23.22**	**0.00**	**0.00**	**23.22**	**24.47**	**0.00**	**0.00**	**24.47**	**25.57**	**0.00**	**0.00**	**25.57**	**98%**	**N/A**	**26.10**	**0.00**	**1.41**	**27.51**
City of Lake City	3.72	0.00	0.00	**3.72**	3.83	0.00	0.00	**3.83**	3.94	0.00	0.00	**3.94**	20%	177	4.18	0.00	0.00	**4.18**
Columbia County Board of Commissioners	0.06	0.00	0.00	**0.06**	0.06	0.00	0.00	**0.06**	0.06	0.00	0.00	**0.06**	50%	635	0.06	0.00	0.00	**0.06**
North Florida Mega Industrial Park Wellfield	2.16	0.00	0.00	**2.16**	2.16	0.00	0.00	**2.16**	2.16	0.00	0.00	**2.16**	N/A	N/A	2.29	0.00	0.00	**2.29**
SRWMD Columbia Total	**5.94**	**0.00**	**0.00**	**5.94**	**6.05**	**0.00**	**0.00**	**6.05**	**6.16**	**0.00**	**0.00**	**6.16**	**86%**	**N/A**	**6.53**	**0.00**	**0.00**	**6.53**
CSWR - Florida Utility Operating Company, LLC	0.08	0.00	0.00	**0.08**	0.08	0.00	0.00	**0.08**	0.08	0.00	0.00	**0.08**	0%	77	0.08	0.00	0.00	**0.08**
City of Baldwin	0.34	0.00	0.00	**0.34**	0.36	0.00	0.00	**0.36**	0.36	0.00	0.00	**0.36**	64%	161	0.38	0.00	0.00	**0.38**
City of Jacksonville Beach	2.63	0.00	0.00	**2.63**	2.80	0.00	0.00	**2.80**	2.80	0.00	0.00	**2.80**	12%	107	2.97	0.00	0.00	**2.97**
Atlantic Beach Utility	2.99	0.00	0.00	**2.99**	3.12	0.00	0.00	**3.12**	3.12	0.00	0.00	**3.12**	43%	98	3.31	0.00	0.00	**3.31**
City of Neptune Beach	0.91	0.00	0.00	**0.91**	0.92	0.00	0.00	**0.92**	0.92	0.00	0.00	**0.92**	-2%	126	0.98	0.00	0.00	**0.98**
St Johns County Utilities / Intercoastal (Also in St. Johns)	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	N/A	0.00	0.00	0.00	**0.00**
Normandy Villages Utilities	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**	7%	90	0.32	0.00	0.00	**0.32**
JEA (Also in Clay, Nassau, St. Johns)	132.79	0.00	1.51	**134.30**	132.79	0.00	10.07	**142.86**	132.79	0.00	18.60	**151.39**	51%	129	132.79	0.00	27.68	**160.47**
SJRWMD Duval Total	**140.04**	**0.00**	**1.51**	**141.55**	**140.37**	**0.00**	**10.07**	**150.44**	**140.37**	**0.00**	**18.60**	**158.97**	**49%**	**N/A**	**168.51**	**0.00**	**27.68**	**168.51**
City of Flagler Beach	1.01	0.00	0.00	**1.01**	1.01	0.00	0.00	**1.01**	1.01	0.00	0.00	**1.01**	55%	144	1.07	0.00	0.00	**1.07**
City of Palm Coast	10.68	0.00	0.00	**10.68**	11.02	0.00	0.00	**11.02**	11.04	0.00	0.00	**11.04**	56%	88	11.70	0.00	0.00	**11.70**
Plantation Bay Utility Company (Also in Volusia)	0.23	0.00	0.00	**0.23**	0.24	0.00	0.00	**0.24**	0.24	0.00	0.00	**0.24**	41%	69	0.25	0.00	0.00	**0.25**
City of Bunnell	0.40	0.00	0.00	**0.40**	0.55	0.00	0.00	**0.55**	1.07	0.00	0.00	**1.07**	224%	131	1.13	0.00	0.00	**1.13**
Manufactured Home Communities	0.08	0.03	0.00	**0.11**	0.08	0.03	0.00	**0.11**	0.08	0.03	0.00	**0.11**	-21%	85	0.09	0.03	0.00	**0.12**
City of Ormond Beach (Also in Volusia)	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	N/A	0.00	0.00	0.00	**0.00**
Volusia County Utilities (Also in Volusia)	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	N/A	0.00	0.00	0.00	**0.00**
Dunes Community Development District	0.83	0.00	0.00	**0.83**	0.86	0.00	0.00	**0.86**	0.86	0.00	0.00	**0.86**	25%	188	0.91	0.00	0.00	**0.91**
SJRWMD Flagler Total	**13.23**	**0.03**	**0.00**	**13.26**	**13.76**	**0.03**	**0.00**	**13.79**	**14.30**	**0.03**	**0.00**	**14.33**	**58%**	**N/A**	**15.15**	**0.03**	**0.00**	**15.18**
City of Trenton Water Treatment Plant	0.28	0.00	0.00	**0.28**	0.28	0.00	0.00	**0.28**	0.28	0.00	0.00	**0.28**	27%	104	0.30	0.00	0.00	**0.30**
Fanning Springs (Also in Dixie and Levy)	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0	0.00	0.00	0.00	**0.00**
SRWMD Gilchrist Total	**0.28**	**0.00**	**0.00**	**0.28**	**0.28**	**0.00**	**0.00**	**0.28**	**0.28**	**0.00**	**0.00**	**0.28**	**27%**	**N/A**	**0.30**	**0.00**	**0.00**	**0.30**
Town of Jennings	0.15	0.00	0.00	**0.15**	0.15	0.00	0.00	**0.15**	0.15	0.00	0.00	**0.15**	7%	208	0.16	0.00	0.00	**0.16**
Town of White Springs	0.05	0.00	0.00	**0.05**	0.05	0.00	0.00	**0.05**	0.05	0.00	0.00	**0.05**	25%	58	0.05	0.00	0.00	**0.05**
Hamilton County Water Facilities	0.13	0.00	0.00	**0.13**	0.13	0.00	0.00	**0.13**	0.13	0.00	0.00	**0.13**	86%	N/A	0.14	0.00	0.00	**0.14**
City of Jasper	0.70	0.00	0.00	**0.70**	0.70	0.00	0.00	**0.70**	0.70	0.00	0.00	**0.70**	6%	188	0.74	0.00	0.00	**0.74**
SRWMD Hamilton Total	**1.03**	**0.00**	**0.00**	**1.03**	**1.03**	**0.00**	**0.00**	**1.03**	**1.03**	**0.00**	**0.00**	**1.03**	**13%**	**N/A**	**1.09**	**0.00**	**0.00**	**1.09**
City of Fernandina Beach	3.46	0.00	0.00	**3.46**	3.46	0.00	0.00	**3.46**	3.46	0.00	0.00	**3.46**	17%	169	3.67	0.00	0.00	**3.67**
Town of Callahan	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**	88%	104	0.32	0.00	0.00	**0.32**
Town of Hilliard	0.35	0.00	0.00	**0.35**	0.37	0.00	0.00	**0.37**	0.37	0.00	0.00	**0.37**	61%	75	0.39	0.00	0.00	**0.39**
Nassau Amelia Utilities	1.44	0.00	0.00	**1.44**	1.44	0.00	0.00	**1.44**	1.44	0.00	0.00	**1.44**	10%	147	1.53	0.00	0.00	**1.53**
JEA (Also in Clay, Duval, St. Johns / Old 942)	2.69	0.00	0.00	**2.69**	2.69	0.00	0.00	**2.69**	2.69	0.00	0.00	**2.69**	19%	138	2.69	0.00	0.00	**2.69**
SJRWMD Nassau Total	**8.24**	**0.00**	**0.00**	**8.24**	**8.26**	**0.00**	**0.00**	**8.26**	**8.26**	**0.00**	**0.00**	**8.26**	**19%**	**N/A**	**8.60**	**0.00**	**0.00**	**8.60**
Town of Interlachen	0.08	0.00	0.00	**0.08**	0.08	0.00	0.00	**0.08**	0.08	0.00	0.00	**0.08**	0%	88	0.08	0.00	0.00	**0.08**
City of Crescent City	0.17	0.00	0.00	**0.17**	0.17	0.00	0.00	**0.17**	0.17	0.00	0.00	**0.17**	0%	96	0.18	0.00	0.00	**0.18**
Melrose Water Association	0.14	0.00	0.00	**0.14**	0.14	0.00	0.00	**0.14**	0.15	0.00	0.00	**0.15**	0%	90	0.16	0.00	0.00	**0.16**
River Park Utilities Management Assoc.	0.07	0.00	0.00	**0.07**	0.07	0.00	0.00	**0.07**	0.07	0.00	0.00	**0.07**	-30%	69	0.07	0.00	0.00	**0.07**
City of Palatka	1.28	0.00	0.00	**1.28**	1.28	0.00	0.00	**1.28**	1.28	0.00	0.00	**1.28**	-2%	106	1.36	0.00	0.00	**1.36**
Town of Welaka	0.13	0.00	0.00	**0.13**	0.14	0.00	0.00	**0.14**	0.15	0.00	0.00	**0.15**	50%	55	0.16	0.00	0.00	**0.16**
Putnam County BOCC	0.28	0.00	0.00	**0.28**	0.28	0.00	0.00	**0.28**	0.28	0.00	0.00	**0.28**	4%	98	0.30	0.00	0.00	**0.30**
SJRWMD Putnam Total	**2.15**	**0.00**	**0.00**	**2.15**	**2.16**	**0.00**	**0.00**	**2.16**	**2.18**	**0.00**	**0.00**	**2.18**	**0%**	**N/A**	**2.31**	**0.00**	**0.00**	**2.31**
North Beach Utilities	0.69	0.00	0.00	**0.69**	0.69	0.00	0.00	**0.69**	0.69	0.00	0.00	**0.69**	53%	136	0.73	0.00	0.00	**0.73**
Wildwood Water Company	0.06	0.00	0.00	**0.06**	0.06	0.00	0.00	**0.06**	0.06	0.00	0.00	**0.06**	0%	68	0.06	0.00	0.00	**0.06**
St. Johns County Utilities / Intercoastal (Also in Duval)	5.42	0.00	0.00	**5.42**	7.10	0.00	0.00	**7.10**	8.40	0.00	0.00	**8.40**	109%	144	8.40	0.00	0.00	**8.40**
St. Johns County Utilities (1198)	15.20	0.00	0.00	**15.20**	15.20	0.00	0.00	**15.20**	15.20	0.00	0.00	**15.20**	120%	96	15.20	0.00	0.00	**15.20**
St. Johns County Utilities (1392)	0.08	0.00	0.00	**0.08**	0.08	0.00	0.00	**0.08**	0.08	0.00	0.00	**0.08**	0%	126	0.08	0.00	0.00	**0.08**
City of St. Augustine Utilities	4.56	0.00	0.00	**4.56**	4.65	0.00	0.00	**4.65**	4.93	0.00	0.00	**4.93**	53%	112	5.23	0.00	0.00	**5.23**
JEA (Also in Clay, Duval, Nassau)	6.50	0.00	0.00	**6.50**	6.50	0.00	0.00	**6.50**	6.50	0.00	0.00	**6.50**	45%	129	6.50	0.00	0.00	**6.50**
SJRWMD St. Johns Total	**32.51**	**0.00**	**0.00**	**32.51**	**34.28**	**0.00**	**0.00**	**34.28**	**35.86**	**0.00**	**0.00**	**35.86**	**87%**	**N/A**	**36.20**	**0.00**	**0.00**	**36.20**
Town of Wellborn	0.04	0.00	0.00	**0.04**	0.05	0.00	0.00	**0.05**	0.05	0.00	0.00	**0.05**	25%	79	0.05	0.00	0.00	**0.05**
Town of Branford	0.11	0.00	0.00	**0.11**	0.11	0.00	0.00	**0.11**	0.11	0.00	0.00	**0.11**	57%	120	0.12	0.00	0.00	**0.12**
Advent Christian Village	0.31	0.00	0.00	**0.31**	0.31	0.00	0.00	**0.31**	0.31	0.00	0.00	**0.31**	121%	199	0.33	0.00	0.00	**0.33**
City of Live Oak	1.33	0.00	0.00	**1.33**	1.37	0.00	0.00	**1.37**	1.40	0.00	0.00	**1.40**	31%	191	1.48	0.00	0.00	**1.48**
SRWMD Suwannee Total	**1.79**	**0.00**	**0.00**	**1.79**	**1.84**	**0.00**	**0.00**	**1.84**	**1.87**	**0.00**	**0.00**	**1.87**	**42%**	**N/A**	**1.98**	**0.00**	**0.00**	**1.98**
City of Lake Butler	0.25	0.00	0.00	**0.25**	0.25	0.00	0.00	**0.25**	0.25	0.00	0.00	**0.25**	-4%	129	0.27	0.00	0.00	**0.27**
SRWMD Union Total	**0.25**	**0.00**	**0.00**	**0.25**	**0.25**	**0.00**	**0.00**	**0.25**	**0.25**	**0.00**	**0.00**	**0.25**	**-4%**	**N/A**	**0.27**	**0.00**	**0.00**	**0.27**
SJRWMD Region 1 Total	**247.01**	**0.03**	**1.51**	**248.55**	**251.63**	**0.03**	**10.07**	**261.73**	**255.42**	**0.03**	**18.60**	**274.05**	**52%**	**N/A**	**287.48**	**0.03**	**29.09**	**288.92**
SRWMD NFRWSP Total	**#REF!**	**#REF!**	**0.00**	**13.41**	**#REF!**	**#REF!**	**0.00**	**13.64**	**#REF!**	**#REF!**	**0.00**	**13.83**	**48%**	**N/A**	**#REF!**	**#REF!**	**0.00**	**14.67**
NFRWSP Total	**#REF!**	**#REF!**	**1.51**	**261.96**	**#REF!**	**#REF!**	**10.07**	**275.37**	**#REF!**	**#REF!**	**18.60**	**287.88**	**52%**	**N/A**	**#REF!**	**#REF!**	**29.09**	**303.59**

Notes:
1.) All water use and demand projections are shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) Projected population for years 2020 - 2045 are based on BEBR Population Projections: Volume 53, Bulletin 186, Published January 2020. For planning purposes, incarcerated population was removed from the BEBR countywide totals for the counties located within the SRWMD.
4.) Population projections shown here are permanent population projections only and do not include any factors such as seasonal residents, tourist population or net commuter population.
5.) Population and demand projections for GRU represent both within the SJRWMD and SRWMD.
6.) During the stakeholder review period the following (SJRWMD) utilities' projections were adjusted based on feedback: Gainesville Regional Utilities (CUP 11339), Clay County Utility Authority (CUP 416), JEA (CUP 88271), Atlantic Beach Utility (CUP 810), City of Neptune Beach (CUP 842), Melrose Water Association (CUP 7961), and St. Johns County Utilities (CUPs 1142 & 1198).
7.) Per capita used to calculate demand projections is an average from 2014 - 2018 and is calculated as (Total Water Use / Total Estimated Population). This per capita is commonly referred to as a gross per capita, as it includes all uses within a utility.
8.) 1-in-10 rainfall year demand for 2045 calculated as an additional 6 percent of 2045 average demand.
9.) SW quantities (allocations) for 2020 - 2045 were obtained from consumptive use permits.
10.) Public water supply utility service areas often include residences that derive their water supply from privately owned (domestic self-supply) wells. Typically, these domestic self-supply water uses existed prior to their locations becoming part of public water supply service areas. For public water supply service areas, the Districts do not have sufficient information to separate the water use demand served by public supply systems from those served by domestic self-supply wells. Therefore, public water supply water demands estimated often include some domestic self-supply demand.
11.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.
12.) As noted above, water demand projections for JEA, SJCUD, and CCUA were adjusted during stakeholder feedback and review of the modeling distribution for the Black Creek settlement agreement. The water demand may not equal population multiplied by per capita.

Table B-5a. 2014-2018 Water Use, Population Served, and Five-Year Gross Per Capita Averages for Public Supply Permitted Equal to or Greater than 0.10 mgd, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

Cup Number	Owner	Utility	Alternate Name / Comments	County	Water Use					Population					2014-2018	Notes
					2014	2015	2016	2017	2018	2014	2015	2016	2017	2018	Average Gross	
1674	City of Hawthorne	City of Hawthorne		Alachua	0.158	0.139	0.159	0.092	0.118	1,508	1,508	1,508	1,510	1,530	88	
11339	Gainesville Regional Utilities	Gainesville Regional Utilities	GRU	Alachua	21.82	22.06	22.29	23.43	22.72	187,900	189,400	190,900	192,200	194,500	118	
11343	Kincaid Hills Water Company	Kincaid Hills Water Company	Kincaid Hills	Alachua	0.075	0.085	0.093	0.104	0.139	606	620	620	620	620	161	
11356	Town of Micanopy	Town of Micanopy		Alachua	0.060	0.059	0.061	0.060	0.051	824	824	824	824	824	71	
11364, 132141	Arredondo Utility Co / Aqua Source Utilities	Arredondo Utility Co / Aqua Source Utilities	Arredondo Farms	Alachua	0.079	0.085	0.102	0.090	0.099	1,266	1,266	1,195	1,195	1,195	74	
SJRWMD Alachua Total					**22.192**	**22.428**	**22.705**	**23.776**	**23.127**	**192,104**	**193,618**	**195,047**	**196,349**	**198,669**	**117**	
216450	City of Newberry	City of Newberry	PWS 2010207	Alachua	0.495	0.521	0.551	0.574	0.591	4,855	5,026	5,197	5,367	5,538	105	
216647	City of Archer	City of Archer	PWS 2010199	Alachua	0.110	0.135	0.117	0.114	0.128	1,246	1,273	1,282	1,284	1,303	95	
216833	City of High Springs Water Plant	City of High Springs Water Plant	PWS 2010201	Alachua	0.409	0.455	0.503	0.556	0.580	5,675	5,684	6,093	6,155	6,221	84	
217300	City of Waldo	City of Waldo	PWS 2010212	Alachua	0.065	0.062	0.067	0.071	0.073	966	947	955	947	960	71	
220667	City of Alachua	City of Alachua	PWS 2010017	Alachua	1.131	1.170	1.275	1.170	1.207	9,665	9,665	9,873	10,027	10,155	121	
SRWMD Alachua Total					**2.210**	**2.343**	**2.513**	**2.485**	**2.579**	**22,407**	**22,595**	**23,400**	**23,780**	**24,177**	**104**	
15	City of Macclenny	City of Macclenny		Baker	0.845	0.886	0.922	0.903	0.934	6,391	6,430	6,430	6,472	6,582	139	
24	Town of Glen St. Mary	Town of Glen St. Mary		Baker	0.031	0.031	0.032	0.033	0.034	428	435	435	440	449	74	
SJRWMD Baker Total					**0.876**	**0.917**	**0.954**	**0.936**	**0.968**	**6,819**	**6,865**	**6,865**	**6,912**	**7,031**	**135**	
216650	City of Starke	City of Starke	PWS 2040211	Bradford	0.696	0.748	0.645	0.707	0.680	6,591	6,585	6,541	6,538	6,700	105	
218998	City of Lawtey	City of Lawtey	PWS 2040648	Bradford	0.186	0.193	0.184	0.191	0.212	855	877	876	868	889	221	
SRWMD Bradford Total					**0.882**	**0.941**	**0.829**	**0.898**	**0.892**	**7,446**	**7,462**	**7,417**	**7,406**	**7,589**	**119**	
416, 431	Clay County Utility Authority	Clay County Utility Authority	Postmaster Village, Keystone Heights, CCUA	Bradford, **Clay**	10.628	11.037	11.729	11.658	11.231	118,554	115,629	118,432	118,437	120,444	95	Clay County Utility served 939 people in SRWMD portion of Bradford County in 2015.
453	Town of Orange Park	Town of Orange Park		Clay	0.862	0.887	0.922	0.889	0.830	9,042	9,042	9,042	9,058	9,058	97	
499	City of Green Cove Springs	City of Green Cove Springs		Clay	0.970	0.996	1.127	1.158	1.049	6,500	6,500	6,500	6,630	6,763	161	
SJRWMD Clay Total					**12.460**	**12.920**	**13.778**	**13.705**	**13.110**	**134,096**	**131,171**	**133,974**	**134,125**	**136,265**	**99**	
217754	City of Lake City	City of Lake City	PWS 2120630 & 2124372	Columbia	3.231	3.280	3.413	3.362	3.345	18,604	18,697	18,752	18,912	19,097	177	
220704	Columbia County Board of Commissio	Columbia County Board of Commissioners	PWS 2124413	Columbia	0.042	0.038	0.035	0.045	0.066	70	70	70	71	75	635	
239112	North Florida Mega Industrial Park We	North Florida Mega Industrial Park Wellfield		Columbia	0.000	0.000	0.000	0.000	0.000	0	0	0	0	0	N/A	Permit issued in 2021
SRWMD Columbia Total					**3.273**	**3.318**	**3.448**	**3.407**	**3.411**	**18,674**	**18,767**	**18,822**	**18,983**	**19,172**	**179**	
756	CSWR - Florida Utility Operating Company, LLC	CSWR - Florida Utility Operating Company, LLC		Duval	0.075	0.079	0.087	0.083	0.068	1,015	1,015	1,015	1,015	1,015	77	Formerly Neighborhood Utilities, Inc.
784	City of Baldwin	City of Baldwin		Duval	0.242	0.217	0.231	0.242	0.199	1,411	1,385	1,392	1,407	1,419	161	
793	City of Jacksonville Beach	City of Jacksonville Beach		Duval	2.365	2.491	2.658	2.539	2.418	23,279	23,279	23,279	23,498	23,733	107	
810	Atlantic Beach Utility	Atlantic Beach Utility	Buccaneer / Atlantic Beach	Duval	2.101	2.179	2.400	2.324	2.319	22,530	22,674	23,024	23,313	23,585	98	
842	City of Neptune Beach	City of Neptune Beach		Duval	0.957	0.938	0.914	0.929	0.884	7,270	7,270	7,270	7,303	7,554	126	
50293	Normandy Villages Utilities	Normandy Villages Utilities		Duval	0.275	0.283	0.279	0.327	0.281	3,265	3,200	3,200	3,202	3,235	90	
88271	JEA	JEA		Clay, **Duval**, Nassau, St. Johns	100.428	104.625	109.845	113.288	110.158	815,762	823,308	833,065	844,347	857,673	129	
SJRWMD Duval Total					**106.443**	**110.812**	**116.414**	**119.732**	**116.327**	**874,532**	**882,131**	**892,245**	**904,085**	**918,214**	**127**	
59	City of Flagler Beach	City of Flagler Beach		Flagler	0.819	0.649	0.673	0.643	0.541	4,507	4,621	4,630	4,677	4,677	144	
1947	City of Palm Coast	City of Palm Coast	Include Beverly Beach Area	Flagler	6.565	7.074	7.606	7.660	7.452	79,903	79,819	81,182	82,137	89,548	88	
1960	Plantation Bay Utility Company	Plantation Bay Utility Company		**Flagler**, Volusia	0.175	0.169	0.223	0.263	0.236	3,000	3,000	3,000	3,174	3,174	69	
1982	City of Bunnell	City of Bunnell		Flagler	0.352	0.329	0.401	0.486	0.337	2,835	2,875	2,910	2,934	2,999	131	
2002	Manufactured Home Communities	Manufactured Home Communities	Bulow Village Campground	Flagler	0.128	0.135	0.098	0.049	0.135	1,284	1,284	1,284	1,284	1,284	85	
51136	Dunes Community Development District	Dunes Community Development District		Flagler	2.475	0.692	0.860	0.912	0.800	4,017	4,017	4,017	4,091	4,153	283	Includes Golf Course. Per capita of 188 for just PS.
SJRWMD Flagler Total					**10.514**	**9.048**	**9.861**	**10.013**	**9.501**	**95,546**	**95,616**	**97,023**	**98,297**	**105,835**	**99**	
216453	City of Trenton Water Treatment Plant	City of Trenton Water Treatment Plant	PWS 2211188	Gilchrist	0.231	0.218	0.220	0.195	0.204	2,042	2,040	2,038	2,041	2,100	104	
220310	Fanning Springs	Fanning Springs		Gilchrist	0.000	0.000	0.000	0.000	0.000	86	85	96	98	101	0	Wells are outside of Gilchrist County
SRWMD Gilchrist Total					**0.231**	**0.218**	**0.220**	**0.195**	**0.204**	**2,128**	**2,125**	**2,134**	**2,139**	**2,201**	**100**	
216567	Town of Jennings	Town of Jennings	PWS 2240579	Hamilton	0.161	0.135	0.140	0.141	0.143	699	699	688	669	699	208	
216651	Town of White Springs	Town of White Springs	PWS 2241264	Hamilton	0.043	0.035	0.035	0.046	0.060	757	754	754	741	777	58	
220443	Hamilton County Water Facilities	Hamilton County Water Facilities	PWS 2244150	Hamilton	0.074	0.067	0.047	0.052	0.060	0	0	0	0	0	N/A	
220463	City of Jasper	City of Jasper	PWS 2240570	Hamilton	0.611	0.658	0.735	0.686	0.716	3,635	3,623	3,598	3,574	3,735	188	
SRWMD Hamilton Total					**0.889**	**0.895**	**0.957**	**0.925**	**0.979**	**5,091**	**5,076**	**5,040**	**4,984**	**5,211**	**183**	

Table B-5a, Continued. 2014-2018 Water Use, Population Served, and Five-Year Gross Per Capita Averages for Public Supply Permitted Equal to or Greater than 0.10 mgd, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

Cup Number	Owner	Utility	Alternate Name / Comments	County	Water Use					Population					2014-2018 Average Gross	Notes
					2014	2015	2016	2017	2018	2014	2015	2016	2017	2018		
122	City of Fernandina Beach	City of Fernandina Beach		Nassau	3.057	2.956	3.273	3.288	3.393	18,661	18,661	18,797	19,020	19,249	169	
922	Town of Callahan	Town of Callahan		Nassau	0.152	0.157	0.168	0.181	0.201	1,609	1,609	1,658	1,672	1,719	104	
948	Town of Hilliard	Town of Hilliard		Nassau	0.221	0.232	0.213	0.231	0.272	3,000	3,000	3,166	3,178	3,189	75	
50087	Nassau County Board of County Commissioners	Nassau Amelia Utilities	Amelia Island	Nassau	1.264	1.309	1.407	1.418	1.385	8,946	9,242	9,290	9,344	9,401	147	
88271	JEA	JEA	Nassau Regional (Old 942)	Nassau	2.185	2.257	2.651	2.890	3.167	16,185	17,253	18,875	20,553	22,170	138	
SJRWMD Nassau Total					**6.879**	**6.911**	**7.712**	**8.008**	**8.418**	**48,401**	**49,765**	**51,786**	**53,767**	**55,728**	**146**	
1624, 8150	Town of Interlachen	Town of Interlachen		Putnam	0.080	0.082	0.080	0.101	0.071	930	935	938	943	959	88	
1627	City of Crescent City	City of Crescent City		Putnam	0.176	0.166	0.171	0.178	0.171	1,800	1,800	1,800	1,804	1,805	96	
7961	Melrose Water Association	Melrose Water Association		Putnam	0.100	0.151	0.113	0.107	0.108	1,286	1,286	1,286	1,293	1,304	90	Service area covers Putnam, Clay, Alachua, and Bradford Counties.
7981	River Park Utility Mgt. Assoc.	River Park Utilities Management Assoc.		Putnam	0.062	0.098	0.065	0.069	0.050	1,000	1,000	1,000	1,001	1,001	69	
8114	City of Palatka	City of Palatka		Putnam	1.326	1.307	1.206	1.526	0.961	11,900	11,941	11,985	12,053	12,053	106	
8168	Town of Welaka	Town of Welaka		Putnam	0.094	0.098	0.088	0.114	0.094	1,781	1,781	1,781	1,785	1,790	55	
92165	Putnam County BOCC	Putnam County BOCC	East Putnam County Water System. East Palatka & San Mateo	Putnam	0.243	0.269	0.274	0.271	0.261	2,393	2,479	2,842	2,851	2,857	98	
SJRWMD Putnam Total					**2.081**	**2.171**	**1.997**	**2.366**	**1.716**	**21,090**	**21,222**	**21,632**	**21,730**	**21,769**	**96**	
157	North Beach Utilities	North Beach Utilities		St. Johns	0.415	0.449	0.493	0.498	0.535	3,295	3,295	3,445	3,702	3,789	136	
324	Wildwood Water Company	Wildwood Water Company		St. Johns	0.061	0.060	0.058	0.059	0.057	858	858	858	858	891	68	
1142	St. Johns County Utilities	St. Johns County Utilities	Was previously Intercoastal Utilities CUP 1213 (consolidated)	Duval, **St. Johns**	3.665	4.017	4.535	4.763	4.010	25,353	25,353	25,707	26,176	27,197	144	
1198	St. Johns County Utilities	St. Johns County Utilities	Serves Eagle Creek - PWSID interconnection 2554353	St. Johns	6.818	6.895	7.922	7.846	7.684	62,675	70,395	70,395	75,016	75,016	96	
1392	St. Johns County Utilities	St. Johns County Utilities	Town of Hastings	St. Johns	0.080	0.084	0.086	0.083	0.089	593	682	682	695	708	126	
50299	City of St. Augustine Utilities	City of St. Augustine Utilities		St. Johns	2.951	3.231	3.409	3.578	3.460	28,207	28,207	29,490	30,190	32,088	112	
SJRWMD St. Johns Total					**13.990**	**14.736**	**16.503**	**16.827**	**15.835**	**120,981**	**128,790**	**130,577**	**136,637**	**139,689**	**119**	
216507	Town of Wellborn	Town of Wellborn	PWS 2611246	Suwannee	0.042	0.035	0.037	0.038	0.039	493	483	485	478	490	79	
216658	Town of Branford	Town of Branford	PWS 2610109	Suwannee	0.075	0.073	0.082	0.094	0.084	666	664	683	683	700	120	
219527	Advent Christian Village	Advent Christian Village	PWS 2610012	Suwannee	0.137	0.136	0.136	0.146	0.127	563	563	753	761	780	199	
220612	City of Live Oak	City of Live Oak	PWS 2610203	Suwannee	1.188	1.065	1.150	1.068	1.056	5,627	5,781	5,750	5,779	6,005	191	
SRWMD Suwannee Total					**1.442**	**1.309**	**1.405**	**1.346**	**1.306**	**7,349**	**7,491**	**7,671**	**7,701**	**7,975**	**178**	
220148	City of Lake Butler	City of Lake Butler	PWS 2630202	Union	0.219	0.260	0.213	0.222	0.223	1,743	1,742	1,742	1,729	1,850	129	
SRWMD Union Total					**0.219**	**0.260**	**0.213**	**0.222**	**0.223**	**1,743**	**1,742**	**1,742**	**1,729**	**1,850**	**129**	
SJRWMD Region 1 Total					**175.435**	**179.943**	**189.924**	**195.363**	**189.002**	**1,493,569**	**1,509,178**	**1,529,149**	**1,551,902**	**1,583,200**	**121**	
SRWMD NFRWSP Total					**9.146**	**9.284**	**9.585**	**9.478**	**9.594**	**64,838**	**65,258**	**66,226**	**66,722**	**68,175**	**142**	
NFRWSP Total					**184.581**	**189.227**	**199.509**	**204.841**	**198.596**	**1,558,407**	**1,574,436**	**1,595,375**	**1,618,624**	**1,651,375**	**122**	

Notes:

1.) All water use is shown in million gallons per day.

2.) Rounding errors account for nominal discrepancies.

3.) 2014 - 2018 water use data source is NFSEG master geodatabase with metered and estimated public supply water use.

4.) 2014 - 2018 population obtained from Technical Staff Reports, BEBR estimates of population, DEP MOR and Basic Facility Report Data, parcel data, and permittee surveys.

Table B-6. Domestic Self-supply and Small Public Supply Systems Population and Water Use for 2015 and 5-in-10 Year Water Demand Projections for 2020-2045, and 1-in-10 Year Water Demand Projections for 2045 by County, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	District	Population	Population Projections						Percent Change	Water Use		
										2015		
		2015	2020	2025	2030	2035	2040	2045	2015-2045	Ground	Surface	Total
Alachua	SJRWMD	9,486	9,756	10,120	11,998	11,998	13,089	14,518	53%	0.65	0.00	**0.65**
Alachua	SRWMD	28,769	33,253	34,803	32,421	32,655	32,209	31,624	10%	1.51	0.00	**1.51**
Alachua	**Total**	**38,255**	**43,009**	**44,923**	**44,419**	**44,653**	**45,298**	**46,142**	**21%**	**2.16**	**0.00**	**2.16**
Baker	SJRWMD	19,691	20,395	21,529	22,193	22,924	23,637	24,364	24%	2.07	0.00	**2.07**
Baker	SRWMD	503	521	549	573	591	609	623	24%	0.05	0.00	**0.05**
Baker	**Total**	**20,194**	**20,916**	**22,078**	**22,766**	**23,515**	**24,246**	**24,987**	**24%**	**2.12**	**0.00**	**2.12**
Bradford	SJRWMD	2,174	2,353	2,727	2,914	2,914	3,079	3,263	50%	0.13	0.00	**0.13**
Bradford	SRWMD	13,289	12,251	12,068	11,939	12,050	11,884	11,414	-14%	0.62	0.00	**0.62**
Bradford	**Total**	**15,463**	**14,604**	**14,795**	**14,853**	**14,964**	**14,963**	**14,677**	**-5%**	**0.75**	**0.00**	**0.75**
Clay	SJRWMD	64,758	64,760	64,876	64,937	65,010	64,951	64,892	0%	6.20	0.00	**6.20**
Columbia	SRWMD	45,270	46,898	49,337	51,272	52,689	53,793	54,677	21%	2.63	0.00	**2.63**
Duval	SJRWMD	158,510	164,146	168,733	170,420	170,879	169,623	167,483	6%	14.74	0.00	**14.74**
Flagler	SJRWMD	4,964	5,542	5,596	6,992	7,114	7,258	7,671	55%	0.26	0.00	**0.26**
Gilchrist	SRWMD	14,033	14,994	15,628	16,204	16,751	17,234	17,734	26%	0.99	0.00	**0.99**
Hamilton	SRWMD	7,065	6,869	7,026	7,103	7,103	7,103	7,169	1%	0.65	0.00	**0.65**
Nassau	SJRWMD	8,433	9,538	11,516	12,355	13,436	14,311	15,120	79%	1.11	0.00	**1.11**
Putnam	SJRWMD	56,398	56,295	56,300	56,304	56,310	56,317	56,324	0%	2.82	0.00	**2.82**
St. Johns	SJRWMD	43,297	52,110	51,807	51,459	51,111	50,763	50,415	16%	2.96	0.00	**2.96**
Suwannee	SRWMD	34,041	35,774	37,338	38,872	40,087	41,234	42,261	24%	2.22	0.00	**2.22**
Union	SRWMD	9,273	8,917	8,982	8,982	9,062	9,062	9,062	-2%	0.66	0.00	**0.66**
SJRWMD Region 1 Total		**367,711**	**384,895**	**393,204**	**399,572**	**401,696**	**403,028**	**404,050**	**10%**	**30.94**	**0.00**	**30.94**
SRWMD NFRWSP Total		**152,243**	**159,477**	**165,731**	**167,366**	**170,988**	**173,128**	**174,564**	**15%**	**9.33**	**0.00**	**9.33**
NFRWSP Total		**519,954**	**544,372**	**558,935**	**566,938**	**572,684**	**576,156**	**578,614**	**11%**	**40.27**	**0.00**	**40.27**

County	District	Demand Projections (5-in-10)											
		2020				2025				2030			
		Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total
Alachua	SJRWMD	0.67	0.00	0.00	**0.67**	0.70	0.00	0.00	**0.70**	0.83	0.00	0.00	**0.83**
Alachua	SRWMD	1.74	0.00	0.00	**1.74**	1.82	0.00	0.00	**1.82**	1.69	0.00	0.00	**1.69**
Alachua	**Total**	**2.41**	**0.00**	**0.00**	**2.41**	**2.52**	**0.00**	**0.00**	**2.52**	**2.52**	**0.00**	**0.00**	**2.52**
Baker	SJRWMD	2.43	0.00	0.00	**2.43**	2.56	0.00	0.00	**2.56**	2.64	0.00	0.00	**2.64**
Baker	SRWMD	0.06	0.00	0.00	**0.06**	0.06	0.00	0.00	**0.06**	0.06	0.00	0.00	**0.06**
Baker	**Total**	**2.49**	**0.00**	**0.00**	**2.49**	**2.62**	**0.00**	**0.00**	**2.62**	**2.70**	**0.00**	**0.00**	**2.70**
Bradford	SJRWMD	0.21	0.00	0.00	**0.21**	0.25	0.00	0.00	**0.25**	0.27	0.00	0.00	**0.27**
Bradford	SRWMD	0.57	0.00	0.00	**0.57**	0.56	0.00	0.00	**0.56**	0.56	0.00	0.00	**0.56**
Bradford	**Total**	**0.78**	**0.00**	**0.00**	**0.78**	**0.81**	**0.00**	**0.00**	**0.81**	**0.83**	**0.00**	**0.00**	**0.83**
Clay	SJRWMD	4.76	0.00	0.00	**4.76**	4.77	0.00	0.00	**4.77**	4.77	0.00	0.00	**4.77**
Columbia	SRWMD	2.73	0.00	0.00	**2.73**	2.87	0.00	0.00	**2.87**	2.98	0.00	0.00	**2.98**
Duval	SJRWMD	15.92	0.00	0.00	**15.92**	16.37	0.00	0.00	**16.37**	16.53	0.00	0.00	**16.53**
Flagler	SJRWMD	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**	0.38	0.00	0.00	**0.38**
Gilchrist	SRWMD	1.06	0.00	0.00	**1.06**	1.11	0.00	0.00	**1.11**	1.15	0.00	0.00	**1.15**
Hamilton	SRWMD	0.64	0.00	0.00	**0.64**	0.65	0.00	0.00	**0.65**	0.66	0.00	0.00	**0.66**
Nassau	SJRWMD	1.49	0.00	0.00	**1.49**	1.72	0.00	0.00	**1.72**	1.85	0.00	0.00	**1.85**
Putnam	SJRWMD	3.24	0.00	0.00	**3.24**	3.24	0.00	0.00	**3.24**	3.24	0.00	0.00	**3.24**
St. Johns	SJRWMD	4.58	0.00	0.00	**4.58**	4.56	0.00	0.00	**4.56**	4.53	0.00	0.00	**4.53**
Suwannee	SRWMD	2.34	0.00	0.00	**2.34**	2.48	0.00	0.00	**2.48**	2.58	0.00	0.00	**2.58**
Union	SRWMD	0.65	0.00	0.00	**0.65**	0.65	0.00	0.00	**0.65**	0.65	0.00	0.00	**0.65**
SJRWMD Region 1 Total		**33.60**	**0.00**	**0.00**	**33.60**	**34.47**	**0.00**	**0.00**	**34.47**	**35.04**	**0.00**	**0.00**	**35.04**
SRWMD NFRWSP Total		**9.79**	**0.00**	**0.00**	**9.79**	**10.20**	**0.00**	**0.00**	**10.20**	**10.33**	**0.00**	**0.00**	**10.33**
NFRWSP Total		**43.39**	**0.00**	**0.00**	**43.39**	**44.67**	**0.00**	**0.00**	**44.67**	**45.37**	**0.00**	**0.00**	**45.37**

County	District	Demand Projections (5-in-10)												Percent Change	Demand Projections (1-in-10)			
		2035				2040				2045					2045			
		Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	2015-2045	Ground	Surface	Other	Total
Alachua	SJRWMD	0.83	0.00	0.00	**0.83**	0.90	0.00	0.00	**0.90**	1.00	0.00	0.00	**1.00**	54%	1.06	0.00	0.00	**1.06**
Alachua	SRWMD	1.70	0.00	0.00	**1.70**	1.68	0.00	0.00	**1.68**	1.65	0.00	0.00	**1.65**	9%	1.75	0.00	0.00	**1.75**
Alachua	**Total**	**2.53**	**0.00**	**0.00**	**2.53**	**2.58**	**0.00**	**0.00**	**2.58**	**2.65**	**0.00**	**0.00**	**2.65**	**23%**	**2.81**	**0.00**	**0.00**	**2.81**
Baker	SJRWMD	2.73	0.00	0.00	**2.73**	2.81	0.00	0.00	**2.81**	2.90	0.00	0.00	**2.90**	40%	3.07	0.00	0.00	**3.07**
Baker	SRWMD	0.06	0.00	0.00	**0.06**	0.07	0.00	0.00	**0.07**	0.07	0.00	0.00	**0.07**	40%	0.07	0.00	0.00	**0.07**
Baker	**Total**	**2.79**	**0.00**	**0.00**	**2.79**	**2.88**	**0.00**	**0.00**	**2.88**	**2.97**	**0.00**	**0.00**	**2.97**	**40%**	**3.14**	**0.00**	**0.00**	**3.14**
Bradford	SJRWMD	0.27	0.00	0.00	**0.27**	0.28	0.00	0.00	**0.28**	0.30	0.00	0.00	**0.30**	131%	0.32	0.00	0.00	**0.32**
Bradford	SRWMD	0.56	0.00	0.00	**0.56**	0.55	0.00	0.00	**0.55**	0.54	0.00	0.00	**0.54**	-13%	0.53	0.00	0.00	**0.53**
Bradford	**Total**	**0.83**	**0.00**	**0.00**	**0.83**	**0.83**	**0.00**	**0.00**	**0.83**	**0.84**	**0.00**	**0.00**	**0.84**	**12%**	**0.85**	**0.00**	**0.00**	**0.85**
Clay	SJRWMD	4.78	0.00	0.00	**4.78**	4.77	0.00	0.00	**4.77**	4.77	0.00	0.00	**4.77**	-23%	5.06	0.00	0.00	**5.06**
Columbia	SRWMD	3.06	0.00	0.00	**3.06**	3.13	0.00	0.00	**3.13**	3.19	0.00	0.00	**3.19**	21%	3.33	0.00	0.00	**3.33**
Duval	SJRWMD	16.58	0.00	0.00	**16.58**	16.45	0.00	0.00	**16.45**	16.25	0.00	0.00	**16.25**	10%	17.23	0.00	0.00	**17.23**
Flagler	SJRWMD	0.39	0.00	0.00	**0.39**	0.39	0.00	0.00	**0.39**	0.40	0.00	0.00	**0.40**	54%	0.42	0.00	0.00	**0.42**
Gilchrist	SRWMD	1.19	0.00	0.00	**1.19**	1.22	0.00	0.00	**1.22**	1.26	0.00	0.00	**1.26**	27%	1.34	0.00	0.00	**1.34**
Hamilton	SRWMD	0.66	0.00	0.00	**0.66**	0.66	0.00	0.00	**0.66**	0.67	0.00	0.00	**0.67**	3%	0.71	0.00	0.00	**0.71**
Nassau	SJRWMD	2.03	0.00	0.00	**2.03**	2.16	0.00	0.00	**2.16**	2.28	0.00	0.00	**2.28**	105%	2.42	0.00	0.00	**2.42**
Putnam	SJRWMD	3.24	0.00	0.00	**3.24**	3.24	0.00	0.00	**3.24**	3.24	0.00	0.00	**3.24**	15%	3.43	0.00	0.00	**3.43**
St. Johns	SJRWMD	4.50	0.00	0.00	**4.50**	4.47	0.00	0.00	**4.47**	4.44	0.00	0.00	**4.44**	50%	4.70	0.00	0.00	**4.70**
Suwannee	SRWMD	2.66	0.00	0.00	**2.66**	2.73	0.00	0.00	**2.73**	2.80	0.00	0.00	**2.80**	26%	2.96	0.00	0.00	**2.96**
Union	SRWMD	0.66	0.00	0.00	**0.66**	0.66	0.00	0.00	**0.66**	0.66	0.00	0.00	**0.66**	0%	0.70	0.00	0.00	**0.70**
SJRWMD Region 1 Total		**35.35**	**0.00**	**0.00**	**35.35**	**35.47**	**0.00**	**0.00**	**35.47**	**35.58**	**0.00**	**0.00**	**35.58**	**15%**	**37.71**	**0.00**	**0.00**	**37.71**
SRWMD NFRWSP Total		**10.55**	**0.00**	**0.00**	**10.55**	**10.70**	**0.00**	**0.00**	**10.70**	**10.84**	**0.00**	**0.00**	**10.84**	**16%**	**11.39**	**0.00**	**0.00**	**11.39**
NFRWSP Total		**45.90**	**0.00**	**0.00**	**45.90**	**46.17**	**0.00**	**0.00**	**46.17**	**46.42**	**0.00**	**0.00**	**46.42**	**15%**	**49.10**	**0.00**	**0.00**	**49.10**

Notes:

1.) All water use is shown in million gallons per day.

2.) Rounding errors account for nominal discrepancies.

3.) Public water supply utility service areas often include residences that derive their water supply from privately owned (domestic self-supply) wells. Typically, these domestic self-supply water uses existed prior to their locations becoming part of public water supply service areas. For public water supply service areas, the Districts do not have sufficient information to separate the populations served by public supply systems from those served by domestic self-supply wells. Therefore, public water supply populations estimated often include some domestic self-supply population.

4.) 1-in-10 rainfall year demand for 2045 calculated as an additional 6 percent of 2045 average demand.

5.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-6a. Domestic Self-Supply Population and Water Use for 2015 and Population Projections for 2020-2045, 5-in-10 Year Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045 by County, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	District	Population 2015	Population Projections 2020	2025	2030	2035	2040	2045	Percent Change 2015-2045
Alachua	SJRWMD	9,486	9,756	10,120	11,998	11,998	13,089	14,518	53%
Alachua	SRWMD	28,504	32,984	34,534	32,152	32,386	31,940	31,355	10%
Alachua	**Total**	**37,990**	**42,740**	**44,654**	**44,150**	**44,384**	**45,029**	**45,873**	**21%**
Baker	SJRWMD	19,691	20,395	21,529	22,193	22,924	23,637	24,364	24%
Baker	SRWMD	503	521	549	573	591	609	623	24%
Baker	**Total**	**20,194**	**20,916**	**22,078**	**22,766**	**23,515**	**24,246**	**24,987**	**24%**
Bradford	SJRWMD	2,174	2,353	2,727	2,914	2,914	3,079	3,263	50%
Bradford	SRWMD	12,502	11,437	11,254	11,125	11,236	11,070	10,766	-14%
Bradford	**Total**	**14,676**	**13,790**	**13,981**	**14,039**	**14,150**	**14,149**	**14,029**	**-4%**
Clay	SJRWMD	63,061	63,061	63,061	63,061	63,002	62,943	62,884	0%
Columbia	SRWMD	42,898	44,510	46,949	48,884	50,301	51,356	52,121	21%
Duval	SJRWMD	158,510	164,146	168,733	170,420	170,879	169,623	167,483	6%
Flagler	SJRWMD	4,584	5,162	5,216	6,612	6,734	6,859	6,864	50%
Gilchrist	SRWMD	14,033	14,994	15,628	16,204	16,751	17,234	17,734	26%
Hamilton	SRWMD	6,634	6,438	6,595	6,672	6,672	6,672	6,738	2%
Nassau	SJRWMD	8,319	9,381	10,820	11,659	12,740	13,615	14,424	73%
Putnam	SJRWMD	53,402	53,285	53,285	53,285	53,285	53,285	53,285	0%
St. Johns	SJRWMD	41,968	50,675	50,327	49,979	49,631	49,283	48,935	17%
Suwannee	SRWMD	33,604	35,337	36,901	38,435	39,650	40,797	41,824	24%
Union	SRWMD	9,180	8,824	8,889	8,889	8,969	8,969	8,969	-2%
SJRWMD Region 1 Total		**361,195**	**378,214**	**385,818**	**392,121**	**394,107**	**395,413**	**396,020**	**10%**
SRWMD NFRWSP Total		**147,858**	**155,045**	**161,299**	**162,934**	**166,556**	**168,647**	**170,130**	**15%**
NFRWSP Total		**509,053**	**533,259**	**547,117**	**555,055**	**560,663**	**564,060**	**566,150**	**11%**

County	District	Water Use 2015 GW	2015 SW	2015 Total	Demand Projections (5-in-10) 2020 GW	2020 SW	2020 Other	2020 Total	2025 GW	2025 SW	2025 Other	2025 Total
Alachua	SJRWMD	0.65	0.00	**0.65**	0.67	0.00	0.00	**0.67**	0.70	0.00	0.00	**0.70**
Alachua	SRWMD	1.49	0.00	**1.49**	1.72	0.00	0.00	**1.72**	1.80	0.00	0.00	**1.80**
Alachua	**Total**	**2.14**	**0.00**	**2.14**	**2.39**	**0.00**	**0.00**	**2.39**	**2.50**	**0.00**	**0.00**	**2.50**
Baker	SJRWMD	2.07	0.00	**2.07**	2.43	0.00	0.00	**2.43**	2.56	0.00	0.00	**2.56**
Baker	SRWMD	0.05	0.00	**0.05**	0.06	0.00	0.00	**0.06**	0.06	0.00	0.00	**0.06**
Baker	**Total**	**2.12**	**0.00**	**2.12**	**2.49**	**0.00**	**0.00**	**2.49**	**2.62**	**0.00**	**0.00**	**2.62**
Bradford	SJRWMD	0.13	0.00	**0.13**	0.21	0.00	0.00	**0.21**	0.25	0.00	0.00	**0.25**
Bradford	SRWMD	0.53	0.00	**0.53**	0.48	0.00	0.00	**0.48**	0.47	0.00	0.00	**0.47**
Bradford	**Total**	**0.66**	**0.00**	**0.66**	**0.69**	**0.00**	**0.00**	**0.69**	**0.72**	**0.00**	**0.00**	**0.72**
Clay	SJRWMD	6.05	0.00	**6.05**	4.60	0.00	0.00	**4.60**	4.60	0.00	0.00	**4.60**
Columbia	SRWMD	2.38	0.00	**2.38**	2.49	0.00	0.00	**2.49**	2.63	0.00	0.00	**2.63**
Duval	SJRWMD	14.74	0.00	**14.74**	15.92	0.00	0.00	**15.92**	16.37	0.00	0.00	**16.37**
Flagler	SJRWMD	0.25	0.00	**0.25**	0.29	0.00	0.00	**0.29**	0.29	0.00	0.00	**0.29**
Gilchrist	SRWMD	0.99	0.00	**0.99**	1.06	0.00	0.00	**1.06**	1.11	0.00	0.00	**1.11**
Hamilton	SRWMD	0.59	0.00	**0.59**	0.58	0.00	0.00	**0.58**	0.59	0.00	0.00	**0.59**
Nassau	SJRWMD	1.10	0.00	**1.10**	1.43	0.00	0.00	**1.43**	1.64	0.00	0.00	**1.64**
Putnam	SJRWMD	2.62	0.00	**2.62**	3.04	0.00	0.00	**3.04**	3.04	0.00	0.00	**3.04**
St. Johns	SJRWMD	2.85	0.00	**2.85**	4.46	0.00	0.00	**4.46**	4.43	0.00	0.00	**4.43**
Suwannee	SRWMD	2.18	0.00	**2.18**	2.30	0.00	0.00	**2.30**	2.40	0.00	0.00	**2.40**
Union	SRWMD	0.65	0.00	**0.65**	0.64	0.00	0.00	**0.64**	0.64	0.00	0.00	**0.64**
SJRWMD Region 1 Total		**30.46**	**0.00**	**30.46**	**33.05**	**0.00**	**0.00**	**33.05**	**33.88**	**0.00**	**0.00**	**33.88**
SRWMD NFRWSP Total		**8.86**	**0.00**	**8.86**	**9.33**	**0.00**	**0.00**	**9.33**	**9.70**	**0.00**	**0.00**	**9.70**
NFRWSP Total		**39.32**	**0.00**	**39.32**	**42.38**	**0.00**	**0.00**	**42.38**	**43.58**	**0.00**	**0.00**	**43.58**

County	District	Demand Projections (5-in-10) 2030 GW	2030 SW	2030 Other	2030 Total	2035 GW	2035 SW	2035 Other	2035 Total	2040 GW	2040 SW	2040 Other	2040 Total
Alachua	SJRWMD	0.83	0.00	0.00	**0.83**	0.83	0.00	0.00	**0.83**	0.90	0.00	0.00	**0.90**
Alachua	SRWMD	1.67	0.00	0.00	**1.67**	1.68	0.00	0.00	**1.68**	1.66	0.00	0.00	**1.66**
Alachua	**Total**	**2.50**	**0.00**	**0.00**	**2.50**	**2.51**	**0.00**	**0.00**	**2.51**	**2.56**	**0.00**	**0.00**	**2.56**
Baker	SJRWMD	2.64	0.00	0.00	**2.64**	2.73	0.00	0.00	**2.73**	2.81	0.00	0.00	**2.81**
Baker	SRWMD	0.06	0.00	0.00	**0.06**	0.06	0.00	0.00	**0.06**	0.07	0.00	0.00	**0.07**
Baker	**Total**	**2.70**	**0.00**	**0.00**	**2.70**	**2.79**	**0.00**	**0.00**	**2.79**	**2.88**	**0.00**	**0.00**	**2.88**
Bradford	SJRWMD	0.27	0.00	0.00	**0.27**	0.27	0.00	0.00	**0.27**	0.28	0.00	0.00	**0.28**
Bradford	SRWMD	0.47	0.00	0.00	**0.47**	0.47	0.00	0.00	**0.47**	0.46	0.00	0.00	**0.46**
Bradford	**Total**	**0.74**	**0.00**	**0.00**	**0.74**	**0.74**	**0.00**	**0.00**	**0.74**	**0.74**	**0.00**	**0.00**	**0.74**
Clay	SJRWMD	4.60	0.00	0.00	**4.60**	4.60	0.00	0.00	**4.60**	4.59	0.00	0.00	**4.59**
Columbia	SRWMD	2.74	0.00	0.00	**2.74**	2.82	0.00	0.00	**2.82**	2.88	0.00	0.00	**2.88**
Duval	SJRWMD	16.53	0.00	0.00	**16.53**	16.58	0.00	0.00	**16.58**	16.45	0.00	0.00	**16.45**
Flagler	SJRWMD	0.37	0.00	0.00	**0.37**	0.38	0.00	0.00	**0.38**	0.38	0.00	0.00	**0.38**
Gilchrist	SRWMD	1.15	0.00	0.00	**1.15**	1.19	0.00	0.00	**1.19**	1.22	0.00	0.00	**1.22**
Hamilton	SRWMD	0.60	0.00	0.00	**0.60**	0.60	0.00	0.00	**0.60**	0.60	0.00	0.00	**0.60**
Nassau	SJRWMD	1.77	0.00	0.00	**1.77**	1.94	0.00	0.00	**1.94**	2.07	0.00	0.00	**2.07**
Putnam	SJRWMD	3.04	0.00	0.00	**3.04**	3.04	0.00	0.00	**3.04**	3.04	0.00	0.00	**3.04**
St. Johns	SJRWMD	4.40	0.00	0.00	**4.40**	4.37	0.00	0.00	**4.37**	4.34	0.00	0.00	**4.34**
Suwannee	SRWMD	2.50	0.00	0.00	**2.50**	2.58	0.00	0.00	**2.58**	2.65	0.00	0.00	**2.65**
Union	SRWMD	0.64	0.00	0.00	**0.64**	0.65	0.00	0.00	**0.65**	0.65	0.00	0.00	**0.65**
SJRWMD Region 1 Total		**34.45**	**0.00**	**0.00**	**34.45**	**34.74**	**0.00**	**0.00**	**34.74**	**34.86**	**0.00**	**0.00**	**34.86**
SRWMD NFRWSP Total		**9.83**	**0.00**	**0.00**	**9.83**	**10.05**	**0.00**	**0.00**	**10.05**	**10.19**	**0.00**	**0.00**	**10.19**
NFRWSP Total		**44.28**	**0.00**	**0.00**	**44.28**	**44.79**	**0.00**	**0.00**	**44.79**	**45.05**	**0.00**	**0.00**	**45.05**

County	District	Demand Projections (5-in-10) 2045 GW	2045 SW	2045 Other	2045 Total	Percent Change 2015-2045	2014-2018 Avg GPCD	Demand Projections (1-in-10) 2045 GW	2045 SW	2045 Other	2045 Total
Alachua	SJRWMD	1.00	0.00	0.00	**1.00**	54%	69	1.06	0.00	0.00	**1.06**
Alachua	SRWMD	1.63	0.00	0.00	**1.63**	9%	52	1.73	0.00	0.00	**1.73**
Alachua	**Total**	**2.63**	**0.00**	**0.00**	**2.63**	**23%**	**N/A**	**2.79**	**0.00**	**0.00**	**2.79**
Baker	SJRWMD	2.90	0.00	0.00	**2.90**	40%	119	3.07	0.00	0.00	**3.07**
Baker	SRWMD	0.07	0.00	0.00	**0.07**	40%	109	0.07	0.00	0.00	**0.07**
Baker	**Total**	**2.97**	**0.00**	**0.00**	**2.97**	**40%**	**N/A**	**3.14**	**0.00**	**0.00**	**3.14**
Bradford	SJRWMD	0.30	0.00	0.00	**0.30**	131%	91	0.32	0.00	0.00	**0.32**
Bradford	SRWMD	0.45	0.00	0.00	**0.45**	-15%	42	0.48	0.00	0.00	**0.48**
Bradford	**Total**	**0.75**	**0.00**	**0.00**	**0.75**	**14%**	**N/A**	**0.80**	**0.00**	**0.00**	**0.80**
Clay	SJRWMD	4.59	0.00	0.00	**4.59**	-24%	73	4.87	0.00	0.00	**4.87**
Columbia	SRWMD	2.92	0.00	0.00	**2.92**	23%	56	3.10	0.00	0.00	**3.10**
Duval	SJRWMD	16.25	0.00	0.00	**16.25**	10%	97	17.23	0.00	0.00	**17.23**
Flagler	SJRWMD	0.38	0.00	0.00	**0.38**	52%	56	0.40	0.00	0.00	**0.40**
Gilchrist	SRWMD	1.26	0.00	0.00	**1.26**	27%	71	1.34	0.00	0.00	**1.34**
Hamilton	SRWMD	0.61	0.00	0.00	**0.61**	3%	90	0.65	0.00	0.00	**0.65**
Nassau	SJRWMD	2.19	0.00	0.00	**2.19**	99%	152	2.32	0.00	0.00	**2.32**
Putnam	SJRWMD	3.04	0.00	0.00	**3.04**	16%	57	3.22	0.00	0.00	**3.22**
St. Johns	SJRWMD	4.31	0.00	0.00	**4.31**	51%	88	4.57	0.00	0.00	**4.57**
Suwannee	SRWMD	2.72	0.00	0.00	**2.72**	25%	65	2.88	0.00	0.00	**2.88**
Union	SRWMD	0.65	0.00	0.00	**0.65**	0%	72	0.69	0.00	0.00	**0.69**
SJRWMD Region 1 Total		**34.96**	**0.00**	**0.00**	**34.96**	**15%**	**N/A**	**37.06**	**0.00**	**0.00**	**37.06**
SRWMD NFRWSP Total		**10.31**	**0.00**	**0.00**	**10.31**	**16%**	**N/A**	**10.94**	**0.00**	**0.00**	**10.94**
NFRWSP Total		**45.27**	**0.00**	**0.00**	**45.27**	**15%**	**N/A**	**48.00**	**0.00**	**0.00**	**48.00**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) Projected population for years 2020 - 2045 are based on BEBR Population Projections: Volume 53, Bulletin 186, Published January 2020.
4.) Population projections shown here are permanent population projections only and do not include any factors such as seasonal residents, tourist population or net commuter population.
5.) Per capita used to calculate demand projections is an average from 2014 - 2018 and is calculated as (Total County-wide Residential Water Use / Total Estimated Population). This per capita is commonly referred to as a residential per capita, as it only includes the indoor and outdoor residential uses.
6.) 1-in-10 rainfall year demand for 2045 calculated as an additional 6 percent of 2045 average demand.
7.) All demands are expected to come from groundwater, thus surface water projections are zero.
8.) 2015 water use data source is NFSEG master geodatabase with estimated domestic self-supply water use.
9.) 2014 - 2018 residential county per capita rates obtained from SJRWMD and SRWMD published water use reports.
10.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-6b. Small Public Supply Population Served and Water Use for 2015, Small Public Supply Population Projections 2020-2045, 5-in-10 Year Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045 by County and Utility, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	Utility	CUP Number	Population Served	Population Projections						Buildout	Percent Change 2015-2045	Water Use			Demand Projections (5-in-10)																								Percent Change 2015-2045	2014-2018 Avg GPCD	Demand Projections (1-in-10)			
			2015	2020	2025	2030	2035	2040	2045			2015			2020				2025				2030				2035				2040				2045						2045			
												GW	SW	Total	GW	SW	Other	Total	GW	SW	Other	Total	GW	SW	Other	Total	GW	SW	Other	Total	GW	SW	Other	Total	GW	SW	Other	Total			GW	SW	Other	Total
Alachua - SRWMD	Bristol Harbour Owners Association	216014	48	48	48	48	48	48	48	48	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	208	0.01	0.00	0.00	0.01
	Farnsworth Properties	219158	21	21	21	21	21	21	21	21	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	143	0.00	0.00	0.00	0.00
	Lake Alto Estates Association, Inc.	220503	196	200	200	200	200	200	200	200	2%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	49	0.01	0.00	0.00	0.01
	SRWMD Alachua Total		**265**	**269**	**269**	**269**	**269**	**269**	**269**	**269**	**2%**	**0.02**	**0.00**	**0.02**	**0.02**	**0.00**	**0.00**	**0.02**	**0.02**	**0.00**	**0.00**	**0.02**	**0.02**	**0.00**	**0.00**	**0.02**	**0.02**	**0.00**	**0.00**	**0.02**	**0.02**	**0.00**	**0.00**	**0.02**	**0.02**	**0.00**	**0.00**	**0.02**	**0%**	**N/A**	**0.02**	**0.00**	**0.00**	**0.02**
Bradford - SRWMD	Town of Brooker	216644	307	322	322	322	322	322	322	932	5%	0.04	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0%	130	0.04	0.00	0.00	0.04
	Erasto Abreu	217909	15	15	15	15	15	15	15	15	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	267	0.00	0.00	0.00	0.00
	City of Hampton	220481	465	477	477	477	477	477	482	1,039	4%	0.05	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0%	97	0.05	0.00	0.00	0.05
	SRWMD Bradford Total		**787**	**814**	**814**	**814**	**814**	**814**	**819**	**1,985**	**4%**	**0.09**	**0.00**	**0.09**	**0.09**	**0.00**	**0.00**	**0.09**	**0.09**	**0.00**	**0.00**	**0.09**	**0.09**	**0.00**	**0.00**	**0.09**	**0.09**	**0.00**	**0.00**	**0.09**	**0.09**	**0.00**	**0.00**	**0.09**	**0.09**	**0.00**	**0.00**	**0.09**	**0%**	**N/A**	**0.05**	**0.00**	**0.00**	**0.05**
Clay - SJRWMD	Penney Retirement Community Inc.	497	202	202	202	202	202	202	202	202	0%	0.05	0.00	0.05	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	-20%	185	0.04	0.00	0.00	0.04
	Penney Farms Water Utility Enterprise	509	495	497	613	674	806	806	806	7,246	63%	0.03	0.00	0.03	0.03	0.00	0.00	0.03	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	67%	60	0.05	0.00	0.00	0.05
	Green Cove Springs LP	527	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	0%	0.07	0.00	0.07	0.09	0.00	0.00	0.09	0.09	0.00	0.00	0.09	0.09	0.00	0.00	0.09	0.09	0.00	0.00	0.09	0.09	0.00	0.00	0.09	0.09	0.00	0.00	0.09	29%	86	0.10	0.00	0.00	0.10
	SJRWMD Clay Total		**1,697**	**1,699**	**1,815**	**1,876**	**2,008**	**2,008**	**2,008**	**8,448**	**18%**	**0.15**	**0.00**	**0.15**	**0.16**	**0.00**	**0.00**	**0.16**	**0.17**	**0.00**	**0.00**	**0.17**	**0.17**	**0.00**	**0.00**	**0.17**	**0.18**	**0.00**	**0.00**	**0.18**	**0.18**	**0.00**	**0.00**	**0.18**	**0.18**	**0.00**	**0.00**	**0.18**	**20%**	**N/A**	**0.19**	**0.00**	**0.00**	**0.19**
Columbia - SRWMD	Waters Park	216402	52	52	52	52	52	52	52	52	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	154	0.01	0.00	0.00	0.01
	B & H Mobile Home Park	216937	48	48	48	48	48	48	48	48	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	146	0.01	0.00	0.00	0.01
	Timberlane Mobile Home Community	217171	136	136	136	136	136	136	136	136	0%	0.02	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0%	147	0.02	0.00	0.00	0.02
	Town of Fort White	218347	490	506	506	506	506	555	674	1,484	38%	0.10	0.00	0.10	0.08	0.00	0.00	0.08	0.08	0.00	0.00	0.08	0.08	0.00	0.00	0.08	0.08	0.00	0.00	0.08	0.09	0.00	0.00	0.09	0.11	0.00	0.00	0.11	10%	161	0.12	0.00	0.00	0.12
	Gator Utilities	218579	60	60	60	60	60	60	60	60	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	87	0.01	0.00	0.00	0.01
	Melvin & Gale Sheppard	218667	12	12	12	12	12	12	12	12	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	167	0.00	0.00	0.00	0.00
	Azalea Park Subdivision	219114	250	250	250	250	250	250	250	250	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	59	0.01	0.00	0.00	0.01
	Shady Oak Subdivision	219122	300	300	300	300	300	300	300	300	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	40	0.01	0.00	0.00	0.01
	Windham Mobile Home Park	219126	96	96	96	96	96	96	96	96	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	146	0.01	0.00	0.00	0.01
	Palm Villa	219141	22	22	22	22	22	22	22	22	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	136	0.00	0.00	0.00	0.00
	Consolidated Water Works/Shade Oaks Subdivision	219146	40	40	40	40	40	40	40	40	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	150	0.01	0.00	0.00	0.01
	McCracken Mobile Home Park	219152	66	66	66	66	66	66	66	66	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	152	0.01	0.00	0.00	0.01
	Paradise Village Mobile Home Park	219195	310	310	310	310	310	310	310	310	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	13	0.00	0.00	0.00	0.00
	GLC Properties, LLC	219755	20	20	20	20	20	20	20	20	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	300	0.01	0.00	0.00	0.01
	Cheryl Kellett Mobile Home Park	219757	30	30	30	30	30	30	30	30	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	133	0.00	0.00	0.00	0.00
	Timmons Apartments	219905	16	16	16	16	16	16	16	16	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	125	0.00	0.00	0.00	0.00
	W.R. Smithey Apartments	220164	16	16	16	16	16	16	16	16	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	125	0.00	0.00	0.00	0.00
	Woodgate Village	220582	348	348	348	348	348	348	348	348	0%	0.04	0.00	0.04	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	25%	139	0.05	0.00	0.00	0.05
	Lance Water	220689	60	60	60	60	60	60	60	60	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	80	0.00	0.00	0.00	0.00
	SRWMD Columbia Total		**2,372**	**2,388**	**2,388**	**2,388**	**2,388**	**2,437**	**2,556**	**3,366**	**8%**	**0.25**	**0.00**	**0.25**	**0.24**	**0.00**	**0.00**	**0.24**	**0.24**	**0.00**	**0.00**	**0.24**	**0.24**	**0.00**	**0.00**	**0.24**	**0.24**	**0.00**	**0.00**	**0.24**	**0.25**	**0.00**	**0.00**	**0.25**	**0.27**	**0.00**	**0.00**	**0.27**	**8%**	**N/A**	**0.23**	**0.00**	**0.00**	**0.23**
Flagler - SJRWMD	Holiday Travel Park Co-op Inc.	1979	380	380	380	380	380	399	807	807	112%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.02	0.00	0.00	0.02	100%	27	0.02	0.00	0.00	0.02
	SJRWMD Flagler Total		**380**	**380**	**380**	**380**	**380**	**399**	**807**	**807**	**112%**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0.02**	**0.00**	**0.00**	**0.02**	**100%**	**N/A**	**0.02**	**0.00**	**0.00**	**0.02**
Hamilton - SRWMD	Shandy Grove Mobile Home Park	215891	60	60	60	60	60	60	60	60	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	133	0.01	0.00	0.00	0.01
	Tommy Cannady Residence / Mobile Homes	219148	21	21	21	21	21	21	21	21	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	143	0.00	0.00	0.00	0.00
	Hamilton County Development Authority	221284	350	350	350	350	350	350	350	350	0%	0.05	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0%	154	0.05	0.00	0.00	0.05
	SRWMD Hamilton Total		**431**	**431**	**431**	**431**	**431**	**431**	**431**	**431**	**0%**	**0.06**	**0.00**	**0.06**	**0.06**	**0.00**	**0.00**	**0.06**	**0.06**	**0.00**	**0.00**	**0.06**	**0.06**	**0.00**	**0.00**	**0.06**	**0.06**	**0.00**	**0.00**	**0.06**	**0.06**	**0.00**	**0.00**	**0.06**	**0.06**	**0.00**	**0.00**	**0.06**	**0%**	**N/A**	**0.06**	**0.00**	**0.00**	**0.06**
Nassau - SJRWMD	Bobby Dollison	925	114	157	246	246	246	246	246	246	116%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	100%	79	0.02	0.00	0.00	0.02
	Callahan Country RV Resort	945	0	0	450	450	450	450	450	450	N/A	0.00	0.00	0.00	0.05	0.00	0.00	0.05	0.06	0.00	0.00	0.06	0.06	0.00	0.00	0.06	0.07	0.00	0.00	0.07	0.07	0.00	0.00	0.07	0.07	0.00	0.00	0.07	N/A	N/A	0.07	0.00	0.00	0.07
	SJRWMD Nassau Total		**114**	**157**	**696**	**696**	**696**	**696**	**696**	**696**	**511%**	**0.01**	**0.00**	**0.01**	**0.06**	**0.00**	**0.00**	**0.06**	**0.08**	**0.00**	**0.00**	**0.08**	**0.08**	**0.00**	**0.00**	**0.08**	**0.09**	**0.00**	**0.00**	**0.09**	**0.09**	**0.00**	**0.00**	**0.09**	**0.09**	**0.00**	**0.00**	**0.09**	**800%**	**N/A**	**0.10**	**0.00**	**0.00**	**0.10**
Putnam - SJRWMD	Florida Government Utility Authority	7982	219	219	219	219	219	219	219	219	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	46	0.01	0.00	0.00	0.01
	Florida Government Utility Authority	7986	622	622	622	622	622	622	622	803	0%	0.03	0.00	0.03	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.03	0%	50	0.03	0.00	0.00	0.03
	Kirkwood Estates	8071	45	45	45	45	45	45	45	160	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	244	0.01	0.00	0.00	0.01
	Lake Como Water Assoc	8072	450	453	453	453	453	453	453	722	1%	0.03	0.00	0.03	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.03	0%	64	0.03	0.00	0.00	0.03
	Hiawatha Management Inc.	8124	138	139	140	140	141	143	145	156	5%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	72	0.01	0.00	0.00	0.01
	Florida Government Utility Authority	8127	218	218	218	218	218	218	218	240	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	49	0.01	0.00	0.00	0.01
	St. Johns Harbor Water Association	90227	365	369	369	369	369	369	369	944	1%	0.01	0.00	0.01	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	100%	63	0.02	0.00	0.00	0.02
	Aqua Utilities Florida, Inc. (formerly P-AUF1)	N/A	203	205	206	207	208	209	210	1,079	3%	0.02	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0%	79	0.02	0.00	0.00	0.02
	Aqua Utilities Florida, Inc. (formerly P-AUF3)	N/A	465	468	470	472	475	478	481	1,237	3%	0.02	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0%	49	0.02	0.00	0.00	0.02
	Aqua Utilities Florida, Inc. (formerly 7984 & 7988)	N/A	211	212	213	214	215	216	217	1,828	3%	0.04	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0%	190	0.04	0.00	0.00	0.04
	River Villas Inc. (formerly 8129)	N/A	60	60	60	60	60	60	60	60	0%	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-100%	83	0.00	0.00	0.00	0.00
	SJRWMD Putnam Total		**2,996**	**3,010**	**3,015**	**3,019**	**3,025**	**3,032**	**3,039**	**7,448**	**1%**	**0.20**	**0.00**	**0.20**	**0.20**	**0.00**	**0.00**	**0.20**	**0.20**	**0.00**	**0.00**	**0.20**	**0.20**	**0.00**	**0.00**	**0.20**	**0.20**	**0.00**	**0.00**	**0.20**	**0.20**	**0.00**	**0.00**	**0.20**	**0.20**	**0.00**	**0.00**	**0.20**	**0%**	**N/A**	**0.21**	**0.00**	**0.00**	**0.21**
St. Johns - SJRWMD	Pinkham Pacetti	1190	345	345	345	345	345	345	345	345	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	29	0.01	0.00	0.00	0.01
	Comachee Cove Yacht Harbor	1381	378	465	465	465	465	465	465	465	23%	0.02	0.00	0.02	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.03	0.03	0.00	0.00	0.03	50%	58	0.03	0.00	0.00	0.03
	Homeowners Utilities	1386	237	250	295	295	295	295	295	295	24%	0.04	0.00	0.04	0.04	0.00	0.00	0.04	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	0.05	0.00	0.00	0.05	25%	176	0.05	0.00	0.00	0.05
	Fruit Cove Utilities	1423	369	375	375	375	375	375	375	375	2%	0.04	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0%	117	0.04	0.00	0.00	0.04
	SJRWMD St. Johns Total		**1,329**	**1,435**	**1,480**	**1,480**	**1,480**	**1,480**	**1,480**	**1,480**	**11%**	**0.11**	**0.00**	**0.11**	**0.12**	**0.00**	**0.00**	**0.12**	**0.13**	**0.00**	**0.00**	**0.13**	**0.13**	**0.00**	**0.00**	**0.13**	**0.13**	**0.00**	**0.00**	**0.13**	**0.13**	**0.00**	**0.00**	**0.13**	**0.13**	**0.00**	**0.00**	**0.13**	**18%**	**N/A**	**0.13**	**0.00**	**0.00**	**0.13**
Suwannee - SRWMD	Wayne Friar Mobile Home Park	217345	320	320	320	320	320	320	320	320	0%	0.02	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00	0.02	0%	69	0.02	0.00	0.00	0.02
	Oak Breeze Mobile Home Park	216536	21	21	21	21	21	21	21	21	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	143	0.00	0.00	0.00	0.00
	Bembry's Trailer Park	219144	39	39	39	39	39	39	39	39	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	154	0.01	0.00	0.00	0.01
	Morgan's Trailer Park	219174	57	57	57	57	57	57	57	57	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	158	0.01	0.00	0.00	0.01
	CR 136/I-75 Water Treatment Plant	234720	0	0	0	0	0	0	0	0	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	0.04	0.00	0.00	0.04	N/A	0	0.04	0.00	0.00	0.04
	SRWMD Suwannee Total		**437**	**437**	**437**	**437**	**437**	**437**	**437**	**437**	**0%**	**0.04**	**0.00**	**0.04**	**0.04**	**0.00**	**0.00**	**0.04**	**0.08**	**0.00**	**0.00**	**0.08**	**0.08**	**0.00**	**0.00**	**0.08**	**0.08**	**0.00**	**0.00**	**0.08**	**0.08**	**0.00**	**0.00**	**0.08**	**0.08**	**0.00**	**0.00**	**0.08**	**100%**	**N/A**	**0.08**	**0.00**	**0.00**	**0.08**
Union - SRWMD	Carl Griffis TRS -052119	215835	12	12	12	12	12	12	12	12	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	167	0.00	0.00	0.00	0.00
	Glenn S. Howard	218586	42	42	42	42	42	42	42	42	0%	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0%	190	0.01	0.00	0.00	0.01
	S. M. Brown, Jr. Mobile Home Park	221370	18	18	18	18	18	18	18	18	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	167	0.00	0.00	0.00	0.00
	Wallace Johns Mobile Home Park	221567	21	21	21	21	21	21	21	21	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	143	0.00	0.00	0.00	0.00
	SRWMD Union Total		**93**	**93**	**93**	**93**	**93**	**93**	**93**	**93**	**0%**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0%**	**N/A**	**0.01**	**0.00**	**0.00**	**0.01**
SJRWMD Region 1 Total			**6,516**	**6,681**	**7,386**	**7,451**	**7,589**	**7,615**	**8,030**	**18,879**	**23%**	**0.48**	**0.00**	**0.48**	**0.55**	**0.00**	**0.00**	**0.55**	**0.59**	**0.00**	**0.00**	**0.59**	**0.59**	**0.00**	**0.00**	**0.59**	**0.61**	**0.00**	**0.00**	**0.61**	**0.61**	**0.00**	**0.00**	**0.61**	**0.62**	**0.00**	**0.00**	**0.62**	**29%**	**N/A**	**0.65**	**0.00**	**0.00**	**0.65**
SRWMD NFRWSP Total			**4,385**	**4,432**	**4,432**	**4,432**	**4,432**	**4,481**	**4,605**	**6,581**	**5%**	**0.47**	**0.00**	**0.47**	**0.46**	**0.00**	**0.00**	**0.46**	**0.50**	**0.00**	**0.00**	**0.50**	**0.50**	**0.00**	**0.00**	**0.50**	**0.50**	**0.00**	**0.00**	**0.50**	**0.51**	**0.00**	**0.00**	**0.51**	**0.53**	**0.00**	**0.00**	**0.53**	**13%**	**N/A**	**0.45**	**0.00**	**0.00**	**0.45**
NFRWSP Total			**10,901**	**11,113**	**11,818**	**11,883**	**12,021**	**12,096**	**12,635**	**25,460**	**16%**	**0.95**	**0.00**	**0.95**	**1.01**	**0.00**	**0.00**	**1.01**	**1.09**	**0.00**	**0.00**	**1.09**	**1.09**	**0.00**	**0.00**	**1.09**	**1.11**	**0.00**	**0.00**	**1.11**	**1.12**	**0.00**	**0.00**	**1.12**	**1.15**	**0.00**	**0.00**	**1.15**	**21%**	**N/A**	**1.10**	**0.00**	**0.00**	**1.10**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) Projected population for years 2020 - 2045 are based on BEBR Population Projections: Volume 53, Bulletin 186, Published January 2020.
4.) Population projections shown here are permanent population projections only and do not include any factors such as seasonal residents, tourist population or net commuter population.
5.) Per capita used to calculate demand projections is an average from 2014 - 2018 and is calculated as (Total Water Use / Total Estimated Population). This per capita is commonly referred to as a gross per capita, as it includes all uses within a utility.
6.) 1-in-10 rainfall year demand for 2045 calculated as an additional 6 percent of 2045 average demand.
7.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-6c. 2014-2018 Water Use, Population Served, and Five-Year Gross Per Capita Averages for Public Supply Permitted Smaller than 0.10 mgd in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

Cup Number	Owner	Utility	Alternate Name / Comments	County	Water Use 2014	Water Use 2015	Water Use 2016	Water Use 2017	Water Use 2018	Population 2014	Population 2015	Population 2016	Population 2017	Population 2018	2014-2018 Avg GPCD	Notes
216014	Bristol Harbour Owners Association	Bristol Harbour Owners Association		Alachua	0.010	0.010	0.010	0.010	0.010	48	48	48	48	48	208	
219158	Farnsworth Properties	Farnsworth Properties		Alachua	0.003	0.003	0.003	0.003	0.003	21	21	21	21	21	143	
220503	Lake Alto Estates Association Inc.	Lake Alto Estates Association Inc.	PWS 2010625	Alachua	0.009	0.010	0.009	0.010	0.010	192	196	200	200	200	49	
	SRWMD Alachua Total				**0.022**	**0.023**	**0.022**	**0.023**	**0.023**	**261**	**265**	**269**	**269**	**269**	**85**	
216644	Town of Brooker	Town of Brooker	PWS 2040113	Bradford	0.041	0.038	0.045	0.040	0.039	305	307	311	311	322	130	
217909	Erasto Abreu	Erasto Abreu		Bradford	0.004	0.004	0.004	0.004	0.004	15	15	15	15	15	267	
220481	City of Hampton	City of Hampton	PWS 2040456	Bradford	0.042	0.046	0.061	0.033	0.044	465	465	463	463	477	97	
	SRWMD Bradford Total				**0.087**	**0.088**	**0.110**	**0.077**	**0.087**	**785**	**787**	**789**	**789**	**814**	**113**	
497	Penney Retirement Community Inc.	Penney Retirement Community Inc.	Penney Retirement Community	Clay	0.043	0.046	0.036	0.035	0.027	202	202	202	202	202	185	
509	Penney Farms Water Utility Enterprise	Penney Farms Water Utility Enterprise	Town of Penney Farms	Clay	0.034	0.027	0.029	0.031	0.027	495	495	495	497	497	60	
527	Green Cove Springs LP	Green Cove Springs LP	St Johns Landing	Clay	0.082	0.074	0.088	0.095	0.090	1,000	1,000	1,000	1,000	1,000	86	
	SJRWMD Clay Total				**0.159**	**0.147**	**0.153**	**0.161**	**0.144**	**1,697**	**1,697**	**1,697**	**1,699**	**1,699**	**90**	
216402	Waters Park	Waters Park		Columbia	0.008	0.008	0.008	0.008	0.008	52	52	52	52	52	154	
216937	B & H Mobile Home Park	B & H Mobile Home Park		Columbia	0.007	0.007	0.007	0.007	0.007	48	48	48	48	48	146	
217171	Timberlane Mobile Home Community	Timberlane Mobile Home Community		Columbia	0.020	0.020	0.020	0.020	0.020	136	136	136	136	136	147	
218347	Town of Fort White	Town of Fort White	PWS 2124399	Columbia	0.087	0.101	0.086	0.061	0.062	494	490	488	490	506	161	
218579	Gator Utilities	Gator Utilities		Columbia	0.007	0.005	0.005	0.004	0.005	60	60	60	60	60	87	
218667	Melvin & Gale Sheppard	Melvin & Gale Sheppard		Columbia	0.002	0.002	0.002	0.002	0.002	12	12	12	12	12	167	
219114	Azalea Park Subdivision	Azalea Park Subdivision		Columbia	0.014	0.013	0.015	0.017	0.015	250	250	250	250	250	59	
219122	Shady Oak Subdivision	Shady Oak Subdivision		Columbia	0.008	0.013	0.011	0.014	0.014	300	300	300	300	300	40	
219126	Windham Mobile Home Park	Windham Mobile Home Park		Columbia	0.014	0.014	0.014	0.014	0.014	96	96	96	96	96	146	
219141	Palm Villa	Palm Villa		Columbia	0.003	0.003	0.003	0.003	0.003	22	22	22	22	22	136	
219146	Consolidated Water Works/Shady Oaks Subdivision	Consolidated Water Works/Shady Oaks Subdivision		Columbia	0.006	0.006	0.006	0.006	0.006	40	40	40	40	40	150	
219152	McCracken Mobile Home Park	McCracken Mobile Home Park		Columbia	0.010	0.010	0.010	0.010	0.010	66	66	66	66	66	152	
219195	Paradise Village Mobile Home Park	Paradise Village Mobile Home Park		Columbia	0.004	0.004	0.004	0.004	0.004	310	310	310	310	310	13	
219755	GLC Properties, LLC	GLC Properties, LLC		Columbia	0.006	0.006	0.006	0.006	0.006	20	20	20	20	20	300	
219757	Cheryl Kellett Mobile Home Park	Cheryl Kellett Mobile Home Park		Columbia	0.004	0.004	0.004	0.004	0.004	30	30	30	30	30	133	
219905	Timmons Apartments	Timmons Apartments		Columbia	0.002	0.002	0.002	0.002	0.002	16	16	16	16	16	125	
220164	W.R. Smithey Apartments	W.R. Smithey Apartments		Columbia	0.002	0.002	0.002	0.002	0.002	16	16	16	16	16	125	
220582	Woodgate Village	Woodgate Village		Columbia	0.039	0.040	0.039	0.043	0.080	348	348	348	348	348	139	
220689	Lance Water	Lance Water		Columbia	0.000	0.000	0.007	0.004	0.013	60	60	60	60	60	80	
	SRWMD Columbia Total				**0.243**	**0.260**	**0.251**	**0.231**	**0.277**	**2,376**	**2,372**	**2,370**	**2,372**	**2,388**	**106**	
1979	Holiday Travel Park Co-op Inc.	Holiday Travel Park Co-op Inc.	Holiday Travel Park	Flagler	0.010	0.010	0.012	0.010	0.010	380	380	380	380	380	27	
	SJRWMD Flagler Total				**0.010**	**0.010**	**0.012**	**0.010**	**0.010**	**380**	**380**	**380**	**380**	**380**	**27**	
215891	Shady Grove Mobile Home Park	Shady Grove Mobile Home Park		Hamilton	0.010	0.010	0.010	0.007	0.003	60	60	60	60	60	133	
219148	Tommy Cannady Residence/Mobile Homes	Tommy Cannady Residence/Mobile Homes		Hamilton	0.003	0.003	0.003	0.003	0.003	21	21	21	21	21	143	
221284	Hamilton County Development Authority	Hamilton County Development Authority		Hamilton	0.054	0.054	0.054	0.054	0.054	350	350	350	350	350	154	
	SRWMD Hamilton Total				**0.067**	**0.067**	**0.067**	**0.064**	**0.060**	**431**	**431**	**431**	**431**	**431**	**151**	
925	Bobby Dollison	Bobby Dollison	American Beach	Nassau	0.009	0.009	0.009	0.009	0.009	114	114	114	114	116	79	
945	Callahan Country RV Resort	Callahan Country RV Resort		Nassau	0.006	0.003	0.018	0.017	0.006	0	0	0	0	0	N/A	
	SJRWMD Nassau Total				**0.015**	**0.012**	**0.027**	**0.026**	**0.015**	**114**	**114**	**114**	**114**	**116**	**166**	
7982	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	River Grove	Putnam	0.010	0.010	0.010	0.010	0.010	219	219	219	219	219	46	
7986	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Park Manor- Interlachen Lake Estates	Putnam	0.030	0.030	0.031	0.032	0.033	622	622	622	622	622	50	
8071	Hilltop Farms Inc.	Kirkwood Estates		Putnam	0.009	0.009	0.010	0.014	0.013	45	45	45	45	45	244	
8072	Lake Como Water Assoc.	Lake Como Water Assoc.	Village of Lake Como	Putnam	0.027	0.027	0.030	0.030	0.030	450	450	450	450	453	64	
8124	Hiawatha Management Inc.	Hiawatha Management Inc.	Hiawatha Management	Putnam	0.010	0.010	0.010	0.010	0.010	138	138	138	138	138	72	
8127	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc.	Palm Port	Putnam	0.010	0.011	0.009	0.012	0.011	218	218	218	218	218	49	
90227	St. Johns Harbor Water Association	St. Johns Harbor Water Association	CUP # 90227 was in house, but never issued - "No permit required."	Putnam	0.022	0.022	0.022	0.023	0.027	365	365	365	367	369	63	
	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc. (formerly P-AUF1)	Wootens MHP (PWSID 2541280), Beechers Point (2540070) do not have any record of CUPs. Two other PWSABs have expired CUPs # 64974 (Silver Lake Oaks - PWSID 2544258) and 82918 (Saratoga - PWSIDs 2541008, 2541242).	Putnam	0.016	0.016	0.016	0.016	0.016	203	203	203	203	203	79	
	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc. (formerly P-AUF3)	Pomona Park	Putnam	0.023	0.023	0.023	0.023	0.023	465	465	465	465	465	49	

Table B-6c, Continued. 2014-2018 Water Use, Population Served, and Five-Year Gross Per Capita Averages for Public Supply Permitted Smaller than 0.10 mgd in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

Cup Number	Owner	Utility	Alternate Name / Comments	County	Water Use 2014	Water Use 2015	Water Use 2016	Water Use 2017	Water Use 2018	Population 2014	Population 2015	Population 2016	Population 2017	Population 2018	2014-2018 Avg GPCD	Notes
	Aqua Utilities of Florida, Inc.	Aqua Utilities of Florida, Inc. (formerly 7984 & 7988)	CUPs 7984 (Hermits Cove - PWSID 2540482) and 7988 (St Johns Highlands / Hermits Cove - PWSID 2540482) expired in 1992 and were not renewed - "No permit required." St Johns River Club Utilities PWSID 2544266 does not have any record of a CUP.	Putnam	0.040	0.040	0.040	0.040	0.040	211	211	211	211	211	190	
	Mr. W. Herrington	River Villas Inc.	CUP 8129 was closed in 2003, no permit required.	Putnam	0.005	0.005	0.005	0.005	0.005	60	60	60	60	60	83	
SJRWMD Putnam Total					**0.202**	**0.203**	**0.206**	**0.215**	**0.218**	**2,996**	**2,996**	**2,996**	**2,998**	**3,003**	**70**	
1190	Pinkham Pacetti	Pinkham Pacetti	Pacetti's Marina & Campground	St. Johns	0.010	0.010	0.010	0.010	0.010	345	345	345	345	345	29	
1381	Comachee Cove Yacht Harbor	Comachee Cove Yacht Harbor		St. Johns	0.023	0.021	0.022	0.025	0.024	378	378	411	411	411	58	
1386	Homeowners Utilities	Homeowners Utilities	Porpoise Point	St. Johns	0.041	0.035	0.048	0.052	0.033	237	237	237	237	237	176	
1423	St. Johns County Board of County Commissioners	Fruit Cove Utilities	owned by Fruit Cove Properties Joint Venture.	St. Johns	0.042	0.044	0.043	0.043	0.043	369	369	369	369	369	117	
SJRWMD St. Johns Total					**0.116**	**0.110**	**0.123**	**0.130**	**0.110**	**1,329**	**1,329**	**1,362**	**1,362**	**1,362**	**87**	
217345	Wayne Friar Mobile Home Park	Wayne Friar Mobile Home Park	PWS ID 2611239	Suwannee	0.026	0.020	0.015	0.013	0.037	320	320	320	320	320	69	
216536	Oak Breeze Mobile Home Park	Oak Breeze Mobile Home Park		Suwannee	0.003	0.003	0.003	0.003	0.003	21	21	21	21	21	143	
219144	Bembry's Trailer Park	Bembry's Trailer Park		Suwannee	0.006	0.006	0.006	0.006	0.006	39	39	39	39	39	154	
219174	Morgan's Trailer Park	Morgan's Trailer Park		Suwannee	0.009	0.009	0.009	0.009	0.009	57	57	57	57	57	158	
234720	CR 136/I-75 Water Treatment Plant	CR 136/I-75 Water Treatment Plant		Suwannee	0.000	0.000	0.000	0.000	0.000	0	0	0	0	0	0	Permit issued in 2019
SRWMD Suwannee Total					**0.044**	**0.038**	**0.033**	**0.031**	**0.055**	**437**	**437**	**437**	**437**	**437**	**92**	
215835	Carl Griffis TRS -052118	Carl Griffis TRS -052119		Union	0.002	0.002	0.002	0.002	0.002	12	12	12	12	12	167	
218586	Glenn S. Howard	Glenn S. Howard		Union	0.008	0.008	0.008	0.008	0.008	42	42	42	42	42	190	
221370	S. M. Brown, Jr. Mobile Home Park	S. M. Brown, Jr. Mobile Home Park		Union	0.003	0.003	0.003	0.003	0.003	18	18	18	18	18	167	
221567	Wallace Johns Mobile Home Park	Wallace Johns Mobile Home Park		Union	0.003	0.003	0.003	0.003	0.003	21	21	21	21	21	143	
SRWMD Union Total					**0.016**	**0.016**	**0.016**	**0.016**	**0.016**	**93**	**93**	**93**	**93**	**93**	**172**	
SJRWMD Region 1 Total					**0.502**	**0.482**	**0.521**	**0.542**	**0.497**	**6,516**	**6,516**	**6,549**	**6,553**	**6,560**	**78**	
SRWMD NFRWSP Total					**0.479**	**0.492**	**0.499**	**0.442**	**0.518**	**4,383**	**4,385**	**4,389**	**4,391**	**4,432**	**111**	
NFRWSP Total					**0.981**	**0.974**	**1.020**	**0.984**	**1.015**	**10,899**	**10,901**	**10,938**	**10,944**	**10,992**	**91**	

Notes:

1.) All water use is shown in million gallons per day.

2.) Rounding errors account for nominal discrepancies.

3.) 2014 - 2018 water use data source is NFSEG master geodatabase with metered and estimated small public supply water use.

4.) 2014 - 2018 population obtained from Technical Staff Reports, BEBR estimates of population, DEP MOR and Basic Facility Report Data, parcel data, and permittee surveys.

Table B-7. Agricultural Irrigation Self-supply Water Use, Miscellaneous Agricultural Water Use, and Acreage for 2015, 5-in-10 Year Water Demand Projections for 2020-2045, Acreage Projections for 2020-2045, and 1-in-10 Year Water Demand Projections for 2045 by County, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	District	Water Use 2015 Ground	Water Use 2015 Surface	Water Use 2015 Total	Demand Projections (5-in-10) 2020 Ground	2020 Surface	2020 Other	2020 Total	2025 Ground	2025 Surface	2025 Other	2025 Total
Alachua	SJRWMD	2.99	0.00	**2.99**	3.13	0.00	0.00	**3.13**	3.18	0.00	0.00	**3.18**
Alachua	SRWMD	12.22	0.00	**12.22**	11.25	0.00	0.00	**11.25**	11.45	0.00	0.00	**11.45**
Alachua	**Total**	**15.21**	**0.00**	**15.21**	**14.38**	**0.00**	**0.00**	**14.38**	**14.63**	**0.00**	**0.00**	**14.63**
Baker	SJRWMD	0.36	0.20	**0.56**	0.28	0.15	0.00	**0.43**	0.28	0.16	0.00	**0.44**
Baker	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
Baker	**Total**	**0.36**	**0.20**	**0.56**	**0.28**	**0.15**	**0.00**	**0.43**	**0.28**	**0.16**	**0.00**	**0.44**
Bradford	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
Bradford	SRWMD	1.82	0.00	**1.82**	1.89	0.00	0.00	**1.89**	1.87	0.00	0.00	**1.87**
Bradford	**Total**	**1.82**	**0.00**	**1.82**	**1.89**	**0.00**	**0.00**	**1.89**	**1.87**	**0.00**	**0.00**	**1.87**
Clay	SJRWMD	1.10	0.13	**1.23**	1.23	0.14	0.00	**1.37**	1.23	0.15	0.00	**1.38**
Columbia	SRWMD	4.66	0.00	**4.66**	4.34	0.00	0.00	**4.34**	5.47	0.00	0.00	**5.47**
Duval	SJRWMD	0.10	1.66	**1.76**	0.46	1.14	0.00	**1.60**	0.46	1.15	0.00	**1.61**
Flagler	SJRWMD	6.45	0.41	**6.86**	10.56	0.67	0.00	**11.23**	10.47	0.67	0.00	**11.14**
Gilchrist	SRWMD	19.01	0.00	**19.01**	19.00	0.00	0.00	**19.00**	19.65	0.00	0.00	**19.65**
Hamilton	SRWMD	16.10	0.00	**16.10**	13.95	0.00	0.00	**13.95**	14.69	0.00	0.00	**14.69**
Nassau	SJRWMD	0.67	0.00	**0.67**	0.95	0.00	0.00	**0.95**	0.97	0.00	0.00	**0.97**
Putnam	SJRWMD	15.50	0.26	**15.76**	15.95	1.08	0.00	**17.03**	16.92	1.13	0.00	**18.05**
St. Johns	SJRWMD	18.18	0.00	**18.18**	25.37	0.39	0.00	**25.76**	24.96	0.39	0.00	**25.35**
Suwannee	SRWMD	33.90	0.00	**33.90**	36.39	0.00	0.00	**36.39**	38.47	0.00	0.00	**38.47**
Union	SRWMD	1.22	0.00	**1.22**	1.32	0.00	0.00	**1.32**	1.53	0.00	0.00	**1.53**
SJRWMD Region 1 Total		**45.35**	**2.66**	**48.01**	**57.93**	**3.57**	**0.00**	**61.50**	**58.47**	**3.65**	**0.00**	**62.12**
SRWMD NFRWSP Total		**88.93**	**0.00**	**88.93**	**88.14**	**0.00**	**0.00**	**88.14**	**93.13**	**0.00**	**0.00**	**93.13**
NFRWSP Total		**134.28**	**2.66**	**136.94**	**146.07**	**3.57**	**0.00**	**149.64**	**151.60**	**3.65**	**0.00**	**155.25**

County	District	2030 Ground	2030 Surface	2030 Other	2030 Total	2035 Ground	2035 Surface	2035 Other	2035 Total	2040 Ground	2040 Surface	2040 Other	2040 Total
Alachua	SJRWMD	3.27	0.00	0.00	**3.27**	3.39	0.00	0.00	**3.39**	3.52	0.00	0.00	**3.52**
Alachua	SRWMD	11.54	0.00	0.00	**11.54**	11.79	0.00	0.00	**11.79**	11.97	0.00	0.00	**11.97**
Alachua	**Total**	**14.81**	**0.00**	**0.00**	**14.81**	**15.18**	**0.00**	**0.00**	**15.18**	**15.49**	**0.00**	**0.00**	**15.49**
Baker	SJRWMD	0.29	0.16	0.00	**0.45**	0.29	0.16	0.00	**0.45**	0.30	0.17	0.00	**0.47**
Baker	SRWMD	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
Baker	**Total**	**0.29**	**0.16**	**0.00**	**0.45**	**0.29**	**0.16**	**0.00**	**0.45**	**0.30**	**0.17**	**0.00**	**0.47**
Bradford	SJRWMD	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**
Bradford	SRWMD	1.85	0.00	0.00	**1.85**	1.88	0.00	0.00	**1.88**	1.87	0.00	0.00	**1.87**
Bradford	**Total**	**1.85**	**0.00**	**0.00**	**1.85**	**1.88**	**0.00**	**0.00**	**1.88**	**1.87**	**0.00**	**0.00**	**1.87**
Clay	SJRWMD	1.23	0.15	0.00	**1.38**	1.24	0.15	0.00	**1.39**	1.26	0.15	0.00	**1.41**
Columbia	SRWMD	6.41	0.00	0.00	**6.41**	7.35	0.00	0.00	**7.35**	8.49	0.00	0.00	**8.49**
Duval	SJRWMD	0.46	1.16	0.00	**1.62**	0.46	1.15	0.00	**1.61**	0.46	1.16	0.00	**1.62**
Flagler	SJRWMD	10.34	0.66	0.00	**11.00**	10.32	0.66	0.00	**10.98**	10.20	0.65	0.00	**10.85**
Gilchrist	SRWMD	20.30	0.00	0.00	**20.30**	21.06	0.00	0.00	**21.06**	21.78	0.00	0.00	**21.78**
Hamilton	SRWMD	15.36	0.00	0.00	**15.36**	16.10	0.00	0.00	**16.10**	16.86	0.00	0.00	**16.86**
Nassau	SJRWMD	0.97	0.00	0.00	**0.97**	0.98	0.00	0.00	**0.98**	0.98	0.00	0.00	**0.98**
Putnam	SJRWMD	17.81	1.14	0.00	**18.95**	18.63	1.15	0.00	**19.78**	19.53	1.19	0.00	**20.72**
St. Johns	SJRWMD	24.51	0.36	0.00	**24.87**	24.08	0.38	0.00	**24.46**	23.55	0.37	0.00	**23.92**
Suwannee	SRWMD	39.99	0.00	0.00	**39.99**	41.84	0.00	0.00	**41.84**	43.65	0.00	0.00	**43.65**
Union	SRWMD	1.68	0.00	0.00	**1.68**	1.77	0.00	0.00	**1.77**	1.94	0.00	0.00	**1.94**
SJRWMD Region 1 Total		**58.88**	**3.63**	**0.00**	**62.51**	**59.39**	**3.65**	**0.00**	**63.04**	**59.80**	**3.69**	**0.00**	**63.49**
SRWMD NFRWSP Total		**97.13**	**0.00**	**0.00**	**97.13**	**101.79**	**0.00**	**0.00**	**101.79**	**106.56**	**0.00**	**0.00**	**106.56**
NFRWSP Total		**156.01**	**3.63**	**0.00**	**159.64**	**161.18**	**3.65**	**0.00**	**164.83**	**166.36**	**3.69**	**0.00**	**170.05**

County	District	2045 Ground	2045 Surface	2045 Other	2045 Total	Percent Change 2015-2045	Acreage 2015
Alachua	SJRWMD	3.56	0.00	0.00	**3.56**	19%	1,911
Alachua	SRWMD	12.24	0.00	0.00	**12.24**	0%	9,777
Alachua	**Total**	**15.80**	**0.00**	**0.00**	**15.80**	**4%**	**11,688**
Baker	SJRWMD	0.30	0.17	0.00	**0.47**	-16%	208
Baker	SRWMD	0.00	0.00	0.00	**0.00**	N/A	0
Baker	**Total**	**0.30**	**0.17**	**0.00**	**0.47**	**-16%**	**208**
Bradford	SJRWMD	0.00	0.00	0.00	**0.00**	N/A	0
Bradford	SRWMD	1.86	0.00	0.00	**1.86**	2%	1,636
Bradford	**Total**	**1.86**	**0.00**	**0.00**	**1.86**	**2%**	**1,636**
Clay	SJRWMD	1.28	0.15	0.00	**1.43**	16%	727
Columbia	SRWMD	9.64	0.00	0.00	**9.64**	107%	3,882
Duval	SJRWMD	0.46	1.15	0.00	**1.61**	-9%	1,287
Flagler	SJRWMD	10.13	0.64	0.00	**10.77**	57%	9,504
Gilchrist	SRWMD	22.57	0.00	0.00	**22.57**	19%	15,560
Hamilton	SRWMD	17.55	0.00	0.00	**17.55**	9%	13,692
Nassau	SJRWMD	0.99	0.00	0.00	**0.99**	48%	825
Putnam	SJRWMD	20.45	1.21	0.00	**21.66**	37%	11,149
St. Johns	SJRWMD	23.05	0.36	0.00	**23.41**	29%	22,044
Suwannee	SRWMD	45.58	0.00	0.00	**45.58**	34%	28,002
Union	SRWMD	2.06	0.00	0.00	**2.06**	69%	755
SJRWMD Region 1 Total		**60.22**	**3.68**	**0.00**	**63.90**	**33%**	**47,655**
SRWMD NFRWSP Total		**111.50**	**0.00**	**0.00**	**111.50**	**25%**	**73,304**
NFRWSP Total		**171.72**	**3.68**	**0.00**	**175.40**	**28%**	**120,959**

County	District	Acreage Projections 2020	2025	2030	2035	2040	2045	Percent Change 2015-2045	Demand Projections (1-in-10) 2045 Ground	Surface	Other	Total
Alachua	SJRWMD	1,820	1,829	1,951	2,006	2,078	2,098	10%	5.44	0.00	0.00	**5.44**
Alachua	SRWMD	10,239	10,405	10,470	10,601	10,721	10,909	12%	15.72	0.00	0.00	**15.72**
Alachua	**Total**	**12,059**	**12,234**	**12,421**	**12,607**	**12,799**	**13,007**	**11%**	**21.16**	**0.00**	**0.00**	**21.16**
Baker	SJRWMD	208	208	208	208	208	208	0%	0.35	0.20	0.00	**0.55**
Baker	SRWMD	0	0	0	0	0	0	N/A	0.00	0.00	0.00	**0.00**
Baker	**Total**	**208**	**208**	**208**	**208**	**208**	**208**	**0%**	**0.35**	**0.20**	**0.00**	**0.55**
Bradford	SJRWMD	0	0	0	0	0	0	N/A	0.00	0.00	0.00	**0.00**
Bradford	SRWMD	1,499	1,499	1,499	1,499	1,499	1,499	-8%	2.38	0.00	0.00	**2.38**
Bradford	**Total**	**1,499**	**1,499**	**1,499**	**1,499**	**1,499**	**1,499**	**-8%**	**2.38**	**0.00**	**0.00**	**2.38**
Clay	SJRWMD	714	714	714	714	714	714	-2%	1.54	0.18	0.00	**1.72**
Columbia	SRWMD	4,290	5,129	5,973	6,782	7,590	8,421	117%	12.22	0.00	0.00	**12.22**
Duval	SJRWMD	1,288	1,288	1,288	1,288	1,288	1,288	0%	0.11	1.83	0.00	**1.94**
Flagler	SJRWMD	9,408	9,212	9,061	8,948	8,761	8,644	-9%	14.24	0.90	0.00	**15.14**
Gilchrist	SRWMD	19,934	20,378	20,823	21,271	21,734	22,191	43%	28.32	0.00	0.00	**28.32**
Hamilton	SRWMD	13,996	14,483	14,959	15,448	15,951	16,429	20%	22.45	0.00	0.00	**22.45**
Nassau	SJRWMD	821	821	821	821	821	821	0%	1.29	0.00	0.00	**1.29**
Putnam	SJRWMD	10,801	11,394	11,990	12,584	13,183	13,788	24%	28.77	0.48	0.00	**29.25**
St. Johns	SJRWMD	21,374	20,846	20,368	19,872	19,319	18,809	-15%	34.25	0.00	0.00	**34.25**
Suwannee	SRWMD	36,677	37,960	39,213	40,473	41,728	43,025	54%	58.13	0.00	0.00	**58.13**
Union	SRWMD	870	999	1,093	1,196	1,305	1,402	86%	2.68	0.00	0.00	**2.68**
SJRWMD Region 1 Total		**46,434**	**46,312**	**46,401**	**46,441**	**46,372**	**46,370**	**-3%**	**85.99**	**3.59**	**0.00**	**89.58**
SRWMD NFRWSP Total		**87,505**	**90,853**	**94,030**	**97,270**	**100,528**	**103,876**	**42%**	**141.90**	**0.00**	**0.00**	**141.90**
NFRWSP Total		**133,939**	**137,165**	**140,431**	**143,711**	**146,900**	**150,246**	**24%**	**227.89**	**3.59**	**0.00**	**231.48**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2015 water use data source is NFSEG master geodatabase with metered and estimated agricultural water use.
4.) 2015 acreage source is FSAID IV published June 30, 2017 by The Balmoral Group for the Florida Department of Agriculture and Consumer Services.
5.) 2020 - 2045 acreage projections and 2020 - 2045 average and 1-in-10 water demand projections derived from FSAID VII, published June 30, 2020 from The Balmoral Group for the Florida Department of Agriculture and Consumer Services.
6.) 2020 - 2045 groundwater / surface water split estimated using 2015 ratios.
7.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-7a. Agricultural Irrigation Self-supply Water Use (Including Miscellaneous Water Use) and Acreage for 2015, 5-in-10 Year Water Demand Projections and Acreage Projections for 2020-2045, and 1-in-10 Year Water Demand Projections for 2045, by Crop Category by County, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	Crop Category	2015 Estimated Agriculture		2020 Projected Agriculture		2025 Projected Agriculture		2030 Projected Agriculture		2035 Projected Agriculture		2040 Projected Agriculture		2045 Projected Agriculture		Percent Change 2015-2045		2045 (1-in-10) Demand
		Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acreage	MGD	
	Citrus	20	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	1,116	2.17	1,118	2.27	1,118	2.31	1,118	2.32	1,127	2.38	1,127	2.39	1,127	2.39	1%	10%	3.45
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Vegetables (Fresh Market)	109	0.11	90	0.11	99	0.12	99	0.12	137	0.17	182	0.23	202	0.26	85%	136%	0.34
	Field Crops	246	0.11	247	0.11	247	0.12	369	0.21	377	0.22	377	0.23	377	0.23	53%	109%	0.34
Alachua - SJRWMD	Greenhouse/Nursery	59	0.14	54	0.15	54	0.15	54	0.15	54	0.16	81	0.22	81	0.23	37%	64%	0.26
	Hay	361	0.28	311	0.29	311	0.28	311	0.27	311	0.26	311	0.25	311	0.25	-14%	-11%	0.40
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.45
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.19	0	0.20	0	0.20	0	0.20	0	0.20	0	0.20	0	0.20	N/A	5%	0.20
	Total	**1,911**	**2.99**	**1,820**	**3.13**	**1,829**	**3.18**	**1,951**	**3.27**	**2,006**	**3.39**	**2,078**	**3.52**	**2,098**	**3.56**	**10%**	**19%**	**5.44**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	592	1.43	592	1.32	592	1.33	592	1.32	592	1.35	592	1.35	608	1.38	3%	-3%	2.16
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Vegetables (Fresh Market)	424	0.58	459	0.53	509	0.60	525	0.63	609	0.75	655	0.81	716	0.90	69%	55%	1.17
	Field Crops	5,200	4.57	5,560	4.21	5,605	4.28	5,633	4.34	5,671	4.44	5,722	4.55	5,818	4.68	12%	2%	5.94
Alachua - SRWMD	Greenhouse/Nursery	895	2.18	831	2.01	831	2.02	831	2.02	840	2.05	840	2.07	855	2.11	-4%	-3%	2.39
	Hay	2,666	2.69	2,797	2.48	2,868	2.52	2,889	2.53	2,889	2.50	2,912	2.49	2,912	2.47	9%	-8%	3.36
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.76	0	0.70	0	0.70	0	0.70	0	0.70	0	0.70	0	0.70	N/A	-8%	0.70
	Total	**9,777**	**12.22**	**10,239**	**11.25**	**10,405**	**11.45**	**10,470**	**11.54**	**10,601**	**11.79**	**10,721**	**11.97**	**10,909**	**12.24**	**12%**	**0%**	**15.72**
	Citrus	20	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	-100%	N/A	0.00
	Fruit (Non-citrus)	1,708	3.60	1,710	3.59	1,710	3.64	1,710	3.64	1,719	3.73	1,719	3.74	1,735	3.77	2%	5%	5.61
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Vegetables (Fresh Market)	533	0.69	549	0.64	608	0.72	624	0.75	746	0.92	837	1.04	918	1.16	72%	68%	1.51
	Field Crops	5,446	4.68	5,807	4.32	5,852	4.40	6,002	4.55	6,048	4.66	6,099	4.78	6,195	4.91	14%	5%	6.28
Alachua - Total	Greenhouse/Nursery	954	2.32	885	2.16	885	2.17	885	2.17	894	2.21	921	2.29	936	2.34	-2%	1%	2.65
	Hay	3,027	2.97	3,108	2.77	3,179	2.80	3,200	2.80	3,200	2.76	3,223	2.74	3,223	2.72	6%	-8%	3.76
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.45
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.95	0	0.90	0	0.90	0	0.90	0	0.90	0	0.90	0	0.90	N/A	-5%	0.90
	Total	**11,688**	**15.21**	**12,059**	**14.38**	**12,234**	**14.63**	**12,421**	**14.81**	**12,607**	**15.18**	**12,799**	**15.49**	**13,007**	**15.80**	**11%**	**4%**	**21.16**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	5	0.01	5	0.01	5	0.01	5	0.01	5	0.01	5	0.01	5	0.01	0%	0%	0.02
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Vegetables (Fresh Market)	45	0.04	45	0.05	45	0.05	45	0.06	45	0.06	45	0.06	45	0.06	0%	50%	0.08
	Field Crops	14	0.02	14	0.02	14	0.02	14	0.02	14	0.02	14	0.02	14	0.02	0%	0%	0.03
Baker - SJRWMD	Greenhouse/Nursery	134	0.20	134	0.24	134	0.25	134	0.25	134	0.25	134	0.26	134	0.26	0%	30%	0.29
	Hay	10	0.01	10	0.01	10	0.01	10	0.01	10	0.01	10	0.02	10	0.02	0%	100%	0.03
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.08	0	0.10	0	0.10	0	0.10	0	0.10	0	0.10	0	0.10	N/A	25%	0.10
	Total	**208**	**0.36**	**208**	**0.43**	**208**	**0.44**	**208**	**0.45**	**208**	**0.45**	**208**	**0.47**	**208**	**0.47**	**0%**	**31%**	**0.55**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Vegetables (Fresh Market)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Field Crops	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
Baker - SRWMD	Greenhouse/Nursery	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Hay	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Total	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**N/A**	**N/A**	**0.00**

Table B-7a, Continued. Agricultural Irrigation Self-supply Water Use (Including Miscellaneous Water Use) and Acreage for 2015, 5-in-10 Year Water Demand Projections and Acreage Projections for 2020-2045, and 1-in-10 Year Water Demand Projections for 2045, by Crop Category by County, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	Crop Category	2015 Estimated Agriculture		2020 Projected Agriculture		2025 Projected Agriculture		2030 Projected Agriculture		2035 Projected Agriculture		2040 Projected Agriculture		2045 Projected Agriculture		Percent Change 2015-2045		2045 (1-in-10) Demand
		Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acreage	MGD	
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	5	0.01	5	0.01	5	0.01	5	0.01	5	0.01	5	0.01	5	0.01	0%	0%	0.02
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Vegetables (Fresh Market)	45	0.04	45	0.05	45	0.05	45	0.06	45	0.06	45	0.06	45	0.06	0%	50%	0.08
	Field Crops	14	0.02	14	0.02	14	0.02	14	0.02	14	0.02	14	0.02	14	0.02	0%	0%	0.03
Baker - Total	Greenhouse/Nursery	134	0.20	134	0.24	134	0.25	134	0.25	134	0.25	134	0.26	134	0.26	0%	30%	0.29
	Hay	10	0.01	10	0.01	10	0.01	10	0.01	10	0.01	10	0.02	10	0.02	0%	100%	0.03
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.08	0	0.10	0	0.10	0	0.10	0	0.10	0	0.10	0	0.10	N/A	25%	0.10
	Total	**208**	**0.36**	**208**	**0.43**	**208**	**0.44**	**208**	**0.45**	**208**	**0.45**	**208**	**0.47**	**208**	**0.47**	**0%**	**31%**	**0.55**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Vegetables (Fresh Market)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Field Crops	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
Bradford- SJRWMD	Greenhouse/Nursery	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Hay	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Total	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**N/A**	**N/A**	**0.00**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	26	0.04	20	0.04	20	0.04	20	0.04	20	0.05	20	0.05	20	0.05	-23%	25%	0.07
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Vegetables (Fresh Market)	306	0.39	306	0.41	306	0.41	306	0.42	306	0.42	306	0.42	306	0.43	0%	10%	0.56
	Field Crops	245	0.14	200	0.15	200	0.15	200	0.15	200	0.16	200	0.16	200	0.16	-18%	14%	0.20
Bradford - SRWMD	Greenhouse/Nursery	2	0.00	2	0.00	2	0.00	2	0.00	2	0.00	2	0.00	2	0.00	0%	N/A	0.00
	Hay	1,057	0.96	971	1.00	971	0.98	971	0.95	971	0.96	971	0.95	971	0.93	-8%	-3%	1.26
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.28	0	0.29	0	0.29	0	0.29	0	0.29	0	0.29	0	0.29	N/A	4%	0.29
	Total	**1,636**	**1.82**	**1,499**	**1.89**	**1,499**	**1.87**	**1,499**	**1.85**	**1,499**	**1.88**	**1,499**	**1.87**	**1,499**	**1.86**	**-8%**	**2%**	**2.38**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	26	0.04	20	0.04	20	0.04	20	0.04	20	0.05	20	0.05	20	0.05	-23%	25%	0.07
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Vegetables (Fresh Market)	306	0.39	306	0.41	306	0.41	306	0.42	306	0.42	306	0.42	306	0.43	0%	10%	0.56
	Field Crops	245	0.14	200	0.15	200	0.15	200	0.15	200	0.16	200	0.16	200	0.16	-18%	14%	0.20
Bradford - Total	Greenhouse/Nursery	2	0.00	2	0.00	2	0.00	2	0.00	2	0.00	2	0.00	2	0.00	0%	N/A	0.00
	Hay	1,057	0.96	971	1.00	971	0.98	971	0.95	971	0.96	971	0.95	971	0.93	-8%	-3%	1.26
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.28	0	0.29	0	0.29	0	0.29	0	0.29	0	0.29	0	0.29	N/A	4%	0.29
	Total	**1,636**	**1.82**	**1,499**	**1.89**	**1,499**	**1.87**	**1,499**	**1.85**	**1,499**	**1.88**	**1,499**	**1.87**	**1,499**	**1.86**	**-8%**	**2%**	**2.38**
	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Vegetables (Fresh Market)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Field Crops	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
Clay - SJRWMD	Greenhouse/Nursery	450	0.97	437	1.08	437	1.10	437	1.10	437	1.12	437	1.14	437	1.16	-3%	20%	1.32
	Hay	277	0.21	277	0.23	277	0.22	277	0.22	277	0.21	277	0.21	277	0.21	0%	0%	0.34
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.05	0	0.06	0	0.06	0	0.06	0	0.06	0	0.06	0	0.06	N/A	20%	0.06
	Total	**727**	**1.23**	**714**	**1.37**	**714**	**1.38**	**714**	**1.38**	**714**	**1.39**	**714**	**1.41**	**714**	**1.43**	**-2%**	**16%**	**1.72**

Table B-7a, Continued. Agricultural Irrigation Self-supply Water Use (Including Miscellaneous Water Use) and Acreage for 2015, 5-in-10 Year Water Demand Projections and Acreage Projections for 2020-2045, and 1-in-10 Year Water Demand Projections for 2045, by Crop Category by County, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	Crop Category	2015 Estimated Agriculture		2020 Projected Agriculture		2025 Projected Agriculture		2030 Projected Agriculture		2035 Projected Agriculture		2040 Projected Agriculture		2045 Projected Agriculture		Percent Change 2015-2045		2045 (1-in-10) Demand
		Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acreage	MGD	
Columbia - SRWMD	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	15	0.29	141	0.27	221	0.41	307	0.56	427	0.78	536	0.97	611	1.11	3973%	283%	1.56
	Potatoes	0	0.03	26	0.03	40	0.05	82	0.09	109	0.12	117	0.13	117	0.13	N/A	333%	0.19
	Vegetables (Fresh Market)	87	0.26	196	0.24	482	0.60	874	1.10	1,125	1.42	1,469	1.85	1,758	2.22	1921%	754%	2.91
	Field Crops	3,196	2.59	3,232	2.41	3,447	2.59	3,617	2.74	4,000	3.06	4,175	3.22	4,372	3.40	37%	31%	4.31
	Greenhouse/Nursery	201	0.61	232	0.57	415	0.97	415	0.97	437	1.02	591	1.36	771	1.76	284%	189%	1.99
	Hay	383	0.50	463	0.47	524	0.50	678	0.60	684	0.60	702	0.61	792	0.67	107%	34%	0.91
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.38	0	0.35	0	0.35	0	0.35	0	0.35	0	0.35	0	0.35	N/A	-8%	0.35
	Total	**3,882**	**4.66**	**4,290**	**4.34**	**5,129**	**5.47**	**5,973**	**6.41**	**6,782**	**7.35**	**7,590**	**8.49**	**8,421**	**9.64**	**117%**	**107%**	**12.22**
Duval - SJRWMD	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	0%	N/A	0.00
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Vegetables (Fresh Market)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Field Crops	146	0.10	146	0.09	146	0.09	146	0.10	146	0.10	146	0.10	146	0.10	0%	0%	0.15
	Greenhouse/Nursery	304	0.80	304	0.73	304	0.73	304	0.74	304	0.74	304	0.75	304	0.75	0%	-6%	0.86
	Hay	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Sod	836	0.63	837	0.57	837	0.58	837	0.57	837	0.56	837	0.56	837	0.55	0%	-13%	0.72
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.23	0	0.21	0	0.21	0	0.21	0	0.21	0	0.21	0	0.21	N/A	-9%	0.21
	Total	**1,287**	**1.76**	**1,288**	**1.60**	**1,288**	**1.61**	**1,288**	**1.62**	**1,288**	**1.61**	**1,288**	**1.62**	**1,288**	**1.61**	**0%**	**-9%**	**1.94**
Flagler - SJRWMD	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	23	0.02	23	0.04	23	0.05	23	0.05	23	0.05	7	0.02	7	0.02	-70%	0%	0.03
	Potatoes	3,492	2.82	3,816	4.61	3,816	4.64	3,665	4.50	3,552	4.39	3,552	4.42	3,490	4.37	0%	55%	6.68
	Vegetables (Fresh Market)	2,030	1.62	2,030	2.66	2,030	2.70	2,030	2.74	2,030	2.77	2,030	2.81	2,013	2.81	-1%	73%	3.77
	Field Crops	283	0.15	284	0.25	284	0.26	284	0.26	284	0.26	284	0.26	284	0.27	0%	80%	0.39
	Greenhouse/Nursery	515	0.70	499	1.15	499	1.16	499	1.16	499	1.17	484	1.14	484	1.15	-6%	64%	1.31
	Hay	834	0.38	636	0.62	636	0.61	636	0.59	636	0.62	578	0.56	540	0.49	-35%	29%	0.81
	Sod	2,327	1.12	2,120	1.83	1,924	1.65	1,924	1.63	1,924	1.65	1,826	1.57	1,826	1.59	-22%	42%	2.08
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.04	0	0.07	0	0.07	0	0.07	0	0.07	0	0.07	0	0.07	N/A	75%	0.07
	Total	**9,504**	**6.86**	**9,408**	**11.23**	**9,212**	**11.14**	**9,061**	**11.00**	**8,948**	**10.98**	**8,761**	**10.85**	**8,644**	**10.77**	**-9%**	**57%**	**15.14**
Gilchrist - SRWMD	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	59	0.07	39	0.07	102	0.18	176	0.32	196	0.35	228	0.41	228	0.41	286%	486%	0.57
	Potatoes	0	0.00	0	0.00	8	0.01	8	0.01	8	0.01	47	0.05	125	0.14	N/A	N/A	0.21
	Vegetables (Fresh Market)	1,459	2.55	1,906	2.55	2,018	2.72	2,200	2.99	2,390	3.27	2,425	3.34	2,497	3.46	71%	36%	4.54
	Field Crops	11,811	12.00	15,828	11.99	15,962	12.19	16,088	12.38	16,214	12.65	16,443	12.98	16,604	13.25	41%	10%	16.83
	Greenhouse/Nursery	174	0.42	174	0.42	225	0.53	225	0.53	306	0.71	409	0.94	555	1.26	219%	200%	1.42
	Hay	2,057	1.84	1,987	1.84	2,063	1.89	2,126	1.94	2,157	1.94	2,182	1.93	2,182	1.92	6%	4%	2.62
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	2.13	0	2.13	0	2.13	0	2.13	0	2.13	0	2.13	0	2.13	N/A	0%	2.13
	Total	**15,560**	**19.01**	**19,934**	**19.00**	**20,378**	**19.65**	**20,823**	**20.30**	**21,271**	**21.06**	**21,734**	**21.78**	**22,191**	**22.57**	**43%**	**19%**	**28.32**

Table B-7a, Continued. Agricultural Irrigation Self-supply Water Use (Including Miscellaneous Water Use) and Acreage for 2015, 5-in-10 Year Water Demand Projections and Acreage Projections for 2020-2045, and 1-in-10 Year Water Demand Projections for 2045, by Crop Category by County, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	Crop Category	2015 Estimated Agriculture		2020 Projected Agriculture		2025 Projected Agriculture		2030 Projected Agriculture		2035 Projected Agriculture		2040 Projected Agriculture		2045 Projected Agriculture		Percent Change 2015-2045		2045 (1-in-10) Demand
		Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acreage	MGD	
Hamilton - SRWMD	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	0	0.07	32	0.06	90	0.16	143	0.26	167	0.30	234	0.42	261	0.47	N/A	571%	0.66
	Potatoes	241	0.36	276	0.31	276	0.31	276	0.31	317	0.36	317	0.36	317	0.37	32%	3%	0.53
	Vegetables (Fresh Market)	3,734	5.47	3,667	4.74	3,883	5.07	4,072	5.35	4,192	5.55	4,331	5.78	4,516	6.05	21%	11%	7.93
	Field Crops	8,610	7.88	8,931	6.83	9,020	6.97	9,153	7.16	9,376	7.46	9,580	7.75	9,816	8.05	14%	2%	10.22
	Greenhouse/Nursery	440	1.26	440	1.09	498	1.22	537	1.30	600	1.44	642	1.54	672	1.61	53%	28%	1.82
	Hay	667	0.82	650	0.71	716	0.75	778	0.77	796	0.78	847	0.80	847	0.79	27%	-4%	1.08
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.24	0	0.21	0	0.21	0	0.21	0	0.21	0	0.21	0	0.21	N/A	-13%	0.21
	Total	**13,692**	**16.10**	**13,996**	**13.95**	**14,483**	**14.69**	**14,959**	**15.36**	**15,448**	**16.10**	**15,951**	**16.86**	**16,429**	**17.55**	**20%**	**9%**	**22.45**
Nassau - SJRWMD	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	33	0.04	33	0.05	33	0.06	33	0.06	33	0.06	33	0.06	33	0.06	0%	50%	0.09
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Vegetables (Fresh Market)	18	0.01	18	0.02	18	0.02	18	0.02	18	0.02	18	0.02	18	0.02	0%	100%	0.03
	Field Crops	681	0.33	681	0.47	681	0.47	681	0.47	681	0.47	681	0.47	681	0.47	0%	42%	0.70
	Greenhouse/Nursery	93	0.16	89	0.22	89	0.23	89	0.23	89	0.24	89	0.24	89	0.25	-4%	56%	0.28
	Hay	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Sod	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.13	0	0.19	0	0.19	0	0.19	0	0.19	0	0.19	0	0.19	N/A	46%	0.19
	Total	**825**	**0.67**	**821**	**0.95**	**821**	**0.97**	**821**	**0.97**	**821**	**0.98**	**821**	**0.98**	**821**	**0.99**	**0%**	**48%**	**1.29**
Putnam - SJRWMD	Citrus	233	0.12	199	0.13	199	0.14	199	0.14	199	0.14	199	0.15	199	0.14	-15%	17%	0.23
	Fruit (Non-citrus)	619	1.05	611	1.13	663	1.24	877	1.64	939	1.77	1,015	1.92	1,015	1.94	64%	85%	2.79
	Potatoes	4,672	5.64	4,675	6.09	4,681	6.19	4,681	6.26	4,695	6.31	4,702	6.39	4,752	6.52	2%	16%	9.97
	Vegetables (Fresh Market)	1,365	1.80	1,546	1.95	1,797	2.29	1,959	2.53	2,117	2.76	2,298	3.02	2,487	3.29	82%	83%	4.41
	Field Crops	322	0.23	343	0.25	424	0.32	550	0.41	841	0.64	1,106	0.85	1,337	1.03	315%	348%	1.53
	Greenhouse/Nursery	2,623	5.65	2,508	6.10	2,624	6.43	2,624	6.43	2,665	6.60	2,735	6.83	2,860	7.19	9%	27%	8.20
	Hay	1,108	0.51	563	0.55	650	0.61	744	0.71	772	0.73	772	0.72	782	0.71	-29%	39%	1.17
	Sod	207	0.31	356	0.33	356	0.33	356	0.33	356	0.33	356	0.34	356	0.34	72%	10%	0.45
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.46	0	0.50	0	0.50	0	0.50	0	0.50	0	0.50	0	0.50	N/A	9%	0.50
	Total	**11,149**	**15.76**	**10,801**	**17.03**	**11,394**	**18.05**	**11,990**	**18.95**	**12,584**	**19.78**	**13,183**	**20.72**	**13,788**	**21.66**	**24%**	**37%**	**29.25**
St. Johns - SJRWMD	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Potatoes	12,772	10.92	12,620	15.47	12,399	15.32	11,932	14.83	11,527	14.45	11,224	14.14	11,019	13.95	-14%	28%	21.34
	Vegetables (Fresh Market)	4,777	4.39	4,721	6.22	4,641	6.18	4,630	6.23	4,564	6.19	4,432	6.07	4,284	5.91	-10%	35%	7.92
	Field Crops	2,210	1.28	2,071	1.81	2,071	1.83	2,071	1.81	2,071	1.87	1,953	1.74	1,819	1.61	-18%	26%	2.39
	Greenhouse/Nursery	292	0.36	195	0.51	158	0.44	158	0.44	133	0.38	133	0.38	133	0.37	-54%	3%	0.43
	Hay	549	0.30	405	0.43	405	0.44	405	0.43	405	0.43	405	0.44	382	0.41	-30%	37%	0.67
	Sod	1,444	0.89	1,362	1.26	1,172	1.08	1,172	1.07	1,172	1.08	1,172	1.09	1,172	1.10	-19%	24%	1.44
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.04	0	0.06	0	0.06	0	0.06	0	0.06	0	0.06	0	0.06	N/A	50%	0.06
	Total	**22,044**	**18.18**	**21,374**	**25.76**	**20,846**	**25.35**	**20,368**	**24.87**	**19,872**	**24.46**	**19,319**	**23.92**	**18,809**	**23.41**	**-15%**	**29%**	**34.25**

Table B-7a, Continued. Agricultural Irrigation Self-supply Water Use (Including Miscellaneous Water Use) and Acreage for 2015, 5-in-10 Year Water Demand Projections and Acreage Projections for 2020-2045, and 1-in-10 Year Water Demand Projections for 2045, by Crop Category by County, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	Crop Category	2015 Estimated Agriculture		2020 Projected Agriculture		2025 Projected Agriculture		2030 Projected Agriculture		2035 Projected Agriculture		2040 Projected Agriculture		2045 Projected Agriculture		Percent Change 2015-2045		2045 (1-in-10) Demand
		Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acreage	MGD	
Suwannee - SRWMD	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	110	0.59	311	0.63	475	0.93	579	1.10	652	1.23	721	1.36	923	1.72	739%	192%	2.42
	Potatoes	1,294	1.65	1,617	1.77	1,617	1.77	1,631	1.80	1,681	1.86	1,705	1.89	1,705	1.90	32%	15%	2.76
	Vegetables (Fresh Market)	4,317	6.01	5,080	6.45	5,609	7.18	6,061	7.82	6,622	8.60	7,102	9.27	7,540	9.88	75%	64%	12.94
	Field Crops	17,067	16.04	22,944	17.22	23,201	17.56	23,504	17.93	23,862	18.46	24,313	19.04	24,684	19.52	45%	22%	24.79
	Greenhouse/Nursery	780	2.24	946	2.40	1,235	3.05	1,235	3.05	1,398	3.41	1,568	3.80	1,793	4.31	130%	92%	4.87
	Hay	4,366	5.11	5,693	5.49	5,737	5.55	6,117	5.87	6,172	5.85	6,233	5.86	6,294	5.82	44%	14%	7.91
	Sod	68	0.06	86	0.06	86	0.06	86	0.05	86	0.06	86	0.06	86	0.06	26%	0%	0.07
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	2.21	0	2.37	0	2.37	0	2.37	0	2.37	0	2.37	0	2.37	N/A	7%	2.37
	Total	**28,002**	**33.90**	**36,677**	**36.39**	**37,960**	**38.47**	**39,213**	**39.99**	**40,473**	**41.84**	**41,728**	**43.65**	**43,025**	**45.58**	**54%**	**34%**	**58.13**
Union - SRWMD	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	203	0.35	222	0.38	263	0.46	263	0.46	263	0.46	300	0.53	300	0.53	48%	51%	0.74
	Potatoes	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Vegetables (Fresh Market)	343	0.57	456	0.62	502	0.68	589	0.80	615	0.84	644	0.88	706	0.96	106%	68%	1.26
	Field Crops	46	0.00	6	0.00	33	0.03	33	0.03	97	0.07	109	0.08	137	0.10	198%	N/A	0.13
	Greenhouse/Nursery	25	0.03	25	0.03	40	0.07	40	0.07	47	0.08	47	0.08	54	0.10	116%	233%	0.11
	Hay	97	0.12	161	0.13	161	0.13	168	0.16	174	0.16	205	0.21	205	0.21	111%	75%	0.28
	Sod	41	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	-100%	N/A	0.00
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	0.15	0	0.16	0	0.16	0	0.16	0	0.16	0	0.16	0	0.16	N/A	7%	0.16
	Total	**755**	**1.22**	**870**	**1.32**	**999**	**1.53**	**1,093**	**1.68**	**1,196**	**1.77**	**1,305**	**1.94**	**1,402**	**2.06**	**86%**	**69%**	**2.68**
SJRWMD Region 1 Total	Citrus	253	0.12	199	0.13	199	0.14	199	0.14	199	0.14	199	0.15	199	0.14	-21%	17%	0.23
	Fruit (Non-citrus)	1,797	3.29	1,791	3.50	1,843	3.67	2,057	4.08	2,128	4.27	2,188	4.40	2,188	4.42	22%	34%	6.38
	Potatoes	20,936	19.38	21,111	26.17	20,896	26.15	20,278	25.59	19,774	25.15	19,478	24.95	19,261	24.84	-8%	28%	37.99
	Vegetables (Fresh Market)	8,344	7.97	8,450	11.01	8,630	11.36	8,781	11.70	8,911	11.97	9,005	12.21	9,049	12.35	8%	55%	16.55
	Field Crops	3,902	2.22	3,786	3.00	3,867	3.11	4,115	3.28	4,414	3.58	4,561	3.67	4,658	3.73	19%	68%	5.53
	Greenhouse/Nursery	4,470	8.98	4,220	10.18	4,299	10.49	4,299	10.50	4,315	10.66	4,397	10.96	4,522	11.36	1%	27%	12.95
	Hay	3,139	1.69	2,202	2.13	2,289	2.17	2,383	2.23	2,411	2.26	2,353	2.20	2,302	2.09	-27%	24%	3.42
	Sod	4,814	2.95	4,675	3.99	4,289	3.64	4,289	3.60	4,289	3.62	4,191	3.56	4,191	3.58	-13%	21%	5.14
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	1.22	0	1.39	0	1.39	0	1.39	0	1.39	0	1.39	0	1.39	N/A	14%	1.39
	Total	**47,655**	**47.82**	**46,434**	**61.50**	**46,312**	**62.12**	**46,401**	**62.51**	**46,441**	**63.04**	**46,372**	**63.49**	**46,370**	**63.90**	**-3%**	**34%**	**89.58**
SRWMD NFRWSP Total	Citrus	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Fruit (Non-citrus)	1,005	2.84	1,357	2.77	1,763	3.51	2,080	4.06	2,317	4.52	2,631	5.09	2,951	5.67	194%	100%	8.18
	Potatoes	1,535	2.04	1,919	2.11	1,941	2.14	1,997	2.21	2,115	2.35	2,186	2.43	2,264	2.54	47%	25%	3.69
	Vegetables (Fresh Market)	10,670	15.83	12,070	15.54	13,309	17.26	14,627	19.11	15,859	20.85	16,932	22.35	18,039	23.90	69%	51%	31.31
	Field Crops	46,175	43.22	56,701	42.81	57,468	43.77	58,228	44.73	59,420	46.30	60,542	47.78	61,631	49.16	33%	14%	62.42
	Greenhouse/Nursery	2,517	6.74	2,650	6.52	3,246	7.86	3,285	7.94	3,630	8.71	4,099	9.79	4,702	11.15	87%	65%	12.60
	Hay	11,293	12.04	12,722	12.12	13,040	12.32	13,727	12.82	13,843	12.79	14,052	12.85	14,203	12.81	26%	6%	17.42
	Sod	109	0.06	86	0.06	86	0.06	86	0.05	86	0.06	86	0.06	86	0.06	-21%	0%	0.07
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	6.15	0	6.21	0	6.21	0	6.21	0	6.21	0	6.21	0	6.21	N/A	1%	6.21
	Total	**73,304**	**88.92**	**87,505**	**88.14**	**90,853**	**93.13**	**94,030**	**97.13**	**97,270**	**101.79**	**100,528**	**106.56**	**103,876**	**111.50**	**42%**	**25%**	**141.90**

Table B-7a, Continued. Agricultural Irrigation Self-supply Water Use (Including Miscellaneous Water Use) and Acreage for 2015, 5-in-10 Year Water Demand Projections and Acreage Projections for 2020-2045, and 1-in-10 Year Water Demand Projections for 2045, by Crop Category by County, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	Crop Category	2015 Estimated Agriculture		2020 Projected Agriculture		2025 Projected Agriculture		2030 Projected Agriculture		2035 Projected Agriculture		2040 Projected Agriculture		2045 Projected Agriculture		Percent Change 2015-2045		2045 (1-in-10) Demand
		Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acres	MGD	Acreage	MGD	
NFRWSP Total	Citrus	253	0.12	199	0.13	199	0.14	199	0.14	199	0.14	199	0.15	199	0.14	-21%	17%	0.23
	Fruit (Non-citrus)	2,802	6.13	3,148	6.27	3,606	7.18	4,137	8.14	4,445	8.79	4,819	9.49	5,139	10.09	83%	65%	14.56
	Potatoes	22,471	21.42	23,030	28.28	22,837	28.29	22,275	27.80	21,889	27.50	21,664	27.38	21,525	27.38	-4%	28%	41.68
	Vegetables (Fresh Market)	19,014	23.80	20,520	26.55	21,939	28.62	23,408	30.81	24,770	32.82	25,937	34.56	27,088	36.25	42%	52%	47.86
	Field Crops	50,077	45.44	60,487	45.81	61,335	46.88	62,343	48.01	63,834	49.88	65,103	51.45	66,289	52.89	32%	16%	67.95
	Greenhouse/Nursery	6,987	15.72	6,870	16.70	7,545	18.35	7,584	18.44	7,945	19.37	8,496	20.75	9,224	22.51	32%	43%	25.55
	Hay	14,432	13.73	14,924	14.25	15,329	14.49	16,110	15.05	16,254	15.05	16,405	15.05	16,505	14.90	14%	9%	20.84
	Sod	4,923	3.01	4,761	4.05	4,375	3.70	4,375	3.65	4,375	3.68	4,277	3.62	4,277	3.64	-13%	21%	5.21
	Sugarcane	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	N/A	N/A	0.00
	Miscellaneous	0	7.37	0	7.60	0	7.60	0	7.60	0	7.60	0	7.60	0	7.60	N/A	3%	7.60
	Total	**120,959**	**136.74**	**133,939**	**149.64**	**137,165**	**155.25**	**140,431**	**159.64**	**143,711**	**164.83**	**146,900**	**170.05**	**150,246**	**175.40**	**24%**	**28%**	**231.48**

Notes:

1.) All water use is shown in million gallons per day.

2.) Rounding errors account for nominal discrepancies.

3.) 2015 total water use data source is NFSEG master geodatabase with metered and estimated agricultural water use. The 2015 water use by crop was estimated using 2020 FSAID VII ratios.

4.) 2015 acreage source is FSAID IV published June 30, 2017 by The Balmoral Group for the Florida Department of Agriculture and Consumer Services.

5.) 2020 - 2045 acreage projections and 2020 - 2045 average and 1-in-10 water demand projections derived from FSAID VII published June 30, 2020 by The Balmoral Group for the Florida Department of Agriculture and Consumer Services.

Table B-7b. Miscellaneous Agricultural Self-supply Water Use for 2015, 5-in-10 Year Demand Projections for 2020-2045, and 1-in-10 Year Demand Projections for 2045 by County, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	District	2015 Water Use				2020-2045 Demand Projections				Percent Change 2015-2045
		Dairy	Livestock	Aquaculture	Total	Dairy	Livestock	Aquaculture	Total	
Alachua	SJRWMD	0.06	0.13	0.00	**0.19**	0.06	0.14	0.00	**0.20**	5%
Alachua	SRWMD	0.21	0.47	0.09	**0.76**	0.19	0.43	0.08	**0.70**	-8%
Alachua	**Total**	**0.27**	**0.60**	**0.09**	**0.95**	**0.25**	**0.57**	**0.08**	**0.90**	**-5%**
Baker	SJRWMD	0.00	0.06	0.02	**0.08**	0.00	0.07	0.03	**0.10**	25%
Baker	SRWMD	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A
Baker	**Total**	**0.00**	**0.06**	**0.02**	**0.08**	**0.00**	**0.07**	**0.03**	**0.10**	**25%**
Bradford	SJRWMD	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A
Bradford	SRWMD	0.00	0.13	0.15	**0.28**	0.00	0.13	0.16	**0.29**	4%
Bradford	**Total**	**0.00**	**0.13**	**0.15**	**0.28**	**0.00**	**0.13**	**0.16**	**0.29**	**4%**
Clay	SJRWMD	0.00	0.05	0.00	**0.05**	0.00	0.06	0.00	**0.06**	20%
Columbia	SRWMD	0.00	0.37	0.02	**0.38**	0.00	0.34	0.02	**0.35**	-8%
Duval	SJRWMD	0.00	0.09	0.14	**0.23**	0.00	0.08	0.13	**0.21**	-9%
Flagler	SJRWMD	0.00	0.04	0.00	**0.04**	0.00	0.07	0.00	**0.07**	75%
Gilchrist	SRWMD	1.78	0.45	0.00	**2.13**	1.78	0.45	0.00	**2.13**	0%
Hamilton	SRWMD	0.00	0.24	0.00	**0.24**	0.00	0.21	0.00	**0.21**	-13%
Nassau	SJRWMD	0.03	0.05	0.05	**0.13**	0.04	0.08	0.07	**0.19**	46%
Putnam	SJRWMD	0.13	0.14	0.19	**0.46**	0.14	0.15	0.21	**0.50**	9%
St. Johns	SJRWMD	0.00	0.03	0.01	**0.04**	0.00	0.04	0.02	**0.06**	50%
Suwannee	SRWMD	1.04	1.16	0.01	**2.21**	1.12	1.24	0.01	**2.37**	7%
Union	SRWMD	0.00	0.15	0.00	**0.15**	0.00	0.15	0.16	**0.16**	7%
SJRWMD Region 1 Total		**0.22**	**0.59**	**0.41**	**1.22**	**0.24**	**0.69**	**0.46**	**1.39**	**14%**
SRWMD NFRWSP Total		**3.03**	**2.97**	**0.27**	**6.15**	**3.09**	**2.95**	**0.43**	**6.21**	**1%**
NFRWSP Total		**3.25**	**3.56**	**0.68**	**7.37**	**3.33**	**3.64**	**0.89**	**7.60**	**3%**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2015 total water use data source is NFSEG master geodatabase with metered and estimated agricultural water use. The 2015 water use by category was estimated using 2020 FSAID VII ratios.
4.) 2020 - 2045 projected water demand derived from FSAID VII AG layer, published June 30, 2020 by the Balmoral Group for the Florida Department of Agriculture and Consumer Services.
5.) FSAID VII AG layer, published June 30, 2020 by the Balmoral Group for the Florida Department of Agriculture and Consumer Services assumes no increase for 1-in-10 year drought conditions.

Table B-8. Landscape / Recreational Self-supply Water Use for 2015 and 5-in-10 Year Demand Projections for 2020-2045, and 1-in-10 Year Demand Projections for 2045 by County, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	District	Water Use			Demand Projections (5-in-10)																									Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045						2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Alachua	SJRWMD	0.19	0.08	**0.27**	0.20	0.08	0.00	**0.28**	0.20	0.09	0.00	**0.29**	0.21	0.09	0.00	**0.30**	0.22	0.09	0.00	**0.31**	0.23	0.09	0.00	**0.32**	0.23	0.10	0.00	**0.33**	22%	0.39	0.17	0.00	**0.56**
Alachua	SRWMD	1.04	0.00	**1.04**	1.18	0.00	0.00	**1.18**	1.21	0.00	0.00	**1.21**	1.20	0.00	0.00	**1.20**	1.23	0.00	0.00	**1.23**	1.23	0.00	0.00	**1.23**	1.22	0.00	0.00	**1.22**	17%	1.23	0.00	0.00	**1.23**
Alachua	**Total**	**1.23**	**0.08**	**1.31**	**1.38**	**0.08**	**0.00**	**1.46**	**1.41**	**0.09**	**0.00**	**1.50**	**1.41**	**0.09**	**0.00**	**1.50**	**1.45**	**0.09**	**0.00**	**1.54**	**1.46**	**0.09**	**0.00**	**1.55**	**1.45**	**0.10**	**0.00**	**1.55**	**18%**	**1.62**	**0.17**	**0.00**	**1.79**
Baker	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Baker	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Baker	**Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**N/A**	**0.00**	**0.00**	**0.00**	**0.00**
Bradford	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Bradford	SRWMD	0.30	0.00	**0.30**	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**	0%	0.35	0.00	0.00	**0.35**
Bradford	**Total**	**0.30**	**0.00**	**0.30**	**0.30**	**0.00**	**0.00**	**0.30**	**0.30**	**0.00**	**0.00**	**0.30**	**0.30**	**0.00**	**0.00**	**0.30**	**0.30**	**0.00**	**0.00**	**0.30**	**0.30**	**0.00**	**0.00**	**0.30**	**0.30**	**0.00**	**0.00**	**0.30**	**0%**	**0.35**	**0.00**	**0.00**	**0.35**
Clay	SJRWMD	0.21	0.20	**0.41**	0.44	0.22	0.00	**0.66**	0.59	0.26	0.00	**0.85**	0.67	0.30	0.00	**0.97**	0.75	0.35	0.00	**1.10**	0.80	0.37	0.00	**1.17**	0.83	0.40	0.00	**1.23**	200%	1.37	0.83	0.00	**1.70**
Columbia	SRWMD	0.73	0.00	**0.73**	0.76	0.00	0.00	**0.76**	0.79	0.00	0.00	**0.79**	0.82	0.00	0.00	**0.82**	0.84	0.00	0.00	**0.84**	0.86	0.00	0.00	**0.86**	0.88	0.00	0.00	**0.88**	21%	0.91	0.00	0.00	**0.91**
Duval	SJRWMD	1.64	3.19	**4.83**	1.94	3.77	0.00	**5.71**	2.02	3.92	0.00	**5.94**	2.09	4.07	0.00	**6.16**	2.16	4.21	0.00	**6.37**	2.23	4.35	0.00	**6.58**	2.30	4.47	0.00	**6.77**	40%	3.17	6.17	0.00	**9.34**
Flagler	SJRWMD	0.43	1.41	**1.84**	0.48	1.59	0.00	**2.07**	0.54	1.75	0.00	**2.29**	0.58	1.90	0.00	**2.48**	0.61	2.02	0.00	**2.63**	0.64	2.09	0.00	**2.73**	0.66	2.15	0.00	**2.81**	53%	0.76	2.50	0.00	**3.26**
Gilchrist	SRWMD	0.16	0.00	**0.16**	0.17	0.00	0.00	**0.17**	0.18	0.00	0.00	**0.18**	0.19	0.00	0.00	**0.19**	0.20	0.00	0.00	**0.20**	0.21	0.00	0.00	**0.21**	0.22	0.00	0.00	**0.22**	38%	0.23	0.00	0.00	**0.23**
Hamilton	SRWMD	0.10	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0%	0.17	0.00	0.00	**0.17**
Nassau	SJRWMD	0.86	1.64	**2.50**	0.76	1.46	0.00	**2.22**	0.87	1.67	0.00	**2.54**	0.98	1.87	0.00	**2.85**	1.07	2.03	0.00	**3.10**	1.15	2.20	0.00	**3.35**	1.23	2.36	0.00	**3.59**	44%	1.51	2.87	0.00	**4.38**
Putnam	SJRWMD	0.37	0.49	**0.86**	0.37	0.50	0.00	**0.87**	0.37	0.50	0.00	**0.87**	0.37	0.50	0.00	**0.87**	0.37	0.50	0.00	**0.87**	0.37	0.50	0.00	**0.87**	0.37	0.50	0.00	**0.87**	1%	0.68	0.90	0.00	**1.58**
St. Johns	SJRWMD	0.52	4.19	**4.71**	0.72	5.84	0.00	**6.56**	0.84	6.77	0.00	**7.61**	0.93	7.50	0.00	**8.43**	1.01	8.18	0.00	**9.19**	1.10	8.82	0.00	**9.92**	1.18	9.50	0.00	**10.68**	127%	1.42	11.40	0.00	**12.82**
Suwannee	SRWMD	0.29	0.00	**0.29**	0.30	0.00	0.00	**0.30**	0.31	0.00	0.00	**0.31**	0.32	0.00	0.00	**0.32**	0.33	0.00	0.00	**0.33**	0.34	0.00	0.00	**0.34**	0.35	0.00	0.00	**0.35**	21%	0.43	0.00	0.00	**0.43**
Union	SRWMD	0.10	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0%	0.14	0.00	0.00	**0.14**
SJRWMD Region 1 Total		**4.22**	**11.20**	**15.42**	**4.91**	**13.46**	**0.00**	**18.37**	**5.43**	**14.96**	**0.00**	**20.39**	**5.83**	**16.23**	**0.00**	**22.06**	**6.19**	**17.38**	**0.00**	**23.57**	**6.52**	**18.42**	**0.00**	**24.94**	**6.80**	**19.48**	**0.00**	**26.28**	**70%**	**9.30**	**24.84**	**0.00**	**33.64**
SRWMD NFRWSP Total		**2.72**	**0.00**	**2.72**	**2.91**	**0.00**	**0.00**	**2.91**	**2.99**	**0.00**	**0.00**	**2.99**	**3.03**	**0.00**	**0.00**	**3.03**	**3.10**	**0.00**	**0.00**	**3.10**	**3.14**	**0.00**	**0.00**	**3.14**	**3.17**	**0.00**	**0.00**	**3.17**	**17%**	**3.46**	**0.00**	**0.00**	**3.46**
NFRWSP Total		**6.94**	**11.20**	**18.14**	**7.82**	**13.46**	**0.00**	**21.28**	**8.42**	**14.96**	**0.00**	**23.38**	**8.86**	**16.23**	**0.00**	**25.09**	**9.29**	**17.38**	**0.00**	**26.67**	**9.66**	**18.42**	**0.00**	**28.08**	**9.97**	**19.48**	**0.00**	**29.45**	**62%**	**12.76**	**24.84**	**0.00**	**37.10**

Notes:

1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2015 water use data source is NFSEG master geodatabase with metered and estimated landscape/recreational water use.
4.) 2020 - 2045 projected surface water demand was interpolated based on 2015 percentages.
5.) 2045 1-in-10 rainfall year demands estimated using percentage above average from highest water year from 2014 - 2018.
6.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.
7.) Projected groundwater demand for Clay County includes an increase in 2025 for the Clay County Utility Authority Reclaimed Water Supplementation.

Table B-8a. 2014-2018 Water Use, Total County Population, and Five-Year Gross Per Capita Averages for Landscape / Recreational Self-supply and Landscape/Recreational Self-supply Water Demand Increases, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	District	Total County Water Use					2014-2018 Average	High Year	% Above Average	County Population Within District					2014-2018 Average GPCD
		2014	2015	2016	2017	2018				2014	2015	2016	2017	2018	
Alachua	SJRWMD	0.39	0.27	0.17	0.20	0.13	0.23	0.39	70%	195,065	203,104	197,528	199,613	201,523	1
Alachua	SRWMD	1.05	1.04	1.04	1.03	1.03	1.04	1.05	1%	54,895	51,364	58,914	59,804	61,389	18
Alachua	**Total**	**1.44**	**1.31**	**1.21**	**1.23**	**1.16**	**1.27**	**1.44**	**13%**	**249,960**	**254,468**	**256,442**	**259,417**	**262,912**	**N/A**
Baker	SJRWMD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0%	26,532	26,556	26,506	26,729	27,189	0
Baker	SRWMD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0%	503	503	489	498	507	0
Baker	**Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0%**	**27,035**	**27,059**	**26,995**	**27,227**	**27,696**	**N/A**
Bradford	SJRWMD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0%	2,301	2,289	2,312	2,319	2,366	0
Bradford	SRWMD	0.30	0.30	0.30	0.30	0.09	0.26	0.30	15%	20,803	20,751	20,853	20,962	20,741	**12**
Bradford	**Total**	**0.30**	**0.30**	**0.30**	**0.30**	**0.09**	**0.26**	**0.30**	**15%**	**23,104**	**23,040**	**23,165**	**23,281**	**23,107**	**N/A**
Clay	SJRWMD	0.32	0.41	0.94	1.23	0.48	0.68	0.94	38%	198,718	202,600	206,498	209,718	213,169	3
Columbia	SRWMD	0.72	0.73	0.70	0.70	0.69	0.71	0.73	3%	63,780	64,037	64,589	65,059	65,770	11
Duval	SJRWMD	4.60	4.83	6.81	4.82	3.69	4.95	6.81	38%	896,665	851,884	946,637	959,764	975,386	5
Flagler	SJRWMD	1.85	1.84	2.11	1.98	1.32	1.82	2.11	16%	103,993	99,769	106,175	107,946	115,564	17
Gilchrist	SRWMD	0.17	0.16	0.16	0.16	0.15	0.16	0.17	6%	16,007	16,158	16,340	16,475	16,704	10
Hamilton	SRWMD	0.19	0.10	0.10	0.08	0.08	0.11	0.19	73%	12,064	12,141	12,146	12,106	12,162	9
Nassau	SJRWMD	2.34	2.50	3.01	2.61	2.08	2.51	3.05	22%	76,619	77,817	79,234	81,833	84,155	31
Putnam	SJRWMD	0.52	0.86	0.62	1.77	1.09	0.97	1.77	82%	78,327	77,620	78,876	79,171	79,125	12
St. Johns	SJRWMD	4.30	4.71	6.03	5.91	4.17	5.02	6.03	20%	210,162	216,513	223,181	232,997	244,161	22
Suwannee	SRWMD	0.32	0.29	0.29	0.19	0.21	0.26	0.32	23%	41,219	41,532	41,644	42,097	42,817	6
Union	SRWMD	0.14	0.10	0.09	0.09	0.09	0.10	0.14	40%	10,804	11,015	10,898	10,735	10,767	9
SJRWMD Region 1 Total		**14.32**	**15.42**	**19.69**	**18.52**	**12.96**	**16.18**	**19.69**	**22%**	**1,788,382**	**1,758,152**	**1,866,947**	**1,900,090**	**1,942,638**	**N/A**
SRWMD NFRWSP Total		**2.89**	**2.72**	**2.68**	**2.55**	**2.34**	**2.64**	**2.89**	**9%**	**220,075**	**217,501**	**225,873**	**227,736**	**230,857**	**N/A**
NFRWSP Total		**17.21**	**18.14**	**22.37**	**21.07**	**15.30**	**18.82**	**22.58**	**20%**	**2,008,457**	**1,975,653**	**2,092,820**	**2,127,826**	**2,173,495**	**N/A**

County	District	County Population Projections Within District							Increase in County Population Within District						Change in Landscape / Recreational Self-supply Water Demand					
		2015	2020	2025	2030	2035	2040	2045	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045	2020	2025	2030	2035	2040	2045
Alachua	SJRWMD	203,104	210,430	220,210	231,023	237,903	245,027	251,193	7,326	9,780	10,813	6,880	7,124	6,166	0.01	0.01	0.01	0.01	0.01	0.01
Alachua	SRWMD	51,364	58,905	60,825	60,095	61,797	61,849	61,558	7,541	1,920	-730	1,702	52	-291	0.14	0.03	-0.01	0.03	0.00	-0.01
Alachua	**Total**	**254,468**	**269,335**	**281,035**	**291,118**	**299,700**	**306,876**	**312,751**	**14,867**	**11,700**	**10,083**	**8,582**	**7,176**	**5,875**	**0.15**	**0.04**	**0.00**	**0.04**	**0.01**	**0.00**
Baker	SJRWMD	26,556	27,440	28,838	30,026	30,922	31,667	32,394	884	1,398	1,188	896	745	727	0.00	0.00	0.00	0.00	0.00	0.00
Baker	SRWMD	503	521	549	573	591	609	623	18	28	24	18	18	14	0.00	0.00	0.00	0.00	0.00	0.00
Baker	**Total**	**27,059**	**27,961**	**29,387**	**30,599**	**31,513**	**32,276**	**33,017**	**902**	**1,426**	**1,212**	**914**	**763**	**741**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Bradford	SJRWMD	2,289	2,475	2,872	3,069	3,069	3,234	3,418	186	397	197	0	165	184	0.00	0.00	0.00	0.00	0.00	0.00
Bradford	SRWMD	20,751	21,094	21,097	21,120	21,351	21,282	20,956	343	3	23	231	-69	-326	0.00	0.00	0.00	0.00	0.00	0.00
Bradford	**Total**	**23,040**	**23,569**	**23,969**	**24,189**	**24,420**	**24,516**	**24,374**	**529**	**400**	**220**	**231**	**96**	**-142**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Clay	SJRWMD	202,600	220,871	247,378	275,396	306,470	322,769	338,510	18,271	26,507	28,018	31,074	16,299	15,741	0.05	0.08	0.08	0.09	0.05	0.05
Columbia	SRWMD	64,037	66,323	69,323	71,823	73,823	75,523	77,023	2,286	3,000	2,500	2,000	1,700	1,500	0.03	0.03	0.03	0.02	0.02	0.02
Duval	SJRWMD	851,884	1,027,320	1,073,631	1,117,321	1,159,034	1,200,741	1,238,401	175,436	46,311	43,690	41,713	41,707	37,660	0.88	0.23	0.22	0.21	0.21	0.19
Flagler	SJRWMD	99,769	113,387	126,488	137,761	146,696	152,470	157,026	13,618	13,101	11,273	8,935	5,774	4,556	0.23	0.22	0.19	0.15	0.10	0.08
Gilchrist	SRWMD	16,158	17,214	18,114	18,914	19,614	20,114	20,614	1,056	900	800	700	500	500	0.01	0.01	0.01	0.01	0.01	0.01
Hamilton	SRWMD	12,141	12,081	12,281	12,381	12,381	12,381	12,481	-60	200	100	0	0	100	0.00	0.00	0.00	0.00	0.00	0.00
Nassau	SJRWMD	77,817	68,650	78,852	88,870	96,828	104,742	112,428	-9,167	10,202	10,018	7,958	7,914	7,686	-0.28	0.32	0.31	0.25	0.25	0.24
Putnam	SJRWMD	77,620	78,189	78,461	78,596	78,825	79,058	79,317	569	272	135	229	233	259	0.01	0.00	0.00	0.00	0.00	0.00
St. Johns	SJRWMD	216,513	300,530	348,452	385,610	420,358	453,570	487,953	84,017	47,922	37,158	34,748	33,212	34,383	1.85	1.05	0.82	0.76	0.73	0.76
Suwannee	SRWMD	41,532	43,899	46,299	48,399	50,099	51,499	52,699	2,367	2,400	2,100	1,700	1,400	1,200	0.01	0.01	0.01	0.01	0.01	0.01
Union	SRWMD	11,015	10,767	10,867	10,867	10,967	10,967	10,967	-248	100	0	100	0	0	0.00	0.00	0.00	0.00	0.00	0.00
SJRWMD Region 1 Total		**1,758,152**	**2,049,292**	**2,205,182**	**2,347,672**	**2,480,105**	**2,593,278**	**2,700,640**	**291,140**	**155,890**	**142,490**	**132,433**	**113,173**	**107,362**	**2.75**	**1.91**	**1.63**	**1.47**	**1.35**	**1.33**
SRWMD NFRWSP Total		**217,501**	**230,804**	**239,355**	**244,172**	**250,623**	**254,224**	**256,921**	**13,303**	**8,551**	**4,817**	**6,451**	**3,601**	**2,697**	**0.19**	**0.08**	**0.04**	**0.07**	**0.04**	**0.03**
NFRWSP Total		**1,975,653**	**2,280,096**	**2,444,537**	**2,591,844**	**2,730,728**	**2,847,502**	**2,957,561**	**304,443**	**164,441**	**147,307**	**138,884**	**116,774**	**110,059**	**2.94**	**1.99**	**1.67**	**1.54**	**1.39**	**1.36**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2014 - 2018 water use data source is NFSEG master geodatabase with metered and estimated landscape / recreational water use.
4.) 2014 - 2018 population obtained from Technical Staff Reports, BEBR estimates of population, DEP MOR and Basic Facility Report Data, parcel data, published annual reports, and permittee surveys.
5.) Projected population for years 2020 - 2045 are based on BEBR Population Projections: Volume 53, Bulletin 186, Published January 2020.

Table B-9. Commercial / Industrial / Institutional and Mining / Dewatering Self-supply Water Use for 2015 and 5-in-10 Year Demand Projections for 2020-2045, by County, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	District	Water Use			Demand Projections (5-in-10)																								Percent Change 2015-2045
		2015			2020				2025				2030				2035				2040				2045				
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	
Alachua	SJRWMD	0.11	0.00	**0.11**	0.12	0.00	0.00	**0.12**	0.13	0.00	0.00	**0.13**	0.14	0.00	0.00	**0.14**	0.15	0.00	0.00	**0.15**	0.16	0.00	0.00	**0.16**	0.17	0.00	0.00	**0.17**	55%
Alachua	SRWMD	0.36	0.00	**0.36**	0.41	0.00	0.00	**0.41**	0.42	0.00	0.00	**0.42**	0.42	0.00	0.00	**0.42**	0.43	0.00	0.00	**0.43**	0.43	0.00	0.00	**0.43**	0.43	0.00	0.00	**0.43**	19%
Alachua	**Total**	**0.47**	**0.00**	**0.47**	**0.53**	**0.00**	**0.00**	**0.53**	**0.55**	**0.00**	**0.00**	**0.55**	**0.56**	**0.00**	**0.00**	**0.56**	**0.58**	**0.00**	**0.00**	**0.58**	**0.59**	**0.00**	**0.00**	**0.59**	**0.60**	**0.00**	**0.00**	**0.60**	**28%**
Baker	SJRWMD	0.15	0.27	**0.42**	0.15	0.28	0.00	**0.43**	0.16	0.29	0.00	**0.45**	0.17	0.30	0.00	**0.47**	0.17	0.31	0.00	**0.48**	0.17	0.32	0.00	**0.49**	0.18	0.32	0.00	**0.50**	19%
Baker	SRWMD	0.21	0.00	**0.21**	0.22	0.00	0.00	**0.22**	0.23	0.00	0.00	**0.23**	0.24	0.00	0.00	**0.24**	0.25	0.00	0.00	**0.25**	0.26	0.00	0.00	**0.26**	0.27	0.00	0.00	**0.27**	29%
Baker	**Total**	**0.36**	**0.27**	**0.63**	**0.37**	**0.28**	**0.00**	**0.65**	**0.39**	**0.29**	**0.00**	**0.68**	**0.41**	**0.30**	**0.00**	**0.71**	**0.42**	**0.31**	**0.00**	**0.73**	**0.43**	**0.32**	**0.00**	**0.75**	**0.45**	**0.32**	**0.00**	**0.77**	**22%**
Bradford	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A
Bradford	SRWMD	1.04	0.00	**1.04**	1.06	0.00	0.00	**1.06**	1.06	0.00	0.00	**1.06**	1.06	0.00	0.00	**1.06**	1.07	0.00	0.00	**1.07**	1.07	0.00	0.00	**1.07**	1.05	0.00	0.00	**1.05**	1%
Bradford	**Total**	**1.04**	**0.00**	**1.04**	**1.06**	**0.00**	**0.00**	**1.06**	**1.06**	**0.00**	**0.00**	**1.06**	**1.06**	**0.00**	**0.00**	**1.06**	**1.07**	**0.00**	**0.00**	**1.07**	**1.07**	**0.00**	**0.00**	**1.07**	**1.05**	**0.00**	**0.00**	**1.05**	**1%**
Clay	SJRWMD	0.31	0.00	**0.31**	0.33	0.00	0.00	**0.33**	0.36	0.00	0.00	**0.36**	0.39	0.00	0.00	**0.39**	0.42	0.00	0.00	**0.42**	0.44	0.00	0.00	**0.44**	0.46	0.00	0.00	**0.46**	48%
Columbia	SRWMD	0.41	0.00	**0.41**	0.42	0.00	0.00	**0.42**	0.44	0.00	0.00	**0.44**	0.46	0.00	0.00	**0.46**	0.47	0.00	0.00	**0.47**	0.48	0.00	0.00	**0.48**	0.49	0.00	0.00	**0.49**	20%
Duval	SJRWMD	14.16	0.79	**14.95**	16.65	0.93	0.00	**17.58**	17.30	0.97	0.00	**18.27**	17.93	1.00	0.00	**18.93**	18.53	1.03	0.00	**19.56**	19.12	1.07	0.00	**20.19**	19.65	1.10	0.00	**20.75**	39%
Flagler	SJRWMD	0.26	0.00	**0.26**	0.27	0.00	0.00	**0.27**	0.28	0.00	0.00	**0.28**	0.29	0.00	0.00	**0.29**	0.30	0.00	0.00	**0.30**	0.31	0.00	0.00	**0.31**	0.31	0.00	0.00	**0.31**	19%
Gilchrist	SRWMD	0.38	0.00	**0.38**	0.41	0.00	0.00	**0.41**	0.43	0.00	0.00	**0.43**	0.45	0.00	0.00	**0.45**	0.47	0.00	0.00	**0.47**	0.48	0.00	0.00	**0.48**	0.49	0.00	0.00	**0.49**	29%
Hamilton	SRWMD	22.93	17.19	**40.12**	22.93	17.19	0.00	**40.12**	22.93	17.19	0.00	**40.12**	22.93	17.19	0.00	**40.12**	22.93	17.19	0.00	**40.12**	22.93	17.19	0.00	**40.12**	22.93	17.19	0.00	**40.12**	0%
Nassau	SJRWMD	33.06	0.05	**33.11**	33.02	0.05	0.00	**33.07**	33.06	0.05	0.00	**33.11**	33.10	0.05	0.00	**33.15**	33.13	0.05	0.00	**33.18**	33.16	0.05	0.00	**33.21**	33.19	0.05	0.00	**33.24**	0%
Putnam	SJRWMD	3.69	23.85	**27.54**	3.69	23.87	0.00	**27.56**	3.69	23.88	0.00	**27.57**	3.70	23.88	0.00	**27.58**	3.70	23.89	0.00	**27.59**	3.70	23.90	0.00	**27.60**	3.70	23.91	0.00	**27.61**	0%
St. Johns	SJRWMD	0.56	0.20	**0.76**	0.74	0.27	0.00	**1.01**	0.85	0.30	0.00	**1.15**	0.93	0.33	0.00	**1.26**	1.00	0.36	0.00	**1.36**	1.08	0.38	0.00	**1.46**	1.15	0.41	0.00	**1.56**	105%
Suwannee	SRWMD	2.72	0.00	**2.72**	2.87	0.00	0.00	**2.87**	3.03	0.00	0.00	**3.03**	3.17	0.00	0.00	**3.17**	3.28	0.00	0.00	**3.28**	3.37	0.00	0.00	**3.37**	3.45	0.00	0.00	**3.45**	27%
Union	SRWMD	0.51	0.00	**0.51**	0.50	0.00	0.00	**0.50**	0.50	0.00	0.00	**0.50**	0.50	0.00	0.00	**0.50**	0.50	0.00	0.00	**0.50**	0.50	0.00	0.00	**0.50**	0.50	0.00	0.00	**0.50**	-2%
SJRWMD Region 1 Total		**52.30**	**25.16**	**77.46**	**54.97**	**25.40**	**0.00**	**80.37**	**55.83**	**25.49**	**0.00**	**81.32**	**56.65**	**25.56**	**0.00**	**82.21**	**57.40**	**25.64**	**0.00**	**83.04**	**58.14**	**25.72**	**0.00**	**83.86**	**58.81**	**25.79**	**0.00**	**84.60**	**9%**
SRWMD NFRWSP Total		**28.56**	**17.19**	**45.75**	**28.82**	**17.19**	**0.00**	**46.01**	**29.04**	**17.19**	**0.00**	**46.23**	**29.23**	**17.19**	**0.00**	**46.42**	**29.40**	**17.19**	**0.00**	**46.59**	**29.52**	**17.19**	**0.00**	**46.71**	**29.61**	**17.19**	**0.00**	**46.80**	**2%**
NFRWSP Total		**80.86**	**42.35**	**123.21**	**83.79**	**42.59**	**0.00**	**126.38**	**84.87**	**42.68**	**0.00**	**127.55**	**85.88**	**42.75**	**0.00**	**128.63**	**86.80**	**42.83**	**0.00**	**129.63**	**87.66**	**42.91**	**0.00**	**130.57**	**88.42**	**42.98**	**0.00**	**131.40**	**7%**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2015 water use data source is NFSEG master geodatabase with metered and estimated commercial/industrial/institutional and mining/dewatering water use.
4.) 2020 - 2045 projected surface water demand was interpolated based on 2015 percentages.
5.) The commercial/industrial/institutional and mining/dewatering water use category is not impacted by drought conditions, therefore the 5-in-10 2045 water demand also serves as the 1-in-10 water demand.
6.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-9a. 2014-2018 Water Use, Total County Population, and Five-Year Gross Per Capita Averages for Commercial / Industrial / Institutional and Mining / Dewatering Self-supply Water Demand Increases, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	District	Total County Water Use					County Population Within District					2014-2018 Average GPCD
		2014	2015	2016	2017	2018	2014	2015	2016	2017	2018	
Alachua	SJRWMD	0.10	0.11	0.11	0.12	0.06	195,065	203,104	197,528	199,613	201,523	1
Alachua	SRWMD	0.37	0.36	0.36	0.35	0.34	54,895	51,364	58,914	59,804	61,389	6
Alachua	**Total**	**0.47**	**0.47**	**0.47**	**0.47**	**0.40**	**249,960**	**254,468**	**256,442**	**259,417**	**262,912**	**2**
Baker	SJRWMD	0.47	0.42	0.34	0.39	0.35	26,532	26,556	26,506	26,729	27,189	15
Baker	SRWMD	0.20	0.21	0.19	0.18	0.19	503	503	489	498	507	388
Baker	**Total**	**0.67**	**0.63**	**0.53**	**0.57**	**0.54**	**27,035**	**27,059**	**26,995**	**27,227**	**27,696**	**22**
Bradford	SJRWMD	0.01	0.00	0.00	0.00	0.00	2,301	2,289	2,312	2,319	2,366	1
Bradford	SRWMD	0.90	1.04	1.02	1.01	1.06	20,803	20,751	20,853	20,962	20,741	48
Bradford	**Total**	**0.91**	**1.04**	**1.02**	**1.01**	**1.06**	**23,104**	**23,040**	**23,165**	**23,281**	**23,107**	**44**
Clay	SJRWMD	0.39	0.31	0.24	0.28	0.28	198,718	202,600	206,498	209,718	213,169	1
Columbia	SRWMD	0.41	0.41	0.41	0.36	0.35	63,780	64,037	64,589	65,059	65,770	6
Duval	SJRWMD	14.47	14.95	14.33	14.63	12.50	896,665	851,884	946,637	959,764	975,386	15
Flagler	SJRWMD	0.13	0.26	0.00	0.00	0.00	103,993	99,769	106,175	107,946	115,564	1
Gilchrist	SRWMD	0.40	0.38	0.42	0.44	0.54	16,007	16,158	16,340	16,475	16,704	27
Hamilton	SRWMD	0.07	0.07	0.07	0.07	0.07	12,064	12,141	12,146	12,106	12,162	6
Nassau	SJRWMD	0.15	0.17	0.35	0.39	0.38	76,619	77,817	79,234	81,833	84,155	4
Putnam	SJRWMD	2.73	3.59	3.67	3.74	3.25	78,327	77,620	78,876	79,171	79,125	43
St. Johns	SJRWMD	0.58	0.76	0.72	0.58	0.56	210,162	216,513	223,181	232,997	244,161	3
Suwannee	SRWMD	2.18	2.72	2.84	2.89	2.95	41,219	41,532	41,644	42,097	42,817	65
Union	SRWMD	0.53	0.51	0.53	0.52	0.51	10,804	11,015	10,898	10,735	10,767	48
SJRWMD Region 1 Total		**19.03**	**20.57**	**19.76**	**20.13**	**17.38**	**1,788,382**	**1,758,152**	**1,866,947**	**1,900,090**	**1,942,638**	**10**
SRWMD NFRWSP Total		**5.06**	**5.70**	**5.84**	**5.82**	**6.01**	**220,075**	**217,501**	**225,873**	**227,736**	**230,857**	**25**
NFRWSP Total		**24.09**	**26.27**	**25.60**	**25.95**	**23.39**	**2,008,457**	**1,975,653**	**2,092,820**	**2,127,826**	**2,173,495**	**12**

County	District	County Population Projections Within District							Increase in County Population Within District					
		2015	2020	2025	2030	2035	2040	2045	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045
Alachua	SJRWMD	203,104	210,430	220,210	231,023	237,903	245,027	251,193	7,326	9,780	10,813	6,880	7,124	6,166
Alachua	SRWMD	51,364	58,905	60,825	60,095	61,797	61,849	61,558	7,541	1,920	-730	1,702	52	-291
Alachua	**Total**	**254,468**	**269,335**	**281,035**	**291,118**	**299,700**	**306,876**	**312,751**	**14,867**	**11,700**	**10,083**	**8,582**	**7,176**	**5,875**
Baker	SJRWMD	26,556	27,440	28,838	30,026	30,922	31,667	32,394	884	1,398	1,188	896	745	727
Baker	SRWMD	503	521	549	573	591	609	623	18	28	24	18	18	14
Baker	**Total**	**27,059**	**27,961**	**29,387**	**30,599**	**31,513**	**32,276**	**33,017**	**902**	**1,426**	**1,212**	**914**	**763**	**741**
Bradford	SJRWMD	2,289	2,475	2,872	3,069	3,069	3,234	3,418	186	397	197	0	165	184
Bradford	SRWMD	20,751	21,094	21,097	21,120	21,351	21,282	20,956	343	3	23	231	-69	-326
Bradford	**Total**	**23,040**	**23,569**	**23,969**	**24,189**	**24,420**	**24,516**	**24,374**	**529**	**400**	**220**	**231**	**96**	**-142**
Clay	SJRWMD	202,600	220,871	247,378	275,396	306,470	322,769	338,510	18,271	26,507	28,018	31,074	16,299	15,741
Columbia	SRWMD	64,037	66,323	69,323	71,823	73,823	75,523	77,023	2,286	3,000	2,500	2,000	1,700	1,500
Duval	SJRWMD	851,884	1,027,320	1,073,631	1,117,321	1,159,034	1,200,741	1,238,401	175,436	46,311	43,690	41,713	41,707	37,660
Flagler	SJRWMD	99,769	113,387	126,488	137,761	146,696	152,470	157,026	13,618	13,101	11,273	8,935	5,774	4,556
Gilchrist	SRWMD	16,158	17,214	18,114	18,914	19,614	20,114	20,614	1,056	900	800	700	500	500
Hamilton	SRWMD	12,141	12,081	12,281	12,381	12,381	12,381	12,481	-60	200	100	0	0	100
Nassau	SJRWMD	77,817	68,650	78,852	88,870	96,828	104,742	112,428	-9,167	10,202	10,018	7,958	7,914	7,686
Putnam	SJRWMD	77,620	78,189	78,461	78,596	78,825	79,058	79,317	569	272	135	229	233	259
St. Johns	SJRWMD	216,513	300,530	348,452	385,610	420,358	453,570	487,953	84,017	47,922	37,158	34,748	33,212	34,383
Suwannee	SRWMD	41,532	43,899	46,299	48,399	50,099	51,499	52,699	2,367	2,400	2,100	1,700	1,400	1,200
Union	SRWMD	11,015	10,767	10,867	10,867	10,967	10,967	10,967	-248	100	0	100	0	0
SJRWMD Region 1 Total		**1,758,152**	**2,049,292**	**2,205,182**	**2,347,672**	**2,480,105**	**2,593,278**	**2,700,640**	**291,140**	**155,890**	**142,490**	**132,433**	**113,173**	**107,362**
SRWMD NFRWSP Total		**217,501**	**230,804**	**239,355**	**244,172**	**250,623**	**254,224**	**256,921**	**13,303**	**8,551**	**4,817**	**6,451**	**3,601**	**2,697**
NFRWSP Total		**1,975,653**	**2,280,096**	**2,444,537**	**2,591,844**	**2,730,728**	**2,847,502**	**2,957,561**	**304,443**	**164,441**	**147,307**	**138,884**	**116,774**	**110,059**

County	District	Change in Commercial / Industrial / Institutional and Mining / Dewatering Self-supply Water Demand					
		2020	2025	2030	2035	2040	2045
Alachua	SJRWMD	0.01	0.01	0.01	0.01	0.01	0.01
Alachua	SRWMD	0.05	0.01	0.00	0.01	0.00	0.00
Alachua	**Total**	**0.06**	**0.02**	**0.01**	**0.02**	**0.01**	**0.01**
Baker	SJRWMD	0.01	0.02	0.02	0.01	0.01	0.01
Baker	SRWMD	0.01	0.01	0.01	0.01	0.01	0.01
Baker	**Total**	**0.02**	**0.03**	**0.03**	**0.02**	**0.02**	**0.02**
Bradford	SJRWMD	0.00	0.00	0.00	0.00	0.00	0.00
Bradford	SRWMD	0.02	0.00	0.00	0.01	0.00	-0.02
Bradford	**Total**	**0.02**	**0.00**	**0.00**	**0.01**	**0.00**	**-0.02**
Clay	SJRWMD	0.02	0.03	0.03	0.03	0.02	0.02
Columbia	SRWMD	0.01	0.02	0.02	0.01	0.01	0.01
Duval	SJRWMD	2.63	0.69	0.66	0.63	0.63	0.56
Flagler	SJRWMD	0.01	0.01	0.01	0.01	0.01	0.00
Gilchrist	SRWMD	0.03	0.02	0.02	0.02	0.01	0.01
Hamilton	SRWMD	0.00	0.00	0.00	0.00	0.00	0.00
Nassau	SJRWMD	-0.04	0.04	0.04	0.03	0.03	0.03
Putnam	SJRWMD	0.02	0.01	0.01	0.01	0.01	0.01
St. Johns	SJRWMD	0.25	0.14	0.11	0.10	0.10	0.10
Suwannee	SRWMD	0.15	0.16	0.14	0.11	0.09	0.08
Union	SRWMD	-0.01	0.00	0.00	0.00	0.00	0.00
SJRWMD Region 1 Total		**2.91**	**0.95**	**0.89**	**0.83**	**0.82**	**0.74**
SRWMD NFRWSP Total		**0.26**	**0.22**	**0.19**	**0.17**	**0.12**	**0.09**
NFRWSP Total		**3.17**	**1.17**	**1.08**	**1.00**	**0.94**	**0.83**

Notes:

1.) All water use is shown in million gallons per day.

2.) Rounding errors account for nominal discrepancies.

3.) 2014 - 2018 water use data source is NFSEG master geodatabase with metered and estimated commercial / industrial / institutional and mining / dewatering water use.

4.) 2014 - 2018 population obtained from Technical Staff Reports, BEBR estimates of population, DEP MOR and Basic Facility Report Data, parcel data, published annual reports, and permittee surveys.

5.) Projected population for years 2020 - 2045 are based on BEBR Population Projections: Volume 53, Bulletin 186, Published January 2020.

6.) Hamilton, Nassau, and Putnam counties projections were adjusted to hold pulp, paper mill, and large industrial quantities constant; total water use shown for calculations does not include pulp, paper mill, and large industrial quantities.

Table B-10. Power Generation Self-supply Water use for 2015 and 5-in-10 Year Demand Projections for 2020-2045, by County, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	District	Water Use			Demand Projections (5-in-10)																										Percent Change 2015-2045	Non-consumptive Saline and Fresh Surface Water Use Cooling						
		2015			2020				2025				2030				2035				2040				2045											
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		2015	2020	2025	2030	2035	2040	2045
Alachua	SJRWMD	0.51	0.00	**0.51**	0.53	0.00	0.00	**0.53**	0.55	0.00	0.00	**0.55**	0.56	0.00	0.00	**0.56**	0.59	0.00	0.00	**0.59**	0.61	0.00	0.00	**0.61**	0.63	0.00	0.00	**0.63**	24%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alachua	SRWMD	1.77	0.00	**1.77**	1.76	0.00	0.00	**1.76**	1.67	0.00	0.00	**1.67**	1.71	0.00	0.00	**1.71**	1.78	0.00	0.00	**1.78**	1.86	0.00	0.00	**1.86**	1.93	0.00	0.00	**1.93**	9%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Alachua	**Total**	**2.28**	**0.00**	**2.28**	**2.29**	**0.00**	**0.00**	**2.29**	**2.22**	**0.00**	**0.00**	**2.22**	**2.27**	**0.00**	**0.00**	**2.27**	**2.37**	**0.00**	**0.00**	**2.37**	**2.47**	**0.00**	**0.00**	**2.47**	**2.56**	**0.00**	**0.00**	**2.56**	**12%**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Baker	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Baker	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Baker	**Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**N/A**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Bradford	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bradford	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bradford	**Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**N/A**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Clay	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Columbia	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Duval	SJRWMD	6.37	12.18	**18.55**	5.04	13.08	0.00	**18.12**	5.18	13.44	0.00	**18.62**	5.40	13.99	0.00	**19.39**	5.80	15.07	0.00	**20.87**	6.25	16.21	0.00	**22.46**	6.72	17.44	0.00	**24.16**	30%	609.08	654.01	671.80	699.89	753.30	810.49	872.00
Flagler	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gilchrist	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hamilton	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nassau	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Putnam	SJRWMD	0.45	0.30	**0.75**	0.48	0.32	0.00	**0.80**	0.51	0.34	0.00	**0.85**	0.54	0.36	0.00	**0.90**	0.56	0.37	0.00	**0.93**	0.57	0.38	0.00	**0.95**	0.58	0.39	0.00	**0.97**	29%	14.98	15.90	17.06	18.02	18.48	18.95	19.44
St. Johns	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Suwannee	SRWMD	0.10	0.06	**0.16**	0.07	0.05	0.00	**0.12**	0.07	0.05	0.00	**0.12**	0.07	0.05	0.00	**0.12**	0.07	0.05	0.00	**0.12**	0.07	0.05	0.00	**0.12**	0.07	0.05	0.00	**0.12**	-25%	3.00	2.25	2.25	2.25	2.25	2.25	2.25
Union	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SJRWMD Region 1 Total		**7.33**	**12.48**	**19.81**	**6.05**	**13.40**	**0.00**	**19.45**	**6.24**	**13.78**	**0.00**	**20.02**	**6.50**	**14.35**	**0.00**	**20.85**	**6.95**	**15.44**	**0.00**	**22.39**	**7.43**	**16.59**	**0.00**	**24.02**	**7.93**	**17.83**	**0.00**	**25.76**	**30%**	**624.06**	**669.91**	**688.86**	**717.91**	**771.78**	**829.44**	**891.44**
SRWMD NFRWSP Total		**1.87**	**0.06**	**1.93**	**1.83**	**0.05**	**0.00**	**1.88**	**1.74**	**0.05**	**0.00**	**1.79**	**1.78**	**0.05**	**0.00**	**1.83**	**1.85**	**0.05**	**0.00**	**1.90**	**1.93**	**0.05**	**0.00**	**1.98**	**2.00**	**0.05**	**0.00**	**2.05**	**6%**	**3.00**	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
NFRWSP Total		**9.20**	**12.54**	**21.74**	**7.88**	**13.45**	**0.00**	**21.33**	**7.98**	**13.83**	**0.00**	**21.81**	**8.28**	**14.40**	**0.00**	**22.68**	**8.80**	**15.49**	**0.00**	**24.29**	**9.36**	**16.64**	**0.00**	**26.00**	**9.93**	**17.88**	**0.00**	**27.81**	**28%**	**627.06**	**672.16**	**691.11**	**720.16**	**774.03**	**831.69**	**893.69**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) The power generation water use category is not impacted by drought conditions, therefore the 5-in-10 2045 water demand also serves as the 1-in-10 water demand.
4.) Consumptive surface water is assumed to be 2 percent of total surface water to account for losses.
5.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-10a. Power Generation Self-supply water use for 2015 and 5-in-10 Year Demand Projections for 2020-2045, by County and Facility, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	Facility	District	Water Use			Demand Projections (5-in-10)																											Percent Change 2015-2045	Non-consumptive Saline and Fresh Surface Water Use for Cooling						
			2015			2020				2025				2030				2035				2040				2045														
			Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		2015	2020	2025	2030	2035	2040	2045
Alachua	Gainesville Regional Utilities - J R Kelly (11374)	SJRWMD	0.51	0.00	**0.51**	0.53	0.00	0.00	**0.53**	0.55	0.00	0.00	**0.55**	0.56	0.00	0.00	**0.56**	0.59	0.00	0.00	**0.59**	0.61	0.00	0.00	**0.61**	0.63	0.00	0.00	**0.63**	24%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Deerhaven Renewable Plant (220496)	SRWMD	0.28	0.00	**0.28**	0.28	0.00	0.00	**0.28**	0.27	0.00	0.00	**0.27**	0.27	0.00	0.00	**0.27**	0.28	0.00	0.00	**0.28**	0.30	0.00	0.00	**0.30**	0.31	0.00	0.00	**0.31**	11%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Gainesville Regional Utilities - Deerhaven Power Plant *(PA 74-04)*	SRWMD	1.49	0.00	**1.49**	1.48	0.00	0.00	**1.48**	1.40	0.00	0.00	**1.40**	1.44	0.00	0.00	**1.44**	1.50	0.00	0.00	**1.50**	1.56	0.00	0.00	**1.56**	1.62	0.00	0.00	**1.62**	9%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total		**2.28**	**0.00**	**2.28**	**2.29**	**0.00**	**0.00**	**2.29**	**2.22**	**0.00**	**0.00**	**2.22**	**2.27**	**0.00**	**0.00**	**2.27**	**2.37**	**0.00**	**0.00**	**2.37**	**2.47**	**0.00**	**0.00**	**2.47**	**2.56**	**0.00**	**0.00**	**2.56**	**12%**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Duval	JEA - Northside (721)	SJRWMD	0.26	12.18	**12.44**	0.28	12.56	0.00	**12.84**	0.29	12.91	0.00	**13.20**	0.30	13.44	0.00	**13.74**	0.32	14.47	0.00	**14.79**	0.35	15.57	0.00	**15.92**	0.37	16.75	0.00	**17.12**	38%	609.08	628.18	645.28	672.24	723.55	778.49	837.57
	JEA - Brandy Branch (140370)	SJRWMD	2.03	0.00	**2.03**	2.02	0.00	0.00	**2.02**	2.08	0.00	0.00	**2.08**	2.17	0.00	0.00	**2.17**	2.33	0.00	0.00	**2.33**	2.51	0.00	0.00	**2.51**	2.70	0.00	0.00	**2.70**	33%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SJR Power Park (140634)	SJRWMD	3.48	0.00	**3.48**	2.74	0.52	0.00	**3.26**	2.81	0.53	0.00	**3.34**	2.93	0.55	0.00	**3.48**	3.15	0.60	0.00	**3.75**	3.39	0.64	0.00	**4.03**	3.65	0.69	0.00	**4.34**	25%	0.00	25.83	26.52	27.65	29.75	32.00	34.43
	Cedar Bay Generating Facility (PA 88-24G)	SJRWMD	0.60	0.00	**0.60**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	-100%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total		**6.37**	**12.18**	**18.55**	**5.04**	**13.08**	**0.00**	**18.12**	**5.18**	**13.44**	**0.00**	**18.62**	**5.40**	**13.99**	**0.00**	**19.39**	**5.80**	**15.07**	**0.00**	**20.87**	**6.25**	**16.21**	**0.00**	**22.46**	**6.72**	**17.44**	**0.00**	**24.16**	**30%**	**609.08**	**654.01**	**671.80**	**699.89**	**753.30**	**810.49**	**872.00**
Putnam	Florida Power & Light - Puntam *(PA 74-01)*	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Seminole Electric Cooperative - Palatka (140536)	SJRWMD	0.45	0.30	**0.75**	0.48	0.32	0.00	**0.80**	0.51	0.34	0.00	**0.85**	0.54	0.36	0.00	**0.90**	0.56	0.37	0.00	**0.93**	0.57	0.38	0.00	**0.95**	0.58	0.39	0.00	**0.97**	29%	14.98	15.90	17.06	18.02	18.48	18.95	19.44
	Total		**0.45**	**0.30**	**0.75**	**0.48**	**0.32**	**0.00**	**0.80**	**0.51**	**0.34**	**0.00**	**0.85**	**0.54**	**0.36**	**0.00**	**0.90**	**0.56**	**0.37**	**0.00**	**0.93**	**0.57**	**0.38**	**0.00**	**0.95**	**0.58**	**0.39**	**0.00**	**0.97**	**29%**	**14.98**	**15.90**	**17.06**	**18.02**	**18.48**	**18.95**	**19.44**
Suwannee	Duke - Ellaville (219872)	SRWMD	0.10	0.06	**0.16**	0.07	0.05	0.00	**0.12**	0.07	0.05	0.00	**0.12**	0.07	0.05	0.00	**0.12**	0.07	0.05	0.00	**0.12**	0.07	0.05	0.00	**0.12**	0.07	0.05	0.00	**0.12**	-25%	3.00	2.25	2.25	2.25	2.25	2.25	2.25
	Total		**0.10**	**0.06**	**0.16**	**0.07**	**0.05**	**0.00**	**0.12**	**0.07**	**0.05**	**0.00**	**0.12**	**0.07**	**0.05**	**0.00**	**0.12**	**0.07**	**0.05**	**0.00**	**0.12**	**0.07**	**0.05**	**0.00**	**0.12**	**0.07**	**0.05**	**0.00**	**0.12**	**-25%**	**3.00**	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
SJRWMD Region 1 Total			**7.33**	**12.48**	**19.81**	**6.05**	**13.40**	**0.00**	**19.45**	**6.24**	**13.78**	**0.00**	**20.02**	**6.50**	**14.35**	**0.00**	**20.85**	**6.95**	**15.44**	**0.00**	**22.39**	**7.43**	**16.59**	**0.00**	**24.02**	**7.93**	**17.83**	**0.00**	**25.76**	**30%**	**624.06**	**669.91**	**688.86**	**717.91**	**771.78**	**829.44**	**891.44**
SRWMD NFRWSP Total			**1.87**	**0.06**	**1.93**	**1.83**	**0.05**	**0.00**	**1.88**	**1.74**	**0.05**	**0.00**	**1.79**	**1.78**	**0.05**	**0.00**	**1.83**	**1.85**	**0.05**	**0.00**	**1.90**	**1.93**	**0.05**	**0.00**	**1.98**	**2.00**	**0.05**	**0.00**	**2.05**	**6%**	**3.00**	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**
NFRWSP Total			**9.20**	**12.54**	**21.74**	**7.88**	**13.45**	**0.00**	**21.33**	**7.98**	**13.83**	**0.00**	**21.81**	**8.28**	**14.40**	**0.00**	**22.68**	**8.80**	**15.49**	**0.00**	**24.29**	**9.36**	**16.64**	**0.00**	**26.00**	**9.93**	**17.88**	**0.00**	**27.81**	**28%**	**627.06**	**672.16**	**691.11**	**720.16**	**774.03**	**831.69**	**893.69**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2015 water use data source is NFSEG master geodatabase with metered and estimated power generation water use.
4.) Consumptive surface water is assumed to be 2 percent of total surface water to account for losses.
5.) The power generation water use category is not impacted by drought conditions, therefore the 5-in-10 2045 water demand also serves as the 1-in-10 water demand.
6.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-10b. 2014-2018 Water Use and Megawatts, Five-Year Gross Per Mega Watt Averages, and 2020-2045 Demand Projections for Power Generation Self-supply Water Demand Increases, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region the Suwannee River Water Management District.

County	Facility	District	Groundwater Water Use					Non-consumptive Saline and Fresh Surface Water Use for Cooling					Notes
			2014	2015	2016	2017	2018	2014	2015	2016	2017	2018	
Alachua	Gainesville Regional Utilities - J R Kelly (11374)	SJRWMD	0.285	0.510	0.753	0.512	0.563	0.000	0.000	0.000	0.000	0.000	
Alachua	Deerhaven Renewable Plant (220496)	SRWMD	0.470	0.276	0.038	0.242	0.379	0.000	0.000	0.000	0.000	0.000	
Alachua	Gainesville Regional Utilities - Deerhaven Power Plant *(PA 74-04)*	SRWMD	1.965	1.489	1.435	1.258	1.251	0.000	0.000	0.000	0.000	0.000	
	Total		**2.72**	**2.275**	**2.226**	**2.012**	**2.193**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	
Duval	JEA - Northside (721)	SJRWMD	0.307	0.262	0.329	0.205	0.258	603.587	609.083	663.973	512.063	666.158	9/10/20 email from Tom Bartol notes no change in groundwater demand but to use allocation. Allocation is much greater than historic average; used NFRWSP methodology.
Duval	JEA - Brandy Branch (140370)	SJRWMD	1.871	2.029	1.529	1.933	2.495	0.000	0.000	0.000	0.000	0.000	9/10/20 email from Tom Bartol notes no change in groundwater demand but to use allocation. Allocation is much greater than historic average; used NFRWSP methodology.
Duval	JEA - SJR Power Park (140634)	SJRWMD	3.711	3.475	3.142	2.75	0.220	44.010	0.000	39.517	41.89	0.190	9/10/20 email from Tom Bartol notes no change in groundwater demand but to use allocation. Allocation is much greater than historic average; used NFRWSP methodology.
Duval	Cedar Bay Generating Facility (*PA 88-24G*)	SJRWMD	0.780	0.603	0.153	0.830	0.000	0.000	0.000	0.000	0.000	0.000	Decommissioned in 2018
	Total		**6.669**	**6.369**	**5.153**	**5.718**	**2.973**	**647.597**	**609.083**	**703.490**	**553.953**	**666.348**	
Putnam	Florida Power & Light - Puntam *(PA 74-01)*	SJRWMD	0	0.001	0.004	0.000	0.000	0.556	0.000	0.000	0.000	0.000	Decommissioned in 2017/2018
Putnam	Seminole Electric Cooperative - Palatka (140536)	SJRWMD	0.437	0.453	0.527	0.449	0.410	15.866	14.984	15.746	15.673	15.052	
	Total		**0.437**	**0.454**	**0.531**	**0.449**	**0.410**	**16.422**	**14.984**	**15.746**	**15.673**	**15.052**	
Suwannee	Duke Energy - Ellaville (219872)	SRWMD	0.106	0.095	0.104	0.025	0.004	3.002	2.995	2.686	1.129	1.440	9/9/20 email from Ilia Balcom notes no new groundwater demand - use historic average.
	Total		**0.106**	**0.095**	**0.104**	**0.025**	**0.155**	**3.002**	**2.995**	**2.686**	**1.129**	**1.440**	
SJRWMD Region 1 Total			**7.391**	**7.333**	**6.437**	**6.679**	**3.946**	**664.019**	**624.067**	**719.236**	**569.626**	**681.400**	
SRWMD NFRWSP Total			**2.541**	**1.860**	**1.577**	**1.525**	**1.634**	**3.002**	**2.995**	**2.686**	**1.129**	**1.440**	
NFRWSP Total			**9.932**	**9.193**	**8.014**	**8.204**	**5.580**	**667.021**	**627.062**	**721.922**	**570.755**	**682.840**	

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) 2014 - 2018 water use data source is NFSEG master geodatabase with metered and estimated power generation water use.
4.) GRU historic and projected customers and historic and projected megawatts obtained from Schedules 2.3 and 3.2, 2020 Ten-Year Site Plan.
5.) JEA historic and projected customers and historic and projected megawatts obtained from Schedules 2.3 and 3.2, 2020 Ten-Year Site Plan.
6.) SEC historic and projected customers and historic and projected megawatts obtained from Schedules 2.3 and 3.2, 2020 Ten-Year Site Plan.

Table B-10b, Continued. 2014-2018 Water Use and Megawatts, Five-Year Gross Per Mega Watt Averages, and 2020-2045 Demand Projections for Power Generation Self-supply Water Demand Increases, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	Facility	District	Historic Megawatts					2014-2018 Gallons (Consumptive) Per Megawatt Average	2014-2018 Gallons (Non-Consumptive) Per Megawatt Average	Projected Megawatts					
			2014	2015	2016	2017	2018			2020	2025	2030	2035	2040	2045
Alachua	Gainesville Regional Utilities - J R Kelly (11374)	SJRWMD	70.6	72.7	73.9	72.2	70.4	0.00729	0.00000	72.1	75.4	77.0	80.2	83.4	87.0
Alachua	Deerhaven Renewable Plant (220496)	SRWMD	68.3	70.3	71.4	69.8	68.1	0.00404	0.00000	69.7	66.1	67.6	70.4	73.3	76.3
Alachua	Gainesville Regional Utilities - Deerhaven Power Plant *(PA 74-04)*	SRWMD	270.1	278.0	282.7	276.1	269.5	0.00537	0.00000	275.8	261.5	267.4	278.4	289.9	301.8
	Total		**409.0**	**421.0**	**428.0**	**418.1**	**408.0**	**0.00548**	**0.00000**	**417.6**	**403.0**	**412.0**	**429.0**	**446.6**	**465.1**
Duval	JEA - Northside (721)	SJRWMD	1,196.0	1,212.0	1,132.0	1,050.0	1,304.0	0.00023	0.51830	1,212.0	1,245.0	1,297.0	1,396.0	1,502.0	1,616.0
Duval	JEA - Brandy Branch (140370)	SJRWMD	728.0	739.0	690.0	640.0	795.0	0.00274	0.00000	738.3	758.2	790.3	850.3	914.8	984.2
Duval	JEA - SJR Power Park (140634)	SJRWMD	899.0	912.0	852.0	790.0	981.0	0.00300	0.02833	911.7	936.2	975.9	1,050.0	1,129.7	1,215.4
Duval	Cedar Bay Generating Facility (*PA 88-24G*)	SJRWMD	258.0	258.0	258.0	258.0	0.0	0.00229	0.00000	0.0	0.0	0.0	0.0	0.0	0.0
	Total		**3,081.0**	**3,121.0**	**2,932.0**	**2,738.0**	**3,080.0**	**0.00180**	**0.21271**	**2,862.0**	**2,939.4**	**3,063.2**	**3,296.3**	**3,546.5**	**3,815.6**
Putnam	Florida Power & Light - Puntam *(PA 74-01)*	SJRWMD	450.1	453.1	434.5	461.1	0.0	0.00000	0.00031	0.0	0.0	0.0	0.0	0.0	0.0
Putnam	Seminole Electric Cooperative - Palatka (140536)	SJRWMD	1,915.2	2,123.8	1,954.8	1,783.9	2,328.3	0.00023	0.00765	2,078.3	2,229.6	2,355.6	2,415.7	2,477.4	2,540.7
	Total		**2,365.3**	**2,576.9**	**2,389.3**	**2,245.0**	**2,328.3**	**0.00019**	**0.00654**	**2,078.3**	**2,229.6**	**2,355.6**	**2,415.7**	**2,477.4**	**2,540.7**
Suwannee	Duke Energy - Ellaville (219872)	SRWMD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total		**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
SJRWMD Region 1 Total			**5,516.9**	**5,770.6**	**5,395.2**	**5,055.2**	**5,478.7**	**0.00117**	**0.11972**	**5,012.4**	**5,244.4**	**5,495.8**	**5,792.2**	**6,107.3**	**6,443.3**
SRWMD NFRWSP Total			**338.4**	**348.3**	**354.1**	**345.9**	**337.6**	**0.00530**	**0.00653**	**345.5**	**327.6**	**335.0**	**348.8**	**363.2**	**378.1**
NFRWSP Total			**5,855.3**	**6,118.9**	**5,749.3**	**5,401.1**	**5,816.3**	**0.00141**	**0.11298**	**5,357.9**	**5,572.0**	**5,830.8**	**6,141.0**	**6,470.5**	**6,821.4**

Table B-10b, Continued. 2014-2018 Water Use and Megawatts, Five-Year Gross Per Mega Watt Averages, and 2020-2045 Demand Projections for Power Generation Self-supply Water Demand Increases, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	Facility	District	Projected Groundwater Demand						Projected Non-consumptive Saline and Fresh Surface Water Demand for Cooling					
			2020	2025	2030	2035	2040	2045	2020	2025	2030	2035	2040	2045
Alachua	Gainesville Regional Utilities - J R Kelly (11374)	SJRWMD	0.526	0.550	0.561	0.585	0.608	0.634	0.000	0.000	0.000	0.000	0.000	0.000
Alachua	Deerhaven Renewable Plant (220496)	SRWMD	0.282	0.267	0.273	0.284	0.296	0.308	0.000	0.000	0.000	0.000	0.000	0.000
Alachua	Gainesville Regional Utilities - Deerhaven Power Plant *(PA 74-04)*	SRWMD	1.481	1.404	1.436	1.495	1.557	1.621	0.000	0.000	0.000	0.000	0.000	0.000
	Total		**2.289**	**2.221**	**2.270**	**2.364**	**2.461**	**2.563**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
Duval	JEA - Northside (721)	SJRWMD	0.279	0.286	0.298	0.321	0.345	0.372	628.180	645.284	672.235	723.547	778.487	837.573
Duval	JEA - Brandy Branch (140370)	SJRWMD	2.023	2.077	2.165	2.330	2.507	2.697	0.000	0.000	0.000	0.000	0.000	0.000
Duval	JEA - SJR Power Park (140634)	SJRWMD	2.735	2.809	2.928	3.150	3.389	3.646	25.828	26.523	27.647	29.747	32.004	34.432
Duval	Cedar Bay Generating Facility (*PA 88-24G*)	SJRWMD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Total		**5.037**	**5.172**	**5.391**	**5.801**	**6.241**	**6.715**	**654.008**	**671.807**	**699.882**	**753.294**	**810.491**	**872.005**
Putnam	Florida Power & Light - Puntam *(PA 74-01)*	SJRWMD	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Putnam	Seminole Electric Cooperative - Palatka (140536)	SJRWMD	0.478	0.513	0.542	0.556	0.570	0.584	15.899	17.056	18.020	18.480	18.952	19.436
	Total		**0.478**	**0.513**	**0.542**	**0.556**	**0.570**	**0.584**	**15.899**	**17.056**	**18.020**	**18.480**	**18.952**	**19.436**
Suwannee	Duke Energy - Ellaville (219872)	SRWMD	0.067	0.067	0.067	0.067	0.067	0.067	2.250	2.250	2.250	2.250	2.250	2.250
	Total		**0.067**	**0.067**	**0.067**	**0.067**	**0.067**	**0.067**	**2.250**	**2.250**	**2.250**	**2.250**	**2.250**	**2.250**
SJRWMD Region 1 Total			**6.041**	**6.235**	**6.494**	**6.942**	**7.419**	**7.933**	**669.907**	**688.863**	**717.902**	**771.774**	**829.443**	**891.441**
SRWMD NFRWSP Total			**1.830**	**1.738**	**1.776**	**1.846**	**1.920**	**1.996**	**2.250**	**2.250**	**2.250**	**2.250**	**2.250**	**2.250**
NFRWSP Total			**7.871**	**7.973**	**8.270**	**8.788**	**9.339**	**9.929**	**672.157**	**691.113**	**720.152**	**774.024**	**831.693**	**893.691**

Table B-11. Public Supply and Domestic Self-supply and Small Public Supply 2015 Water Use, 5-in-10 Year Water Demand Projections for 2020-2045, and 1-in-10 Year Water Demand Projections for 2045, by County, in Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	District	2015 Water Use			2020 Demand Projections (5-in-10)			2025 Demand Projections (5-in-10)			2030 Demand Projections (5-in-10)			2035 Demand Projections (5-in-10)			2040 Demand Projections (5-in-10)			2045 Demand Projections (5-in-10)			Percent Change 2015-2045			2045 Demand Projections (1-in-10)		
		Public Supply	Domestic Self-Supply and Small Public Supply	Total	Public Supply	Domestic Self-Supply and Small Public Supply	Total	Public Supply	Domestic Self-Supply and Small Public Supply	Total	Public Supply	Domestic Self-Supply and Small Public Supply	Total	Public Supply	Domestic Self-Supply and Small Public Supply	Total	Public Supply	Domestic Self-Supply and Small Public Supply	Total	Public Supply	Domestic Self-Supply and Small Public Supply	Total	Public Supply	Domestic Self-Supply and Small Public Supply	Total	Public Supply	Domestic Self-Supply and Small Public Supply	Total
Alachua	SJRWMD	22.44	0.65	**23.09**	23.57	0.67	**24.24**	24.68	0.70	**25.38**	25.71	0.83	**26.54**	26.53	0.83	**27.36**	27.23	0.90	**28.13**	27.78	1.00	**28.78**	24%	54%	**25%**	29.45	1.06	**30.51**
Alachua	SRWMD	2.35	1.51	**3.86**	2.68	1.74	**4.42**	2.71	1.82	**4.53**	2.87	1.69	**4.56**	3.04	1.70	**4.74**	3.10	1.68	**4.78**	3.13	1.65	**4.78**	33%	9%	**24%**	3.33	1.75	**5.08**
Alachua Total		**24.79**	**2.16**	**26.95**	**26.25**	**2.41**	**28.66**	**27.39**	**2.52**	**29.91**	**28.58**	**2.52**	**31.10**	**29.57**	**2.53**	**32.10**	**30.33**	**2.58**	**32.91**	**30.91**	**2.65**	**33.56**	**25%**	**23%**	**25%**	**32.78**	**2.81**	**35.59**
Baker	SJRWMD	0.92	2.07	**2.99**	0.95	2.43	**3.38**	0.99	2.56	**3.55**	1.06	2.64	**3.70**	1.08	2.73	**3.81**	1.09	2.81	**3.90**	1.09	2.90	**3.99**	18%	40%	**33%**	1.15	3.07	**4.22**
Baker	SRWMD	0.00	0.05	**0.05**	0.00	0.06	**0.06**	0.00	0.06	**0.06**	0.00	0.06	**0.06**	0.00	0.06	**0.06**	0.00	0.07	**0.07**	0.00	0.07	**0.07**	N/A	40%	**40%**	0.00	0.07	**0.07**
Baker Total		**0.92**	**2.12**	**3.04**	**0.95**	**2.49**	**3.44**	**0.99**	**2.62**	**3.61**	**1.06**	**2.70**	**3.76**	**1.08**	**2.79**	**3.87**	**1.09**	**2.88**	**3.97**	**1.09**	**2.97**	**4.06**	**18%**	**40%**	**34%**	**1.15**	**3.14**	**4.29**
Bradford	SJRWMD	0.04	0.13	**0.17**	0.01	0.21	**0.22**	0.01	0.25	**0.26**	0.01	0.27	**0.28**	0.01	0.27	**0.28**	0.01	0.28	**0.29**	0.01	0.30	**0.31**	-75%	131%	**82%**	0.01	0.32	**0.33**
Bradford	SRWMD	0.94	0.62	**1.56**	1.04	0.57	**1.61**	1.05	0.56	**1.61**	1.07	0.56	**1.63**	1.08	0.56	**1.64**	1.09	0.55	**1.64**	1.11	0.54	**1.65**	18%	-13%	**6%**	1.17	0.53	**1.70**
Bradford Total		**0.98**	**0.75**	**1.73**	**1.05**	**0.78**	**1.83**	**1.06**	**0.81**	**1.87**	**1.08**	**0.83**	**1.91**	**1.09**	**0.83**	**1.92**	**1.10**	**0.83**	**1.93**	**1.12**	**0.84**	**1.96**	**14%**	**12%**	**13%**	**1.18**	**0.85**	**2.03**
Clay	SJRWMD	12.89	6.20	**19.09**	13.72	4.76	**18.48**	18.33	4.77	**23.10**	20.64	4.77	**25.41**	23.22	4.78	**28.00**	24.47	4.77	**29.24**	25.57	4.77	**30.34**	98%	-23%	**59%**	27.51	5.06	**32.57**
Columbia	SRWMD	3.32	2.63	**5.95**	3.47	2.73	**6.20**	5.74	2.87	**8.61**	5.84	2.98	**8.82**	5.94	3.06	**9.00**	6.05	3.13	**9.18**	6.16	3.19	**9.35**	86%	21%	**57%**	6.53	3.33	**9.86**
Duval	SJRWMD	106.34	14.74	**121.08**	115.27	15.92	**131.19**	124.03	16.37	**140.40**	132.85	16.53	**149.38**	141.55	16.58	**158.13**	150.44	16.45	**166.89**	158.97	16.25	**175.22**	49%	10%	**45%**	168.51	17.23	**185.74**
Flagler	SJRWMD	9.05	0.26	**9.31**	10.29	0.30	**10.59**	11.45	0.30	**11.75**	12.45	0.38	**12.83**	13.26	0.39	**13.65**	13.79	0.39	**14.18**	14.33	0.40	**14.73**	58%	54%	**58%**	15.18	0.42	**15.60**
Gilchrist	SRWMD	0.22	0.99	**1.21**	0.22	1.06	**1.28**	0.25	1.11	**1.36**	0.27	1.15	**1.42**	0.28	1.19	**1.47**	0.28	1.22	**1.50**	0.28	1.26	**1.54**	27%	27%	**27%**	0.30	1.34	**1.64**
Hamilton	SRWMD	0.91	0.65	**1.56**	1.03	0.64	**1.67**	1.03	0.65	**1.68**	1.03	0.66	**1.69**	1.03	0.66	**1.69**	1.03	0.66	**1.69**	1.03	0.67	**1.70**	13%	3%	**9%**	1.09	0.71	**1.80**
Nassau	SJRWMD	6.92	1.11	**8.03**	7.85	1.49	**9.34**	8.05	1.72	**9.77**	8.24	1.85	**10.09**	8.24	2.03	**10.27**	8.26	2.16	**10.42**	8.26	2.28	**10.54**	19%	105%	**31%**	8.60	2.42	**11.02**
Putnam	SJRWMD	2.18	2.82	**5.00**	2.11	3.24	**5.35**	2.12	3.24	**5.36**	2.13	3.24	**5.37**	2.15	3.24	**5.39**	2.16	3.24	**5.40**	2.18	3.24	**5.42**	0%	15%	**8%**	2.31	3.43	**5.74**
St. Johns	SJRWMD	19.21	2.96	**22.17**	25.10	4.58	**29.68**	28.43	4.56	**32.99**	30.60	4.53	**35.13**	32.51	4.50	**37.01**	34.28	4.47	**38.75**	35.86	4.44	**40.30**	87%	50%	**82%**	36.20	4.70	**40.90**
Suwannee	SRWMD	1.32	2.22	**3.54**	1.45	2.34	**3.79**	1.61	2.48	**4.09**	1.73	2.58	**4.31**	1.79	2.66	**4.45**	1.84	2.73	**4.57**	1.87	2.80	**4.67**	42%	26%	**32%**	1.98	2.96	**4.94**
Union	SRWMD	0.26	0.66	**0.92**	0.24	0.65	**0.89**	0.24	0.65	**0.89**	0.24	0.65	**0.89**	0.25	0.66	**0.91**	0.25	0.66	**0.91**	0.25	0.66	**0.91**	-4%	0%	**-1%**	0.27	0.70	**0.97**
SJRWMD Region 1 Total		**179.99**	**30.94**	**210.93**	**198.87**	**33.60**	**232.47**	**218.09**	**34.47**	**252.56**	**233.69**	**35.04**	**268.73**	**248.55**	**35.35**	**283.90**	**261.73**	**35.47**	**297.20**	**274.05**	**35.58**	**309.63**	**52%**	**15%**	**47%**	**288.92**	**37.71**	**326.63**
SRWMD NFRWSP Total		**9.32**	**9.33**	**18.65**	**10.13**	**9.79**	**19.92**	**12.63**	**10.20**	**22.83**	**13.05**	**10.33**	**23.38**	**13.41**	**10.55**	**23.96**	**13.64**	**10.70**	**24.34**	**13.83**	**10.84**	**24.67**	**48%**	**16%**	**32%**	**14.67**	**11.39**	**26.06**
NFRWSP Total		**189.31**	**40.27**	**229.58**	**209.00**	**43.39**	**252.39**	**230.72**	**44.67**	**275.39**	**246.74**	**45.37**	**292.11**	**261.96**	**45.90**	**307.86**	**275.37**	**46.17**	**321.54**	**287.88**	**46.42**	**334.30**	**52%**	**15%**	**46%**	**303.59**	**49.10**	**352.69**

Notes:

1.) All water use is shown in million gallons per day.

2.) Rounding errors account for nominal discrepancies.

3.) Water use for the Public Supply category includes groundwater, surface water, and water from the Other category.

Table B-12 (1 - Alachua County). Water Use for 2015 and 5-in-10 Year Total Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045, by Category of Use and by District in Alachua County for the North Florida Regional Water Supply Plan.

Category	District	Water Use			Demand Projections (5-in-10)																								Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045					2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Public Supply	SJRWMD	22.44	0.00	**22.44**	23.57	0.00	0.00	**23.57**	24.68	0.00	0.00	**24.68**	25.71	0.00	0.00	**25.71**	26.53	0.00	0.00	**26.53**	27.23	0.00	0.00	**27.23**	27.78	0.00	0.00	**27.78**	24%	29.45	0.00	0.00	**29.45**
Public Supply	SRWMD	2.35	0.00	**2.35**	2.68	0.00	0.00	**2.68**	2.71	0.00	0.00	**2.71**	2.87	0.00	0.00	**2.87**	3.04	0.00	0.00	**3.04**	3.10	0.00	0.00	**3.10**	3.13	0.00	0.00	**3.13**	33%	3.33	0.00	0.00	**3.33**
Public Supply	**Total**	**24.79**	**0.00**	**24.79**	**26.25**	**0.00**	**0.00**	**26.25**	**27.39**	**0.00**	**0.00**	**27.39**	**28.58**	**0.00**	**0.00**	**28.58**	**29.57**	**0.00**	**0.00**	**29.57**	**30.33**	**0.00**	**0.00**	**30.33**	**30.91**	**0.00**	**0.00**	**30.91**	**25%**	**32.78**	**0.00**	**0.00**	**32.78**
Domestic Self-supply and Small Public Supply Systems	SJRWMD	0.65	0.00	**0.65**	0.67	0.00	0.00	**0.67**	0.70	0.00	0.00	**0.70**	0.83	0.00	0.00	**0.83**	0.83	0.00	0.00	**0.83**	0.90	0.00	0.00	**0.90**	1.00	0.00	0.00	**1.00**	54%	1.06	0.00	0.00	**1.06**
Domestic Self-supply and Small Public Supply Systems	SRWMD	1.51	0.00	**1.51**	1.74	0.00	0.00	**1.74**	1.82	0.00	0.00	**1.82**	1.69	0.00	0.00	**1.69**	1.70	0.00	0.00	**1.70**	1.68	0.00	0.00	**1.68**	1.65	0.00	0.00	**1.65**	9%	1.75	0.00	0.00	**1.75**
Domestic Self-supply and Small Public Supply Systems	**Total**	**2.16**	**0.00**	**2.16**	**2.41**	**0.00**	**0.00**	**2.41**	**2.52**	**0.00**	**0.00**	**2.52**	**2.52**	**0.00**	**0.00**	**2.52**	**2.53**	**0.00**	**0.00**	**2.53**	**2.58**	**0.00**	**0.00**	**2.58**	**2.65**	**0.00**	**0.00**	**2.65**	**23%**	**2.81**	**0.00**	**0.00**	**2.81**
Agricultural Irrigation Self-supply	SJRWMD	2.99	0.00	**2.99**	3.13	0.00	0.00	**3.13**	3.18	0.00	0.00	**3.18**	3.27	0.00	0.00	**3.27**	3.39	0.00	0.00	**3.39**	3.52	0.00	0.00	**3.52**	3.56	0.00	0.00	**3.56**	19%	5.44	0.00	0.00	**5.44**
Agricultural Irrigation Self-supply	SRWMD	12.22	0.00	**12.22**	11.25	0.00	0.00	**11.25**	11.45	0.00	0.00	**11.45**	11.54	0.00	0.00	**11.54**	11.79	0.00	0.00	**11.79**	11.97	0.00	0.00	**11.97**	12.24	0.00	0.00	**12.24**	0%	15.72	0.00	0.00	**15.72**
Agricultural Irrigation Self-supply	**Total**	**15.21**	**0.00**	**15.21**	**14.38**	**0.00**	**0.00**	**14.38**	**14.63**	**0.00**	**0.00**	**14.63**	**14.81**	**0.00**	**0.00**	**14.81**	**15.18**	**0.00**	**0.00**	**15.18**	**15.49**	**0.00**	**0.00**	**15.49**	**15.80**	**0.00**	**0.00**	**15.80**	**4%**	**21.16**	**0.00**	**0.00**	**21.16**
Landscape / Recreational Self-supply	SJRWMD	0.19	0.08	**0.27**	0.20	0.08	0.00	**0.28**	0.20	0.09	0.00	**0.29**	0.21	0.09	0.00	**0.30**	0.22	0.09	0.00	**0.31**	0.23	0.09	0.00	**0.32**	0.23	0.10	0.00	**0.33**	22%	0.39	0.17	0.00	**0.56**
Landscape / Recreational Self-supply	SRWMD	1.04	0.00	**1.04**	1.18	0.00	0.00	**1.18**	1.21	0.00	0.00	**1.21**	1.20	0.00	0.00	**1.20**	1.23	0.00	0.00	**1.23**	1.23	0.00	0.00	**1.23**	1.22	0.00	0.00	**1.22**	17%	1.23	0.00	0.00	**1.23**
Landscape / Recreational Self-supply	**Total**	**1.23**	**0.08**	**1.31**	**1.38**	**0.08**	**0.00**	**1.46**	**1.41**	**0.09**	**0.00**	**1.50**	**1.41**	**0.09**	**0.00**	**1.50**	**1.45**	**0.09**	**0.00**	**1.54**	**1.46**	**0.09**	**0.00**	**1.55**	**1.45**	**0.10**	**0.00**	**1.55**	**18%**	**1.62**	**0.17**	**0.00**	**1.79**
Commercial / Industrial / Institutional Self-supply	SJRWMD	0.11	0.00	**0.11**	0.12	0.00	0.00	**0.12**	0.13	0.00	0.00	**0.13**	0.14	0.00	0.00	**0.14**	0.15	0.00	0.00	**0.15**	0.16	0.00	0.00	**0.16**	0.17	0.00	0.00	**0.17**	55%	0.17	0.00	0.00	**0.17**
Commercial / Industrial / Institutional Self-supply	SRWMD	0.36	0.00	**0.36**	0.41	0.00	0.00	**0.41**	0.42	0.00	0.00	**0.42**	0.42	0.00	0.00	**0.42**	0.43	0.00	0.00	**0.43**	0.43	0.00	0.00	**0.43**	0.43	0.00	0.00	**0.43**	19%	0.43	0.00	0.00	**0.43**
Commercial / Industrial / Institutional Self-supply	**Total**	**0.47**	**0.00**	**0.47**	**0.53**	**0.00**	**0.00**	**0.53**	**0.55**	**0.00**	**0.00**	**0.55**	**0.56**	**0.00**	**0.00**	**0.56**	**0.58**	**0.00**	**0.00**	**0.58**	**0.59**	**0.00**	**0.00**	**0.59**	**0.60**	**0.00**	**0.00**	**0.60**	**28%**	**0.60**	**0.00**	**0.00**	**0.60**
Power Generation Self-supply	SJRWMD	0.51	0.00	**0.51**	0.53	0.00	0.00	**0.53**	0.55	0.00	0.00	**0.55**	0.56	0.00	0.00	**0.56**	0.59	0.00	0.00	**0.59**	0.61	0.00	0.00	**0.61**	0.63	0.00	0.00	**0.63**	24%	0.63	0.00	0.00	**0.63**
Power Generation Self-supply	SRWMD	1.77	0.00	**1.77**	1.76	0.00	0.00	**1.76**	1.67	0.00	0.00	**1.67**	1.71	0.00	0.00	**1.71**	1.78	0.00	0.00	**1.78**	1.86	0.00	0.00	**1.86**	1.93	0.00	0.00	**1.93**	9%	1.93	0.00	0.00	**1.93**
Power Generation Self-supply	**Total**	**2.28**	**0.00**	**2.28**	**2.29**	**0.00**	**0.00**	**2.29**	**2.22**	**0.00**	**0.00**	**2.22**	**2.27**	**0.00**	**0.00**	**2.27**	**2.37**	**0.00**	**0.00**	**2.37**	**2.47**	**0.00**	**0.00**	**2.47**	**2.56**	**0.00**	**0.00**	**2.56**	**12%**	**2.56**	**0.00**	**0.00**	**2.56**
Alachua County Total	SJRWMD	**26.89**	**0.08**	**26.97**	**28.22**	**0.08**	**0.00**	**28.30**	**29.44**	**0.09**	**0.00**	**29.53**	**30.72**	**0.09**	**0.00**	**30.81**	**31.71**	**0.09**	**0.00**	**31.80**	**32.65**	**0.09**	**0.00**	**32.74**	**33.37**	**0.10**	**0.00**	**33.47**	**24%**	**37.14**	**0.17**	**0.00**	**37.31**
Alachua County Total	SRWMD	**19.25**	**0.00**	**19.25**	**19.02**	**0.00**	**0.00**	**19.02**	**19.28**	**0.00**	**0.00**	**19.28**	**19.43**	**0.00**	**0.00**	**19.43**	**19.97**	**0.00**	**0.00**	**19.97**	**20.27**	**0.00**	**0.00**	**20.27**	**20.60**	**0.00**	**0.00**	**20.60**	**7%**	**24.39**	**0.00**	**0.00**	**24.39**
Alachua County Total		**46.14**	**0.08**	**46.22**	**47.24**	**0.08**	**0.00**	**47.32**	**48.72**	**0.09**	**0.00**	**48.81**	**50.15**	**0.09**	**0.00**	**50.24**	**51.68**	**0.09**	**0.00**	**51.77**	**52.92**	**0.09**	**0.00**	**53.01**	**53.97**	**0.10**	**0.00**	**54.07**	**17%**	**61.53**	**0.17**	**0.00**	**61.70**

Notes:

1.) All water use is shown in million gallons per day.

2.) Rounding errors account for nominal discrepancies.

3.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-12 (2 - Baker County). Water Use for 2015 and 5-in-10 Year Total Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045, by Category of Use and by District in Baker County for the North Florida Regional Water Supply Plan.

Category	District	Water Use			Demand Projections (5-in-10)																								Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045					2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Public Supply	SJRWMD	0.92	0.00	**0.92**	0.95	0.00	0.00	**0.95**	0.99	0.00	0.00	**0.99**	1.06	0.00	0.00	**1.06**	1.08	0.00	0.00	**1.08**	1.09	0.00	0.00	**1.09**	1.09	0.00	0.00	**1.09**	18%	1.15	0.00	0.00	**1.15**
Public Supply	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Public Supply	**Total**	**0.92**	**0.00**	**0.92**	**0.95**	**0.00**	**0.00**	**0.95**	**0.99**	**0.00**	**0.00**	**0.99**	**1.06**	**0.00**	**0.00**	**1.06**	**1.08**	**0.00**	**0.00**	**1.08**	**1.09**	**0.00**	**0.00**	**1.09**	**1.09**	**0.00**	**0.00**	**1.09**	**18%**	**1.15**	**0.00**	**0.00**	**1.15**
Domestic Self-supply and Small Public Supply Systems	SJRWMD	2.07	0.00	**2.07**	2.43	0.00	0.00	**2.43**	2.56	0.00	0.00	**2.56**	2.64	0.00	0.00	**2.64**	2.73	0.00	0.00	**2.73**	2.81	0.00	0.00	**2.81**	2.90	0.00	0.00	**2.90**	40%	3.07	0.00	0.00	**3.07**
Domestic Self-supply and Small Public Supply Systems	SRWMD	0.05	0.00	**0.05**	0.06	0.00	0.00	**0.06**	0.06	0.00	0.00	**0.06**	0.06	0.00	0.00	**0.06**	0.06	0.00	0.00	**0.06**	0.07	0.00	0.00	**0.07**	0.07	0.00	0.00	**0.07**	40%	0.07	0.00	0.00	**0.07**
Domestic Self-supply and Small Public Supply Systems	**Total**	**2.12**	**0.00**	**2.12**	**2.49**	**0.00**	**0.00**	**2.49**	**2.62**	**0.00**	**0.00**	**2.62**	**2.70**	**0.00**	**0.00**	**2.70**	**2.79**	**0.00**	**0.00**	**2.79**	**2.88**	**0.00**	**0.00**	**2.88**	**2.97**	**0.00**	**0.00**	**2.97**	**40%**	**3.14**	**0.00**	**0.00**	**3.14**
Agricultural Irrigation Self-supply	SJRWMD	0.36	0.20	**0.56**	0.28	0.15	0.00	**0.43**	0.28	0.16	0.00	**0.44**	0.29	0.16	0.00	**0.45**	0.29	0.16	0.00	**0.45**	0.30	0.17	0.00	**0.47**	0.30	0.17	0.00	**0.47**	-16%	0.35	0.20	0.00	**0.55**
Agricultural Irrigation Self-supply	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Agricultural Irrigation Self-supply	**Total**	**0.36**	**0.20**	**0.56**	**0.28**	**0.15**	**0.00**	**0.43**	**0.28**	**0.16**	**0.00**	**0.44**	**0.29**	**0.16**	**0.00**	**0.45**	**0.29**	**0.16**	**0.00**	**0.45**	**0.30**	**0.17**	**0.00**	**0.47**	**0.30**	**0.17**	**0.00**	**0.47**	**-16%**	**0.35**	**0.20**	**0.00**	**0.55**
Landscape / Recreational Self-supply	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Landscape / Recreational Self-supply	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Landscape / Recreational Self-supply	**Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**N/A**	**0.00**	**0.00**	**0.00**	**0.00**
Commercial / Industrial / Institutional Self-supply	SJRWMD	0.15	0.27	**0.42**	0.15	0.28	0.00	**0.43**	0.16	0.29	0.00	**0.45**	0.17	0.30	0.00	**0.47**	0.17	0.31	0.00	**0.48**	0.17	0.32	0.00	**0.49**	0.18	0.32	0.00	**0.50**	19%	0.18	0.32	0.00	**0.50**
Commercial / Industrial / Institutional Self-supply	SRWMD	0.21	0.00	**0.21**	0.22	0.00	0.00	**0.22**	0.23	0.00	0.00	**0.23**	0.24	0.00	0.00	**0.24**	0.25	0.00	0.00	**0.25**	0.26	0.00	0.00	**0.26**	0.27	0.00	0.00	**0.27**	29%	0.27	0.00	0.00	**0.27**
Commercial / Industrial / Institutional Self-supply	**Total**	**0.36**	**0.27**	**0.63**	**0.37**	**0.28**	**0.00**	**0.65**	**0.39**	**0.29**	**0.00**	**0.68**	**0.41**	**0.30**	**0.00**	**0.71**	**0.42**	**0.31**	**0.00**	**0.73**	**0.43**	**0.32**	**0.00**	**0.75**	**0.45**	**0.32**	**0.00**	**0.77**	**22%**	**0.45**	**0.32**	**0.00**	**0.77**
Power Generation Self-supply	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Power Generation Self-supply	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Power Generation Self-supply	**Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**N/A**	**0.00**	**0.00**	**0.00**	**0.00**
Baker County Total	SJRWMD	**3.50**	**0.47**	**3.97**	**3.81**	**0.43**	**0.00**	**4.24**	**3.99**	**0.45**	**0.00**	**4.44**	**4.16**	**0.46**	**0.00**	**4.62**	**4.27**	**0.47**	**0.00**	**4.74**	**4.37**	**0.49**	**0.00**	**4.86**	**4.47**	**0.49**	**0.00**	**4.96**	**25%**	**4.75**	**0.52**	**0.00**	**5.27**
Baker County Total	SRWMD	**0.26**	**0.00**	**0.26**	**0.28**	**0.00**	**0.00**	**0.28**	**0.29**	**0.00**	**0.00**	**0.29**	**0.30**	**0.00**	**0.00**	**0.30**	**0.31**	**0.00**	**0.00**	**0.31**	**0.33**	**0.00**	**0.00**	**0.33**	**0.34**	**0.00**	**0.00**	**0.34**	**31%**	**0.34**	**0.00**	**0.00**	**0.34**
Baker County Total		**3.76**	**0.47**	**4.23**	**4.09**	**0.43**	**0.00**	**4.52**	**4.28**	**0.45**	**0.00**	**4.73**	**4.46**	**0.46**	**0.00**	**4.92**	**4.58**	**0.47**	**0.00**	**5.05**	**4.70**	**0.49**	**0.00**	**5.19**	**4.81**	**0.49**	**0.00**	**5.30**	**25%**	**5.09**	**0.52**	**0.00**	**5.61**

Notes:

1.) All water use is shown in million gallons per day.

2.) Rounding errors account for nominal discrepancies.

3.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-12 (3 - Bradford County). Water Use for 2015 and 5-in-10 Year Total Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045, by Category of Use and by District in Bradford County for the North Florida Regional Water Supply Plan.

Category	District	Water Use			Demand Projections (5-in-10)																								Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045					2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Public Supply	SJRWMD	0.04	0.00	**0.04**	0.01	0.00	0.00	**0.01**	0.01	0.00	0.00	**0.01**	0.01	0.00	0.00	**0.01**	0.01	0.00	0.00	**0.01**	0.01	0.00	0.00	**0.01**	0.01	0.00	0.00	**0.01**	-75%	0.01	0.00	0.00	**0.01**
Public Supply	SRWMD	0.94	0.00	**0.94**	1.04	0.00	0.00	**1.04**	1.05	0.00	0.00	**1.05**	1.07	0.00	0.00	**1.07**	1.08	0.00	0.00	**1.08**	1.09	0.00	0.00	**1.09**	1.11	0.00	0.00	**1.11**	18%	1.17	0.00	0.00	**1.17**
Public Supply	**Total**	**0.98**	**0.00**	**0.98**	**1.05**	**0.00**	**0.00**	**1.05**	**1.06**	**0.00**	**0.00**	**1.06**	**1.08**	**0.00**	**0.00**	**1.08**	**1.09**	**0.00**	**0.00**	**1.09**	**1.10**	**0.00**	**0.00**	**1.10**	**1.12**	**0.00**	**0.00**	**1.12**	**14%**	**1.18**	**0.00**	**0.00**	**1.18**
Domestic Self-supply and Small Public Supply Systems	SJRWMD	0.13	0.00	**0.13**	0.21	0.00	0.00	**0.21**	0.25	0.00	0.00	**0.25**	0.27	0.00	0.00	**0.27**	0.27	0.00	0.00	**0.27**	0.28	0.00	0.00	**0.28**	0.30	0.00	0.00	**0.30**	131%	0.32	0.00	0.00	**0.32**
Domestic Self-supply and Small Public Supply Systems	SRWMD	0.62	0.00	**0.62**	0.57	0.00	0.00	**0.57**	0.56	0.00	0.00	**0.56**	0.56	0.00	0.00	**0.56**	0.56	0.00	0.00	**0.56**	0.55	0.00	0.00	**0.55**	0.54	0.00	0.00	**0.54**	-13%	0.53	0.00	0.00	**0.53**
Domestic Self-supply and Small Public Supply Systems	**Total**	**0.75**	**0.00**	**0.75**	**0.78**	**0.00**	**0.00**	**0.78**	**0.81**	**0.00**	**0.00**	**0.81**	**0.83**	**0.00**	**0.00**	**0.83**	**0.83**	**0.00**	**0.00**	**0.83**	**0.83**	**0.00**	**0.00**	**0.83**	**0.84**	**0.00**	**0.00**	**0.84**	**12%**	**0.85**	**0.00**	**0.00**	**0.85**
Agricultural Irrigation Self-supply	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Agricultural Irrigation Self-supply	SRWMD	1.82	0.00	**1.82**	1.89	0.00	0.00	**1.89**	1.87	0.00	0.00	**1.87**	1.85	0.00	0.00	**1.85**	1.88	0.00	0.00	**1.88**	1.87	0.00	0.00	**1.87**	1.86	0.00	0.00	**1.86**	2%	2.38	0.00	0.00	**2.38**
Agricultural Irrigation Self-supply	**Total**	**1.82**	**0.00**	**1.82**	**1.89**	**0.00**	**0.00**	**1.89**	**1.87**	**0.00**	**0.00**	**1.87**	**1.85**	**0.00**	**0.00**	**1.85**	**1.88**	**0.00**	**0.00**	**1.88**	**1.87**	**0.00**	**0.00**	**1.87**	**1.86**	**0.00**	**0.00**	**1.86**	**2%**	**2.38**	**0.00**	**0.00**	**2.38**
Landscape / Recreational Self-supply	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Landscape / Recreational Self-supply	SRWMD	0.30	0.00	**0.30**	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**	0%	0.35	0.00	0.00	**0.35**
Landscape / Recreational Self-supply	**Total**	**0.30**	**0.00**	**0.30**	**0.30**	**0.00**	**0.00**	**0.30**	**0.30**	**0.00**	**0.00**	**0.30**	**0.30**	**0.00**	**0.00**	**0.30**	**0.30**	**0.00**	**0.00**	**0.30**	**0.30**	**0.00**	**0.00**	**0.30**	**0.30**	**0.00**	**0.00**	**0.30**	**0%**	**0.35**	**0.00**	**0.00**	**0.35**
Commercial / Industrial / Institutional Self-supply	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Commercial / Industrial / Institutional Self-supply	SRWMD	1.04	0.00	**1.04**	1.06	0.00	0.00	**1.06**	1.06	0.00	0.00	**1.06**	1.06	0.00	0.00	**1.06**	1.07	0.00	0.00	**1.07**	1.07	0.00	0.00	**1.07**	1.05	0.00	0.00	**1.05**	1%	1.05	0.00	0.00	**1.05**
Commercial / Industrial / Institutional Self-supply	**Total**	**1.04**	**0.00**	**1.04**	**1.06**	**0.00**	**0.00**	**1.06**	**1.06**	**0.00**	**0.00**	**1.06**	**1.06**	**0.00**	**0.00**	**1.06**	**1.07**	**0.00**	**0.00**	**1.07**	**1.07**	**0.00**	**0.00**	**1.07**	**1.05**	**0.00**	**0.00**	**1.05**	**1%**	**1.05**	**0.00**	**0.00**	**1.05**
Power Generation Self-supply	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Power Generation Self-supply	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Power Generation Self-supply	**Total**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**N/A**	**0.00**	**0.00**	**0.00**	**0.00**
Bradford County Total	SJRWMD	**0.17**	**0.00**	**0.17**	**0.22**	**0.00**	**0.00**	**0.22**	**0.26**	**0.00**	**0.00**	**0.26**	**0.28**	**0.00**	**0.00**	**0.28**	**0.28**	**0.00**	**0.00**	**0.28**	**0.29**	**0.00**	**0.00**	**0.29**	**0.31**	**0.00**	**0.00**	**0.31**	**82%**	**0.33**	**0.00**	**0.00**	**0.33**
Bradford County Total	SRWMD	**4.72**	**0.00**	**4.72**	**4.86**	**0.00**	**0.00**	**4.86**	**4.84**	**0.00**	**0.00**	**4.84**	**4.84**	**0.00**	**0.00**	**4.84**	**4.89**	**0.00**	**0.00**	**4.89**	**4.88**	**0.00**	**0.00**	**4.88**	**4.86**	**0.00**	**0.00**	**4.86**	**3%**	**5.48**	**0.00**	**0.00**	**5.48**
Bradford County Total		**4.89**	**0.00**	**4.89**	**5.08**	**0.00**	**0.00**	**5.08**	**5.10**	**0.00**	**0.00**	**5.10**	**5.12**	**0.00**	**0.00**	**5.12**	**5.17**	**0.00**	**0.00**	**5.17**	**5.17**	**0.00**	**0.00**	**5.17**	**5.17**	**0.00**	**0.00**	**5.17**	**6%**	**5.81**	**0.00**	**0.00**	**5.81**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-12 (4 - Clay County). Water Use for 2015 and 5-in-10 Year Total Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045, by Category of Use in Clay County in the St. Johns River Water Management District for the North Florida Regional Water Supply Plan.

Category	District	Water Use			Demand Projections (5-in-10)																								Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045					2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Public Supply	SJRWMD	12.89	0.00	**12.89**	13.72	0.00	0.00	**13.72**	18.33	0.00	0.00	**18.33**	20.64	0.00	0.00	**20.64**	23.22	0.00	0.00	**23.22**	24.47	0.00	0.00	**24.47**	25.57	0.00	0.00	**25.57**	98%	26.10	0.00	1.41	**27.51**
Domestic Self-supply and Small Public Supply Systems	SJRWMD	6.20	0.00	**6.20**	4.76	0.00	0.00	**4.76**	4.77	0.00	0.00	**4.77**	4.77	0.00	0.00	**4.77**	4.78	0.00	0.00	**4.78**	4.77	0.00	0.00	**4.77**	4.77	0.00	0.00	**4.77**	-23%	5.06	0.00	0.00	**5.06**
Agricultural Irrigation Self-supply	SJRWMD	1.10	0.13	**1.23**	1.23	0.14	0.00	**1.37**	1.23	0.15	0.00	**1.38**	1.23	0.15	0.00	**1.38**	1.24	0.15	0.00	**1.39**	1.26	0.15	0.00	**1.41**	1.28	0.15	0.00	**1.43**	16%	1.54	0.18	0.00	**1.72**
Landscape / Recreational Self-supply	SJRWMD	0.21	0.20	**0.41**	0.44	0.22	0.00	**0.66**	0.59	0.26	0.00	**0.85**	0.67	0.30	0.00	**0.97**	0.75	0.35	0.00	**1.10**	0.80	0.37	0.00	**1.17**	0.83	0.40	0.00	**1.23**	200%	1.37	0.83	0.00	**1.70**
Commercial / Industrial / Institutional Self-supply	SJRWMD	0.31	0.00	**0.31**	0.33	0.00	0.00	**0.33**	0.36	0.00	0.00	**0.36**	0.39	0.00	0.00	**0.39**	0.42	0.00	0.00	**0.42**	0.44	0.00	0.00	**0.44**	0.46	0.00	0.00	**0.46**	48%	0.46	0.00	0.00	**0.46**
Power Generation Self-supply	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Clay County Total		**20.71**	**0.33**	**21.04**	**20.48**	**0.36**	**0.00**	**20.84**	**25.28**	**0.41**	**0.00**	**25.69**	**27.70**	**0.45**	**0.00**	**28.15**	**30.41**	**0.50**	**0.00**	**30.91**	**31.74**	**0.52**	**0.00**	**32.26**	**32.91**	**0.55**	**0.00**	**33.46**	**59%**	**34.53**	**1.01**	**1.41**	**36.45**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-12 (5 - Columbia County). Water Use for 2015 and 5-in-10 Year Total Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045, by Category of Use in Columbia County in the Suwannee River Water Management District for the North Florida Regional Water Supply Plan.

Category	District	Water Use			Demand Projections (5-in-10)																								Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045					2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Public Supply	SRWMD	3.32	0.00	**3.32**	3.47	0.00	0.00	**3.47**	5.74	0.00	0.00	**5.74**	5.84	0.00	0.00	**5.84**	5.94	0.00	0.00	**5.94**	6.05	0.00	0.00	**6.05**	6.16	0.00	0.00	**6.16**	86%	6.53	0.00	0.00	**6.53**
Domestic Self-supply and Small Public Supply Systems	SRWMD	2.63	0.00	**2.63**	2.73	0.00	0.00	**2.73**	2.87	0.00	0.00	**2.87**	2.98	0.00	0.00	**2.98**	3.06	0.00	0.00	**3.06**	3.13	0.00	0.00	**3.13**	3.19	0.00	0.00	**3.19**	21%	3.33	0.00	0.00	**3.33**
Agricultural Irrigation Self-supply	SRWMD	4.66	0.00	**4.66**	4.34	0.00	0.00	**4.34**	5.47	0.00	0.00	**5.47**	6.41	0.00	0.00	**6.41**	7.35	0.00	0.00	**7.35**	8.49	0.00	0.00	**8.49**	9.64	0.00	0.00	**9.64**	107%	12.22	0.00	0.00	**12.22**
Landscape / Recreational Self-supply	SRWMD	0.73	0.00	**0.73**	0.76	0.00	0.00	**0.76**	0.79	0.00	0.00	**0.79**	0.82	0.00	0.00	**0.82**	0.84	0.00	0.00	**0.84**	0.86	0.00	0.00	**0.86**	0.88	0.00	0.00	**0.88**	21%	0.91	0.00	0.00	**0.91**
Commercial / Industrial / Institutional Self-supply	SRWMD	0.41	0.00	**0.41**	0.42	0.00	0.00	**0.42**	0.44	0.00	0.00	**0.44**	0.46	0.00	0.00	**0.46**	0.47	0.00	0.00	**0.47**	0.48	0.00	0.00	**0.48**	0.49	0.00	0.00	**0.49**	20%	0.49	0.00	0.00	**0.49**
Power Generation Self-supply	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Columbia County Total		**11.75**	**0.00**	**11.75**	**11.72**	**0.00**	**0.00**	**11.72**	**15.31**	**0.00**	**0.00**	**15.31**	**16.51**	**0.00**	**0.00**	**16.51**	**17.66**	**0.00**	**0.00**	**17.66**	**19.01**	**0.00**	**0.00**	**19.01**	**20.36**	**0.00**	**0.00**	**20.36**	**73%**	**23.48**	**0.00**	**0.00**	**23.48**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-12 (6 - Duval County). Water Use for 2015 and 5-in-10 Year Total Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045, by Category of Use in Duval County in the St. Johns River Water Management District for the North Florida Regional Water Supply Plan.

Category	District	Water Use			Demand Projections (5-in-10)																								Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045					2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Public Supply	SJRWMD	106.34	0.00	**106.34**	115.27	0.00	0.00	**115.27**	124.03	0.00	0.00	**124.03**	132.85	0.00	0.00	**132.85**	140.04	0.00	1.51	**141.55**	140.37	0.00	10.07	**150.44**	140.37	0.00	18.60	**158.97**	49%	168.51	0.00	27.68	**168.51**
Domestic Self-supply and Small Public Supply Systems	SJRWMD	14.74	0.00	**14.74**	15.92	0.00	0.00	**15.92**	16.37	0.00	0.00	**16.37**	16.53	0.00	0.00	**16.53**	16.58	0.00	0.00	**16.58**	16.45	0.00	0.00	**16.45**	16.25	0.00	0.00	**16.25**	10%	17.23	0.00	0.00	**17.23**
Agricultural Irrigation Self-supply	SJRWMD	0.10	1.66	**1.76**	0.46	1.14	0.00	**1.60**	0.46	1.15	0.00	**1.61**	0.46	1.16	0.00	**1.62**	0.46	1.15	0.00	**1.61**	0.46	1.16	0.00	**1.62**	0.46	1.15	0.00	**1.61**	-9%	0.11	1.83	0.00	**1.94**
Landscape / Recreational Self-supply	SJRWMD	1.64	3.19	**4.83**	1.94	3.77	0.00	**5.71**	2.02	3.92	0.00	**5.94**	2.09	4.07	0.00	**6.16**	2.16	4.21	0.00	**6.37**	2.23	4.35	0.00	**6.58**	2.30	4.47	0.00	**6.77**	40%	3.17	6.17	0.00	**9.34**
Commercial / Industrial / Institutional Self-supply	SJRWMD	14.16	0.79	**14.95**	16.65	0.93	0.00	**17.58**	17.30	0.97	0.00	**18.27**	17.93	1.00	0.00	**18.93**	18.53	1.03	0.00	**19.56**	19.12	1.07	0.00	**20.19**	19.65	1.10	0.00	**20.75**	39%	19.65	1.10	0.00	**20.75**
Power Generation Self-supply	SJRWMD	6.37	12.18	**18.55**	5.04	13.08	0.00	**18.12**	5.18	13.44	0.00	**18.62**	5.40	13.99	0.00	**19.39**	5.80	15.07	0.00	**20.87**	6.25	16.21	0.00	**22.46**	6.72	17.44	0.00	**24.16**	30%	6.72	17.44	0.00	**24.16**
Duval County Total		**143.35**	**17.82**	**161.17**	**155.28**	**18.92**	**0.00**	**174.20**	**165.36**	**19.48**	**0.00**	**184.84**	**175.26**	**20.22**	**0.00**	**195.48**	**183.57**	**21.46**	**1.51**	**206.54**	**184.88**	**22.79**	**10.07**	**217.74**	**185.75**	**24.16**	**18.60**	**228.51**	**42%**	**215.39**	**26.54**	**27.68**	**241.93**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-12 (7 - Flagler County). Water Use for 2015 and 5-in-10 Year Total Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045, by Category of Use in Flagler County in the St. Johns River Water Management District for the North Florida Regional Water Supply Plan.

Category	District	Water Use			Demand Projections (5-in-10)																								Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045					2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Public Supply	SJRWMD	8.98	0.07	**9.05**	10.26	0.03	0.00	**10.29**	11.42	0.03	0.00	**11.45**	12.42	0.03	0.00	**12.45**	13.23	0.03	0.00	**13.26**	13.76	0.03	0.00	**13.79**	14.30	0.03	0.00	**14.33**	58%	15.15	0.03	0.00	**15.18**
Domestic Self-supply and Small Public Supply Systems	SJRWMD	0.26	0.00	**0.26**	0.30	0.00	0.00	**0.30**	0.30	0.00	0.00	**0.30**	0.38	0.00	0.00	**0.38**	0.39	0.00	0.00	**0.39**	0.39	0.00	0.00	**0.39**	0.40	0.00	0.00	**0.40**	54%	0.42	0.00	0.00	**0.42**
Agricultural Irrigation Self-supply	SJRWMD	6.45	0.41	**6.86**	10.56	0.67	0.00	**11.23**	10.47	0.67	0.00	**11.14**	10.34	0.66	0.00	**11.00**	10.32	0.66	0.00	**10.98**	10.20	0.65	0.00	**10.85**	10.13	0.64	0.00	**10.77**	57%	14.24	0.90	0.00	**15.14**
Landscape / Recreational Self-supply	SJRWMD	0.43	1.41	**1.84**	0.48	1.59	0.00	**2.07**	0.54	1.75	0.00	**2.29**	0.58	1.90	0.00	**2.48**	0.61	2.02	0.00	**2.63**	0.64	2.09	0.00	**2.73**	0.66	2.15	0.00	**2.81**	53%	0.76	2.50	0.00	**3.26**
Commercial / Industrial / Institutional Self-supply	SJRWMD	0.26	0.00	**0.26**	0.27	0.00	0.00	**0.27**	0.28	0.00	0.00	**0.28**	0.29	0.00	0.00	**0.29**	0.30	0.00	0.00	**0.30**	0.31	0.00	0.00	**0.31**	0.31	0.00	0.00	**0.31**	19%	0.31	0.00	0.00	**0.31**
Power Generation Self-supply	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Flagler County Total		**16.38**	**1.89**	**18.27**	**21.87**	**2.29**	**0.00**	**24.16**	**23.01**	**2.45**	**0.00**	**25.46**	**24.01**	**2.59**	**0.00**	**26.60**	**24.85**	**2.71**	**0.00**	**27.56**	**25.30**	**2.77**	**0.00**	**28.07**	**25.80**	**2.82**	**0.00**	**28.62**	**57%**	**30.88**	**3.43**	**0.00**	**34.31**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-12 (8 - Gilchrist County). Water Use for 2015 and 5-in-10 Year Total Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045, by Category of Use in Gilchrist County in the Suwannee River Water Management District for the North Florida Regional Water Supply Plan.

Category	District	Water Use			Demand Projections (5-in-10)																								Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045					2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Public Supply	SRWMD	0.22	0.00	**0.22**	0.22	0.00	0.00	**0.22**	0.25	0.00	0.00	**0.25**	0.27	0.00	0.00	**0.27**	0.28	0.00	0.00	**0.28**	0.28	0.00	0.00	**0.28**	0.28	0.00	0.00	**0.28**	27%	0.30	0.00	0.00	**0.30**
Domestic Self-supply and Small Public Supply Systems	SRWMD	0.99	0.00	**0.99**	1.06	0.00	0.00	**1.06**	1.11	0.00	0.00	**1.11**	1.15	0.00	0.00	**1.15**	1.19	0.00	0.00	**1.19**	1.22	0.00	0.00	**1.22**	1.26	0.00	0.00	**1.26**	27%	1.34	0.00	0.00	**1.34**
Agricultural Irrigation Self-supply	SRWMD	19.01	0.00	**19.01**	19.00	0.00	0.00	**19.00**	19.65	0.00	0.00	**19.65**	20.30	0.00	0.00	**20.30**	21.06	0.00	0.00	**21.06**	21.78	0.00	0.00	**21.78**	22.57	0.00	0.00	**22.57**	19%	28.32	0.00	0.00	**28.32**
Landscape / Recreational Self-supply	SRWMD	0.16	0.00	**0.16**	0.17	0.00	0.00	**0.17**	0.18	0.00	0.00	**0.18**	0.19	0.00	0.00	**0.19**	0.20	0.00	0.00	**0.20**	0.21	0.00	0.00	**0.21**	0.22	0.00	0.00	**0.22**	38%	0.23	0.00	0.00	**0.23**
Commercial / Industrial / Institutional Self-supply	SRWMD	0.38	0.00	**0.38**	0.41	0.00	0.00	**0.41**	0.43	0.00	0.00	**0.43**	0.45	0.00	0.00	**0.45**	0.47	0.00	0.00	**0.47**	0.48	0.00	0.00	**0.48**	0.49	0.00	0.00	**0.49**	29%	0.49	0.00	0.00	**0.49**
Power Generation Self-supply	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Gilchrist County Total		**20.76**	**0.00**	**20.76**	**20.86**	**0.00**	**0.00**	**20.86**	**21.62**	**0.00**	**0.00**	**21.62**	**22.36**	**0.00**	**0.00**	**22.36**	**23.20**	**0.00**	**0.00**	**23.20**	**23.97**	**0.00**	**0.00**	**23.97**	**24.82**	**0.00**	**0.00**	**24.82**	**20%**	**30.68**	**0.00**	**0.00**	**30.68**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-12 (9 - Hamilton County). Water Use for 2015 and 5-in-10 Year Total Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045, by Category of Use in Hamilton County in the Suwannee River Water Management District for the North Florida Regional Water Supply Plan.

Category	District	Water Use			Demand Projections (5-in-10)																								Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045					2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Public Supply	SRWMD	0.91	0.00	**0.91**	1.03	0.00	0.00	**1.03**	1.03	0.00	0.00	**1.03**	1.03	0.00	0.00	**1.03**	1.03	0.00	0.00	**1.03**	1.03	0.00	0.00	**1.03**	1.03	0.00	0.00	**1.03**	13%	1.09	0.00	0.00	**1.09**
Domestic Self-supply and Small Public Supply Systems	SRWMD	0.65	0.00	**0.65**	0.64	0.00	0.00	**0.64**	0.65	0.00	0.00	**0.65**	0.66	0.00	0.00	**0.66**	0.66	0.00	0.00	**0.66**	0.66	0.00	0.00	**0.66**	0.67	0.00	0.00	**0.67**	3%	0.71	0.00	0.00	**0.71**
Agricultural Irrigation Self-supply	SRWMD	16.10	0.00	**16.10**	13.95	0.00	0.00	**13.95**	14.69	0.00	0.00	**14.69**	15.36	0.00	0.00	**15.36**	16.10	0.00	0.00	**16.10**	16.86	0.00	0.00	**16.86**	17.55	0.00	0.00	**17.55**	9%	22.45	0.00	0.00	**22.45**
Landscape / Recreational Self-supply	SRWMD	0.10	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0%	0.17	0.00	0.00	**0.17**
Commercial / Industrial / Institutional Self-supply	SRWMD	22.93	17.19	**40.12**	22.93	17.19	0.00	**40.12**	22.93	17.19	0.00	**40.12**	22.93	17.19	0.00	**40.12**	22.93	17.19	0.00	**40.12**	22.93	17.19	0.00	**40.12**	22.93	17.19	0.00	**40.12**	0%	22.93	17.19	0.00	**40.12**
Power Generation Self-supply	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Hamilton County Total		**40.69**	**17.19**	**57.88**	**38.65**	**17.19**	**0.00**	**55.84**	**39.40**	**17.19**	**0.00**	**56.59**	**40.08**	**17.19**	**0.00**	**57.27**	**40.82**	**17.19**	**0.00**	**58.01**	**41.58**	**17.19**	**0.00**	**58.77**	**42.28**	**17.19**	**0.00**	**59.47**	**3%**	**47.35**	**17.19**	**0.00**	**64.54**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-12 (10 - Nassau County). Water Use for 2015 and 5-in-10 Year Total Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045, by Category of Use in Nassau County in the St. Johns River Water Management District for the North Florida Regional Water Supply Plan.

Category	District	Water Use			Demand Projections (5-in-10)																												Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045					2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Public Supply	SJRWMD	6.92	0.00	**6.92**	7.85	0.00	0.00	**7.85**	8.05	0.00	0.00	**8.05**	8.24	0.00	0.00	**8.24**	8.24	0.00	0.00	**8.24**	8.26	0.00	0.00	**8.26**	8.26	0.00	0.00	**8.26**	19%	8.60	0.00	0.00	**8.60**
Domestic Self-supply and Small Public Supply Systems	SJRWMD	1.11	0.00	**1.11**	1.49	0.00	0.00	**1.49**	1.72	0.00	0.00	**1.72**	1.85	0.00	0.00	**1.85**	2.03	0.00	0.00	**2.03**	2.16	0.00	0.00	**2.16**	2.28	0.00	0.00	**2.28**	105%	2.42	0.00	0.00	**2.42**
Agricultural Irrigation Self-supply	SJRWMD	0.67	0.00	**0.67**	0.95	0.00	0.00	**0.95**	0.97	0.00	0.00	**0.97**	0.97	0.00	0.00	**0.97**	0.98	0.00	0.00	**0.98**	0.98	0.00	0.00	**0.98**	0.99	0.00	0.00	**0.99**	48%	1.29	0.00	0.00	**1.29**
Landscape / Recreational Self-supply	SJRWMD	0.86	1.64	**2.50**	0.76	1.46	0.00	**2.22**	0.87	1.67	0.00	**2.54**	0.98	1.87	0.00	**2.85**	1.07	2.03	0.00	**3.10**	1.15	2.20	0.00	**3.35**	1.23	2.36	0.00	**3.59**	44%	1.51	2.87	0.00	**4.38**
Commercial / Industrial / Institutional Self-supply	SJRWMD	33.06	0.05	**33.11**	33.02	0.05	0.00	**33.07**	33.06	0.05	0.00	**33.11**	33.10	0.05	0.00	**33.15**	33.13	0.05	0.00	**33.18**	33.16	0.05	0.00	**33.21**	33.19	0.05	0.00	**33.24**	0%	33.19	0.05	0.00	**33.24**
Power Generation Self-supply	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Nassau County Total		**42.62**	**1.69**	**44.31**	**44.07**	**1.51**	**0.00**	**45.58**	**44.67**	**1.72**	**0.00**	**46.39**	**45.14**	**1.92**	**0.00**	**47.06**	**45.45**	**2.08**	**0.00**	**47.53**	**45.71**	**2.25**	**0.00**	**47.96**	**45.95**	**2.41**	**0.00**	**48.36**	**9%**	**47.01**	**2.92**	**0.00**	**49.93**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-12 (11 - Putnam County). Water Use for 2015 and 5-in-10 Year Total Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045, by Category of Use in Putnam County in the St. Johns River Water Management District for the North Florida Regional Water Supply Plan.

Category	District	Water Use			Demand Projections (5-in-10)																												Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045					2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Public Supply	SJRWMD	2.18	0.00	**2.18**	2.11	0.00	0.00	**2.11**	2.12	0.00	0.00	**2.12**	2.13	0.00	0.00	**2.13**	2.15	0.00	0.00	**2.15**	2.16	0.00	0.00	**2.16**	2.18	0.00	0.00	**2.18**	0%	2.31	0.00	0.00	**2.31**
Domestic Self-supply and Small Public Supply Systems	SJRWMD	2.82	0.00	**2.82**	3.24	0.00	0.00	**3.24**	3.24	0.00	0.00	**3.24**	3.24	0.00	0.00	**3.24**	3.24	0.00	0.00	**3.24**	3.24	0.00	0.00	**3.24**	3.24	0.00	0.00	**3.24**	15%	3.43	0.00	0.00	**3.43**
Agricultural Irrigation Self-supply	SJRWMD	15.50	0.26	**15.76**	15.95	1.08	0.00	**17.03**	16.92	1.13	0.00	**18.05**	17.81	1.14	0.00	**18.95**	18.63	1.15	0.00	**19.78**	19.53	1.19	0.00	**20.72**	20.45	1.21	0.00	**21.66**	37%	28.77	0.48	0.00	**29.25**
Landscape / Recreational Self-supply	SJRWMD	0.37	0.49	**0.86**	0.37	0.50	0.00	**0.87**	0.37	0.50	0.00	**0.87**	0.37	0.50	0.00	**0.87**	0.37	0.50	0.00	**0.87**	0.37	0.50	0.00	**0.87**	0.37	0.50	0.00	**0.87**	1%	0.68	0.90	0.00	**1.58**
Commercial / Industrial / Institutional Self-supply	SJRWMD	3.69	23.85	**27.54**	3.69	23.87	0.00	**27.56**	3.69	23.88	0.00	**27.57**	3.70	23.88	0.00	**27.58**	3.70	23.89	0.00	**27.59**	3.70	23.90	0.00	**27.60**	3.70	23.91	0.00	**27.61**	0%	3.70	23.91	0.00	**27.61**
Power Generation Self-supply	SJRWMD	0.45	0.30	**0.75**	0.48	0.32	0.00	**0.80**	0.51	0.34	0.00	**0.85**	0.54	0.36	0.00	**0.90**	0.56	0.37	0.00	**0.93**	0.57	0.38	0.00	**0.95**	0.58	0.39	0.00	**0.97**	29%	0.58	0.39	0.00	**0.97**
Putnam County Total		**25.01**	**24.90**	**49.91**	**25.84**	**25.77**	**0.00**	**51.61**	**26.85**	**25.85**	**0.00**	**52.70**	**27.79**	**25.88**	**0.00**	**53.67**	**28.65**	**25.91**	**0.00**	**54.56**	**29.57**	**25.97**	**0.00**	**55.54**	**30.52**	**26.01**	**0.00**	**56.53**	**13%**	**39.47**	**25.68**	**0.00**	**65.15**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-12 (12 - St. Johns County). Water Use for 2015 and 5-in-10 Year Total Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045, by Category of Use in St. Johns County in the St. Johns River Water Management District for the North Florida Regional Water Supply Plan.

Category	District	Water Use			Demand Projections (5-in-10)																												Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045					2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Public Supply	SJRWMD	19.21	0.00	**19.21**	25.10	0.00	0.00	**25.10**	28.43	0.00	0.00	**28.43**	30.60	0.00	0.00	**30.60**	32.51	0.00	0.00	**32.51**	34.28	0.00	0.00	**34.28**	35.86	0.00	0.00	**35.86**	87%	36.20	0.00	0.00	**36.20**
Domestic Self-supply and Small Public Supply Systems	SJRWMD	2.96	0.00	**2.96**	4.58	0.00	0.00	**4.58**	4.56	0.00	0.00	**4.56**	4.53	0.00	0.00	**4.53**	4.50	0.00	0.00	**4.50**	4.47	0.00	0.00	**4.47**	4.44	0.00	0.00	**4.44**	50%	4.70	0.00	0.00	**4.70**
Agricultural Irrigation Self-supply	SJRWMD	18.18	0.00	**18.18**	25.37	0.39	0.00	**25.76**	24.96	0.39	0.00	**25.35**	24.51	0.36	0.00	**24.87**	24.08	0.38	0.00	**24.46**	23.55	0.37	0.00	**23.92**	23.05	0.36	0.00	**23.41**	29%	34.25	0.00	0.00	**34.25**
Landscape / Recreational Self-supply	SJRWMD	0.52	4.19	**4.71**	0.72	5.84	0.00	**6.56**	0.84	6.77	0.00	**7.61**	0.93	7.50	0.00	**8.43**	1.01	8.18	0.00	**9.19**	1.10	8.82	0.00	**9.92**	1.18	9.50	0.00	**10.68**	127%	1.42	11.40	0.00	**12.82**
Commercial / Industrial / Institutional Self-supply	SJRWMD	0.56	0.20	**0.76**	0.74	0.27	0.00	**1.01**	0.85	0.30	0.00	**1.15**	0.93	0.33	0.00	**1.26**	1.00	0.36	0.00	**1.36**	1.08	0.38	0.00	**1.46**	1.15	0.41	0.00	**1.56**	105%	1.15	0.41	0.00	**1.56**
Power Generation Self-supply	SJRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
St. Johns County Total		**41.43**	**4.39**	**45.82**	**56.51**	**6.50**	**0.00**	**63.01**	**59.64**	**7.46**	**0.00**	**67.10**	**61.50**	**8.19**	**0.00**	**69.69**	**63.10**	**8.92**	**0.00**	**72.02**	**64.48**	**9.57**	**0.00**	**74.05**	**65.68**	**10.27**	**0.00**	**75.95**	**66%**	**77.72**	**11.81**	**0.00**	**89.53**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-12 (13- Suwannee County). Water Use for 2015 and 5-in-10 Year Total Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045, by Category of Use in Suwannee County in the Suwannee River Water Management District for the North Florida Regional Water Supply Plan.

Category	District	Water Use			Demand Projections (5-in-10)																												Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045					2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Public Supply	SRWMD	1.32	0.00	**1.32**	1.45	0.00	0.00	**1.45**	1.61	0.00	0.00	**1.61**	1.73	0.00	0.00	**1.73**	1.79	0.00	0.00	**1.79**	1.84	0.00	0.00	**1.84**	1.87	0.00	0.00	**1.87**	42%	1.98	0.00	0.00	**1.98**
Domestic Self-supply and Small Public Supply Systems	SRWMD	2.22	0.00	**2.22**	2.34	0.00	0.00	**2.34**	2.48	0.00	0.00	**2.48**	2.58	0.00	0.00	**2.58**	2.66	0.00	0.00	**2.66**	2.73	0.00	0.00	**2.73**	2.80	0.00	0.00	**2.80**	26%	2.96	0.00	0.00	**2.96**
Agricultural Irrigation Self-supply	SRWMD	33.90	0.00	**33.90**	36.39	0.00	0.00	**36.39**	38.47	0.00	0.00	**38.47**	39.99	0.00	0.00	**39.99**	41.84	0.00	0.00	**41.84**	43.65	0.00	0.00	**43.65**	45.58	0.00	0.00	**45.58**	34%	58.13	0.00	0.00	**58.13**
Landscape / Recreational Self-supply	SRWMD	0.29	0.00	**0.29**	0.30	0.00	0.00	**0.30**	0.31	0.00	0.00	**0.31**	0.32	0.00	0.00	**0.32**	0.33	0.00	0.00	**0.33**	0.34	0.00	0.00	**0.34**	0.35	0.00	0.00	**0.35**	21%	0.43	0.00	0.00	**0.43**
Commercial / Industrial / Institutional Self-supply	SRWMD	2.72	0.00	**2.72**	2.87	0.00	0.00	**2.87**	3.03	0.00	0.00	**3.03**	3.17	0.00	0.00	**3.17**	3.28	0.00	0.00	**3.28**	3.37	0.00	0.00	**3.37**	3.45	0.00	0.00	**3.45**	27%	3.45	0.00	0.00	**3.45**
Power Generation Self-supply	SRWMD	0.10	0.06	**0.16**	0.07	0.05	0.00	**0.12**	0.07	0.05	0.00	**0.12**	0.07	0.05	0.00	**0.12**	0.07	0.05	0.00	**0.12**	0.07	0.05	0.00	**0.12**	0.07	0.05	0.00	**0.12**	-25%	0.07	0.05	0.00	**0.12**
Suwannee County Total		**40.55**	**0.06**	**40.61**	**43.42**	**0.05**	**0.00**	**43.47**	**45.97**	**0.05**	**0.00**	**46.02**	**47.86**	**0.05**	**0.00**	**47.91**	**49.97**	**0.05**	**0.00**	**50.02**	**52.00**	**0.05**	**0.00**	**52.05**	**54.12**	**0.05**	**0.00**	**54.17**	**33%**	**67.02**	**0.05**	**0.00**	**67.07**

Notes:
1.) All water use is shown in million gallons per day.
2.) Rounding errors account for nominal discrepancies.
3.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-12 (14 - Union County). Water Use for 2015 and 5-in-10 Year Total Water Demand Projections for 2020-2045 and 1-in-10 Year Water Demand Projections for 2045, by Category of Use in Union County in the Suwannee River Water Management District for the North Florida Regional Water Supply Plan.

Category	District	Water Use			Demand Projections (5-in-10)																								Percent Change 2015-2045	Demand Projections (1-in-10)			
		2015			2020				2025				2030				2035				2040				2045					2045			
		Ground	Surface	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total	Ground	Surface	Other	Total		Ground	Surface	Other	Total
Public Supply	SRWMD	0.26	0.00	**0.26**	0.24	0.00	0.00	**0.24**	0.24	0.00	0.00	**0.24**	0.24	0.00	0.00	**0.24**	0.25	0.00	0.00	**0.25**	0.25	0.00	0.00	**0.25**	0.25	0.00	0.00	**0.25**	-4%	0.27	0.00	0.00	**0.27**
Domestic Self-supply and Small Public Supply Systems	SRWMD	0.66	0.00	**0.66**	0.65	0.00	0.00	**0.65**	0.65	0.00	0.00	**0.65**	0.65	0.00	0.00	**0.65**	0.66	0.00	0.00	**0.66**	0.66	0.00	0.00	**0.66**	0.66	0.00	0.00	**0.66**	0%	0.70	0.00	0.00	**0.70**
Agricultural Irrigation Self-supply	SRWMD	1.22	0.00	**1.22**	1.32	0.00	0.00	**1.32**	1.53	0.00	0.00	**1.53**	1.68	0.00	0.00	**1.68**	1.77	0.00	0.00	**1.77**	1.94	0.00	0.00	**1.94**	2.06	0.00	0.00	**2.06**	69%	2.68	0.00	0.00	**2.68**
Landscape / Recreational Self-supply	SRWMD	0.10	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0.10	0.00	0.00	**0.10**	0%	0.14	0.00	0.00	**0.14**
Commercial / Industrial / Institutional Self-supply	SRWMD	0.51	0.00	**0.51**	0.50	0.00	0.00	**0.50**	0.50	0.00	0.00	**0.50**	0.50	0.00	0.00	**0.50**	0.50	0.00	0.00	**0.50**	0.50	0.00	0.00	**0.50**	0.50	0.00	0.00	**0.50**	-2%	0.50	0.00	0.00	**0.50**
Power Generation Self-supply	SRWMD	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	**0.00**	N/A	0.00	0.00	0.00	**0.00**
Union County Total		**2.75**	**0.00**	**2.75**	**2.81**	**0.00**	**0.00**	**2.81**	**3.02**	**0.00**	**0.00**	**3.02**	**3.17**	**0.00**	**0.00**	**3.17**	**3.28**	**0.00**	**0.00**	**3.28**	**3.45**	**0.00**	**0.00**	**3.45**	**3.57**	**0.00**	**0.00**	**3.57**	**30%**	**4.29**	**0.00**	**0.00**	**4.29**

Notes:

1.) All water use is shown in million gallons per day.

2.) Rounding errors account for nominal discrepancies.

3.) The Other water source category represents water demand exceeding the permittee's groundwater withdrawal limit as identified in the Black Creek Water Resource Development Project Participation Agreement.

Table B-13. 2045 Reclaimed Water Projections Using 75 Percent Beneficial Utilization for the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Waste Water Treatment Facility Name	Reuse System Name	WAFR ID	PAA	2018	Associated CUP	2018 Total Facility Treatment Flow	2018 Total Beneficial Reuse	Potential Existing Additional Reclaimed Water for Reuse	2018 Population	2045 Population	2045 Additional Population Hooked up to Sewer System	2045 New Waste Water Flow	2045 Potential New Additional Reclaimed Water for Reuse	2045 Total Potential Additional Reclaimed Water for Reuse	2045 Total Facility Treatment Flow	At least 75% Utilization
Alachua	SJRWMD	Hawthorne WWTF	Hawthorne	FLA011291	No	Basic	1674	0.14	0.14	0.00	1,530	2,426	851	0.06	0.05	**0.05**	0.20	75%
Alachua	SJRWMD	GRU - Kanapaha (#5) WRF	GRU - Kanapaha	FL0112895	Yes	High	11339	11.63	11.63	0.00	195,460	231,295	34,043					
Alachua	SJRWMD	GRU - Main Street (#1 & #2) WRF	GRU - Main Street	FL0027251	Yes	High & Basic	11339	6.70	6.70	0.00	N/A	N/A	N/A	2.49	1.86	**1.86**	14.12	75%
Alachua	SJRWMD	University of Florida WRF	UF - Lake Alice	FLA011322	Yes	High	N/A	1.74	0.94	0.60	0	0	N/A	0.00	0.00	**0.60**	1.74	75%
Alachua County - SJRWMD Total								**20.21**	**19.41**	**0.60**	**196,990**	**233,721**	**34,894**	**2.55**	**1.91**	**2.51**	**22.76**	**75%**
Alachua	SRWMD	Alachua	Alachua	FLA011290	Yes	High	220667	0.72	0.69	0.02	10,155	11,925	1,682	0.12	0.09	**0.11**	0.84	75%
Alachua	SRWMD	High Springs WWTF	High Springs WWTF	FLA286095	No	Basic	216833	0.16	0.16	0.00	6,221	7,230	959	0.07	0.05	**0.05**	0.23	75%
Alachua	SRWMD	Newberry WWTF	Newberry WWTF	FLA011292	No	Basic	216450	0.21	0.21	0.00	5,538	7,973	2,313	0.17	0.13	**0.13**	0.38	75%
Alachua	SRWMD	Waldo, City of WWTF	Waldo, City of WWTF	FL0042242	No	Basic	217300	0.00	0.00	0.00	960	1,230	N/A	N/A	N/A	**N/A**	N/A	75%
Alachua County - SRWMD Total								**1.09**	**1.06**	**0.02**	**22,874**	**28,358**	**4,953**	**0.36**	**0.27**	**0.29**	**1.45**	**75%**
Alachua County Total								**21.30**	**20.47**	**0.62**	**219,864**	**262,079**	**39,848**	**2.91**	**2.18**	**2.80**	**24.21**	**75%**
Baker	SJRWMD	City of Macclenny WWTF	City of Macclenny WWTF	FL0040495	No	Basic	15	0.87	0.00	0.65	6,582	7,528	899	0.07	0.05	**0.70**	0.94	75%
Baker County - SJRWMD Total								**0.87**	**0.00**	**0.65**	**6,582**	**7,528**	**899**	**0.07**	**0.05**	**0.70**	**0.94**	**75%**
Baker	SRWMD	Baker Correctional Institution	Baker Correctional Institution	FLA011332	No	Basic	N/A	0.21	0.21	0.00	0	0	N/A	0.00	0.00	**0.00**	0.21	75%
Baker County - SRWMD Total								**0.21**	**0.21**	**0.00**	**0**	**0**	**N/A**	**0.00**	**0.00**	**0.00**	**0.21**	**75%**
Baker County Total								**1.08**	**0.21**	**0.65**	**6,582**	**7,528**	**N/A**	**0.07**	**0.05**	**0.70**	**1.14**	**75%**
Bradford	SRWMD	Florida State Prison WWTF	Florida State Prison WWTF	FLA113450	No	Basic	N/A	1.01	1.01	0.00	0	0	N/A	0.00	0.00	**0.00**	1.01	75%
Bradford	SRWMD	Starke, City of	Starke, City of	FL0028126	No	Basic	216650	0.75	0.16	0.44	6,700	8,653	1,855	0.14	0.10	**0.54**	0.89	75%
Bradford County - SRWMD Total								**1.76**	**1.17**	**0.44**	**6,700**	**8,653**	**1,855**	**0.14**	**0.10**	**0.54**	**1.90**	**75%**
Clay	SJRWMD	Town of Orange Orange Park WWTF	Town of Orange Orange Park WWTF	FL0023922	No	Basic	453	0.99	0.00	0.74	9,058	10,076	967	0.07	0.05	**0.80**	1.06	75%
Clay	SJRWMD	Green Cove Springs - Harbor Road	Green Cove Springs - Harbor Road WWTP	FL0020915	Yes	High	499	0.50	0.25	0.19	6,763	8,702	1,842					
Clay	SJRWMD	City of Green Cove Springs South	City of Green Cove Springs South	FL0030210	No	Basic	499	0.29	0.00	0.22	N/A	N/A	N/A	0.13	0.10	**0.29**	0.92	75%
Clay	SJRWMD	CCUA-Fleming Island Regional WWTF	CCUA - Fleming Island	FL0043834	Yes	High	416, 431, 137335	5.68	5.06	0.47	120,444	227,726	101,918					
Clay	SJRWMD	CCUA-Fleming Oaks WWTF	CCUA - Fleming Island	FL0032875	No	Basic	416, 431	0.00	0.00	0.00	N/A	N/A	N/A					
Clay	SJRWMD	CCUA-Fleming Oaks WWTF	CCUA - Keystone Heights WWTF	FLA362743	No	Basic	416, 431	0.00	0.00	0.00	N/A	N/A	N/A					
Clay	SJRWMD	CCUA-Fleming Oaks WWTF	CCUA - Peter's Creek WWTF	FLA327841	No	Basic	416, 431	0.00	0.00	0.00	N/A	N/A	N/A					
Clay	SJRWMD	CCUA - Mid-Clay Regional WWTF	CCUA - Mid-Clay Regional	FLA011377	Yes	High	416, 431	0.00	0.00	0.00	N/A	N/A	N/A					
Clay	SJRWMD	CCUA-Miller Street WWTF	CCUA-Miller Street WWTF	FL0025151	Yes	High	416, 431	0.00	0.00	0.00	N/A	N/A	N/A					
Clay	SJRWMD	CCUA - Ravines	CCUA - Ravines	FLA011371	No	Basic	416, 431	0.00	0.00	0.00	N/A	N/A	N/A					
Clay	SJRWMD	CCUA - Ridaught Landing WWTF	CCUA - Ridaught Landing (Fleming Island)	FL0039721	Yes	High	416, 431	0.00	0.00	0.00	N/A	N/A	N/A					
Clay	SJRWMD	CCUA - Spencer WWTP	CCUA - Reclaimed Distribution	FL0173371	Yes	High	416, 431	2.99	0.00	2.24	N/A	N/A	N/A	7.44	5.58	**6.05**	16.11	75%
Clay	SJRWMD	Fang - Camp Blanding WWTF	Fang - Camp Blanding WWTF	FL0022853	No	Basic	N/A	0.13	0.00	0.10	0	0	N/A	0.00	0.00	**0.10**	0.13	75%
Clay County - SJRWMD Total								**10.58**	**5.31**	**3.95**	**136,265**	**246,504**	**104,727**	**7.65**	**5.73**	**9.69**	**18.23**	**75%**
Columbia	SRWMD	Columbia Correctional Institution	Columbia Correctional Institution	FLA011418	Yes	High & Basic	N/A	0.41	0.41	0.00	0	0	N/A	0.00	0.00	**0.00**	0.41	75%
Columbia	SRWMD	Lake City WWTF	Lake City WWTF	FLA113956	No	Intermediate	217754	2.76	2.71	0.04	19,097	22,252	2,997	0.22	0.16	**0.20**	2.98	75%
Columbia County - SRWMD Total								**3.18**	**3.12**	**0.04**	**19,097**	**22,252**	**2,997**	**0.22**	**0.16**	**0.21**	**3.39**	**75%**
Duval	SJRWMD	Town of Baldwin WWTF	Town of Baldwin WWTF	FL0027812	No	Basic	784	0.30	0.00	0.23	1,419	2,260	799	0.06	0.04	**0.27**	0.36	75%
Duval	SJRWMD	Jacksonville Beach	Jacksonville Beach	FL0020231	Yes	High	793	2.84	0.54	1.73	23,733	26,195	2,339	0.17	0.13	**1.85**	3.01	75%
Duval	SJRWMD	City of Atlantic Beach (Buccaneer)	City of Atlantic Beach (Buccaneer)	FL0038776	No	Basic	810	0.00	0.00	0.00	N/A	N/A	N/A					
Duval	SJRWMD	City of Atlantic Beach WWTF - Main	City of Atlantic Beach WWTF - Main	FL0023248	No	Basic	810	1.81	0.00	1.36	23,585	31,857	7,858	0.57	0.43	**0.43**	2.38	75%
Duval	SJRWMD	Neptune Beach WWTF	Neptune Beach WWTF	FL0020427	No	Basic	842	0.68	0.00	0.51	7,554	7,283	-257	-0.02	-0.01	**0.50**	0.66	75%
Duval	SJRWMD	Normandy Village Utility	Normandy Village Utility	FLA011517	No	Basic	50293	0.35	0.00	0.26	3,235	3,313	74	0.01	0.00	**0.27**	0.36	75%
Duval	SJRWMD	Beacon Hills Subdivision WWTF	Beacon Hills Subdivision WWTF	FL0026778	No	Basic	88271	0.00	0.00	0.00	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Arlington East	JEA - South Grid	FL0026441	Yes	High	88271	0.00	0.00	0.00	N/A	N/A	N/A					
Duval	SJRWMD	JEA - District II WWTF	JEA - District II (Cedar Bay)	FL0026450	Yes	High & Basic	88271	5.79	1.34	3.34	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Blacks Ford	JEA - South Grid	FL0174441	Yes	High	88271	35.63	11.34	18.22	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Buckman Street WWTF	JEA - Buckman Street	FL0026000	No	Basic	88271	29.82	3.65	19.63	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Jacksonville Heights	JEA - Jacksonville Heights	FL0023671	No	Basic	88271	0.00	0.00	0.00	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Mandarin	JEA - South Grid	FL0023493	Yes	High	88271	0.00	0.00	0.00	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Monterey WWTF	JEA - Monterey WWTF	FL0023604	No	Basic	88271	1.64	0.00	1.23	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Royal Lakes WRF	JEA - Royal Lakes WRF	FL0026751	No	Basic	88271	0.00	0.00	0.00	N/A	N/A	N/A					
Duval	SJRWMD	JEA - San Jose WRF	JEA - San Jose WRF	FL0023663	No	Basic	88271	0.00	0.00	0.00	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Southwest District WWTF	JEA - Southwest District	FL0026468	No	Basic	88271	12.42	0.37	9.04	790,271	998,910	198,207	14.47	10.85	**10.85**	99.77	75%
Duval	SJRWMD	USN Mayport NS WWTF	USN Mayport NS WWTF	FL0000922	No	Basic	N/A	0.69	0.00	0.52	0	0	N/A	0.00	0.00	**0.52**	0.69	75%
Duval	SJRWMD	USN NAS Jacksonville	USN NAS Jacksonville	FL0000957	Yes	High	N/A	0.66	0.11	0.41	0	0	N/A	0.00	0.00	**0.41**	0.66	75%
Duval County - SJRWMD Total								**92.63**	**17.35**	**56.46**	**849,797**	**1,069,818**	**209,020**	**15.26**	**11.44**	**67.90**	**107.89**	**75%**

Table B-13, Continued. 2045 Reclaimed Water Projections Using 75 Percent Beneficial Utilization for the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Waste Water Treatment Facility Name	Reuse System Name	WAFR ID	PAA	2018	Associated CUP	2018 Total Facility Treatment Flow	2018 Total Beneficial Reuse	Potential Existing Additional Reclaimed Water for Reuse	2018 Population	2045 Population	2045 Additional Population Hooked up to Sewer System	2045 New Waste Water Flow	2045 Potential New Additional Reclaimed Water for Reuse	2045 Total Potential Additional Reclaimed Water for Reuse	2045 Total Facility Treatment Flow	75% Utilization
Flagler	SJRWMD	City of Flagler Beach WWTF	City of Flagler Beach WWTF	FL0026611	No	Basic	59	0.69	0.00	0.52	4,677	7,044	2,249	0.16	0.12	**0.64**	0.85	75%
Flagler	SJRWMD	Matanzas Shores	Matanzas Shores	FLA011599	No	Basic	1947	0.11	0.00	0.08	N/A	N/A	N/A					
Flagler	SJRWMD	Palm Coast WWTF	Palm Coast	FL0116009	Yes	High	1947	7.96	6.72	0.93	89,548	125,437	34,095	2.49	1.87	**1.95**	10.56	75%
Flagler	SJRWMD	Plantation Bay WWTF	Plantation Bay WWTP	FLA011597	Yes	High	1960	0.13	0.13	0.00	3,174	3,499	309	0.02	0.02	**0.02**	0.15	75%
Flagler	SJRWMD	City of Bunnell - Micheal J. Mikulk	City of Bunnell	FL0020907	Yes	High	1982	0.55	0.39	0.12	2,999	8,174	4,916	0.36	0.27	**0.39**	0.91	75%
Flagler	SJRWMD	Bulow Village WWTF	Bulow Village	FLA011601	No	Basic	2002	0.04	0.00	0.03	1,284	1,284	0	0.00	0.00	**0.03**	0.04	75%
Flagler	SJRWMD	Dunes CDD WWTF	Dunes CDD	FLA011602	Yes	High	51136	2.09	2.09	0.00	4,153	4,551	378	0.03	0.02	**0.02**	2.12	75%
Flagler County - SJRWMD Total								**11.57**	**9.33**	**1.68**	**105,835**	**149,989**	**41,946**	**3.06**	**2.30**	**3.98**	**14.63**	**75%**
Gilchrist	SRWMD	Lancaster Correctional Institution WWTP	Lancaster Correctional Instituti	FLA011620	No	Basic	N/A	0.10	0.10	0.00	0	0	N/A	0.00	0.00	**0.00**	0.10	75%
Gilchrist	SRWMD	Trenton	Trenton WWTF	FLA011615	No	Basic	216453	0.09	0.09	0.00	2,100	2,710	580	0.04	0.03	**0.03**	0.13	75%
Gilchrist County - SRWMD Total								**0.19**	**0.19**	**0.00**	**2,100**	**2,710**	**580**	**0.04**	**0.03**	**0.03**	**0.23**	**75%**
Hamilton	SRWMD	Jasper, City of WWTF	Jasper, City of WWTF	FL0027880	No	Basic	220463	0.63	0.00	0.47	3,735	3,736	1	0.00	0.00	**0.47**	0.63	75%
Hamilton	SRWMD	Jennings, Town of WWTP	Jennings	FLA011623	No	Basic	216567	0.14	0.14	0.00	699	699	0	0.00	0.00	**0.00**	0.14	75%
Hamilton	SRWMD	SR-6/I-75 WWTF	SR-6/I-75 WWTF	FLA649163	No	Basic	N/A	0.03	0.03	0.00	0	0	0	0.00	0.00	**0.00**	0.03	75%
Hamilton	SRWMD	White Springs WWTF	White Springs WWTF	FLA116220	No	Basic	216651	0.06	0.06	0.00	777	877	95	0.01	0.01	**0.01**	0.07	75%
Hamilton County - SRWMD Total								**0.86**	**0.23**	**0.47**	**5,211**	**5,312**	**96**	**0.01**	**0.01**	**0.47**	**0.86**	**75%**
Nassau	SJRWMD	City of Fernandina Beach WWTF	City of Fernandina Beach WWTF	FL0027260	No	Basic	122	1.67	0.00	1.25	19,249	20,476	1,166	0.09	0.06	**1.32**	1.76	75%
Nassau	SJRWMD	Town of Callahan WWTF	Town of Callahan WWTF	FL0038407	No	Basic	922	0.14	0.00	0.11	1,719	2,861	1,085	0.08	0.06	**0.16**	0.22	75%
Nassau	SJRWMD	Town of Hilliard WWTF	Town of Hilliard WWTF	FL0043079	No	Basic	948	0.33	0.00	0.25	3,189	4,889	1,615	0.12	0.09	**0.34**	0.45	75%
Nassau	SJRWMD	Amelia Island WWTF	Nassau Amelia Utilities - Amelia Island	FLA011688	Yes	High	50087	0.67	0.67	0.00	9,401	9,775	355	0.03	0.02	**0.02**	0.70	75%
Nassau	SJRWMD	Nassau Regional (Sun Ray)(JEA)	Nassau Regional (Sun Ray)	FL0116793	Yes	High	88271	1.65	0.81	0.63	22,170	59,307	35,280	2.58	1.93	**2.56**	4.23	75%
Nassau County - SJRWMD Total								**4.46**	**1.48**	**2.24**	**55,728**	**97,308**	**39,501**	**2.88**	**2.16**	**4.40**	**7.34**	**75%**
Putnam	SJRWMD	City of Crescent City	City of Crescent City	FL0021610	No	Basic	1627	0.11	0.11	0.00	1,805	1,805	0	0.00	0.00	**0.00**	0.11	75%
Putnam	SJRWMD	East Putnam County Regional WWTF	East Putnam County Regional	FLA649163	No	Basic	N/A	0.14	0.00	0.11	0	0	0	0.00	0.00	**0.11**	0.14	75%
Putnam	SJRWMD	River Park MHP	River Park MHP	FLA117218	Yes	High	7981	0.03	0.03	0.00	1,001	1,001	0	0.00	0.00	**0.00**	0.03	75%
Putnam	SJRWMD	City of Palatka	City of Palatka	FL0040061	Yes	High & Basic	8114	2.00	1.66	0.26	12,053	12,053	0	0.00	0.00	**0.26**	2.00	75%
Putnam County - SJRWMD Total								**2.28**	**1.80**	**0.36**	**14,859**	**14,859**	**0**	**0.00**	**0.00**	**0.36**	**2.28**	**75%**
St. Johns	SJRWMD	North Beach Utilities	North Beach Utilities	FLA011765	No	Basic	157	0.28	0.00	0.21	3,789	5,077	1,224	0.09	0.07	**0.28**	0.37	75%
St. Johns	SJRWMD	Town of Hastings WWTF	Town of Hastings WWTF	FL0042315	No	Basic	1392	0.11	0.00	0.08	708	2,862	2,046	0.15	0.11	**0.19**	0.26	75%
St. Johns	SJRWMD	St. Augustine WWTF # 1	City of St. Augustine # 1	FL0021938	No	Basic	50299	4.21	0.25	2.97	32,088	43,975	11,293	0.82	0.62	**3.59**	5.03	75%
St. Johns	SJRWMD	JEA - Ponce De Leon WRF	JEA - Ponce De Leon	FLA011773	No	Basic	88271	0.04	0.00	0.03	N/A	N/A	N/A					
St. Johns	SJRWMD	JEA - Julington Creek	JEA - South Grid	FL0043591	Yes	High	88271	0.00	0.00	0.00	67,402	155,377	83,576					
St. Johns	SJRWMD	JEA - Ponte Vedra WWTF	Ponte Vedra	FL0117951	Yes	High	88271	0.30	0.26	0.03	N/A	N/A	N/A	6.10	4.58	**4.61**	6.44	75%
St. Johns	SJRWMD	Anastasia	St. Johns Co. - Anastasia	FL0038831	Yes	High	1142, 1198	2.73	0.16	1.93	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - Innlet Beach WWTF	St. Johns Co. - Innlet Beach	FL0044237	Yes	High	1142, 1198	0.24	0.21	0.02	0	0	0					
St. Johns	SJRWMD	St. Johns Co. - Mainland (S.R. 207)	St. Johns Co. - Mainland (S.R. 207)	FL0117471	Yes	High	1142, 1198	0.17	0.17	0.00	N/A	N/A	N/A					
St. Johns	SJRWMD	JEA - Ponte Vedra WWTF	JEA - Ponte Vedra	FL0117951	Yes	High	1142, 1198	0.30	0.26	0.03	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - Marsh Landing WWTF	St. Johns Co. - Marsh Landing @ Ponte Vedra Lakes	FL0044253	Yes	High	1142, 1198	0.56	0.23	0.25	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - Northwest WWTP	St. Johns Co. - Northwest	FL0670651	Yes	High	1142, 1198	1.61	1.61	0.00	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - Players Club South	St. Johns Co. - Players Club South	FL0044245	Yes	High	1142, 1198	0.43	0.15	0.21	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - Sawgrass WWTF	St. Johns Co. - Sawgrass	FL0117897	Yes	High	1142, 1198	0.81	0.37	0.33	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - SR16 WWTP	St. Johns Co. - SR16	FL0043109	Yes	High	1142, 1198	0.00	0.00	0.00	N/A	N/A	N/A	0.00	0.00	**1.93**	4.94	75%
St. Johns County - SJRWMD Total								**11.79**	**3.67**	**6.09**	**103,987**	**207,291**	**98,139**	**7.16**	**5.37**	**11.46**	**17.04**	**75%**
Suwannee	SRWMD	Advent Christian Village	Advent Christian Home	FLA011819	No	Basic	219527	0.04	0.04	0.00	780	1,579	759	0.06	0.04	**0.04**	0.10	75%
Suwannee	SRWMD	Branford	Branford	FLA011806	No	Basic	216658	0.06	0.06	0.00	700	927	216	0.02	0.01	**0.01**	0.07	75%
Suwannee	SRWMD	Live Oak, City of WWTF	Live Oak, City of	FLA011805	Yes	High	220612	0.95	0.94	0.01	6,005	7,319	1,248	0.09	0.07	**0.08**	1.04	75%
Suwannee County - SRWMD Total								**1.05**	**1.04**	**0.01**	**7,485**	**9,825**	**2,223**	**0.16**	**0.12**	**0.13**	**1.22**	**75%**
Union	SRWMD	Lake Butler WWTF	Lake Butler	FLA118338	No	Basic	220148	0.54	0.54	0.00	1,850	1,905	52	0.00	0.00	**0.00**	0.54	75%
Union County - SRWMD Total								**0.54**	**0.54**	**0.00**	**1,850**	**1,905**	**52**	**0.00**	**0.00**	**0.00**	**0.54**	**75%**
SJRWMD Total								**154.39**	**58.35**	**72.03**	**1,470,043**	**2,027,018**	**529,126**	**38.63**	**28.97**	**101.00**	**191.11**	**75%**
SRWMD Total								**8.87**	**7.55**	**0.99**	**65,317**	**79,015**	**12,757**	**0.93**	**0.70**	**1.68**	**9.59**	**75%**
Total								**163.26**	**65.90**	**73.02**	**1,535,360**	**2,106,033**	**541,883**	**39.56**	**29.67**	**102.68**	**200.70**	**75%**

Notes:

1.) All estimates of reclaimed water and reuse flow are shown in million gallons per day.
2.) Rounding anomalies account for nominal discrepancies.
3.) 2018 Total facility treatment flow obtained from DEP 2018 Annual Reuse Inventory.
4.) Beneficial reuse for SJRWMD and SRWMD consists of uses in which reclaimed water takes the place of a pre-existing or potential use of higher quality water for which reclaimed water is suitable and as such does not match DEP's broader definition of reuse.
5.) Potential existing additional reclaimed water for reuse calculated using 75 percent beneficial utilization of the 2018 total facility treatment flow minus the 2018 total beneficial reuse.
6.) Additional population hooked up to the sewer system calculated as 95 percent of the additional population growth within a service area from 2018 to 2045.
7.) New waste water flow calculated as additional population hooked up to the sewer system times 73 gpcd (58.6 gpcd for residential flow, AWWA indoor standard and 15 gpcd for commercial flow, National Engineering Handbook per employee).
8.) Potential new additional reclaimed water for reuse calculated using 75 percent beneficial utilization of the new waste water flow.
9.) Total potential additional reclaimed water for reuse calculated as potential existing additional reclaimed water for reuse plus potential new additional reclaimed water for reuse.
10.) 2045 Total facility treatment flow calculated as 2018 total facility treatment flow plus 2045 new waste water flow.
11.) Projections are grouped by population expected to growth within a public supply service area. Therefore, the projections by wastewater facility (WWTF) may not be specific to the WWTF, but as the region as a whole.
12.) Projections are not included for those service areas that do not currently have waste water treatment facilities.

Table B-14. 2045 Reclaimed Water Projections Using 2018 Percent Beneficial Utilization for the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Waste Water Treatment Facility Name	Reuse System Name	WAFR ID	PAA	2018	Associated CUP	2018 Total Facility Treatment Flow	2018 Total Beneficial Reuse	Potential Existing Additional Reclaimed Water for Reuse	2018 Population	2045 Population	2045 Additional Population Hooked up to Sewer System	2045 New Waste Water Flow	2045 Potential New Additional Reclaimed Water for Reuse	2045 Total Potential Additional Reclaimed Water for Reuse	2045 Total Facility Treatment Flow	2018 Percent Utilization
Alachua	SJRWMD	Hawthorne WWTF	Hawthorne	FLA011291	No	Basic	1674	0.14	0.14	0.00	1,530	2,426	851	0.06	0.06	0.06	0.20	100%
Alachua	SJRWMD	GRU - Kanapaha (#5) WRF	GRU - Kanapaha	FL0112895	Yes	High	11339	11.63	11.63	0.00	195,460	231,295	34,043					
Alachua	SJRWMD	GRU - Main Street (#1 & #2) WRF	GRU - Main Street	FL0027251	Yes	High & Basic	11339	6.70	6.70	0.00	N/A	N/A	N/A	2.49	2.49	2.49	14.12	100%
Alachua	SJRWMD	University of Florida WRF	UF - Lake Alice	FLA011322	Yes	High	N/A	1.74	0.94	0.43	0	0	N/A	0.00	0.00	0.43	1.74	54%
Alachua County - SJRWMD Total								**20.21**	**19.41**	**0.77**	**196,990**	**233,721**	**34,894**	**2.55**	**2.45**	**3.21**	**22.76**	**96%**
Alachua	SRWMD	Alachua	Alachua	FLA011290	Yes	High	220667	0.72	0.69	0.03	10,155	11,925	1,682	0.12	0.12	0.15	0.84	96%
Alachua	SRWMD	High Springs WWTF	High Springs WWTF	FLA286095	No	Basic	216833	0.16	0.16	0.00	6,221	7,230	959	0.07	0.07	0.07	0.23	100%
Alachua	SRWMD	Newberry WWTF	Newberry WWTF	FLA011292	No	Basic	216450	0.21	0.21	0.00	5,538	7,973	2,313	0.17	0.17	0.17	0.38	100%
Alachua	SRWMD	Waldo, City of WWTF	Waldo, City of WWTF	FL0042242	No	Basic	217300	0.00	0.00	N/A	960	1,230	N/A	N/A	N/A	N/A	0.00	N/A
Alachua County - SRWMD Total								**1.09**	**1.06**	**0.03**	**22,874**	**28,358**	**4,953**	**0.36**	**0.35**	**0.38**	**1.45**	**97%**
Alachua County Total								**21.30**	**20.47**	**0.80**	**219,864**	**262,079**	**39,848**	**2.91**	**2.80**	**3.59**	**24.21**	**96%**
Baker	SJRWMD	City of Macclenny WWTF	City of Macclenny WWTF	FL0040495	No	Basic	15	0.87	0.00	0.00	6,582	7,528	899	0.07	0.00	0.00	0.94	0%
Baker County - SJRWMD Total								**0.87**	**0.00**	**0.00**	**6,582**	**7,528**	**899**	**0.07**	**0.00**	**0.00**	**0.94**	**0%**
Baker	SRWMD	Baker Correctional Institution	Baker Correctional Institution	FLA011332	No	Basic	N/A	0.21	0.21	0.00	0	0	N/A	0.00	0.00	0.00	0.21	100%
Baker County - SRWMD Total								**0.21**	**0.21**	**0.00**	**0**	**0**	**N/A**	**0.00**	**0.00**	**0.00**	**0.21**	**100%**
Baker County Total								**1.08**	**0.21**	**0.17**	**6,582**	**7,528**	**899**	**0.07**	**0.01**	**0.18**	**1.14**	**19%**
Bradford	SRWMD	Florida State Prison WWTF	Florida State Prison WWTF	FLA113450	No	Basic	N/A	1.01	1.01	0.00	0	0	N/A	0.00	0.00	0.00	1.01	100%
Bradford	SRWMD	Starke, City of	Starke, City of	FL0028126	No	Basic	216650	0.75	0.16	0.13	6,700	8,653	1,855	0.14	0.03	0.16	0.89	21%
Bradford County - SRWMD Total								**1.76**	**1.17**	**0.39**	**6,700**	**8,653**	**1,855**	**0.14**	**0.09**	**0.48**	**1.90**	**66%**
Clay	SJRWMD	Town of Orange Orange Park WWTF	Town of Orange Orange Park WWTF	FL0023922	No	Basic	453	0.99	0.00	0.00	9,058	10,076	967	0.07	0.00	0.00	1.06	0%
Clay	SJRWMD	Green Cove Springs - Harbor Road	Green Cove Springs - Harbor Road WWTP	FL0020915	Yes	High	499	0.50	0.25	0.08	6,763	8,702	1,842					
Clay	SJRWMD	City of Green Cove Springs South	City of Green Cove Springs South	FL0030210	No	Basic	499	0.29	0.00	0.00	N/A	N/A	N/A	0.13	0.04	0.12	0.92	32%
Clay	SJRWMD	CCUA-Fleming Island Regional WWTF	CCUA - Fleming Island	FL0043834	Yes	High	416, 431, 137335	5.68	5.06	0.36	120,444	227,726	101,918					
Clay	SJRWMD	CCUA-Fleming Oaks WWTF	CCUA - Fleming Island	FL0032875	No	Basic	416, 431	0.00	0.00	N/A	N/A	N/A	N/A					
Clay	SJRWMD	CCUA-Fleming Oaks WWTF	CCUA - Keystone Heights WWTF	FLA362743	No	Basic	416, 431	0.00	0.00	N/A	N/A	N/A	N/A					
Clay	SJRWMD	CCUA-Fleming Oaks WWTF	CCUA - Peter's Creek WWTF	FLA327841	No	Basic	416, 431	0.00	0.00	N/A	N/A	N/A	N/A					
Clay	SJRWMD	CCUA - Mid-Clay Regional WWTF	CCUA - Mid-Clay Regional	FLA011377	Yes	High	416, 431	0.00	0.00	N/A	N/A	N/A	N/A					
Clay	SJRWMD	CCUA-Miller Street WWTF	CCUA-Miller Street WWTF	FL0025151	Yes	High	416, 431	0.00	0.00	N/A	N/A	N/A	N/A					
Clay	SJRWMD	CCUA - Ravines	CCUA - Ravines	FLA011371	No	Basic	416, 431	0.00	0.00	N/A	N/A	N/A	N/A					
Clay	SJRWMD	CCUA - Ridaught Landing WWTF	CCUA - Ridaught Landing (Fleming Island)	FL0039721	Yes	High	416, 431	0.00	0.00	N/A	N/A	N/A	N/A					
Clay	SJRWMD	CCUA - Spencer WWTP	CCUA - Reclaimed Distribution	FL0173371	Yes	High	416, 431	2.99	0.00	0.00	N/A	N/A	N/A	7.44	4.34	4.70	16.11	58%
Clay	SJRWMD	Fang - Camp Blanding WWTF	Fang - Camp Blanding WWTF	FL0022853	No	Basic	N/A	0.13	0.00	0.00	0	0	N/A	0.00	0.00	0.00	0.13	0%
Clay County - SJRWMD Total								**10.58**	**5.31**	**2.64**	**136,265**	**246,504**	**104,727**	**7.65**	**3.84**	**6.48**	**18.23**	**50%**
Columbia	SRWMD	Columbia Correctional Institution	Columbia Correctional Institution	FLA011418	Yes	High & Basic	N/A	0.41	0.41	0.01	0	0	N/A	0.00	0.00	0.01	0.41	99%
Columbia	SRWMD	Lake City WWTF	Lake City WWTF	FLA113956	No	Intermediate	217754	2.76	2.71	0.05	19,097	22,252	2,997	0.22	0.21	0.26	2.98	98%
Columbia County - SRWMD Total								**3.18**	**3.12**	**0.06**	**19,097**	**22,252**	**2,997**	**0.22**	**0.21**	**0.27**	**3.39**	**98%**
Duval	SJRWMD	Town of Baldwin WWTF	Town of Baldwin WWTF	FL0027812	No	Basic	784	0.30	0.00	0.00	1,419	2,260	799	0.06	0.00	0.00	0.36	0%
Duval	SJRWMD	Jacksonville Beach	Jacksonville Beach	FL0020231	Yes	High	793	2.84	0.54	0.44	23,733	26,195	2,339	0.17	0.03	0.47	3.01	19%
Duval	SJRWMD	City of Atlantic Beach (Buccaneer)	City of Atlantic Beach (Buccaneer)	FL0038776	No	Basic	810	0.00	0.00	0.00	N/A	N/A	N/A					
Duval	SJRWMD	City of Atlantic Beach WWTF - Main	City of Atlantic Beach WWTF - Main	FL0023248	No	Basic	810	1.81	0.00	0.00	23,585	31,857	7,858	0.57	0.00	0.00	2.38	0%
Duval	SJRWMD	Neptune Beach WWTF	Neptune Beach WWTF	FL0020427	No	Basic	842	0.68	0.00	0.00	7,554	7,283	-257	-0.02	0.00	0.00	0.66	0%
Duval	SJRWMD	Normandy Village Utility	Normandy Village Utility	FLA011517	No	Basic	50293	0.35	0.00	0.00	3,235	3,313	74	0.01	0.00	0.00	0.36	0%
Duval	SJRWMD	Beacon Hills Subdivision WWTF	Beacon Hills Subdivision WWTF	FL0026778	No	Basic	88271	0.00	0.00	0.00	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Arlington East	JEA - South Grid	FL0026441	Yes	High	88271	0.00	0.00	N/A	N/A	N/A	N/A					
Duval	SJRWMD	JEA - District II WWTF	JEA - District II (Cedar Bay)	FL0026450	Yes	High & Basic	88271	5.79	1.34	1.03	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Blacks Ford	JEA - South Grid	FL0174441	Yes	High	88271	35.63	11.34	7.73	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Buckman Street WWTF	JEA - Buckman Street	FL0026000	No	Basic	88271	29.82	3.65	3.20	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Jacksonville Heights	JEA - Jacksonville Heights	FL0023671	No	Basic	88271	0.00	0.00	N/A	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Mandarin	JEA - South Grid	FL0023493	Yes	High	88271	0.00	0.00	N/A	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Monterey WWTF	JEA - Monterey WWTF	FL0023604	No	Basic	88271	1.64	0.00	0.00	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Royal Lakes WRF	JEA - Royal Lakes WRF	FL0026751	No	Basic	88271	0.00	0.00	N/A	N/A	N/A	N/A					
Duval	SJRWMD	JEA - San Jose WRF	JEA - San Jose WRF	FL0023663	No	Basic	88271	0.00	0.00	N/A	N/A	N/A	N/A					
Duval	SJRWMD	JEA - Southwest District WWTF	JEA - Southwest District	FL0026468	No	Basic	88271	12.42	0.37	0.36	790,271	998,910	198,207	14.47	2.83	2.83	99.77	20%
Duval	SJRWMD	USN Mayport NS WWTF	USN Mayport NS WWTF	FL0000922	No	Basic	N/A	0.69	0.00	0.00	0	0	N/A	0.00	0.00	0.00	0.69	0%
Duval	SJRWMD	USN NAS Jacksonville	USN NAS Jacksonville	FL0000957	Yes	High	N/A	0.66	0.11	0.09	0	0	N/A	0.00	0.00	0.09	0.66	17%
Duval County - SJRWMD Total								**92.63**	**17.35**	**14.10**	**849,797**	**1,069,818**	**209,020**	**15.26**	**2.86**	**16.96**	**107.89**	**19%**
Flagler	SJRWMD	City of Flagler Beach WWTF	City of Flagler Beach WWTF	FL0026611	No	Basic	59	0.69	0.00	0.00	4,677	7,044	2,249	0.16	0.00	0.00	0.85	0%
Flagler	SJRWMD	Matanzas Shores	Matanzas Shores	FLA011599	No	Basic	1947	0.11	0.00	0.09	N/A	N/A	N/A					
Flagler	SJRWMD	Palm Coast WWTF	Palm Coast	FL0116009	Yes	High	1947	7.96	6.72	1.05	89,548	125,437	34,095	2.49	2.07	2.16	10.56	83%
Flagler	SJRWMD	Plantation Bay WWTF	Plantation Bay WWTP	FLA011597	Yes	High	1960	0.13	0.13	0.00	3,174	3,499	309	0.02	0.02	0.02	0.15	100%
Flagler	SJRWMD	City of Bunnell - Micheal J. Mikulk	City of Bunnell	FL0020907	Yes	High	1982	0.55	0.39	0.11	2,999	8,174	4,916	0.36	0.25	0.37	0.91	71%
Flagler	SJRWMD	Bulow Village WWTF	Bulow Village	FLA011601	No	Basic	2002	0.04	0.00	0.00	1,284	1,284	0	0.00	0.00	0.00	0.04	0%
Flagler	SJRWMD	Dunes CDD WWTF	Dunes CDD	FLA011602	Yes	High	51136	2.09	2.09	0.00	4,153	4,551	378	0.03	0.03	0.03	2.12	100%
Flagler County - SJRWMD Total								**11.57**	**9.33**	**1.81**	**105,835**	**149,989**	**41,946**	**3.06**	**2.47**	**4.28**	**14.63**	**81%**

Table B-14, Continued. 2045 Reclaimed Water Projections Using 2018 Percent Beneficial Utilization for the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Waste Water Treatment Facility Name	Reuse System Name	WAFR ID	PAA	2018	Associated CUP	2018 Total Facility Treatment Flow	2018 Total Beneficial Reuse	Potential Existing Additional Reclaimed Water for Reuse	2018 Population	2045 Population	2045 Additional Population Hooked up to Sewer System	2045 New Waste Water Flow	2045 Potential New Additional Reclaimed Water for Reuse	2045 Total Potential Additional Reclaimed Water for Reuse	2045 Total Facility Treatment Flow	2018 Percent Utilization
Gilchrist	SRWMD	Lancaster Correctional Institution WWTP	Lancaster Correctional Institutio	FLA011620	No	Basic	N/A	0.10	0.10	0.00	0	0	N/A	0.00	0.00	0.00	0.10	100%
Gilchrist	SRWMD	Trenton	Trenton WWTF	FLA011615	No	Basic	216453	0.09	0.09	0.00	2,100	2,710	580	0.04	0.04	0.04	0.13	100%
Gilchrist County - SRWMD Total								0.19	0.19	0.00	2,100	2,710	580	0.04	0.04	0.04	0.23	100%
Hamilton	SRWMD	Jasper, City of WWTF	Jasper, City of WWTF	FL0027880	No	Basic	220463	0.63	0.00	0.00	3,735	3,736	1	0.00	0.00	0.00	0.63	0%
Hamilton	SRWMD	Jennings, Town of WWTP	Jennings	FLA011623	No	Basic	216567	0.14	0.14	0.00	699	699	0	0.00	0.00	0.00	0.14	100%
Hamilton	SRWMD	SR-6/I-75 WWTF	SR-6/I-75 WWTF	FLA649163	No	Basic	N/A	0.03	0.03	0.00	0	0	0	0.00	0.00	0.00	0.03	100%
Hamilton	SRWMD	White Springs WWTF	White Springs WWTF	FLA116220	No	Basic	216651	0.06	0.06	0.00	777	877	95	0.01	0.01	0.01	0.07	100%
Hamilton County - SRWMD Total								0.86	0.23	0.17	5,211	5,312	96	0.01	0.00	0.17	0.86	27%
Nassau	SJRWMD	City of Fernandina Beach WWTF	City of Fernandina Beach WWTF	FL0027260	No	Basic	122	1.67	0.00	0.00	19,249	20,476	1,166	0.09	0.00	0.00	1.76	0%
Nassau	SJRWMD	Town of Callahan WWTF	Town of Callahan WWTF	FL0038407	No	Basic	922	0.14	0.00	0.00	1,719	2,861	1,085	0.08	0.00	0.00	0.22	0%
Nassau	SJRWMD	Town of Hilliard WWTF	Town of Hilliard WWTF	FL0043079	No	Basic	948	0.33	0.00	0.00	3,189	4,889	1,615	0.12	0.00	0.00	0.45	0%
Nassau	SJRWMD	Amelia Island WWTF	Nassau Amelia Utilities - Amelia Island	FLA011688	Yes	High	50087	0.67	0.67	0.00	9,401	9,775	355	0.03	0.03	0.03	0.70	100%
Nassau	SJRWMD	Nassau Regional (Sun Ray)(JEA)	Nassau Regional (Sun Ray)	FL0116793	Yes	High	88271	1.65	0.81	0.41	22,170	59,307	35,280	2.58	1.26	1.68	4.23	49%
Nassau County - SJRWMD Total								4.46	1.48	0.99	55,728	97,308	39,501	2.88	0.96	1.95	7.34	33%
Putnam	SJRWMD	City of Crescent City	City of Crescent City	FL0021610	No	Basic	1627	0.11	0.11	0.00	1,805	1,805	0	0.00	0.00	0.00	0.11	100%
Putnam	SJRWMD	East Putnam County Regional WWTF	East Putnam County Regional	FLA649163	No	Basic	N/A	0.14	0.00	0.00	0	0	0	0.00	0.00	0.00	0.14	0%
Putnam	SJRWMD	River Park MHP	River Park MHP	FLA117218	Yes	High	7981	0.03	0.03	0.00	1,001	1,001	0	0.00	0.00	0.00	0.03	100%
Putnam	SJRWMD	City of Palatka	City of Palatka	FL0040061	Yes	High & Basic	8114	2.00	1.66	0.28	12,053	12,053	0	0.00	0.00	0.28	2.00	83%
Putnam County - SJRWMD Total								2.28	1.80	0.38	14,859	14,859	0	0.00	0.00	0.38	2.28	79%
St. Johns	SJRWMD	North Beach Utilities	North Beach Utilities	FLA011765	No	Basic	157	0.28	0.00	0.00	3,789	5,077	1,224	0.09	0.00	0.00	0.37	0%
St. Johns	SJRWMD	Town of Hastings WWTF	Town of Hastings WWTF	FL0042315	No	Basic	1392	0.11	0.00	0.00	708	2,862	2,046	0.15	0.00	0.00	0.26	0%
St. Johns	SJRWMD	St. Augustine WWTF # 1	City of St. Augustine # 1	FL0021938	No	Basic	50299	4.21	0.25	0.24	32,088	43,975	11,293	0.82	0.05	0.28	5.03	6%
St. Johns	SJRWMD	JEA - Ponce De Leon WRF	JEA - Ponce De Leon	FLA011773	No	Basic	88271	0.04	0.00	0.03	N/A	N/A	N/A					
St. Johns	SJRWMD	JEA - Julington Creek	JEA - South Grid	FL0043591	Yes	High	88271	0.00	0.00	N/A	67,402	155,377	83,576					
St. Johns	SJRWMD	JEA - Ponte Vedra WWTF	Ponte Vedra	FL0117951	Yes	High	88271	0.30	0.26	0.03	N/A	N/A	N/A	6.10	4.67	4.70	6.44	76%
St. Johns	SJRWMD	Anastasia	St. Johns Co. - Anastasia	FL0038831	Yes	High	1142, 1198	2.73	0.16	1.19	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - Innlet Beach WWTF	St. Johns Co. - Innlet Beach	FL0044237	Yes	High	1142, 1198	0.24	0.21	0.03	0	0	0					
St. Johns	SJRWMD	St. Johns Co. - Mainland (S.R. 207)	St. Johns Co. - Mainland (S.R. 207)	FL0117471	Yes	High	1142, 1198	0.17	0.17	0.00	N/A	N/A	N/A					
St. Johns	SJRWMD	JEA - Ponte Vedra WWTF	JEA - Ponte Vedra	FL0117951	Yes	High	1142, 1198	0.30	0.26	0.03	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - Marsh Landing WWTF	St. Johns Co. - Marsh Landing @ Ponte Vedra Lakes	FL0044253	Yes	High	1142, 1198	0.56	0.23	0.14	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - Northwest WWTP	St. Johns Co. - Northwest	FL0670651	Yes	High	1142, 1198	1.61	1.61	0.00	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - Players Club South	St. Johns Co. - Players Club South	FL0044245	Yes	High	1142, 1198	0.43	0.15	0.10	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - Sawgrass WWTF	St. Johns Co. - Sawgrass	FL0117897	Yes	High	1142, 1198	0.81	0.37	0.20	N/A	N/A	N/A					
St. Johns	SJRWMD	St. Johns Co. - SR16 WWTP	St. Johns Co. - SR16	FL0043109	Yes	High	1142, 1198	0.00	0.00	N/A	N/A	N/A	N/A	0.00	0.00	1.19	4.94	46%
St. Johns County - SJRWMD Total								11.79	3.67	2.53	103,987	207,291	98,139	7.16	2.23	4.76	17.04	31%
Suwannee	SRWMD	Advent Christian Village	Advent Christian Home	FLA011819	No	Basic	219527	0.04	0.04	0.00	780	1,579	759	0.06	0.06	0.06	0.10	100%
Suwannee	SRWMD	Branford	Branford	FLA011806	No	Basic	216658	0.06	0.06	0.00	700	927	216	0.02	0.02	0.02	0.07	100%
Suwannee	SRWMD	Live Oak, City of WWTF	Live Oak, City of	FLA011805	Yes	High	220612	0.95	0.94	0.01	6,005	7,319	1,248	0.09	0.09	0.10	1.04	99%
Suwannee County - SRWMD Total								1.05	1.04	0.01	7,485	9,825	2,223	0.16	0.16	0.17	1.22	99%
Union	SRWMD	Lake Butler WWTF	Lake Butler	FLA118338	No	Basic	220148	0.54	0.54	0.00	1,850	1,905	52	0.00	0.00	0.00	0.54	100%
Union County - SRWMD Total								0.54	0.54	0.00	1,850	1,905	52	0.00	0.00	0.00	0.54	100%
SJRWMD Total								154.39	58.35	36.30	1,470,043	2,027,018	529,126	38.63	14.60	50.90	191.11	38%
SRWMD Total								8.87	7.55	1.12	65,317	79,015	12,757	0.93	0.79	1.91	9.80	85%
Total								163.26	65.90	39.30	1,535,360	2,106,033	541,883	39.56	15.97	55.27	200.90	40%

Notes:

1.) All estimates of reclaimed water and reuse flow are shown in million gallons per day.

2.) Rounding anomalies account for nominal discrepancies.

3.) 2018 Total facility treatment flow obtained from DEP 2018 Annual Reuse Inventory.

4.) Beneficial reuse for SJRWMD and SRWMD consists of uses in which reclaimed water takes the place of a pre-existing or potential use of higher quality water for which reclaimed water is suitable and as such does not match DEP's broader definition of reuse.

5.) Potential existing additional reclaimed water for reuse calculated using the 2018 percent beneficial utilization of the 2018 total facility treatment flow minus the 2018 total beneficial reuse.

6.) Additional population hooked up to the sewer system calculated as 95 percent of the additional population growth within a service area from 2018 to 2045.

7.) New waste water flow calculated as additional population hooked up to the sewer system times 73 gpcd (58.6 gpcd for residential flow, AWWA indoor standard and 15 gpcd for commercial flow, National Engineering Handbook per employee).

8.) Potential new additional reclaimed water for reuse calculated using the 2018 percent beneficial utilization of the new waste water flow.

9.) Total potential additional reclaimed water for reuse calculated as potential existing additional reclaimed water for reuse plus potential new additional reclaimed water for reuse.

10.) 2045 Total facility treatment flow calculated as 2018 total facility treatment flow plus 2045 new waste water flow.

11.) Projections are grouped by population expected to growth within a public supply service area. Therefore, the projections by wastewater facility (WWTF) may not be specific to the WWTF, but as the region as a whole.

12.) Projections are not included for those service areas that do not currently have waste water treatment facilities.

Table B-15. 2045 Reclaimed Water Projections for the St. Johns River Water Management District and Suwannee River Water Management District.

County	District	Estimates Using WWTF 2018 Percent Beneficial Utilization Rate							Estimates Using DEP Beneficial Utilization Rate of 75 Percent						
		2018 Total Facility Treatment Flow	2018 Total Beneficial Reuse	Potential Existing Additional Reclaimed Water for Reuse	2045 New Waste Water Flow	2045 Potential New Additional Reclaimed Water for Reuse	2045 Total Potential Additional Reclaimed Water for Reuse	2045 Total Facility Treatment Flow	2018 Total Facility Treatment Flow	2018 Total Beneficial Reuse	Potential Existing Additional Reclaimed Water for Reuse	2045 New Waste Water Flow	2045 Potential New Additional Reclaimed Water for Reuse	2045 Total Potential Additional Reclaimed Water for Reuse	2045 Total Facility Treatment Flow
Alachua	SJRWMD	20.21	19.41	0.77	2.55	2.45	3.21	22.76	20.21	19.41	0.60	2.55	1.91	2.51	22.76
Alachua	SRWMD	1.09	1.06	0.03	0.36	0.35	0.38	1.45	1.09	1.06	0.02	0.36	0.27	0.29	1.45
Alachua	**Total**	**21.30**	**20.47**	**0.80**	**2.91**	**2.80**	**3.59**	**24.21**	**21.30**	**20.47**	**0.62**	**2.91**	**2.18**	**2.80**	**24.21**
Baker	SJRWMD	0.87	0.00	0.00	0.07	0.00	0.00	0.94	0.87	0.00	0.65	0.07	0.05	0.70	0.94
Baker	SRWMD	0.21	0.21	0.00	0.00	0.00	0.00	0.21	0.21	0.21	0.00	0.00	0.00	0.00	0.21
Baker	**Total**	**1.08**	**0.21**	**0.17**	**0.07**	**0.01**	**0.18**	**1.14**	**1.08**	**0.21**	**0.65**	**0.07**	**0.05**	**0.70**	**1.14**
Bradford	SJRWMD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bradford	SRWMD	1.76	1.17	0.39	0.14	0.09	0.48	1.90	1.76	1.17	0.44	0.14	0.10	0.54	1.90
Bradford	**Total**	**1.76**	**1.17**	**0.39**	**0.14**	**0.09**	**0.48**	**1.90**	**1.76**	**1.17**	**0.44**	**0.14**	**0.10**	**0.54**	**1.90**
Clay	SJRWMD	10.58	5.31	2.64	7.65	3.84	6.48	18.23	10.58	5.31	3.95	7.65	5.73	9.69	18.23
Columbia	SRWMD	3.18	3.12	0.06	0.22	0.21	0.27	3.39	3.18	3.12	0.04	0.22	0.16	0.21	3.39
Duval	SJRWMD	92.63	17.35	14.10	15.26	2.86	16.96	107.89	92.63	17.35	56.46	15.26	11.44	67.90	107.89
Flagler	SJRWMD	11.57	9.33	1.81	3.06	2.47	4.28	14.63	11.57	9.33	1.68	3.06	2.30	3.98	14.63
Gilchrist	SRWMD	0.19	0.19	0.00	0.04	0.04	0.04	0.23	0.19	0.19	0.00	0.04	0.03	0.03	0.23
Hamilton	SRWMD	0.86	0.23	0.17	0.01	0.00	0.17	0.86	0.86	0.23	0.47	0.01	0.01	0.47	0.86
Nassau	SJRWMD	4.46	1.48	0.99	2.88	0.96	1.95	7.34	4.46	1.48	2.24	2.88	2.16	4.40	7.34
Putnam	SJRWMD	2.28	1.80	0.38	0.00	0.00	0.38	2.28	2.28	1.80	0.36	0.00	0.00	0.36	2.28
St. Johns	SJRWMD	11.79	3.67	2.53	7.16	2.23	4.76	17.04	11.79	3.67	6.09	7.16	5.37	11.46	17.04
Suwannee	SRWMD	1.05	1.04	0.01	0.16	0.16	0.17	1.22	1.05	1.04	0.01	0.16	0.12	0.13	1.22
Union	SRWMD	0.54	0.54	0.00	0.00	0.00	0.00	0.54	0.54	0.54	0.00	0.00	0.00	0.00	0.54
SJRWMD Total		**154.39**	**58.35**	**36.30**	**38.63**	**14.60**	**50.90**	**191.11**	**154.39**	**58.35**	**72.03**	**38.63**	**28.97**	**101.00**	**191.11**
SRWMD Total		**8.87**	**7.55**	**1.12**	**0.93**	**0.79**	**1.91**	**9.80**	**8.87**	**7.55**	**0.99**	**0.93**	**0.70**	**1.68**	**9.59**
Total		**163.26**	**65.90**	**39.30**	**39.56**	**15.97**	**55.27**	**200.90**	**163.26**	**65.90**	**73.02**	**39.56**	**29.67**	**102.68**	**200.70**

Notes:

1.) All estimates of reclaimed water and reuse flow are shown in million gallons per day.

2.) Rounding anomalies account for nominal discrepancies.

3.) 2018 Total facility treatment flow obtained from DEP 2018 Annual Reuse Inventory.

4.) Beneficial reuse for SJRWMD and SRWMD consists of uses in which reclaimed water takes the place of a pre-existing or potential use of higher quality water for which reclaimed water is suitable and as such does not match DEP's broader definition of reuse.

5.) Total potential additional reclaimed water for reuse calculated as potential existing additional reclaimed water for reuse plus potential new additional reclaimed water for reuse.

6.) 2045 Total facility treatment flow calculated as 2018 total facility treatment flow plus 2045 new waste water flow.

7.) Projections are not included for those service areas that do not currently have waste water treatment facilities.

Table B-16. First Scenario of Potential Water Conservation for Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

Category	District	Projected 2045 Water Demand	First Conservation Scenario		
			Percent Conservation	Projected 2045 Water Conservation	
Public Supply	SJRWMD	274.05	7.0%	19.18	
Public Supply	SRWMD	13.83	7.0%	0.97	
Domestic Self-supply and Small Public Supply Systems	SJRWMD	35.58	3.5%	1.25	
Domestic Self-supply and Small Public Supply Systems	SRWMD	10.84	3.5%	0.38	
Agricultural Irrigation Self-supply	SJRWMD	63.90	N/A	11.86	**
Agricultural Irrigation Self-supply	SRWMD	111.5	N/A	18.31	**
Landscape / Recreational Self-supply	SJRWMD	26.28	4.7%	1.24	
Landscape / Recreational Self-supply	SRWMD	3.17	4.7%	0.15	
Commercial / Industrial / Institutional Self-supply	SJRWMD	84.60	2.2%	1.86	
Commercial / Industrial / Institutional Self-supply	SRWMD	46.80	2.2%	1.03	
Power Generation Self-supply	SJRWMD	25.76	13.8%	3.55	
Power Generation Self-supply	SRWMD	2.05	13.8%	0.28	
SJRWMD Region 1 Total		**510.17**	**31.0%**	**38.94**	
SRWMD NFRWSP Total		**188.19**	**31.0%**	**21.12**	
NFRWSP Total		**698.36**	**62.0%**	**60.06**	

Notes:

1.) First Conservation Scenario - Percent of potential conservation for public supply, domestic self-supply, landscape/recreational self-supply, commercial/industrial/institutional self-supply, and power generation self-supply were based on the 2020 CFWI estimated percent savings.

2.) First Conservation Scenario - Agriculture is based on the Florida Department of Agriculture and Consumer Services Florida Statewide Agricultural Irrigation Demand VII Balmoral deliverable.

3.) Projected 2045 water demand and 2045 conservation potential are shown in million gallons per day.

**Interactive FSAID Power BI Conservation Slide 5

https://app.powerbi.com/view?r=eyJrIjoiNzBkZmI0YjYtYThjYi00OWY0LTllZjgtNTk1NTNjNjRmYTMxIiwidCI6ImNkZjIwZmQ4LTUzYzgtNDA5ZC1hZDViLTM4NDVmNjJiYWY2ZCIsImMiOjJ9

Table B-17. Average Gross Per Capita Scenario for Potential Public Supply Conservation for Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

County	Utility	CUP Number	2045 Population Projection	2045 Water Demand Projection	Utility-Level 2014-2018 Average Gross Per Capita	2014-2018 Average Gross Per Capita for Part I	New 2045 Water Demand if Utility-Level Average Gross Per Capita is limited to the Average Gross for Part I	Potential Reduction in 2045 Water Demand	Potential Reduction in 2045 Water Demand (Percent)
Alachua - SJRWMD	City of Hawthorne	1674	2,426	0.21	88	121	0.21	0.00	0.0%
	Gainesville Regional Utilities (includes SRWMD)	11339	231,295	27.29	118	121	27.29	0.00	0.0%
	Kincaid Hills Water Company	11343	654	0.11	161	121	0.08	-0.03	-28.1%
	Town of Micanopy	11356	1,073	0.08	71	121	0.08	0.00	0.0%
	Arredondo Utility Co / Aqua Source Utilities	11364, 132141	1,227	0.09	74	121	0.09	0.00	0.0%
	SJRWMD Alachua Total		**236,675**	**27.78**	**N/A**	**N/A**	**27.75**	**-0.03**	**-0.1%**
Alachua - SRWMD	City Of Newberry	216450	7,973	0.84	105	142	0.84	0.00	0.0%
	City Of Archer	216647	1,576	0.15	95	142	0.15	0.00	0.0%
	City Of High Springs Water Plant	216833	7,230	0.61	84	142	0.61	0.00	0.0%
	City Of Waldo	217300	1,230	0.09	71	142	0.09	0.00	0.0%
	City Of Alachua	220667	11,925	1.44	121	142	1.44	0.00	0.0%
	SRWMD Alachua Total		**29,934**	**3.13**	**N/A**	**N/A**	**3.13**	**0.00**	**0.0%**
Baker - SJRWMD	City of Macclenny	15	7,528	1.05	139	121	0.91	-0.14	-13.2%
	Town of Glen St Mary	24	502	0.04	74	121	0.04	0.00	0.0%
	SJRWMD Baker Total		**8,030**	**1.09**	**N/A**	**N/A**	**0.95**	**-0.14**	**-12.8%**
Bradford - SJRWMD	Clay County Utility Authority	431	155	0.01	102	121	0.01	0.00	0.0%
	SJRWMD Bradford Total		**155**	**0.01**	**N/A**	**N/A**	**0.01**	**0.00**	**0.0%**
Bradford - SRWMD	City of Starke	216650	8,653	0.91	105	142	0.91	0.00	0.0%
	City of Lawtey	218998	889	0.20	221	142	0.13	-0.07	-36.9%
	SRWMD Bradford Total		**9,542**	**1.11**	**N/A**	**N/A**	**1.04**	**-0.07**	**-6.6%**
Clay - SJRWMD	Clay County Utility Authority	416, 431, 137335	227,726	23.19	102	121	23.19	0.00	**0.0%**
	Town of Orange Park	453	10,076	0.98	97	121	0.98	0.00	**0.0%**
	City of Green Cove Springs	499	8,702	1.40	161	121	1.05	-0.35	**-24.8%**
	JEA (Also in Duval, Nassau, St. Johns)	88271	27,114	0.00	0	121	0.00	**N/A**	**N/A**
	SJRWMD Clay Total		**273,618**	**25.57**	**N/A**	**N/A**	**25.22**	**-0.35**	**-1.4%**
Columbia - SRWMD	City of Lake City	217754	22,252	3.94	177	142	3.16	**-0.78**	**-19.8%**
	Columbia County Board of Commissioners	220704	94	0.06	635	142	0.01	**-0.05**	**-77.8%**
	North Florida Mega Industrial Park Wellfield	239112	0	2.16	N/A	142	2.16	**0.00**	**0.0%**
	SRWMD Columbia Total		**22,346**	**6.16**	**N/A**	**N/A**	**5.33**	**-0.83**	**-13.4%**
Duval - SJRWMD	CSWR - Florida Utility Operating Company, LLC	756	1,015	0.08	77	121	0.08	**0.00**	**0.0%**
	City of Baldwin	784	2,260	0.36	161	121	0.27	**-0.09**	**-24.0%**
	City of Jacksonville Beach	793	26,195	2.80	107	121	2.80	**0.00**	**0.0%**
	Atlantic Beach Utility	810	31,857	3.12	98	121	3.12	**0.00**	**0.0%**
	City of Neptune Beach	842	7,283	0.92	126	121	0.88	**-0.04**	**-4.2%**
	St Johns County Utilities / Intercoastal (Also in St. Johns)	1142	85	0.00	N/A	121	0.00	**N/A**	**N/A**
	Normandy Villages Utilities	50293	3,313	0.30	90	121	0.30	**0.00**	**0.0%**
	JEA (Also in Clay, Nassau, St. Johns)	88271	998,910	151.39	152	121	120.87	**-30.52**	**-20.2%**
	SJRWMD Duval Total		**1,070,918**	**158.97**	**N/A**	**N/A**	**128.32**	**-30.65**	**-19.3%**
Flagler - SJRWMD	City of Flagler Beach	59	7,044	1.01	144	121	0.85	**-0.16**	**-15.6%**
	City of Palm Coast	1947	125,437	11.04	88	121	11.04	**0.00**	**0.0%**
	Plantation Bay Utility Company (Also in Volusia)	1960	1,784	0.24	69	121	0.24	**0.00**	**0.0%**
	City of Bunnell	1982	8,174	1.07	131	121	0.99	**-0.08**	**-7.6%**
	Manufactured Home Communities	2002	1,284	0.11	85	121	0.11	**0.00**	**0.0%**
	City of Ormond Beach (Also in Volusia)	8932	622	0.00	N/A	121	0.00	**N/A**	**N/A**
	Volusia County Utilities (Also in Volusia)	50157, 50659, 86278	459	0.00	N/A	121	0.00	**N/A**	**N/A**
	Dunes Community Development District	51136	4,551	0.86	188	121	0.55	**-0.31**	**-36.0%**
	SJRWMD Flagler Total		**149,355**	**14.33**	**N/A**	**N/A**	**13.78**	**-0.55**	**-3.8%**
Gilchrist - SRWMD	City of Trenton Water Treatment Plant	216453	2,710	0.28	104	142	0.28	**0.00**	**0.0%**
	Fanning Springs (Also in Dixie and Levy)	220310	170	0.00	0	142	0.00	**N/A**	**N/A**
	SRWMD Gilchrist Total		**2,880**	**0.28**	**N/A**	**N/A**	**0.28**	**0.00**	**0.0%**

Table B-17, Continued. Average Gross Per Capita Scenario for Potential Public Supply Conservation for Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District.

Hamilton - SRWMD	Town of Jennings	216567	699	0.15	208	142	0.10	**-0.05**	**-33.8%**
	Town of White Springs	216651	877	0.05	58	142	0.05	**0.00**	**0.0%**
	Hamilton County Water Facilities	220443	0	0.13	N/A	142	0.13	**0.00**	**0.0%**
	City of Jasper	220463	3,736	0.70	188	142	0.53	**-0.17**	**-24.2%**
	SRWMD Hamilton Total		**5,312**	**1.03**	**N/A**	**N/A**	**0.81**	**-0.22**	**-21.4%**
Nassau - SJRWMD	City of Fernandina Beach	122	20,476	3.46	169	121	2.48	**-0.98**	**-28.4%**
	Town of Callahan	922	2,861	0.30	104	121	0.30	**0.00**	**0.0%**
	Town of Hilliard	948	4,889	0.37	75	121	0.37	**0.00**	**0.0%**
	Nassau Amelia Utilities	50087	9,775	1.44	147	121	1.18	**-0.26**	**-17.9%**
	JEA (Also in Clay, Duval, St. Johns / Old 942)	88271	59,307	2.69	45	121	2.69	**0.00**	**0.0%**
	SJRWMD Nassau Total		**97,308**	**8.26**	**N/A**	**N/A**	**7.02**	**-1.24**	**-15.0%**
Putnam - SJRWMD	Town of Interlachen	1624, 8150	959	0.08	88	121	0.08	**0.00**	**0.0%**
	City of Crescent City	1627	1,805	0.17	96	121	0.17	**0.00**	**0.0%**
	Melrose Water Association	7961	1,650	0.15	90	121	0.15	**0.00**	**0.0%**
	River Park Utilities Management Assoc.	7981	1,001	0.07	69	121	0.07	**0.00**	**0.0%**
	City of Palatka	8114	12,053	1.28	106	121	1.28	**0.00**	**0.0%**
	Town of Welaka	8168	2,668	0.15	55	121	0.15	**0.00**	**0.0%**
	Putnam County BOCC	92165	2,857	0.28	98	121	0.28	**0.00**	**0.0%**
	SJRWMD Putnam Total		**22,993**	**2.18**	**N/A**	**N/A**	**2.18**	**0.00**	**0.0%**
St. Johns - SJRWMD	North Beach Utilities	157	5,077	0.69	136	121	0.61	**-0.08**	**-11.0%**
	Wildwood Water Company	324	933	0.06	68	121	0.06	**0.00**	**0.0%**
	St. Johns County Utilities / Intercoastal (Also in Duval)	1142	33,776	8.40	249	121	4.09	**-4.31**	**-51.3%**
	St. Johns County Utilities	1198	195,538	15.20	78	121	15.20	**0.00**	**0.0%**
	St. Johns County Utilities	1392	2,862	0.08	28	121	0.08	**0.00**	**0.0%**
	City of St. Augustine Utilities	50299	43,975	4.93	112	121	4.93	**0.00**	**0.0%**
	JEA (Also in Clay, Duval, Nassau)	88271	155,377	6.50	42	121	6.50	**0.00**	**0.0%**
	SJRWMD St. Johns Total		**437,538**	**35.86**	**N/A**	**N/A**	**31.47**	**-4.39**	**-12.2%**
Suwannee - SRWMD	Town of Wellborn	216507	613	0.05	79	142	0.05	**0.00**	**0.0%**
	Town of Branford	216658	927	0.11	120	142	0.11	**0.00**	**0.0%**
	Advent Christian Village	219527	1,579	0.31	199	142	0.22	**-0.09**	**-27.7%**
	City of Live Oak	220612	7,319	1.40	191	142	1.04	**-0.36**	**-25.8%**
	SRWMD Suwannee Total		**10,438**	**1.87**	**N/A**	**N/A**	**1.42**	**-0.45**	**-23.9%**
Union - SRWMD	City of Lake Butler	220148	1,905	0.25	129	142	0.25	**0.00**	**0.0%**
	SRWMD Union Total		**1,905**	**0.25**	**N/A**	**N/A**	**0.25**	**0.00**	**0.0%**
Region I Total			**2,378,947**	**287.88**	**N/A**	**N/A**	**248.97**	**-38.91**	**-13.5%**
		Region I SJRWMD 2014-2018 Average Gross Per Capita			**121**				
		Region I SRWMD 2014-2018 Average Gross Per Capita			**142**				

Notes:
1.) Projected 2045 water demand and potential reduction is shown in million gallons per day.
2.) Due to feedback from stakeholders, 2045 demand projections have been updated to reflect what was modeled for the Black Creek Settlement Agreement and therefore don't reflect the 2014-2018 average per capita. The per capitas have been recalculated in this table based on the updated 2045 populations and demand.

Table B-18. Range of Potential Water Conservation for Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District

County	Category	Projected 2045 Water Demand	Second Conservation Scenario	
			Percent Conservation	Projected 2045 Water Conservation
Alachua - SJRWMD	Public Supply	27.78	0.11%	0.03
	Domestic Self-supply and Small Public Supply Systems	1.00	0.11%	0.00
	Total	**28.78**	**0.11%**	**0.03**
Alachua - SRWMD	Public Supply	3.13	0.00%	0.00
	Domestic Self-supply and Small Public Supply Systems	1.65	0.00%	0.00
	Total	**4.78**	**0.00%**	**0.00**
Baker - SJRWMD	Public Supply	1.09	12.76%	0.14
	Domestic Self-supply and Small Public Supply Systems	2.90	12.76%	0.37
	Total	**3.99**	**12.76%**	**0.51**
Baker - SRWMD	Public Supply	0.00	N/A	N/A
	Domestic Self-supply and Small Public Supply Systems	0.07	N/A	N/A
	Total	**0.07**	**N/A**	**N/A**
Bradford - SJRWMD	Public Supply	0.01	0.00%	0.00
	Domestic Self-supply and Small Public Supply Systems	0.30	0.00%	0.00
	Total	**0.31**	**0.00%**	**0.00**
Bradford - SRWMD	Public Supply	1.11	6.65%	0.07
	Domestic Self-supply and Small Public Supply Systems	0.54	6.65%	0.04
	Total	**1.65**	**6.65%**	**0.11**
Clay - SJRWMD	Public Supply	25.57	1.36%	0.35
	Domestic Self-supply and Small Public Supply Systems	4.77	1.36%	0.06
	Total	**30.34**	**1.36%**	**0.41**
Columbia - SRWMD	Public Supply	6.16	13.42%	0.83
	Domestic Self-supply and Small Public Supply Systems	3.19	13.42%	0.43
	Total	**9.35**	**13.42%**	**1.26**
Duval - SJRWMD	Public Supply	158.97	19.28%	30.65
	Domestic Self-supply and Small Public Supply Systems	16.25	19.28%	3.13
	Total	**175.22**	**19.28%**	**33.78**
Flagler - SJRWMD	Public Supply	14.33	3.82%	0.55
	Domestic Self-supply and Small Public Supply Systems	0.40	3.82%	0.02
	Total	**14.73**	**3.82%**	**0.56**
Gilchrist - SRWMD	Public Supply	0.28	0.00%	0.00
	Domestic Self-supply and Small Public Supply Systems	1.26	0.00%	0.00
	Total	**1.54**	**0.00%**	**0.00**
Hamilton - SRWMD	Public Supply	1.03	21.38%	0.22
	Domestic Self-supply and Small Public Supply Systems	0.67	21.38%	0.14
	Total	**1.70**	**21.38%**	**0.36**
Nassau - SJRWMD	Public Supply	8.26	15.01%	1.24
	Domestic Self-supply and Small Public Supply Systems	2.28	15.01%	0.34
	Total	**10.54**	**15.01%**	**1.58**
Putnam - SJRWMD	Public Supply	2.18	0.00%	0.00
	Domestic Self-supply and Small Public Supply Systems	3.24	0.00%	0.00
	Total	**5.42**	**0.00%**	**0.00**

Table B-18, Continued. Range of Potential Water Conservation for Region 1 of the St. Johns River Water Management District and the North Florida Regional Water Supply Planning Region of the Suwannee River Water Management District

St. Johns - SJRWMD	Public Supply	35.86	12.24%	4.39
	Domestic Self-supply and Small Public Supply Systems	4.44	12.24%	0.54
	Total	**40.30**	**12.24%**	**4.93**
Suwannee - SRWMD	Public Supply	1.87	23.88%	0.45
	Domestic Self-supply and Small Public Supply Systems	2.80	23.88%	0.67
	Total	**4.67**	**23.88%**	**1.12**
Union - SRWMD	Public Supply	0.25	0.00%	0.00
	Domestic Self-supply and Small Public Supply Systems	0.66	0.00%	0.00
	Total	**0.91**	**0.00%**	**0.00**
NFRWSP Total	**Public Supply**	**287.88**	**13.52%**	**38.91**
	Domestic Self-supply and Small Public Supply Systems	**46.42**	**12.38%**	**5.75**
	Total	**334.30**	**13.36%**	**44.65**

Notes:

1.) Second Conservation Scenario - Public supply is based on savings achieved if each Part 2014-2018 average gross per capita rate was met by respective utilities. The same percent savings are applied to the domestic self-supply category

2.) Projected 2045 water demand and 2045 water conservation potential are shown in million gallons per day

Population Estimation and Projection Technical Memorandum (2014-2018)

Overview

The Suwannee River Water Management District (SRWMD) estimated population for 2014-2018 and developed population projections from 2020-2045 which will be used for upcoming water supply planning efforts. Estimating an accurate population for the SRWMD is important for planning purposes because it forms the foundation of estimating and projecting water use for different categories within each county. This technical memorandum provides information on the data sources used, methodology and results of the population estimation process.

Data

This section explains the data that were used to estimate population, where the data came from, and how or why data were used.

Bureau of Economic and Business Research (BEBR)

BEBR publishes estimates of population and persons per household in Florida on a county-wide basis. These data are updated and published annually. They also publish population projections by county on a 25-year planning horizon. The SRWMD uses the annual and projected populations (medium series) to estimate population. Additional data sources described below are used to estimate residential populations within the county as well as prepare estimates of residential population on public supply versus self-supply.

Public Supply Utility Data

The SRWMD sent out a public supply (PS) data request in October 2019 to utilities inquiring about estimated population served by the utility, annual water use by category (residential, commercial, institutional, other), water connections by category, per capita rates (if known), and any additional information related to public supply service area boundaries (PSAB) and/or water lines. These data were used to estimate the 2018 residential population being served by the utility's water system and to calculate gross and residential per capita rates.

Public Supply Service Area Boundary (PSAB)

The SRWMD used the existing PSAB data collected for the 2017 North Florida Regional Water Supply Partnership (NFRWSP) Plan and made updates to the boundaries based on information provided by utilities. These data are in a shapefile format and show the extent of public supply service areas. The boundaries are used to estimate the potential served population. The potential served population is estimated to evaluate the maximum number of people that could be served by the utility using parcel data and published estimates of persons per household. This estimate is used to project population growth within the county.

Parcel Layer

The parcel layer data originates from each individual county property appraiser and is sent to the Florida Department of Revenue (FDOR) once a year. The SRWMD's contractors, Quantum Spatial and Panda Consultants, gather the data from the FDOR, compile it, and deliver it back to the SRWMD. Later in the year, they make updates from data received from each property appraiser. All water management districts (districts) individually contract with Quantum Spatial who uses Panda Consultants to process the data. All districts use the same specifications to ensure a consistent and complete dataset. The SRWMD used these data to estimate population served where utility data was not available, to estimate population distribution within counties served by two districts, and to calculate the potential served population inside of a PSAB.

Methodology

This section describes the methods used for estimating split counties, or counties that are shared with adjacent water management districts, as well as estimating served, non-served, institutional, and projected population.

Total County-wide Population

The BEBR county-wide population estimates, without institutional population, for 2014-2018 were used for the estimation of the total residential population (BEBR 2014, 2015, 2016, 2017, 2018). For split counties in the Western Region, a percent share was used to calculate the total population residing in the SRWMD‘s portion of the county.

Split Counties

The SRWMD shares five counties with adjacent districts. These counties are Alachua, Baker, Bradford, Jefferson, and Levy counties. For counties in the NFRWSP area, population estimates and projections for Alachua, Baker, and Bradford counties were developed in coordination with the St. Johns River Water Management District (SJRWMD). The total county-wide population estimates came from BEBR. The population model created by the SJRWMD was applied to estimate the population in the SJRWMD portion of NFRWSP counties for 2014-2018. The remainder of the population was assumed to be residing in the SRWMD’s portion of shared counties.

For counties that are not located in the NFRWSP area, the SRWMD used the parcel layer to calculate the percent of dwelling units located in the SRWMD’s portion of the counties. These counties include Jefferson and Levy counties. The percent share was calculated by taking the number of dwelling units in the SRWMD’s portion of the county, dividing it by the total number of dwelling units in the county, and multiplying it by 100. For SRWMD planning efforts, this percent share was calculated annually for 2014-2018 to consider any shifts in dwelling units.

Public Supply and Small Public Supply (Served Population)

The served population is defined as the number of people receiving their water use from a public supply utility. The served population for 2018 was provided by many utilities from the public supply utility data request. For utilities that did not have an estimate of their served population, the SRWMD estimated the population by using the number of residential connections reported by the utility in the 2018 data request and multiplied them by BEBR’s estimated persons per household for the corresponding county in which the public supply utility was located.

The potential served population was calculated to estimate the number of people served by a public supply utility from 2014-2017. The potential served population was estimated to evaluate the maximum number of people that could be served by the utility using parcel data and published estimates of persons per household. To calculate the potential served population, the number of residential dwelling units in a PSAB was multiplied by BEBR’s estimated persons per household for the corresponding county and year. The percent change of potential served from one year to the next was used to estimate the served population from 2014-2017. To calculate the served population, the potential served population estimates for a given year were divided by the 2018 potential served population and multiplied by the 2018 utility reported population. Below shows an example of the formula used to calculate the served population for 2017.

$$2017\, served\ population = \frac{2017\, potential\ served}{2018\, potential\ served}\ X\ 2018\, utility\ reported\ population$$

There are two utilities for which additional data was used to estimate the served population. First, the City of Lake City provided additional data on residential connections that was used to calculate the served population for 2015-2018. The number of residential connections was multiplied by an estimate of 2.5 persons per household.

The second utility that provided additional information was Jefferson Communities Water System (JCWS). JCWS has two different systems located in the SRWMD; the Lloyd system which is split between the SRWMD and the Northwest Florida Water Management District (NWFWMD), and the Lamont system which is wholly encompassed in the SRWMD. To estimate the served population for Lloyd portion of JCWS, the SRWMD calculated the percent of parcels in the PSAB that fell within the SRWMD boundary. The 2018 served population was then multiplied by this percent to estimate the 2018 population served in the SRWMD's portion of the Lloyd system. The formula above was then used to estimate the served population for 2014-2017. JCWS provided estimates of population served for the Lamont system.

Population estimates for the SRWMD's portion of Gainesville Regional Utilities (GRU), Clay County Utility Authority, and Melrose Water Association were provided by the SJRWMD. These estimates were incorporated into the served population estimates for Alachua and Bradford counties and used to more accurately estimate the non-served population.

For small public supply permits that did not have a PSAB (i.e., mobile home parks), the served population was estimated based on the information provided in the permit. This estimate of population was held constant for current and projected years (2014-2018, 2020-2045).

Domestic Self Supply (Non-served Population)

The non-served population is defined as the number of people getting their water use from their own domestic self-supply well. This population was estimated by taking the total BEBR county-wide population estimate, less institutional population, and subtracting the served population.

Institutional Population

Correctional facilities and prisons located in the SRWMD are either connected to a public supply utility or are self-supplied and have an institutional water use permit that is required to report use. This institutional use is therefore already being accounted for in the water use estimates for either the public supply (PS) or commercial/industrial/institutional category (CII). Accounting for the institutional population separately enables the SRWMD to more accurately estimate the non-served population and the water use associated with the DSS category. The SRWMD used the 2014-2018 BEBR published inmate population estimates to determine the institutional population by county. To be consistent with BEBR Volume 53, Bulletin 186, which was used for projections, the 2019 institutional population was used as the projected population and held constant through the 2020-2045 planning period (Rayer, S. and Y. Wang. 2020).

Projections

County population projection estimates published by BEBR in January 2020 were used for estimating population from 2020-2045 (Rayer, S. and Y. Wang. 2020). The percent split calculated for 2018 was used to estimate the future populations of shared counties in the Western Region. In the NFRWSP, the county population estimated for the SRWMD is the difference between the BEBR estimate and the SJRWMD projected estimate for each projected year (2020, 2025, 2030, 2035, 2040, and 2045). Because BEBR's projection estimates include both residential and institutional population, the institutional population was subtracted out to be able to get an accurate estimate of the non-served residential population in the future. The institutional population was held constant through the projection period.

In some counties, the 2020 projected population was less than the estimated 2018 population, therefore there was a negative projection estimate due to the variability in the estimation of the institutional population. For counties with a negative projected population for 2020, the estimated total population was set equal to the 2018 total population and grown by the number of people BEBR projected for each time increment. Counties adjusted included Hamilton, Madison, and Union counties. Counties that had a positive 2020 projected residential population estimate were grown by the BEBR reported population projections, less the estimate of institutional population.

The SRWMD applied the population model created by the SJRWMD to distribute projected future population within the county (SJRWMD. 2021). This model also estimated the projected future served populations within PSABs. The projected future served population estimates were subtracted from the county-wide residential projections to get an estimate of the non-served projected population.

Stakeholder Outreach

The SRWMD summarized each utility's population and water use estimates and projections. We reached out to individual utilities to discuss the data and further refine our estimates. We made updates to the served population estimates for 2014-2018 for utilities that provided comments. If documentation was provided to substantiate higher growth estimates than the model predicted, then estimates were updated. For example, the City of Newberry provided the SRWMD with a citywide Equivalent Residential Unit (ERU) water use study with estimates and projections for their utility to substantiate a different growth rate.

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St. Johns River Water Management District

Ann B. Shortelle, Ph.D., Executive Director

Technical Memorandum
Methodology for Generating Utility Level Projections and Buildout Estimates Using Parcel Data
June 25, 2021

Through: Tammy Bader-Gibbs, Technical Program Manager
Clay Coarsey, P.E., Bureau Chief

From: Rebecca May, Water Use Analyst

Background

The earliest St. Johns River Water Management District's (District) efforts to distribute the Bureau of Economic and Business Research (BEBR) population estimates and projections to parcels were led by Dr. Nitesh Tripathi and Dr. Eugene Agyei and used Visual Basic software. The current model, refined by Yassert Gonzalez and James Walters, uses Python to distribute BEBR estimates and projections to parcels. The land use parcel layer is compiled by Panda Consultants and contains data from tax property appraiser databases. The data in the parcel layer relevant to this project are as follows: use class designations for all parcels (e.g., which parcels are considered single family or multi-family), year built, and residential unit counts. If there were null or zero values in necessary fields of this layer, estimations were made (described below). All examples of calculations in this technical memorandum were derived in 2019 and do not reflect the most recent data.

Overview

The tasks described in this memorandum are as follows:

1) Added district, utility, and census attributes to parcel centroids
2) Identified developed and developable parcels
3) Distributed current population to developed residential parcels
4) Calculated persons per acre from developed acreage
5) Generated buildout estimates
6) Ranked developable parcels
7) Generated projections for the period 2020 through 2045

The above tasks were performed using python scripts written in PyCharm. See Figure 1 for a simplified graphical.

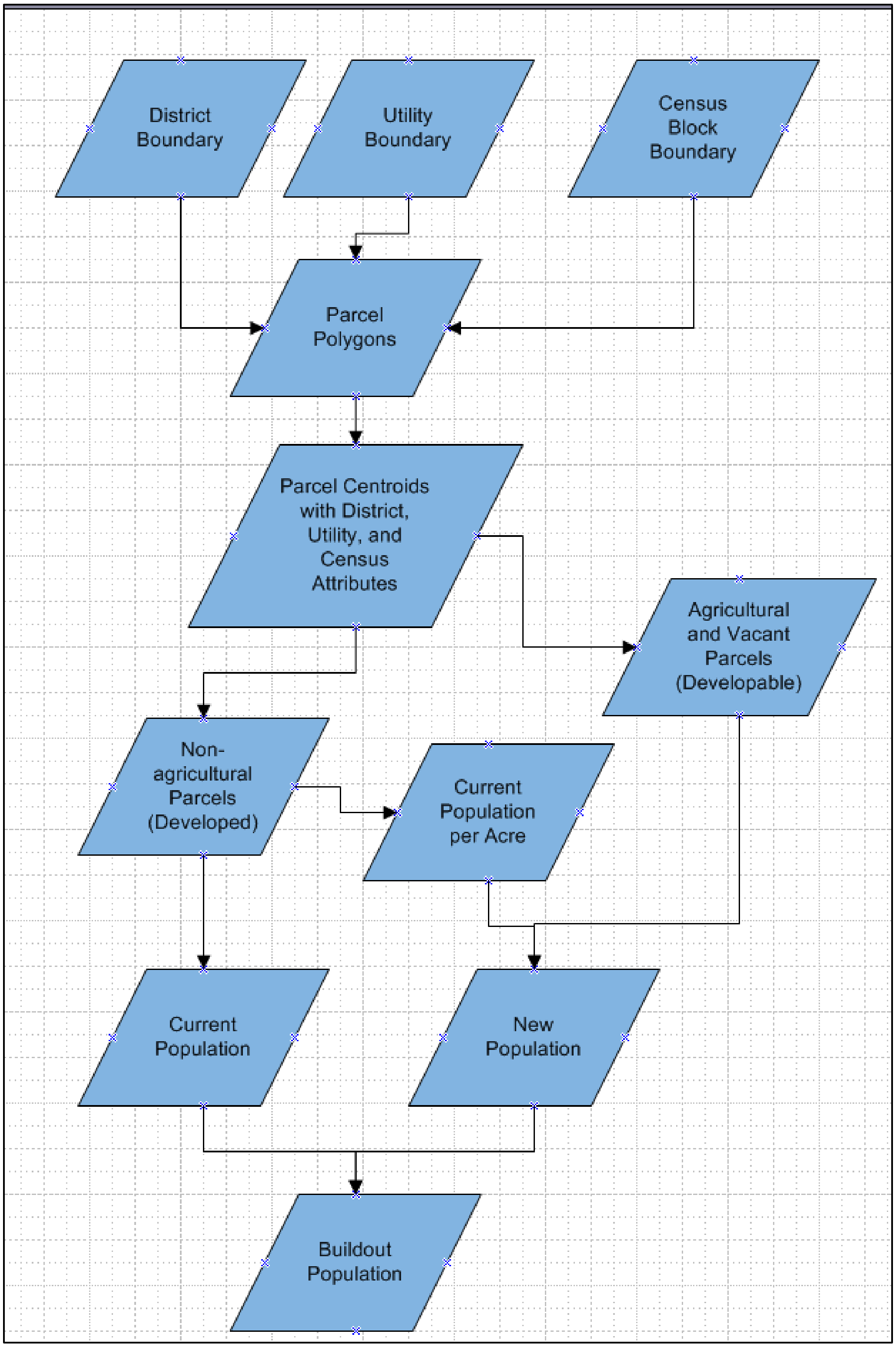

Figure 1. Overview of the buildout population estimation process

Data Sources

The datasets used were:

1) Parcel centroids generated from the land use parcel polygon dataset provided by Panda Consulting. Water management district, planning region, utility, and census block information were assigned to these centroids.
2) Utility-level served population estimates (if available)
3) BEBR's countywide population estimates
4) BEBR's countywide medium projections (2020-2045)
5) Parcel development rank table
6) Public Supply service area boundaries (PSABs)

Parcel Classification for Historical Data

Assumptions:

1) Parcels classified as "CENTRALLY ASSESSED (098)" were excluded from "developable" parcels. These are parcels owned by railroads and other large industrial businesses.
2) Developed residential parcels were classified as follows:
    a. Single Family
        i. Customer class category is comprised of Single Family and Mobile Homes
        ii. Zero or null values were replaced with the consumptive use permit (CUP) level average residential units for single family residences.
            1. Through conducting QA/QC of the data, single family parcels were reviewed using basemap imagery in ArcMap to verify if there were residential units present despite the null or zero values in the property appraiser data.
    b. Multi-Family
        i. Customer class category includes condominiums, cooperatives, multi-family, mobile home parks, and undefined (see 3.h. definition below for undefined).
        ii. Zero or null values were replaced with the CUP-level average residential units for multi-family residences.
            1. If CUP-level data was not available, county-level data was used.
            2. Through conducting QA/QC of the data, multi-family parcels were reviewed using basemap imagery in ArcMap to verify if there were residential units present despite the null or zero values in the property appraiser data.
3) Parcel use types and codes for Single Family and Multi-Family residential parcels:
    a. CONDOMINIA (004) – Condominium developments. The units are owned individually. Classified as Multi-Family.
    b. COOPERATIVES (005) – Condominium developments. The units are owned cooperatively. Classified as Multi-Family.
    c. MOBILE HOMES (002) – Individual mobile homes. Classified as Single Family.
    d. MULTI-FAMILY - 10 UNITS OR MORE (003) – Large apartment complexes with at least 10 residential units. Classified as Multi-Family.
    e. MULTI-FAMILY - LESS THAN 10 UNITS (008) – Smaller apartment complexes with less than 10 residential units. Classified as Multi-Family.
    f. PARKING LOTS (COMMERCIAL OR PATRON) MOBILE HOME PARKS (028) – Mobile home parks. Classified as Multi-Family.
    g. SINGLE FAMILY (001) – Single family homes. Classified as Single Family.
    h. UNDEFINED - RESERVED FOR USE BY DEPARTMENT OF REVENUE (009) –

Condominium developments. The units are owned cooperatively. Classified as Multi-Family.

4) It was assumed that the persons per acre ratio does not change over the planning horizon.
5) The buildout figures only apply to the current public service area boundary. If PSAB changes occur, the buildout analysis needs to be redone.

Calculating Residential Unit Share

The data provided in the property appraiser layer contained missing or zero values for some single family and multi-family parcels. Therefore, the original residential unit counts were modified by replacing the nulls and zeroes where applicable. The residential unit share for each utility was derived by dividing the number of residential units within a given PSAB by the total for the county. The non-served population outside PSABs was also derived in this manner: the residential units that did not fall within a service area were divided by the countywide total number of residential units.

Estimating Served and Non-Served Population

The total population within each PSAB was estimated by multiplying the countywide BEBR population by the share of residential units. If the population estimated from the share of residential units was greater than the reported served population, the difference was assumed to be the non-served population within the public service area boundary. If the utility did not report a population estimate, it was assumed that the entire population estimated by the share of residential units was served. For areas outside PSABs, the population was calculated by multiplying the residential unit share by the countywide BEBR population estimate. Historical population was distributed to residential parcels evenly by dividing the population by the number of single family/multi-family residential units.

Population Calculation Example Using Palm Coast (CUP# 1947)

After infilling null and missing values in the residential unit counts from the original layer, residential units for single and multi-family homes in Palm Coast increased 6.52% (Table 1). There were 40,357 single and multi-family residential units in Palm Coast in 2019. There were 51,170 single and multi-family residential units in Flagler County. Thus, the share of residential units inside the Palm Coast's PSAB was approximately 78.87% (i.e., 40,357/51,170). The BEBR 2017 countywide population for Flagler County was 105,157 persons, which was used to calculate the total population for each served and non-served region. Therefore, in Palm Coast the total population was 82,936 persons (i.e., 105,157*78.87%). The estimated 2017 served population for Palm Coast was 82,137 persons. Therefore, the non-served population within Palm Coast's service area was 799 persons (i.e., 82,936-82,137). Due to multiple public supply utilities exceeding their residential share (i.e., CUPs 1982, 1979, 1953, 8932, and Flagler County Utilities), the Flagler countywide total population for 2017 exceeds the published BEBR county estimate (108,309 > 105,157).

Calculating Buildout Population

Once the served and non-served populations were determined for the historical period, the buildout value for the public service area boundary was calculated. The buildout is a theoretical maximum population that a PSAB can contain if all developable land is developed for residential uses. The average person per acre was calculated and then multiplied by the sum of developed and developable acres. The following sections and figures use Palm Coast (CUP# 1947) as an example for how the Python script works and applies the buildout concept to a public supply utility. The PSAB and the parcels intersecting the PSAB are shown in Figures 2 and 3, below.

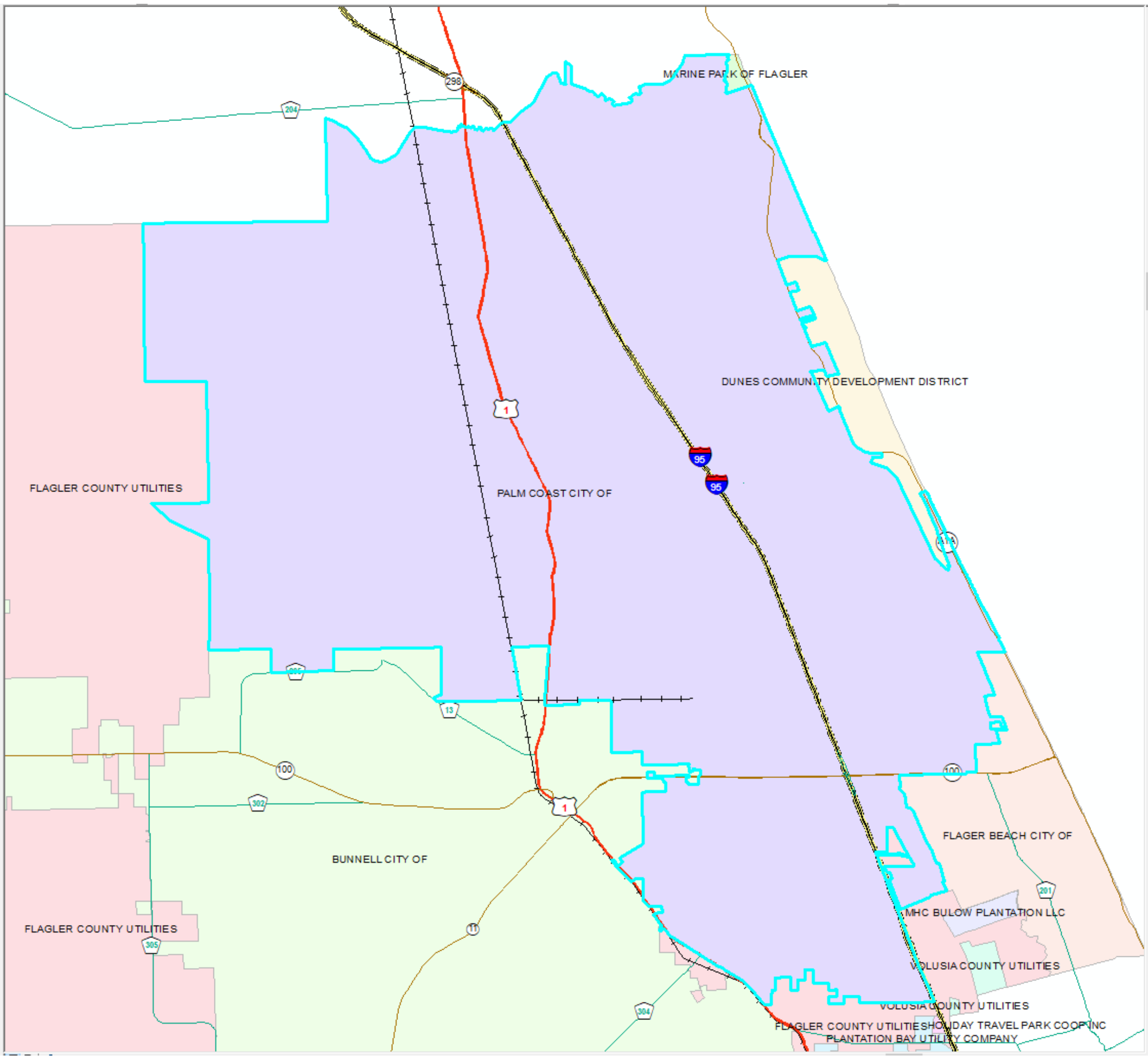

Figure 2. Public service area boundary served by Palm Coast (Consumptive Use Permit 1947)

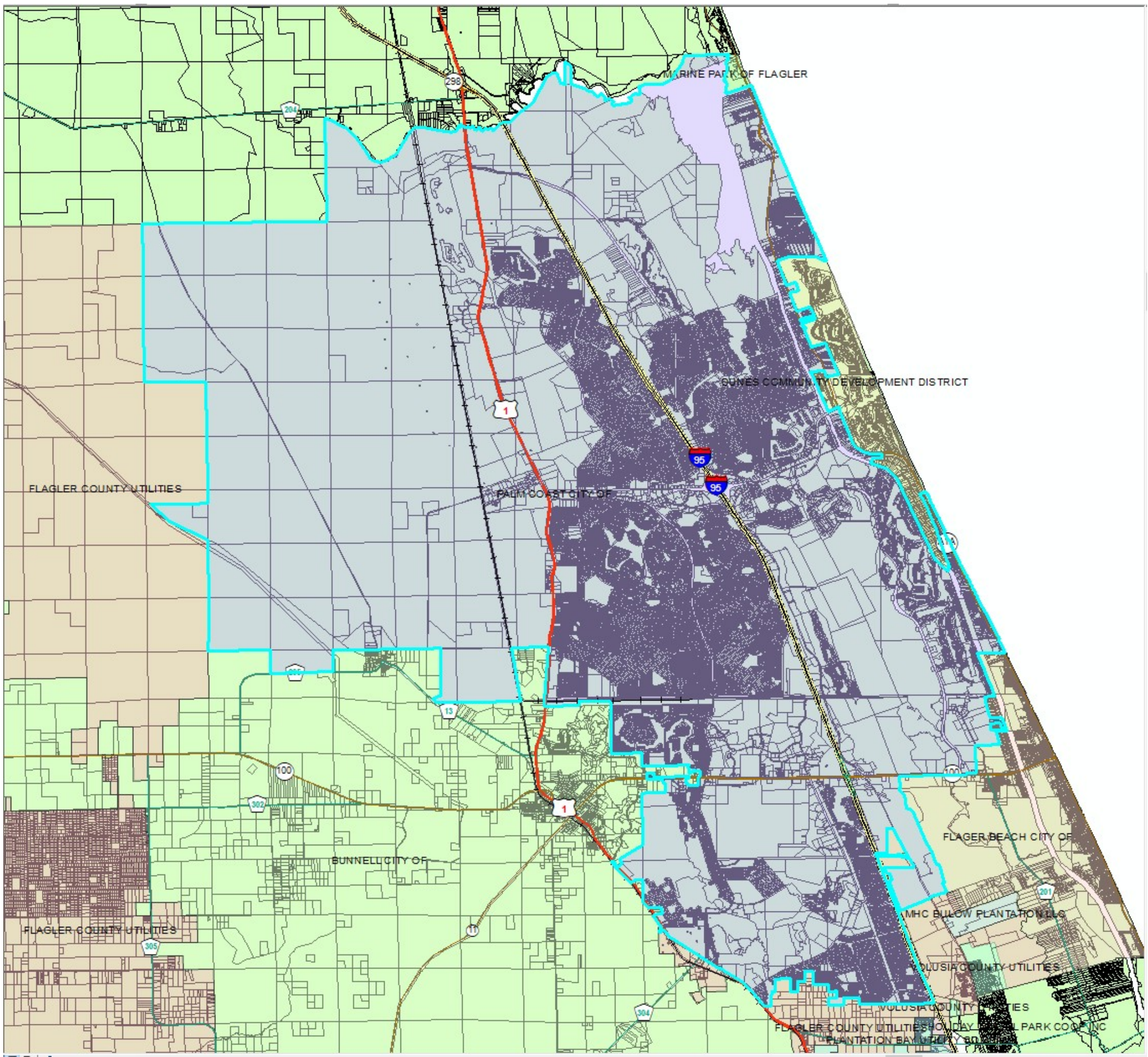

Figure 3. Parcels intersecting the public service area boundary served by Palm Coast (Consumptive Use Permit 1947)

Estimating Buildout Population for Palm Coast (CUP# 1947)

For Palm Coast, the average person per acre in 2017 was 6.87 (i.e., 82,936 persons/12,079 residential acres). The average served and non-served persons per acre were calculated by dividing the served or non-served populations by the residential acreage. Therefore, the served persons per acre was 6.8 (82,136 persons/12,079 residential acres), and the non-served persons per acre was 0.07 (799 persons/12,079 residential acres).

Palm Coast is comprised of 81,412 acres (Table 2). There were 40,912 acres zoned agricultural or vacant residential, which were considered developable in the future.

The buildout population was 360,787 persons (Table 3). This theoretical number is the sum of the current population in developed parcels (82,136 persons) and the potential population in developable parcels 278,651 persons (i.e., 6.8 persons/acre * 40,912 developable acres).

Parcel Classification for Projections

Parcel centroids were classified as follows:

1) Unavailable
    a. CAMPS (036) – Campgrounds
    b. CENTRALLY ASSESSED (098) – Acreage owned by railroad and other large industrialists. At some point in the future these parcels may be developed, however, the present analysis excludes them.
    c. FOREST, PARKS, RECREATIONAL AREAS (082)
    d. STATE, OTHER THAN MILITARY, FORESTS, PARKS, RECREATIONAL AREAS (087)
2) Developed – Parcels that have already been developed (e.g., “SINGLE FAMILY (001)”, “STORES, ONE STORY (011)”, and “SUPERMARKETS (014)”).
3) Developable – Acres that are most likely to be developed in future.
    a. Residential
        i. VACANT RESIDENTIAL (000)
        ii. MISCELLANEOUS RESIDENTIAL (MIGRANT CAMPS, BOARDING HOMES, ETC.) (007)
    b. Agricultural
        i. IMPROVED AGRICULTURAL (050)
        ii. CROPLAND SOIL CAPABILITY CLASS I (051)
        iii. CROPLAND SOIL CAPABILITY CLASS II (052)
        iv. CROPLAND SOIL CAPABILITY CLASS III (053)
        v. TIMBERLAND - SITE INDEX 90 AND ABOVE (054)
        vi. TIMBERLAND - SITE INDEX 80 TO 89 (055)
        vii. TIMBERLAND - SITE INDEX 70 TO 79 (056)
        viii. TIMBERLAND - SITE INDEX 60 TO 69 (057)
        ix. TIMBERLAND - SITE INDEX 50 TO 59 (058)
        x. TIMBERLAND NOT CLASSIFIED BY SITE INDEX TO PINES (059)
        xi. GRAZING LAND SOIL CAPABILITY CLASS I (060)
        xii. GRAZING LAND SOIL CAPABILITY CLASS II (061)
        xiii. GRAZING LAND SOIL CAPABILITY CLASS III (062)
        xiv. GRAZING LAND SOIL CAPABILITY CLASS IV (063)
        xv. GRAZING LAND SOIL CAPABILITY CLASS V (064)
        xvi. GRAZING LAND SOIL CAPABILITY CLASS VI (065)
        xvii. ORCHARD GROVES, CITRUS, ETC. (066)

- xviii. POULTRY, BEES, TROPICAL FISH, RABBITS, ETC. (067)
- xix. DAIRIES, FEED LOTS (068)
- xx. ORNAMENTALS, MISCELLANEOUS AGRICULTURAL (069)

c. Miscellaneous
- i. MINING LANDS, PETROLEUM LANDS, OR GAS LANDS (092)

d. Non-Agricultural Acreage
- i. ACREAGE NOT ZONED AGRICULTURAL (099)

Table 1. Residential units by parcel type for Palm Coast (consumptive use permit 1947) using 2019 parcels.

Parcel Use Description (PARUSEDESC)	Parcels	Percent of Total Parcels	Original Residential Units	Corrected Residential Units	Percent of Total Residential Units	Percent Change in Residential Units
CONDOMINIA	2,422	6.27%	2,418	2,443	6.05%	1.04%
COOPERATIVES	234	0.61%	0	468	1.16%	N/A
MOBILE HOMES	205	0.53%	74	211	0.52%	185.14%
MULTI-FAMILY - 10 UNITS OR MORE	7	0.02%	43	524	1.30%	1,118.99%
MULTI-FAMILY - LESS THAN 10 UNITS	820	2.12%	824	1,145	2.84%	38.95%
PARKING LOTS (COMMERCIAL OR PATRON) MOBILE HOME PARKS	14	0.04%	25	124	0.31%	397.37%
SINGLE FAMILY	34,485	89.22%	34,499	34,502	85.49%	0.01%
UNDEFINED - RESERVED FOR USE BY DEPARTMENT OF REVENUE	465	1.20%	4	940	2.33%	23,380.55%
Total	**38,652**	**100.00**	**37,887**	**40,357**	**100.00%**	**6.52%**

Note: Nominal discrepancies accounted for by rounding anomalies.

Table 2. Acreage by parcel use code for Palm Coast (consumptive use permit 1947) using 2019 parcels.

Parcel Use Description (PARUSEDESC)	Parcels	Percent of Total Parcels	Acreage	Percent of Total Acreage
NONE	446	0.74%	318.27	0.39%
ACREAGE NOT ZONED AGRICULTURAL	32	0.05%	4,079.61	5.01%
AIRPORTS (PRIVATE OR COMMERCIAL),BUS TERMINALS,MARINE TERMINALS,PIERS,MARINAS	2	0.00%	14.42	0.02%
AUTO SALES,AUTO REPAIR AND STORAGE,AUTO SERVICE SHOPS,BODY AND FENDER SHOPS,COMMERCIAL GARAGES	19	0.03%	53.74	0.07%
BOWLING ALLEYS,SKATING RINKS,POOL HALLS,ENCLOSED ARENAS	2	0.00%	7.97	0.01%
CENTRALLY ASSESSED	1	0.00%	207.81	0.26%
CHURCHES	27	0.04%	165.93	0.20%
CLUBS,LODGES,UNION HALLS	7	0.01%	28.23	0.03%
COLLEGES	1	0.00%	98.57	0.12%
COMMUNITY SHOPPING CENTERS	39	0.06%	152.16	0.19%
CONDOMINIA	2,422	4.03%	447.49	0.55%
COOPERATIVES	234	0.39%	18.90	0.02%
COUNTIES (OTHER THAN PUBLIC SCHOOLS,COLLEGES,HOSPITALS) INCLUDING NON-MUNICIPAL GOVERNMENT	190	0.32%	8,517.41	10.46%
DEPARTMENT STORES	2	0.00%	17.24	0.02%
DRIVE-IN RESTAURANTS	15	0.02%	19.03	0.02%
ENCLOSED THEATERS,ENCLOSED AUDITORIUMS	1	0.00%	18.48	0.02%
FEDERAL,OTHER THAN MILITARY,FORESTS,PARKS,RECREATIONAL AREAS	10	0.02%	83.86	0.10%
FINANCIAL INSTITUTIONS (BANKS,SAVING AND LOAN COMPANIES,MORTGAGE COMPANIES,CREDIT SERVICES)	19	0.03%	26.66	0.03%
FLORIST,GREENHOUSES	2	0.00%	3.06	0.00%
FOREST,PARKS,RECREATIONAL AREAS	11	0.02%	440.94	0.54%
GOLF COURSES,DRIVING RANGES	7	0.01%	1,595.03	1.96%
GRAZING LAND SOIL CAPABILITY CLASS I	7	0.01%	548.39	0.67%
GRAZING LAND SOIL CAPABILITY CLASS IV	3	0.00%	44.48	0.05%
HEAVY INDUSTRIAL,HEAVY EQUIPMENT MANUFACTURING,LARGE MACHINE SHOPS,FOUNDRIES,STEEL FABRICATING PLANT	2	0.00%	43.87	0.05%
HOMES FOR THE AGED	67	0.11%	80.56	0.10%
HOSPITALS	1	0.00%	93.96	0.12%
HOTELS,MOTELS	11	0.02%	38.99	0.05%

Parcel Use Description (PARUSEDESC)	Parcels	Percent of Total Parcels	Acreage	Percent of Total Acreage
IMPROVED AGRICULTURAL	6	0.01%	163.30	0.20%
LIGHT MANUFACTURING,SMALL EQUIPMENT MANUFACTURING PLANTS,SMALL MACHINE	28	0.05%	95.11	0.12%
MISCELLANEOUS RESIDENTIAL (MIGRANT CAMPS,BOARDING HOMES,ETC.)	188	0.31%	104.21	0.13%
MIXED USE - STORE AND OFFICE OR STORE AND RESIDENTIAL OR RESIDENTIAL COMBINATION	18	0.03%	25.66	0.03%
MOBILE HOMES	205	0.34%	56.80	0.07%
MORTUARIES,CEMETERIES,CREMATORIUMS	5	0.01%	17.01	0.02%
MULTI-FAMILY - 10 UNITS OR MORE	7	0.01%	162.00	0.20%
MULTI-FAMILY - LESS THAN 10 UNITS	820	1.36%	216.46	0.27%
MUNICIPAL,OTHER THAN PARKS,RECREATIONAL AREAS,COLLEGES,HOSPITALS	830	1.38%	4,653.59	5.72%
OFFICE BUILDINGS,NON-PROFESSIONAL SERVICE BUILDINGS,MULTI-STORY	17	0.03%	28.65	0.04%
OFFICE BUILDINGS,NON-PROFESSIONAL SERVICE BUILDINGS,ONE STORY	492	0.82%	70.12	0.09%
OPEN STORAGE,NEW AND USED BUILDING SUPPLIES,JUNK YARDS,AUTO WRECKING,FUEL STORAGE	13	0.02%	20.83	0.03%
ORPHANAGES,OTHER NON-PROFIT OR CHARITABLE SERVICES	1	0.00%	19.46	0.02%
PARKING LOTS (COMMERCIAL OR PATRON) MOBILE HOME PARKS	14	0.02%	71.71	0.09%
PRIVATE SCHOOLS AND COLLEGES	2	0.00%	4.54	0.01%
PROFESSIONAL SERVICE BUILDINGS	70	0.12%	44.80	0.06%
PUBLIC COUNTY SCHOOLS - INCLUDE ALL PROPERTY OF BOARD OF PUBLIC INSTRUCTION	21	0.03%	586.02	0.72%
REPAIR SERVICE SHOPS (EXCLUDING AUTOMOTIVE),RADIO AND T.V. REPAIR,REFRIGERATION SERVICE,ELECTRIC REP	2	0.00%	0.85	0.00%
RESTAURANTS,CAFETERIAS	11	0.02%	14.22	0.02%
RIGHT-OF-WAY,STREETS,ROADS,IRRIGATION CHANNEL,DITCH	161	0.27%	416.20	0.51%
RIVERS AND LAKES,SUBMERGED LANDS	56	0.09%	483.65	0.59%
SEWAGE DISPOSAL,SOLID WASTE,BORROW PITS,DRAINAGE RESERVOIRS,WASTE LAND	20	0.03%	174.46	0.21%
SINGLE FAMILY	34,485	57.34%	9,293.39	11.42%
STATE,OTHER THAN MILITARY,FORESTS,PARKS,RECREATIONAL AREAS	60	0.10%	3,901.99	4.79%
STORES,ONE STORY	48	0.08%	152.56	0.19%
SUPERMARKETS	2	0.00%	9.50	0.01%
TIMBERLAND - SITE INDEX 70 TO 79	36	0.06%	7,100.02	8.72%
TIMBERLAND - SITE INDEX 80 TO 89	117	0.19%	22,384.60	27.50%
TIMBERLAND - SITE INDEX 90 AND ABOVE	1	0.00%	79.47	0.10%
TIMBERLAND NOT CLASSIFIED BY SITE INDEX TO PINES	9	0.01%	1,090.98	1.34%
TOURIST ATTRACTIONS,PERMANENT EXHIBITS,OTHER ENTERTAINMENT FACILITIES,FAIRGROUNDS (PRIVATELY OWNED)	3	0.00%	113.07	0.14%
UNDEFINED - RESERVED FOR USE BY DEPARTMENT OF REVENUE	465	0.77%	1,812.48	2.23%
UTILITY,GAS AND ELECTRICITY,TELEPHONE AND TELEGRAPH,LOCALLY ASSESSED RAILROADS,WATER AND SEWER SERVICE	32	0.05%	318.68	0.39%
VACANT	3	0.00%	8.59	0.01%
VACANT COMMERCIAL	400	0.67%	4,740.54	5.82%
VACANT INDUSTRIAL	52	0.09%	369.63	0.45%
VACANT RESIDENTIAL	17,839	29.66%	5,316.81	6.53%
WAREHOUSING,DISTRIBUTION TERMINALS,TRUCKING TERMINALS,VAN AND STORAGE WAREHOUSING	26	0.04%	124.51	0.15%
Total	**60,145**	**100.00%**	**81,412**	**100.00%**

Parcel Use Description (PARUSEDESC)	Parcels	Percent of Total Parcels	Acreage	Percent of Total Acreage
Total Developable	**18,238**	**30.32%**	**40,912**	**50.25%**

Note: Nominal discrepancies accounted for by rounding anomalies.

Table 3. Current population estimates and buildout population served and non-served areas in Flagler County.

Utility Name	Consumptive Use Permit	Number of Residential Parcels	Heated Square Footage	Number of Residential Buildings	Number of Residential Units	Served Buildout Population	Non-Served Buildout Population	Total Buildout Population	2015 Served Population Estimate	2015 Non-Served Population Estimate	2015 Total Population Estimate	2017 Served Population Estimate	2017 Non-Served Population Estimate	2017 Total Population Estimate
BUNNELL CITY OF	1982	3,082	5,304,353	1,783	1,338	137,733	0	137,733	2,875	0	2,875	2,934	0	2,934
DUNES COMMUNITY DEVELOPMENT	51136	3,303	7,310,078	2,576	2,860	4,548	1,780	6,329	4,017	1,476	5,493	4,091	1,601	5,692
FLAGLER BEACH CITY OF	59	4,824	7,440,260	3,568	3,523	8,616	4,622	13,238	4,621	2,382	7,003	4,677	2,509	7,186
FLAGLER COUNTY UTILITIES	UtilityID_43	6,389	4,045,638	2,112	1,988	84524	0	84,254	4,577	0	4,577	4,772	0	4,772
HOLIDAY TRAVEL PARK COOP INC	1979	1	9,786	6	5	380	0	380	380	0	380	380	0	380
MARINE PARK OF FLAGLER	1953	13	105,505	23	9	13	0	17	17	0	17	17	0	17
MHC BULOW PLANTATION LLC	2002	3	50,426	16	24	1,284	0	1,284	1,284	0	1,284	1,284	0	1,284
ORMOND BEACH CITY OF	8932	285	237,146	92	138	4,314	0	4,314	239	0	239	316	0	316
OUTSIDE SERVICE AREA BOUNDARY	NO_CUP	15	115,119	18	21	0	43	43	0	43	43	0	43	43
PALM COAST CITY OF	1947	60,145	99,618,193	40,340	40,992	360,787	3,508	364,295	79,819	216	80,035	82,137	799	82,936
PLANTATION BAY UTILITY COMPANY	1960	1,446	2,770,059	1,027	1,121	4,226	1,794	6,020	1,532	588	2,120	1,617	686	2,304
ST. JOHNS COUNTY UTILITIES	1198	25	0	0	0	0	0	0	0	0	0	0	0	0
VOLUSIA COUNTY UTILITIES	50157	239	683,724	200	217	512	17	528	430	10	440	432	14	446
Total		**79,770**	**127,690,287**	**51,761**	**52,235**	**606,940**	**11,764**	**618,704**	**99,791**	**4,715**	**104,506**	**102,656**	**5,653**	**108,309**

Population Projections for Flagler County Example

After calculating buildout, the BEBR population projection growth was distributed to the developable parcels in Flagler County. The development was prioritized using a ranking system. Each developable parcel was assigned a rank based on parcel use type, ZIP Code population density, and the built-year of the newest-built parcel in each ZIP Code. As seen in Table 4, Vacant Residential parcels (Rank = 27) were considered more readily developable than Timberland Not Classified by Site Index to Pines parcels (Rank = 2). The other two components of the ranking system were ZIP Code density and the ZIP Code newest year built. The highest ranked developable parcel in Flagler County was a vacant residential parcel in a ZIP Code with a density of 2.02 persons per acre and the newest year built was 2017. Thus, the development priority for this parcel is 2,046.02 (i.e., 27+2017+2.02). Alternatively, the lowest ranked parcel was improved agricultural. It was in a ZIP Code with a low population density and the built year of the most recently developed parcel is 2005. Thus, the development priority for this parcel is 2,015.00 (i.e., 10+2,005+0.00). As noted, vacant residential parcels in densely populated ZIP Codes will have the highest development priority score. There were 18,238 developable parcels inside Palm Coast (CUP# 1947) that comprised 40,912 acres (Table 5).

After ranking all the parcels in a county, BEBR's medium projected growth was distributed in 5-year increments through 2045. As seen in Table 6 below, BEBR expected 4,989 people would move to Flagler County by 2020. With parcels sorted by development priority rank, the first parcels were selected whose combined population was less than or equal to 4,989. In the specific case of Palm Coast (CUP# 1947), 2,638 vacant residential parcels (724 acres) would be developed by 2020 to house 4,934 new residents. The next group of sorted parcels whose total population was less than or equal to 11,400 was selected, etc. See Table 7 for projections and buildout for all PSABs in Flagler County. The future growth was distributed to developable parcels based on the buildout population calculated in the previous step. In the case of Palm Coast (CUP# 1947), the served and non-served persons per acre (6.8 and 0.07, respectively) were multiplied by the acreage of the parcel to determine the parcel-level persons per household. The most recent year's calculated persons per household for single family and multi-family parcels were kept constant through the planning horizon. See Table 8 using Palm Coast (CUP# 1947) as an example of the historical and projected population distribution at the parcel level.

Parcel Projection Methodology and BEBR Considerations

The SJRWMD considers published BEBR population estimates and medium population projections. In many cases, since the method takes into account residential units at the parcel layer for the base year, the base year estimates of population and projected population for the planning horizon may differ than the actual published BEBR values. It should be noted that the parcel projection method does grow population using the additional population growth from BEBR medium population projections.

Additional Methodology Considerations:

1) Used in SJRWMD Public Supply CUP reviews.
2) Provides for incorporation of utility feedback in currently served population.
    a. Never results in negative DSS
    b. Leads to more consistent DSS estimates from year to year, because DSS does not need to be modified as a direct result of served population reported.
3) Allows utilities to grow at different rates due to population density and recent parcel development (i.e., development rank).
    a. For example, in the case of Flagler County, all growth was attributed to Palm Coast

and Bunnell in 2020 because they had the highest ranked parcels. In 2030, Dunes Community Development, the City of Flagler Beach, Flagler County Utilities, and Volusia County Utilities also had population distributed to their areas, as they had the next-highest ranked parcels.

4) Approach allows for and incorporates buildout/real world "on the ground" look at residential parcels and units built.
5) Transparent and documented methodology
    a. Similar methods have been used in the approved Central Florida Water Initiative Regional Water Supply Plan (BEBR/Rich Doty parcel method) and Central Springs/East Coast Regional Water Supply Plan (SJRWMD parcel methodology).
    b. The Southwest Florida Water Management District hires BEBR/Rich Doty every year to develop parcel-level projections that vary from published BEBR estimates (includes functional population cohorts and utility served data). 2020 Regional Water Supply Plan, Appendix 3-3: Demand Projections for Public Supply Appendix_3_3_PS_Demands_Tech_Memo (state.fl.us).
        i. "In the case of Manatee and Pinellas counties, the sum of the projections for all utilities exceeds the projected county population. Thus, the county population was increased enough to cover the deficit plus allow for self-supplied population."

Table 4. Parcels ranked according to likelihood of development. Higher rank equals increased likelihood of development.

Parcel Use Description	Parcel Use Code	Rank
VACANT RESIDENTIAL	000	27
CROPLAND SOIL CAPABILITY CLASS III	053	26
CROPLAND SOIL CAPABILITY CLASS II	052	25
CROPLAND SOIL CAPABILITY CLASS I	051	24
GRAZING LAND SOIL CAPABILITY CLASS VI	065	23
GRAZING LAND SOIL CAPABILITY CLASS V	064	22
GRAZING LAND SOIL CAPABILITY CLASS IV	063	21
GRAZING LAND SOIL CAPABILITY CLASS III	062	20
GRAZING LAND SOIL CAPABILITY CLASS II	061	19
GRAZING LAND SOIL CAPABILITY CLASS I	060	18
TIMBERLAND - SITE INDEX 90 AND ABOVE	054	17
TIMBERLAND - SITE INDEX 80 TO 89	055	16
TIMBERLAND - SITE INDEX 70 TO 79	056	15
TIMBERLAND - SITE INDEX 60 TO 69	057	14
TIMBERLAND - SITE INDEX 50 TO 59	058	13
ACREAGE NOT ZONED AGRICULTURAL	099	12
DAIRIES,FEED LOTS	068	11
IMPROVED AGRICULTURAL	050	10
LUMBER YARDS,SAWMILLS,PLANING MILLS	043	9
MINERAL PROCESSING,PHOSPHATE PROCESSING,CEMENT PLANTS,REFINERIES,CLAY PLANTS	047	8
MINING LANDS,PETROLEUM LANDS,OR GAS LANDS	092	7
MISCELLANEOUS RESIDENTIAL (MIGRANT CAMPS,BOARDING HOMES,ETC.)	007	6
ORCHARD GROVES,CITRUS,ETC.	066	5
ORNAMENTALS,MISCELLANEOUS AGRICULTURAL	069	4
POULTRY, BEES, TROPICAL FISH, RABBITS, ETC.	067	3
TIMBERLAND NOT CLASSIFIED BY SITE INDEX TO PINES	059	2
UNDEFINED - RESERVED FOR FUTURE USE	080	1

Table 5. Developable acreage by parcel use code description for Palm Coast, consumptive use permit 1947.

Parcel Use Description (PARUSEDESC)	Parcels	Percent of Total Parcels	Acreage	Percent of Total Acreage
ACREAGE NOT ZONED AGRICULTURAL	32	0.18%	4,080	9.97%
GRAZING LAND SOIL CAPABILITY CLASS I	7	0.04%	548	1.34%
GRAZING LAND SOIL CAPABILITY CLASS IV	3	0.02%	44	0.11%
IMPROVED AGRICULTURAL	6	0.03%	163	0.40%
MISCELLANEAOUS RESIDENTIAL (MIGRANT CAMPS,BOARDING HOMES, ETC.)	188	1.03%	104	0.25%
TIMBERLAND - SITE INDEX 70 TO 79	36	0.20%	7,100	17.25%
TIMBERLAND - SITE INDEX 80 TO 89	117	0.64%	22,385	54.71%
TIMBERLAND - SITE INDEX 90 AND ABOVE	1	0.01%	79	0.19%
TIMBERLAND NOT CLASSIFIED BY SITE INDEX TO PINES	9	0.05%	1,091	2.67%
VACANT RESIDENTIAL	17,839	97.81%	5,317	13.00%
Total	**18,238**	**100.00%**	**40,912**	**100.00%**

Note: Nominal discrepancies accounted for by rounding anomalies.

Table 6. New population expected in Flagler County from BEBR's medium projections published in 2019.

Year	2018	2020	2025	2030	2035	2040	2045
Population	107,511	112,500	123,900	134,400	143,600	151,600	159,000
Increase in Population	0	4,989	11,400	10,500	9,200	8,000	7,400

Note: Population projections source: Bureau of Economic and Business Research. Volume 52, Bulletin 183, April 2019.

Table 7. Population estimates, projections, and buildout for Flagler County.

Utility	Consumptive Use Permit	Number of Parcels	Buildout	2015	2017	2020	2025	2030	2035	2040	2045
BUNNELL CITY OF	1982	3,082	137,733	2,875	2,934	2,940	2,955	2,961	2,961	2,961	6,386
DUNES COMMUNITY DEVELOPMENT	51136	3,303	6,329	5,493	5,692	5,692	5,733	6,036	6,302	6,302	6,302
FLAGLER BEACH CITY OF	59	4,824	13,238	7,003	7,186	7,186	7,186	10,998	10,998	10,998	10,998
FLAGLER COUNTY UTILITIES	UtilityID_43	6,389	84,254	4,577	4,772	4,772	4,772	5,086	6,224	7,418	11,207
HOLIDAY TRAVEL PARK COOP INC	1979	1	380	380	380	380	380	380	380	380	380
MARINE PARK OF FLAGLER	1953	13	17	17	17	17	17	17	17	17	17
MHC BULOW PLANTATION LLC	2002	3	1,284	1,284	1,284	1,284	1,284	1,284	1,284	1,284	1,284
ORMOND BEACH CITY OF	8932	285	4,314	239	316	316	316	316	316	603	636
OUTSIDE SERVICE AREA BOUNDARY	NO_CUP	15	43	43	43	43	43	43	43	43	43
PALM COAST CITY OF	1947	60,145	364,295	80,030	82,936	87,918	99,276	105,604	113,281	119,446	119,459
PLANTATION BAY UTILITY COMPANY	1960	1,446	6,020	2,120	2,304	2,304	2,304	2,304	2,304	2,456	2,585
ST. JOHNS COUNTY UTILITIES	1198	25	0	0	0	0	0	0	0	0	0
VOLUSIA COUNTY UTILITIES	50157	239	528	440	446	446	446	490	490	490	490
Total		**79,770**	**618,705**	**104,506**	**108,310**	**113,298**	**124,671**	**135,198**	**144,334**	**152,398**	**159,787**

Table 8. Distribution of population estimates and projections at the parcel level for Palm Coast, consumptive use permit 1947.

Parcel Number	CUSTCLASS	Number of Residential Units on Parcel	Number of SF_MF Residential Units in PSAB	2017 Served Population Estimate for PSAB	2017 Served for Parcel	2017 Non-Served Population Estimate for PSAB	2017 Non-Served for Parcel	Parcel Acreage	2017 Served Persons Per Acre	2017 Non-Served Persons Per Acre	Build-out Served for Parcel	Build-out Non-Served for Parcel	2020 Served for Parcel	2020 Non-Served for Parcel
07-11-31-7033-00480-0020	Single Family	1	40,356	82,137	2.04	799	0.02	0.24	-	-	2.04	0.02	2.04	0.02
05-11-31-4075-00000-0002	Multi-Family	2	40,356	82,137	4.07	799	0.04	0.60	-	-	4.07	0.04	4.07	0.04
07-11-31-7032-00880-0040	Vacant Residential	Null	40,356	82,137	0.00	0	0.00	0.23	6.79	0.07	1.56	0.02	1.56	0.02

Notes: PSAB – public supply service area boundary.

2017 Served for Parcel is based on served persons per residential unit: (82,137/40,356) = 2.04; for Multi-Family, it is multiplied by the Number of Residential Units on Parcel: (82,137/40,356) = 2.04*2 = 4.07

2017 Non-Served for Parcel is based on non-served persons per residential unit (799/40,356) = 0.02; for Multi-Family, it is multiplied by the Number of Residential Units on Parcel: (799/40,356) = 0.02*2 = 0.04

St. Johns River Water Management District
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Technical Memorandum
Documentation and Methodologies for Updating St. Johns River Water Management District 2020-2045 North Florida Regional Water Supply Plan Projections Resulting from Stakeholder Feedback
May 23, 2022

To: NFRWSP Stakeholders

Through: Tammy Bader
Technical Program Manager, Bureau of Water Supply Planning

John Fitzgerald
Bureau Chief, Bureau of Water Supply Planning

From: Rebecca May
Senior Water Use Analyst, Bureau of Water Supply Planning

JEA

Background

During the current iteration of the 2023 North Florida Regional Water Supply Plan (NFRWSP), feedback was provided regarding projections for utilities in the North Florida Utility Coordination Group (NFUCG). This section explains the methodology for incorporating feedback to adjust the population and water demand projections for JEA.

Overview

The tasks described in this section are as follows:

1) Splitting the provided historical annual connections by county using a service grid shapefile.
2) Deriving population using Bureau of Economic and Business Research (BEBR) persons per household.
3) Projecting connections, population, and water demands.
4) Domestic self-supply (DSS) conversion.

Data Sources

The datasets used were:

1) Parcel centroids generated from the land use parcel polygon dataset provided by Panda Consulting (Spring 2020).
2) BEBR's countywide persons per household estimates (BEBR 2019).
3) BEBR's projections of Florida population by county (2020-2045; BEBR 2020).
4) JEA_Future_Water_Grid.shp

Splitting historical connections

JEA provided data to the St. Johns River Water Management District (SJRWMD) regarding historical and projected number of connections, population, and water use by service grid. To derive population, the value of 2.55 persons per household was used across all service grids as this value was the Census 2015-2019 average for Duval County. The SJRWMD, for consistency, uses county-specific data, so residential units from single family and multi-family parcels were totaled for each currently existing service grid and then percentages for each county and year were obtained using the year built (Table 1).

Table 1. Example of residential units split by county for the North Service Grid of JEA

County	2014 Residential Units	2014 Percent	2014 Number of Connections
Duval	170,856	97.8	142,906
Clay	3,856	2.2	3,226
Total	**174,712**	**100**	**146,132**

BEBR county-specific persons per household values were multiplied by the number of connections to derive the population for each year. Annual increases in connections were calculated and the 2014-2018 average number of new connections was used to project for each 5-year increment (2020-2045; Table 2).

Table 2. Example of projected population calculations for Duval County in the North Service Grid of JEA using BEBR's persons per household of 2.43 (BEBR 2019)

Year	2013	2014	2015	2016	2017	2018	2014-2018 Average	2020
Connections	142,226	142,906	143,479	143,974	145,170	146,953	N/A	148,843
Increase in Connections	N/A	680	573	495	1,196	1,783	945	
Population	345,609	347,262	348,654	349,857	352,763	357,096	N/A	361,688

Populations were then summed to the county totals across the service grids. Historical populations were updated based on the data provided, with SJRWMD adjustments, which updated the gross per capita rates. The updated 5-year average (2014-2018) gross per capita was used to project water demands through the end of the planning horizon (2045).

DSS conversion

In areas of high growth and development there is often conversion of DSS to public supply. The fastest growing counties in which JEA's service boundary extends are Clay, Duval, and St. Johns. Therefore, it can be assumed that there would be a DSS conversion rate of 1% per year to public supply in these counties. Similar conversion rates have been used in other planning efforts throughout the state such as the 2020 Central Florida Water Initiative Regional Water Supply Plan (available at cfwiwater.com) and the 2015 NFRWSP (available at northfloridawater.com). The DSS within the service area was derived as the difference between the number of residential units and the number of connections using provided data. The result was multiplied by 5% (as there are 5 years in each projected increment) and then multiplied by the county specific BEBR persons per household. This value was then removed from DSS and added into the public supply. See the following example for Clay County in Tables 3a and 3b.

Table 3a. Calculation to derive the domestic self-supplied population available for conversion to public supply in 2020 for Clay County in the North Service Grid of JEA

Residential Units - Connections	DSS * 1%/year	Population
4970 - 4536 = 434	434 * 5% = 22	22 * 2.7 = 59

Table 3b. Populations within the Clay County portion of JEA's North Service Grid before and after DSS conversion

Year	2020	2025	2030	2035	2040	2045
JEA Population Before Conversion	12,247	15,150	18,052	20,955	23,857	26,760
DSS Population Before Conversion	67,682	74,518	84,148	84,148	84,148	84,148
DSS Conversion	59	118	177	236	295	354
DSS After Conversion	67,623	74,400	83,971	83,912	83,853	83,794
JEA Population After Conversion	12,306	15,268	18,229	21,191	24,152	27,114

Based on the SJRWMD's adjustments described in this technical memorandum, the recommended population and water demand projections for JEA are below (Table 4). The SJRWMD's recommended 2045 water demand projections are within three percent of what was proposed by JEA.

Table 4. Comparison of the proposed projected population and water demands by JEA and the SJRWMD

	Population						Water Demand					
Entity	2020	2025	2030	2035	2040	2045	2020	2025	2030	2035	2040	2045
JEA	N/A	1,028,933	1,107,626	1,186,319	1,265,004	1,321,256	N/A	129.27	139.24	149.20	159.17	166.22
SJRWMD	911,434	977,404	1,043,290	1,109,147	1,174,926	1,240,708	117.80	126.37	134.93	143.49	152.04	160.59

Note: Water demand in this table is shown as million gallons per day.

SJCUD

Background

This section explains the methodology for incorporating feedback to adjust the population and water demand projections for St. Johns County Utilities Department (SJCUD). SJCUD utilized a parcel-based population model developed by GIS and Associates, Inc. (GISA) to derive population and water demand through the end of the planning horizon (2045). Due to a reduction in gross per capita rates, the water demand projections produced by GISA and SJCUD were lower than what was originally projected by the SJRWMD, despite having greater population growth.

Overview

The task described in this section is:

1) Adjusting historic gross per capita rates.

Data Sources

The datasets used were:

1) 2018.06.21_WaterDemand_TechnicalMemo.pdf.
2) SJC_Water Projection_Summary - Eval for Black Creek Ag.xlsx.
3) BEBR’s projections of Florida population by county (2020-2045; BEBR 2020).

Adjusting historic gross per capita rates

SJCUD provided data that were used to generate water demand projections for the Black Creek Agreement. These data, and the data from the Water Demand Technical Memorandum, were considered in the SJRWMD’s calculations. Historical populations were only provided for 2017, so the historical 5-year average (2014-2018) could not be re-adjusted. Gross per capita rates were calculated based on the available 2045 water demand and population data (Table 5). These gross per capita rates were 96 and 144 gallons per person per day for the Main and Ponte Vedra Systems, respectively.

Table 5. A comparison of the proposed projected population and water demands by SJCUD and the SJRWMD

Entity	Population						Water Demands					
	2020	2025	2030	2035	2040	2045	2020	2025	2030	2035	2040	2045
SJCUD	134,814	158,261	178,464	196,678	213,231	229,314	14.78	16.97	18.87	20.52	22.05	23.53
SJRWMD	134,814	158,261	178,464	196,678	213,231	229,314	14.13	16.54	18.71	20.62	22.30	23.60

Note: Water demand in this table is shown as million gallons per day. Town of Hastings (CUP 1392) population and demand are not included in the above figures.

GRU

Background

This section explains the methodology for incorporating feedback to adjust the population and water demand projections for Gainesville Regional Utilities (GRU). GRU is proposing that 80% of Alachua County's projected growth will occur within their service area. GRU is proposing to use a more recent version of BEBR estimates (January 2022) and to use a fixed number of additional people per year through the end of the planning horizon (2045).

Overview

The task described in this section is:

1) Adjusting projected population and water demands.

Data Sources

1) 2022.01.27 GRU Water Forecast3.xlsx.
2) 2022.02.18 GRU Water Projections.pdf.
3) BEBR's projections of Florida population by county (2020-2045; BEBR 2020).

Adjusting projected population

SJRWMD recognizes that the majority of growth in Alachua County will likely be in GRU's service area. Based on the historical 5-year average (2014-2018) of data, approximately 70% of the countywide growth occurred in GRU. When the provided historical water use and population data were incorporated, the 2020 version of BEBR projections was used (BEBR 2020), and 80% of the growth was applied to GRU, the following projections were derived (Table 6).

Table 6. A comparison of the proposed projected population and water demands by GRU and the SJRWMD

Entity	Population						Water Demand					
	2020	**2025**	**2030**	**2035**	**2040**	**2045**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
GRU	N/A	210,931	223,331	235,731	248,131	260,531	N/A	24.81	26.27	27.72	29.18	30.64
SJRWMD	196,495	205,855	213,935	220,815	226,575	231,295	23.19	24.29	25.24	26.06	26.74	27.29

Note: Water demand in this table is shown as million gallons per day.

CCUA

Background

This section explains the methodology for incorporating feedback to adjust the population and water demand projections for Clay County Utility Authority (CCUA). CCUA provided documentation to support numerous new developments that have been approved, particularly along the First Coast Expressway. The SJRWMD has adjusted the projections to incorporate these approved developments.

Overview

The task described in this section is:

1) Adjusting projected population and water demands.

Data Sources

1) CCUA Population and Demand Projection Information.pdf.
2) BEBR's projections of Florida population by county (2020-2045; BEBR 2020).

Adjusting projected population and water demands

The SJRWMD recognizes the rapid growth and development of regions within CCUA's service area. The additional population CCUA attributed to these developments has been factored into the SJRWMD's projections. In addition, 1.95 million gallons per day (mgd) has been added to the water demand beginning in 2025 for the Niagara Bottling facility. Table 7 provides a comparison of the population and water demand projections proposed by the SJRWMD that incorporates these changes.

Table 7. A comparison of the proposed projected population and water demands by CCUA and the SJRWMD

Entity	Population						Water Demand					
	2020	**2025**	**2030**	**2035**	**2040**	**2045**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
CCUA	124,004	145,929	171,602	198,671	214,389	227,920	13.70	15.80	18.20	20.80	22.30	23.60
SJRWMD	126,966	149,238	173,816	201,719	214,888	227,726	11.65	16.07	18.32	20.88	22.09	23.19

Note: Water demand in this table is shown as million gallons per day. CCUA Reclaimed Water Supplementation (CUP 51227) demand is not included in the above figures.

Incorporation of Additional Stakeholder Feedback

Additional feedback was provided regarding the population and demand projections for the Cities of Neptune and Atlantic Beach. The City of Neptune Beach provided data from a recent Revision to their Comprehensive Plan using BEBR data. The projections were provided in 10-year increments through 2050, so the SJRWMD interpolated to obtain the years in between. The City of Atlantic Beach requested to use the projections from their recent consumptive use permit renewal (2020).

Additional Considerations

County-level data adjustments

The SJRWMD is required by statute to consider BEBR Medium Projections [Section 373.709(2)(a)1a, F.S.]., as such, the SJRWMD used these projections to assess county totals once utility feedback was incorporated. Data were provided by utilities that justifies exceedance of the medium projections. Based on those additional data, adjustments were made to the DSS populations in Clay, Duval, and St. Johns Counties to accommodate the public supply growth trends.

For Clay County, there are numerous new developments planned near the First Coast Expressway in CCUA's service area. Based on this information, the SJRWMD has adjusted the DSS projected populations to be held constant from 2015 through 2045, as the majority of growth is projected to be on Public Supply. That DSS growth was then added to CCUA (population and water demand are included in Table 7). The county-level totals are exceeding BEBR High projections from 2035 through 2045 but are within three percent.

For Duval County, the 2020 published Annual Water Use Survey DSS estimate was used, and the SJRWMD's initially projected growth was applied to each 5-year increment. The county-level total is exceeding BEBR High projections in 2020 but is within one percent.

For St. Johns County, there is also large growth and development in Public Supply predicted. Therefore, the DSS population was held constant from 2020 through 2045. The county-level totals are exceeding BEBR High projections in 2020 and 2025 but are within eight percent.

Due to the nature of the extreme growth in these areas, the slight exceedance of BEBR High in a few projected years reflects the latest trends observed. In addition, more recently published BEBR reports have indicated higher projection estimates (Table 8).

Table 8. A comparison of BEBR's published projections for Clay, Duval, Nassau, and St. Johns Counties

	Bulletin 186, 2020		Bulletin 192, 2022	
County	**2045 BEBR Medium**	**2045 BEBR High**	**2045 BEBR Medium**	**2045 BEBR High**
Clay	285,100	334,100	278,300	335,300
Duval	1,216,200	1,413,100	1,249,500	1,505,700
Nassau	118,900	148,000	131,100	162,000
St. Johns	434,900	529,700	465,500	563,800

References

[BEBR 2019] Bureau of Economic and Business Research. 2019. *Households and Average Household Size in Florida: April 2019. Volume 53, Bulletin 185, December 2019.* Gainesville, Fla.: Bureau of Economic Business and Research, Univ. of Florida.

[BEBR 2020] Bureau of Economic and Business Research. 2020. *Projections of Florida Population by County, 2020–2045, with Estimates for 2019*. *January 2020.* Gainesville, Fla.: Bureau of Economic Business and Research, Univ. of Florida.

Appendix C

Simulated Change in Groundwater Levels within the North Florida-Southeast Georgia Regional Groundwater Flow Model (NFSEG)

Introduction

The North Florida-Southeast Georgia regional groundwater flow model (NFSEG) is a tool developed as a requirement of the North Florida Regional Water Supply Partnership (Charter for SJRWMD-SRWMD Cooperative Groundwater Model Development Project). For consistency in water supply planning, establishment and assessment of MFLs, and permitting decisions, the Partnership agreed to implement a joint regional groundwater flow model. Spanning larger areas within a single model enables improved representation of the aquifer system on a regional basis.

Technical experts from the Districts and other key stakeholders worked collaboratively to develop the next generation regional-scale groundwater flow model for north Florida. The technical team's mandate was to ensure appropriate science is applied to the modeling and data analysis to support decision-making, and that the work completed is defensible, understood by the team, and collaboratively developed, as described in the Partnership's charter, available at northfloridawater.com. The current version of NFSEG is referred to as NFSEG v1.1 (Durden et al., 2019).

The NFSEG v1.1 was used to simulate changes in the potentiometric surface of the Floridan aquifer system due to projected groundwater withdrawals. The focus of this effort is to assess the effect of groundwater withdrawals in the NFRWSP region.

NFSEG Overview

The NFSEG is a porous-equivalent, three-dimensional, steady-state, groundwater flow model covering approximately 60,000 square miles (Figure C1). The model is vertically discretized into seven layers representing, from top to bottom: (1) the surficial aquifer system (SAS), (2) the intermediate confining unit (ICU), where present; (3) the Upper Floridan aquifer (UFA); (4) the middle semi-confining unit (MSCU), where present; (5) the Lower Floridan aquifer (LFA) where present; (6) the lower semi-confining unit, where present; and (7) the Fernandina permeable zone of the LFA, where present. The model is horizontally discretized into uniform grid cells measuring 2,500 feet by 2,500 feet. Calibration of the NFSEG v1.1 was based on hydrologic conditions occurring during calendar years 2001 and 2009 (Durden et al., 2019).

Prior to development of the NFSEG, the groundwater models of the Floridan Aquifer System (FAS) in north Florida and southeast Georgia used by staff focused on specific geographic regions relative to each District. The primary design objective of the NFSEG model was to develop a tool capable of making assessments that span District and state boundaries at required levels of accuracy and reliability. To this end, a considerable effort has been expended in the development and compilation of required data sets, in the model calibration, and in collaboration between affected Districts and other stakeholders.

The following, which comes from USGS Scientific Investigations Report 2016-5116 (Kuniansky, 2016), is a general statement regarding modeling of the Floridan Aquifer System using porous-equivalent media models.

> "The USGS, multiple State water management districts, and other agencies and consultants have frequently used porous-equivalent media models for water-management problems to simulate the Biscayne aquifer and the FAS in Florida. The Biscayne aquifer and FAS are composed of karstified carbonate rocks that can be characterized as dual porosity continua. As of 2015, more than 30 models developed by the USGS have used a single-continuum porous-equivalent (SCPE) model approach to meet necessary calibration criteria for the study objectives. Many of the water management districts in Florida use a SCPE model approach for groundwater management and resource evaluation. Most of these SCPE models are applied to water-supply studies and are regional or subregional in scale and water budgets are desired; this is an appropriate application of such models."

NFSEG v1.1 meets requirements for use in water supply planning, regulatory evaluation, and MFL-related evaluation within the NFSEG domain and is currently being utilized in support of these types of evaluations.

Methodology

NFSEG v1.1 was used to simulate groundwater levels and evaluate differences resulting from simulations of the 2009 "pumps-off" scenario (PO), the average 2014-2018 scenario, which is referred to as current pumping (CP), and the 2045 scenario. The "pumps off" scenario does not represent a historic or predevelopment condition; rather, it approximates a condition where no groundwater pumping is taking place. The CP and 2045 scenarios used the 2009 "pumps off" calibrated hydrologic conditions and only withdrawals were updated for CP and 2045. The water budget parameters were held to the 2009 "pumps off" calibrated condition, assuming the natural variability in the CP and 2045 scenarios was the same as 2009. This approach enables the effects of changes in pumping on groundwater levels to be isolated with respect to other influences.

Water use estimates used as inputs to the NFSEG were updated from the 2017 NFRWSP and vetted through a thorough public review process. Simulations included groundwater level changes in the SAS and the UFA and LFA. The scenarios were utilized to estimate potential impacts of existing and projected groundwater withdrawals with respect to adopted MFLs (including OFSs), waterbodies without MFLs, and wetlands in the NFRWSP area (see Appendices F, G, and H).

Results

Decreases in simulated groundwater levels (aquifer drawdown) were predicted across the planning region for the SAS, UFA, and LFA (Figures C1 to C4). Small areas of increase in the simulated potentiometric surface (aquifer rebound) were associated with reductions in pumping between CP and 2045. Cones of depression were more apparent in the eastern portion of the planning region where the UFA and LFA tend to be confined. Conversely, lower magnitudes of drawdown were observed in the western portion of the planning region where the Floridan aquifer tends to be semi-confined or unconfined. However, the heightened transmissivity of the aquifer in these areas increases the potential for spring flow changes induced by groundwater withdrawals.

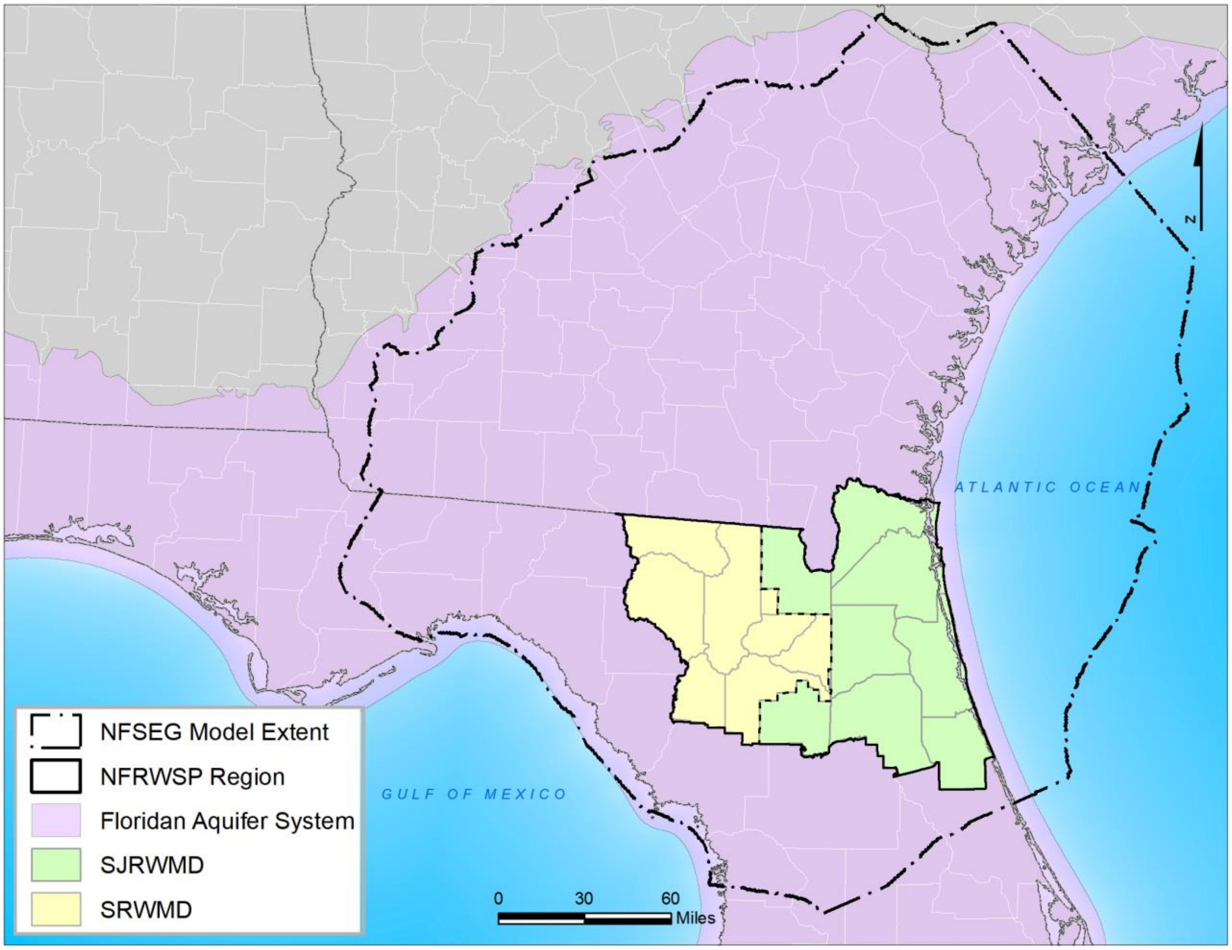

Figure C1. NFSEG domain

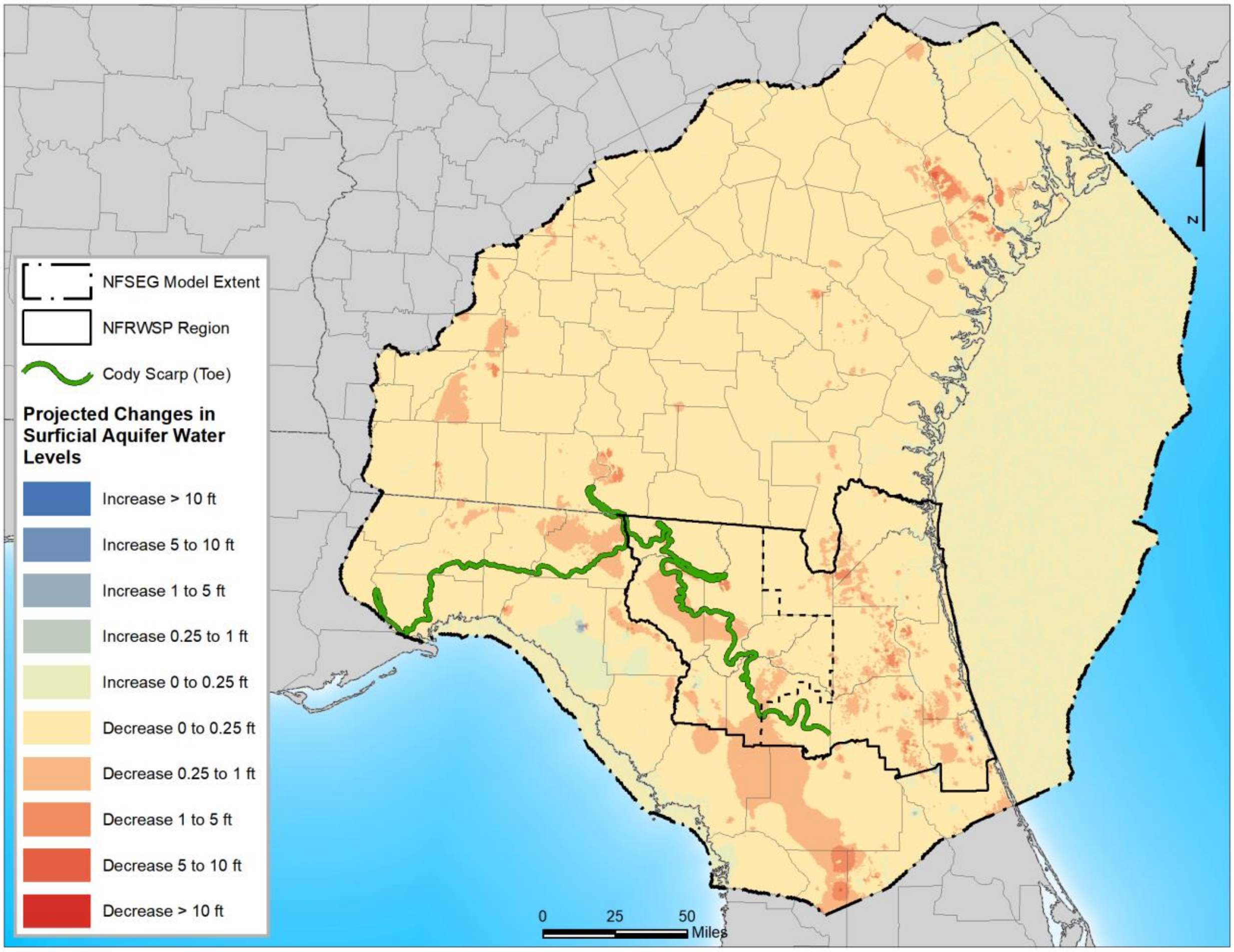

Figure C2. Changes in SAS water levels from current pumping to 2045 within the NFSEG domain

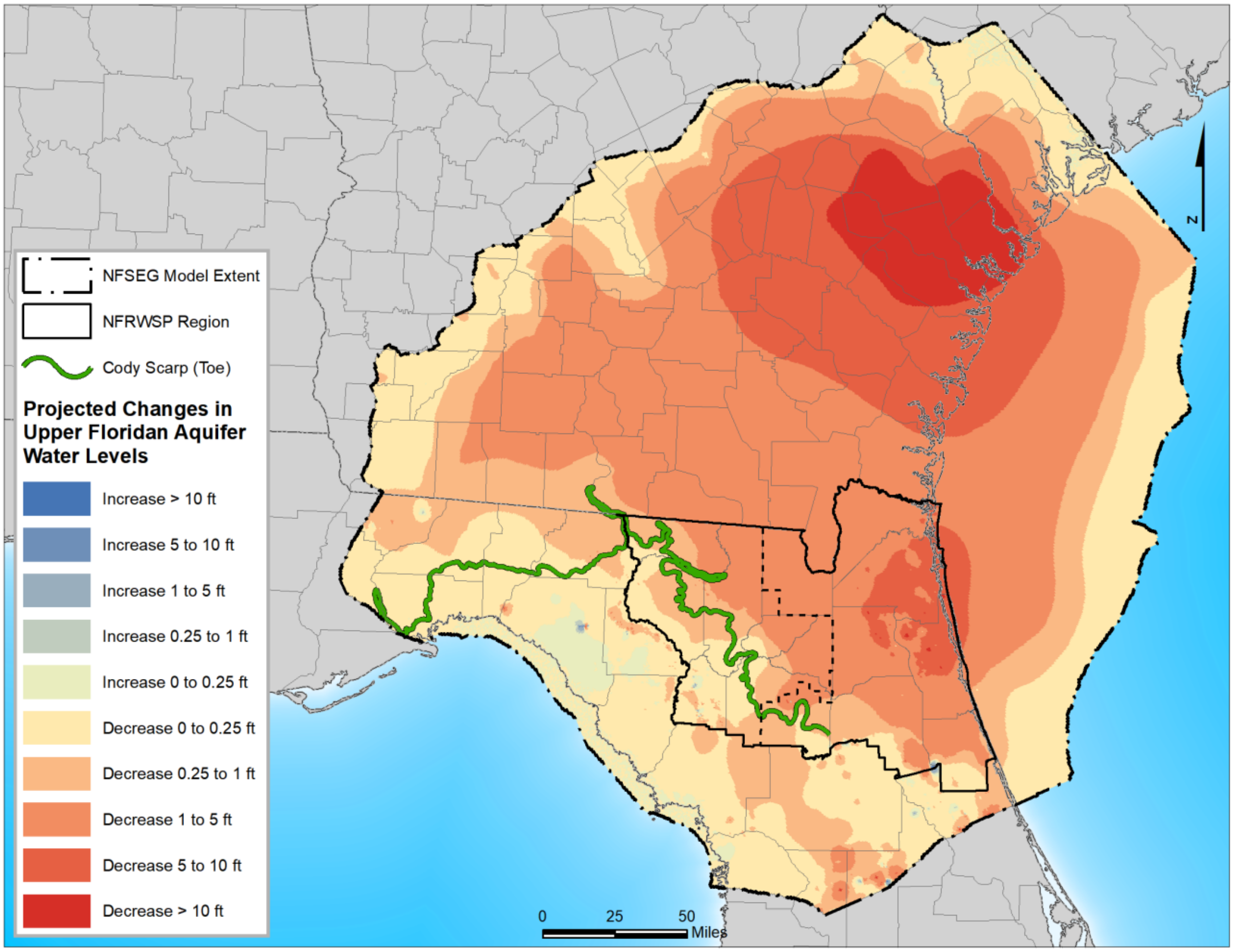

Figure C3. Changes in UFA water levels from current pumping to 2045 within the NFSEG domain

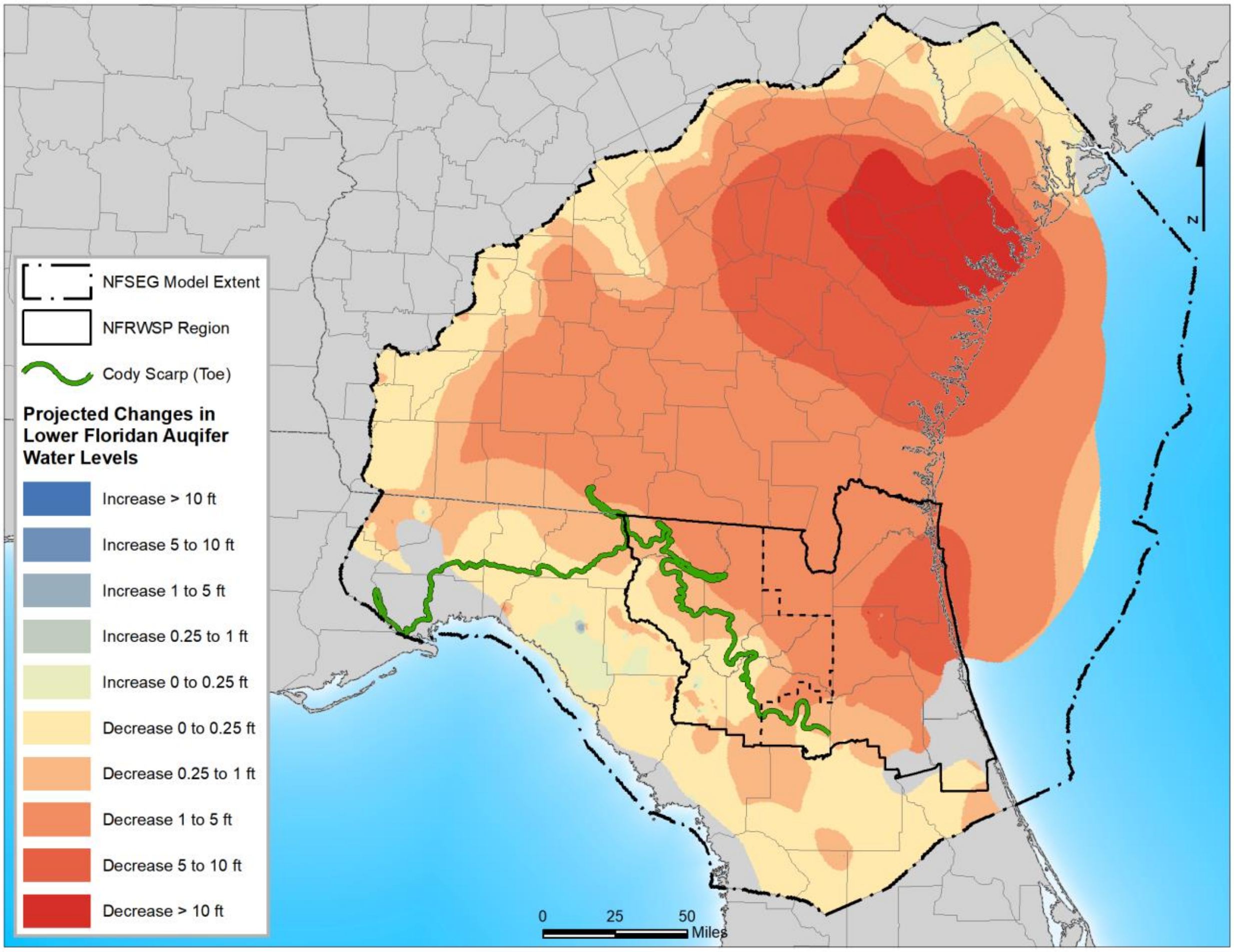

Figure C4. Changes in LFA water levels from current pumping to 2045 within the NFSEG domain

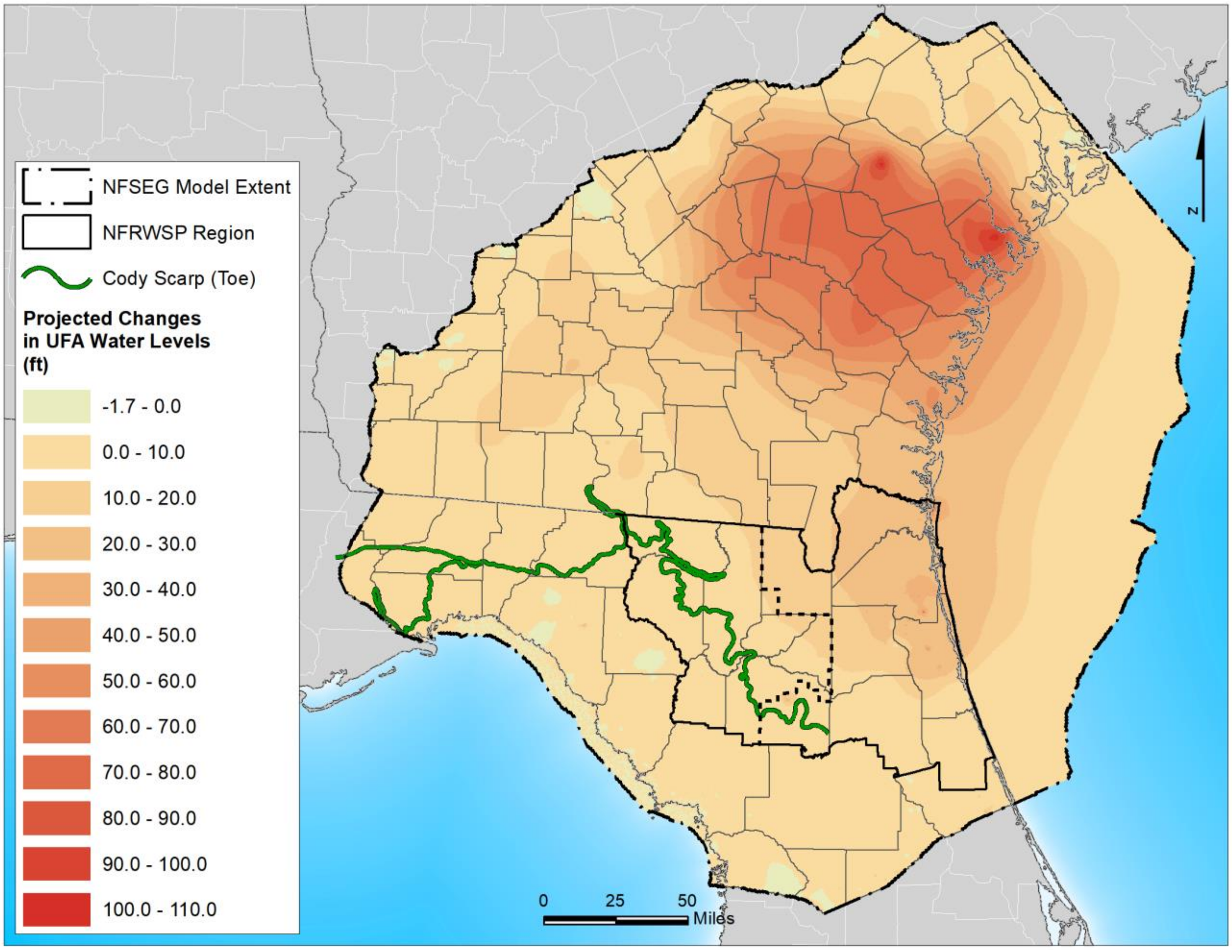

Figure C5. Changes in UFA water levels from 2009 pumps off to 2045 projections within the NFSEG domain

References

Durden, D., F. Gordu, Hearn, D., Cera, T., Desmarais, T., Meridth, L., Angel, A., Leahy, C., Oseguera, J., and Grubbs, T. (2019). *North Florida-Southeast Georgia Groundwater Model (NFSEG v1.1)*. St. Johns River Water Management District Technical Publication SJ2019-01. Palatka, Fla.: St. Johns River Water Management District. 513 pp.

Kuniansky, E. (2016). *Simulating Groundwater Flow in Karst Aquifers with Distributed Parameter Models – Comparison of Porous-Equivalent Media and Hybrid Flow Approaches*. USGS Scientific Investigations Report 2016-5116.

Appendix D

Water Quality Assessment

Objective

The Floridan aquifer system (FAS) is the primary source of potable water in northeast Florida. These groundwater withdrawals have resulted in lowering of water levels of the FAS within the region. Lower water levels in the aquifer create a potential for decreased water quality in the form of saltwater intrusion. Saltwater intrusion can occur from saltwater moving inland from the ocean (i.e., lateral intrusion) or from relic seawater migrating vertically (i.e., upconing). Saltwater intrusion can affect the productivity of existing infrastructure, resulting in an increase in treatment costs and infrastructure costs. Although saltwater intrusion poses a challenge for all affected water users, the issue is particularly acute for small public supply systems and self-supply water users that may have fewer options for infrastructure modifications.

An evaluation was conducted to assess the potential degradation of groundwater quality in the UFA from saltwater intrusion that may constrain the availability of groundwater sources. This was accomplished through creation and review of a combination of chloride concentration mapping efforts and statistical analyses of time-series chloride data. Chloride is a useful chemical indicator of saltwater intrusion because it is one of the principal chemical constituents in seawater and is unaffected by ion exchange (unlike sodium, the other principal component). The Florida Safe Drinking Water Act (sections 403.850 - 403.864, F.S.) directs DEP to develop rules that reflect national drinking water standards. Chapters 62-550, 62-555, and 62-560, Florida Administrative Code (F.A.C.), were promulgated to implement the requirements of the Florida Safe Drinking Water Act. More specifically, chapter 62-550, F.A.C., lists secondary drinking water standards (SDWS) for finished drinking water that include concentration limits for Total Dissolved Solids (TDS) (500 milligram per Liter (mg/L) and chloride (250 mg/L). Increasing trends in chloride concentration can be an indicator of saltwater intrusion. Maps created to evaluate the status and trends in chloride concentrations are listed below:

- Recent Chloride Concentration Map of the Upper Floridan Aquifer
- Movement of the Saltwater Interface in the Upper Floridan Aquifer
- 2021 Annual Assessment of District Monitoring Network – Status and Trends
- Production Well Water Quality Assessment – Status and Trends

The methodologies used to create these maps are included in Attachment A and provide an overview of dataset selection and preparation (5-year average vs annual concentrations and 5-year intervals for movement of the isochlor); dataset source (SJRWMD and SRWMD District Monitoring Well networks gap-filled with SJRWMD CUP production wells); dataset screening for similar construction and dataset consistency for the comparison maps. Details on mapping techniques are also provided.

Results and Observations

Recent Chloride Concentration Map of the Upper Floridan Aquifer

A generalized map of 2016-2020 average chloride concentrations in the upper portions of the UFA was developed using all available SJRWMD and SRWMD (Districts) monitoring and SJRWMD CUP production well water quality data. As can be seen in Figure D1, the majority of the planning area has less than 100 mg/L of chloride in the groundwater. In the eastern portion of the planning area there are two areas of elevated chloride concentrations in coastal Nassau and central Duval counties. There is also an overall increase in concentration from north to south, where you find broad areas of much higher chloride concentrations in southern St. Johns, eastern Putnam, and Flagler counties. Given the elevated concentrations, these regions are identified as the areas of water quality concern.

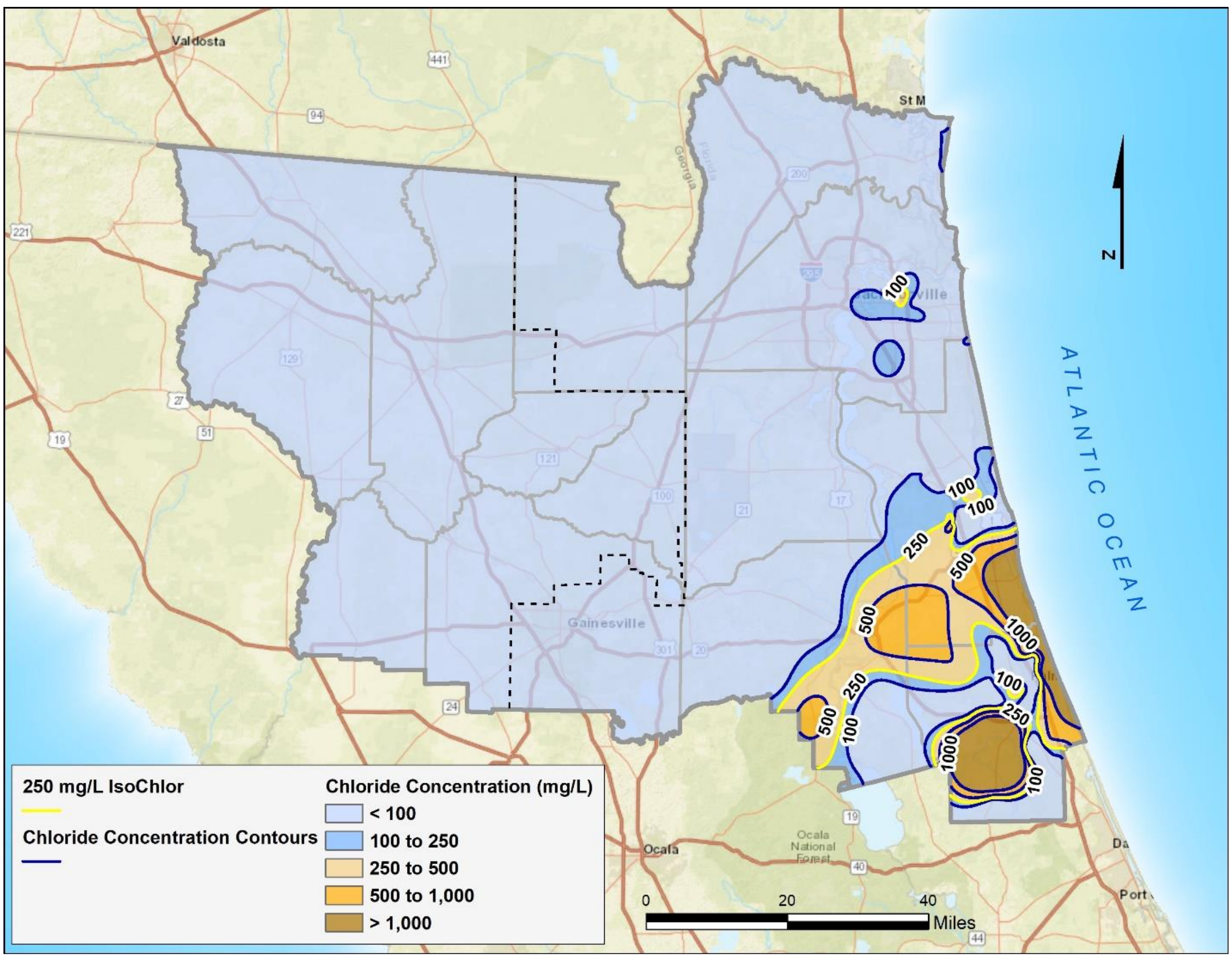

Figure D1. 2016-2020 Average chloride concentrations in the Upper Floridan Aquifer

Trends in Chloride Concentrations

In addition to the recent chloride concentration map of the region, which provides a regional representation of the current status of chloride concentrations in the UFA, trends in water quality data were also evaluated. Water quality trends indicate whether chloride concentrations are increasing or decreasing over time.

Movement of the Saltwater Interface in the Upper Floridan Aquifer

The trends were first evaluated using a series of chloride concentration maps of the UFA at five-year intervals from 2006 to 2020. These maps were combined into a single map showing the approximate location of the 250 mg/L isochlor, a line of equal concentration, for the following time-intervals: 2006-2010AVG; 2011-2015AVG; and 2016-2020AVG. The 250 mg/L isochlor is only present in the eastern portions of the NFRWSP area. Inferences were made on the movement of the saltwater interface by comparing the relative location of the 250 mg/L isochlor through time (Figure D2).

In Duval County, the earliest isochlor (2006-2010AVG) is not present. The isochlors then expand from the 2011-2015AVG time-interval to the 2016-2020AVG time interval. Expanding isochlors isolated from the coast are indicative of upconing or the upward vertical movement of deeper lower quality water, as opposed to lateral saltwater encroachment from the coast. This kind of vertical movement can occur due to natural upward gradients in flow within the aquifer system but can also be the result of pumping.

In southern St Johns, eastern Putnam, and Flagler counties the three different isochlor lines from 2006 to 2020 are not distinct from each other. This is an indication that the isochlor has not moved much since 2006. It should be noted that there is no consistent movement of the isochlor in a landward direction near the coast which would have been indicative of lateral saltwater encroachment. This region has been stable for the past 15 years; however, it is susceptible to upconing and lateral saltwater encroachment due to low water levels in the aquifer.

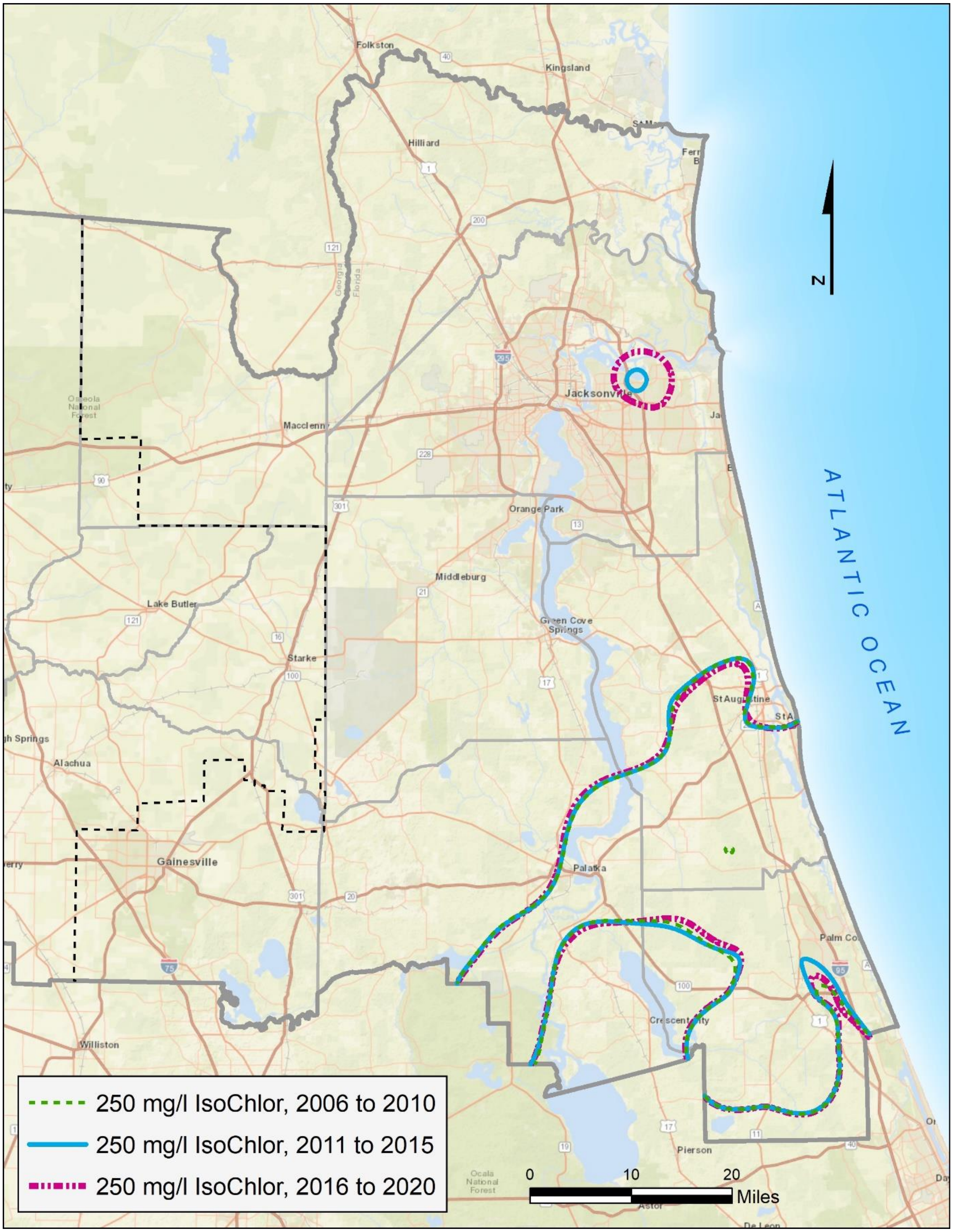

Figure D2. Movement of the saltwater interface in the Upper Floridan aquifer

2021 Annual Assessment of Districts' Monitoring Networks – Status and Trends

The second way status and trends in water quality were evaluated was to consider the Districts' 2021 annual assessment of groundwater quality from the regional monitoring well networks. The status and trends map shows the chloride concentration status in the UFA at the monitoring well that location (Figure D3). The status assessment period was five years, January 1, 2017, to December 31, 2021. The trend assessment period was 15 years, from January 1, 2007, to December 31, 2021.

The majority of the wells in the region had no detectable change in chloride concentrations from 2007 to 2021 and are considered stable. Some areas of low chloride concentration (less than 50 mg/L) located in the western portion of the planning area, northern Duval, southern Duval and northern St. Johns and southern Putnam counties have wells with increasing trends of less than 5%. Given the low status (concentrations of less than 100 mg/L, with most of the wells below 50 mg/L) and low rate of change, these areas are not approaching the potable limit for chloride concentration in the UFA. However, two wells were identified with a high rate of change (greater than 5%). One well is located in southern Putnam with a low chloride concentration. The other well has a high concentration (greater than 250 mg/L) and is located in eastern Flagler County. This area has already been identified as one of the areas of water quality concern but as a region has been stable in regard to movement of the saltwater interface for the past 15 years.

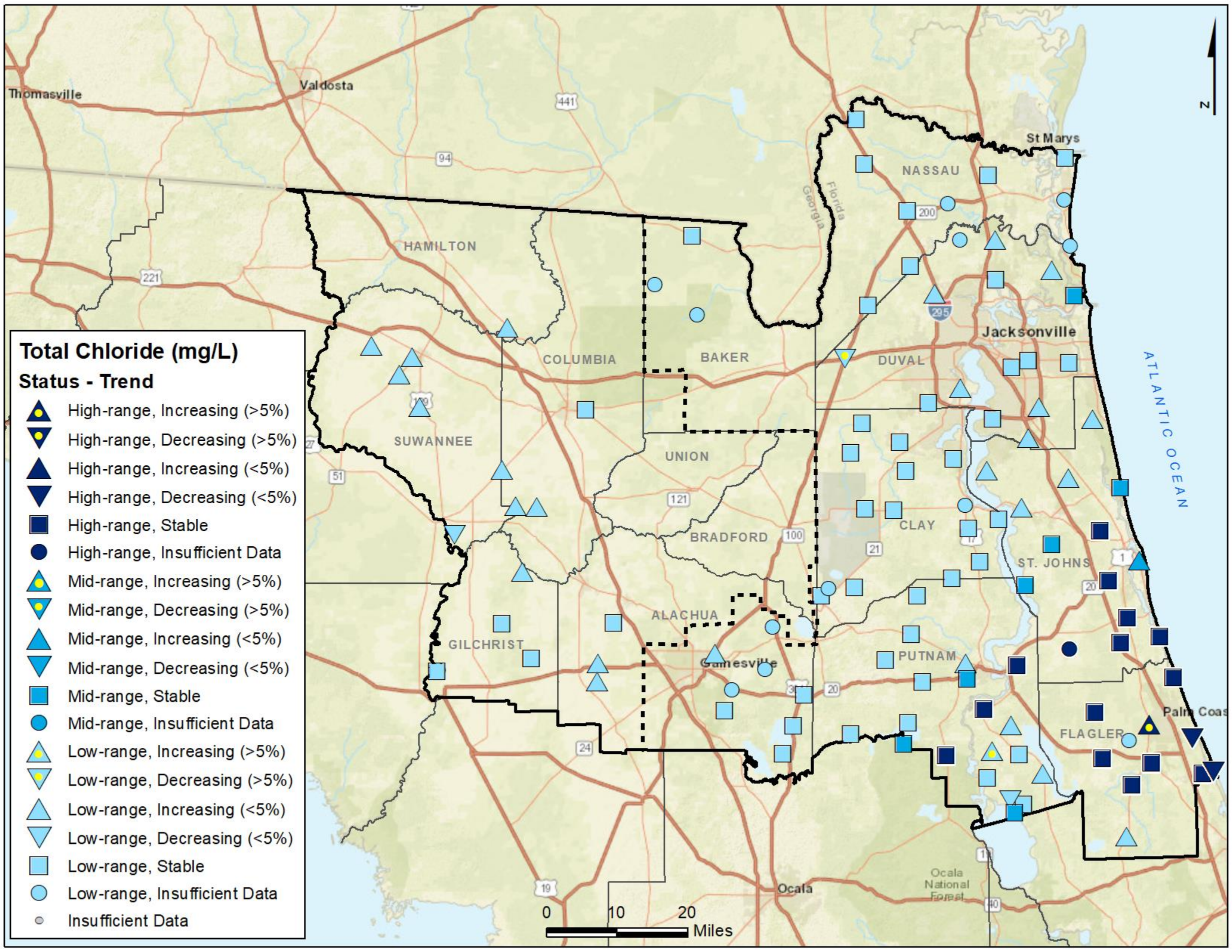

Figure D3. 2021 Annual assessment of Districts' monitoring networks – Status and Trends (High – greater than 250 mg/L; Mid – 50 to 250 mg/L; and Low – less than 50 mg/L)

Production Well Water Quality Assessment

The final evaluation of status and trends in water quality was conducted on 17 permitted production wells in the SJRWMD region. These wells were evaluated in the 2017 North Florida Regional Water Supply Plan (NFRWSP) and were selected for further evaluation since they had shown statistically significant increasing trends in chloride concentrations. Since statistically significant trends in chloride concentration can be an indicator of groundwater degradation due to saltwater intrusion, the focus of this evaluation was on chloride time series data.

Water quality from these wells was assessed over a period of record from 1998 to 2021, based on the availability of data. Time-series graphs of chloride concentrations and the average rate of withdrawal were visually interpreted for breaks in slope, then each segment was statistically analyzed for significant trends. The assessment showed that chloride concentrations increased, decreased, or stayed stable at different intervals over the period of record for a given well. The final segment was used to evaluate the current potential trend in concentration. Of the 17 wells assessed, five wells showed an increasing trend, one well had a decreasing trend and 11 wells were stable or showed no trend at all. (Figure D4).

Out of the five wells with increasing trends, four are located in central Duval County and one is located in southern Flagler County. The Floridan aquifer in Duval County is characterized by faulting and fracturing that allows lower quality water from the LFA to mix with fresh water in the UFA through upward leakage (Leve 1983). This upconing appears to be localized to wellfields as other monitor wells in the vicinity do not show increasing trends. In Flagler County, the aquifer has a higher transmissivity (Durden et al. 2019), which allows seawater to encroach from the coast more easily when freshwater levels decline, making wells here more susceptible to saltwater intrusion. As discussed earlier, the area has been stable with regard to lateral saltwater encroachment for the previous 15 years.

Groundwater quality degradation in the areas identified may constrain the availability of fresh groundwater due to the susceptibility to both vertical and lateral saltwater intrusion, but with continued wellfield management these trends can be addressed. Wellfield management, such as back plugging, reduced pumping rates, and relocation of withdrawals to less susceptible areas has been successful in managing the increasing chloride trends in the majority of these wells.

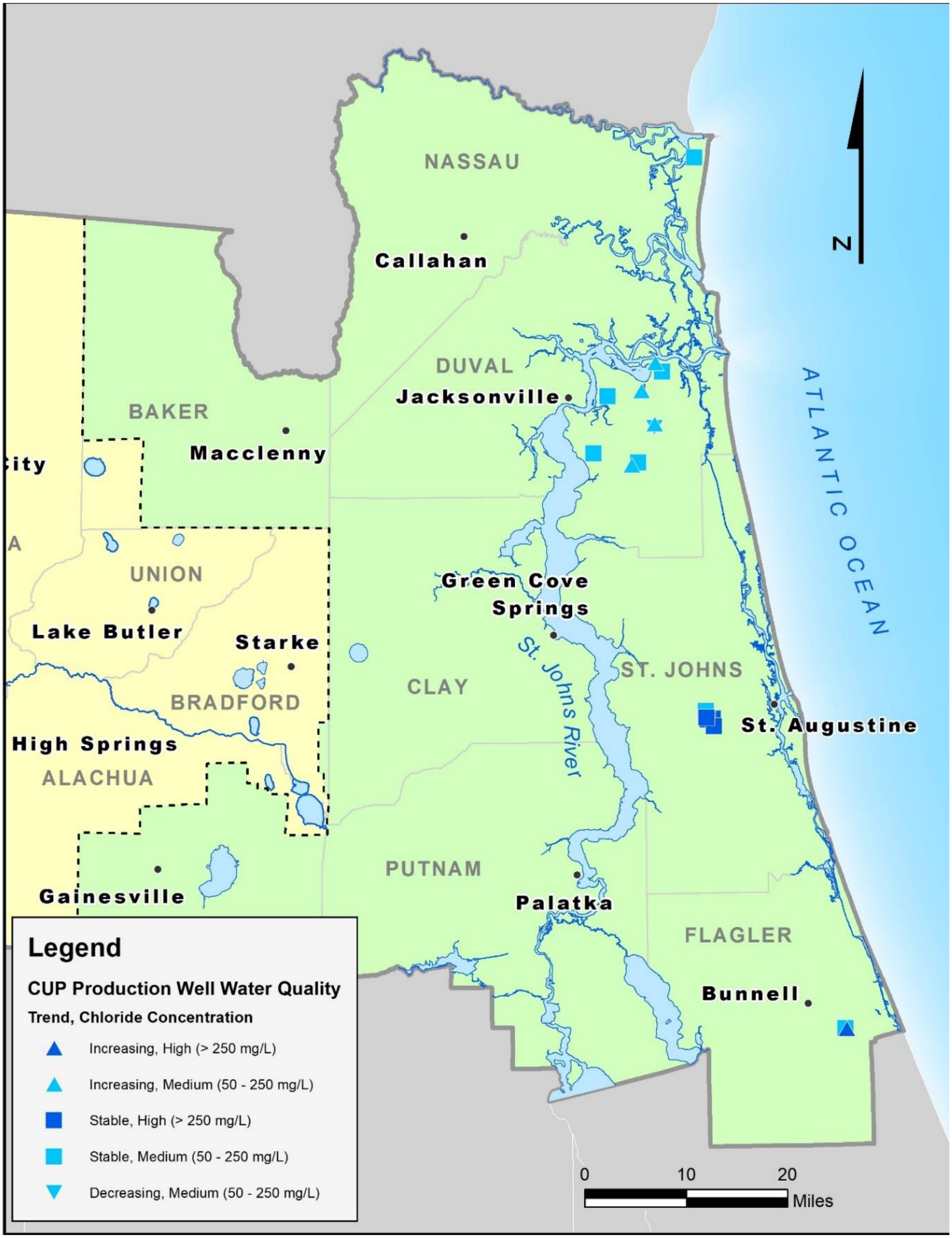

Figure D4. Production well water quality assessment – Status and Trends

Hydrogeology and other possible contributing factors

Numerous investigations of water quality in the Floridan aquifer system (FAS) have been made by the SJRWMD since the mid-1970s. Prior to this, the U.S. Geological Survey investigated water quality in the FAS. These investigations have continued as more demand has been placed on the FAS to provide potable water for a growing population in North Florida.

Early studies of North Florida water quality by SJRWMD staff noted that the Hawthorne Formation generally thickens to the north and west and is thin or absent in southern Flagler County (Frazee and McClaugherty 1979). In coastal Nassau and Duval counties, this confining unit provides a barrier retarding the downward migration of saline water in the shallow aquifers toward the UFA. Additional studies conducted in Nassau, southern Duval, and northern St. Johns and Clay counties identified areas of buried faults in these counties that may allow for lower quality water to migrate upward due to natural hydraulic gradient or induced by pumping (Leve 1983; Spechler 1994). A more recent study in Duval County further confirmed that the pathways of upward saline water movement are along interconnecting vertical and horizontal fractures or solution zones (Phelps 2001).

In Flagler and southern St Johns counties where the confining unit is thin or missing, deeper connate water (water trapped in pores during formation of the rock) in the FAS migrates upward due to natural discharge in the Haw Creek basin and where historically overly deep wells coupled with large agricultural withdrawals induced further connate upwelling or intrusion (Leve 1983; Navoy and Bradner 1987). Phelps (2001) also noted the upward migration of lower quality water in St. Johns, Putnam, and Flagler counties and near the City of Fernandina Beach occurs through natural leakage or discharge through springs or pumping wells. Indications of upconing and lateral saltwater intrusion in coastal Flagler County, noted by Frazee and McClaugherty (1979) and Navoy and Bradner (1987), can also be seen in Figure D1.

Figure D5 shows drawdown in the UFA as it relates to the faults identified by Leve (1983) and areas of high chloride concentration in central Duval County. Pumping in this region may be causing additional preferential movement of lower quality water along the faults and fractures in the FAS. Figure D6 shows the relationship of discharge areas in the UFA as well as a high transmissivity zones in southern St. Johns, eastern Putnam, and northern Flagler counties as it relates to areas of high chloride concentrations (Durden et al. 2019, Figure 4-74). Pumping in this region would promote additional upward movement of lower quality water in the FAS.

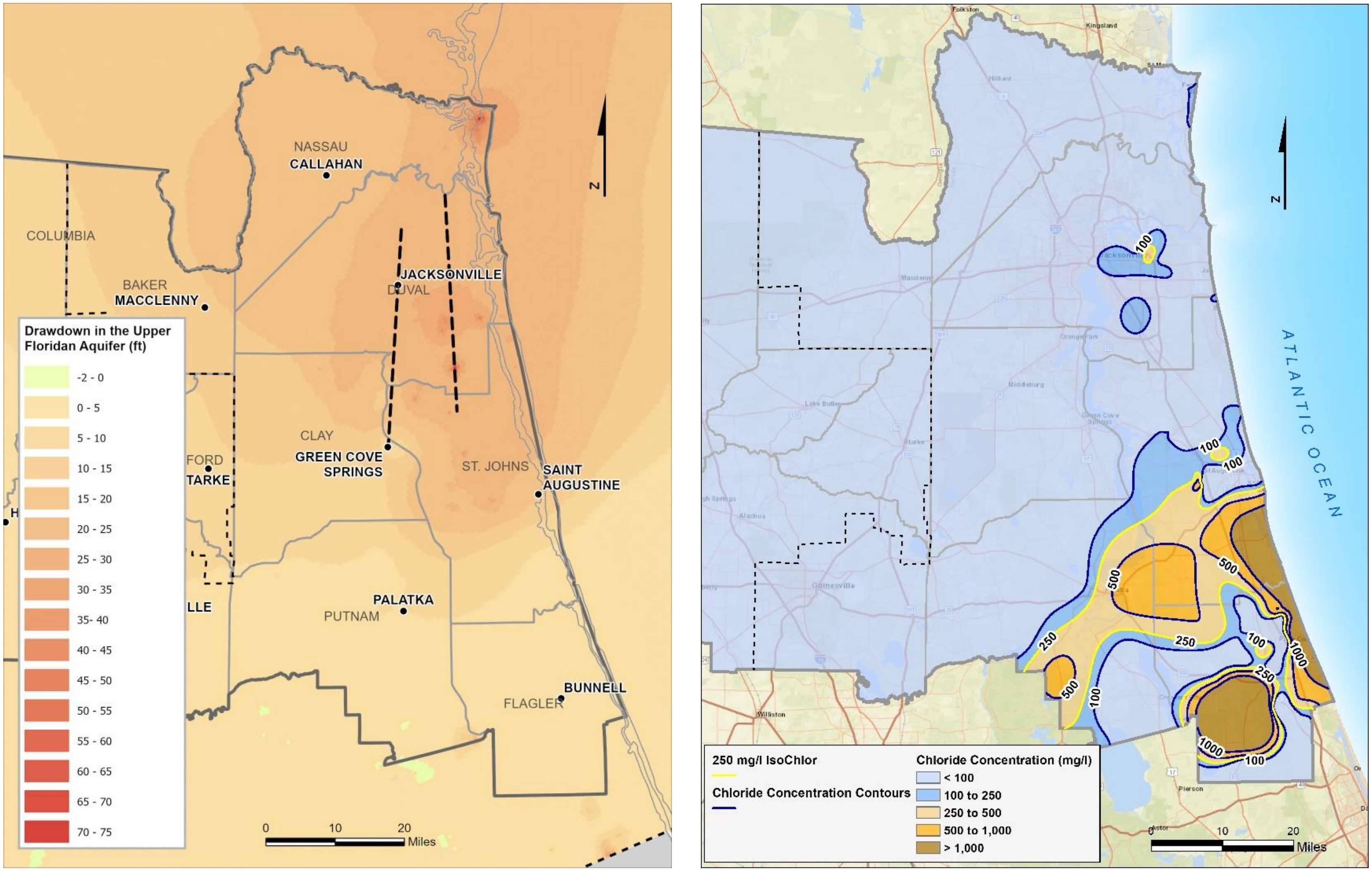

Figure D5. Possible Contributing Factors to Elevated Chloride Concentrations in UFA – Left Figure - UFA Drawdown (Pumps Off to Current Pumping), FAS Fracturing (Leve 1983) and Right Figure - Recent (2016-2020AVG) Chloride Concentrations in the UFA

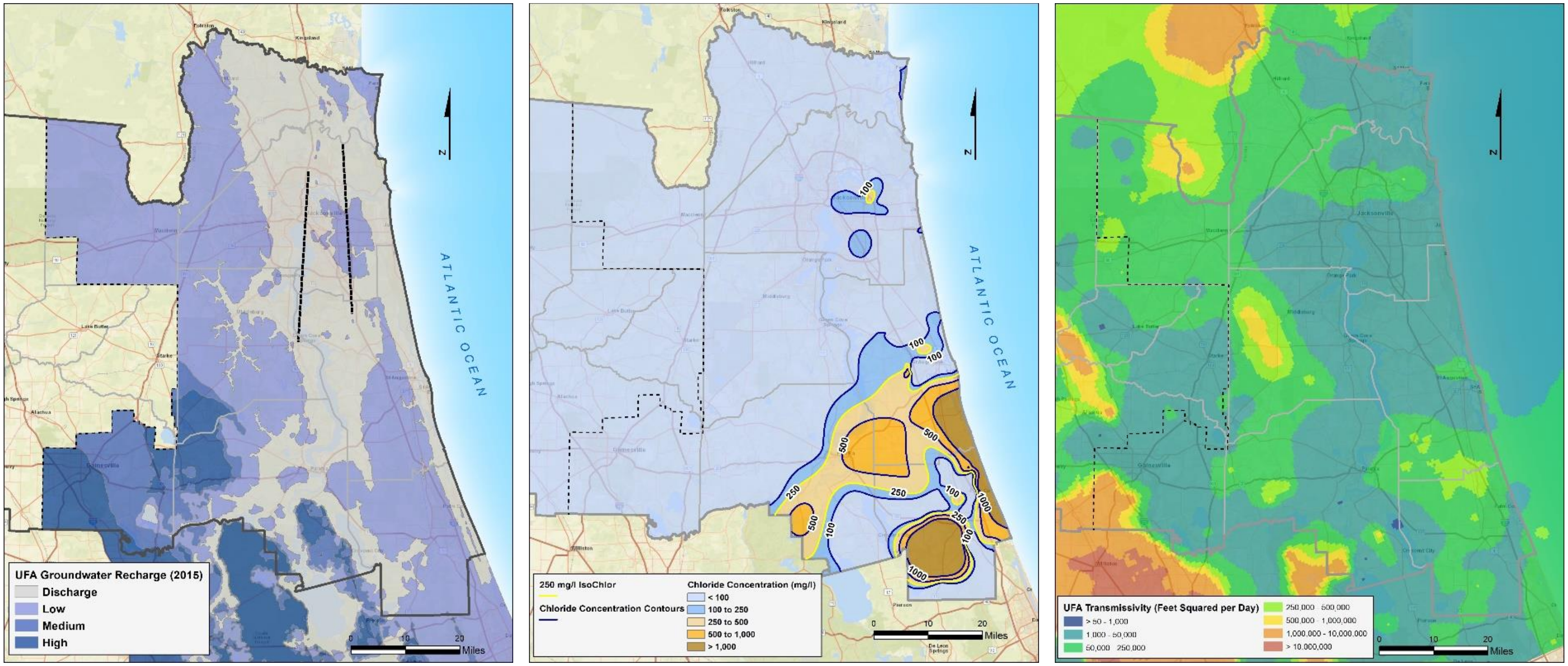

Figure D6. Possible Contributing Factors to Elevated Chloride Concentrations in UFA – Left Figure - UFA Groundwater Recharge/Discharge Areas (2015), Middle Figure - Recent (2016-2020AVG) Chloride Concentrations in the UFA and Right Figure - Transmissivity in the UFA (Durden et al. 2019)

Constraints and Recommendations

The results of the water quality assessment showed that the majority of the NFRWSP area west of the St. Johns River has less than 100 mg/L of chloride and the majority of wells in the Districts' monitoring well networks show no detectable change in chloride concentrations from 2006 to 2020. Areas of elevated chloride concentration were identified in the following counties: coastal northeast Nassau, central Duval, southern St. Johns, eastern Putnam, and portions of Flagler counties. These areas of high chloride concentrations in the UFA are in areas of faulting and fracturing (Nassau and Duval counties) and areas of naturally occurring upward leakage of salty water through thin semi-confining units (St. Johns, eastern Putnam, and portions of Flagler counties) (Spechler. 1994).

A spatial analysis of movement of the 250 mg/L isochlor identified an area of potential upconing in central Duval County where isochlor results expanded from the 2011-2015 average as compared to the 2016-2020 average. Several CUP production wells in this region also show increasing trends in chloride concentration which further suggests localized upconing. An assessment of the movement of the isochlor in southern St Johns, eastern Putnam and Flagler counties shows the isochlor has been stable since 2006, with no consistent movement in a landward direction near the coast. While the region is stable, one CUP production well in Flagler County showed an increasing trend in chloride concentrations.

When viewed in total, the primary conclusion of this analysis is that groundwater quality may constrain the availability of fresh groundwater in relatively limited geographic areas of the NFRWSP region east of the St. Johns River in portions of Duval, Nassau, St. Johns, Putnam and Flagler counties. Results of the water quality analysis show that saltwater intrusion in Duval and St. Johns counties appears to be localized due to upconing in response to withdrawals of groundwater from a single well and/or combined withdrawals from a wellfield. Flagler County shows indications of both localized upconing and possible lateral saltwater intrusion. Since the increasing chloride concentrations in Duval, St. Johns, and Flagler counties are at least partially related to upconing, these concerns are being managed through appropriate well construction, pumping operations and reverse osmosis for treatment of brackish UFA water. The effectiveness of wellfield management was evident in the reassessment of the 17 CUP production wells that had increasing trends in the previous NFRWSP from 2017. Due to back-plugging and withdrawal reductions, only five of the 17 wells continue to have an increasing trend.

It should be noted that some public supply utilities in Flagler and Duval counties have developed or are proposing to develop additional wellfields in less susceptible areas further inland. New wellfields are necessary to meet increased water demand of growing populations while reducing risk of water quality degradation in areas susceptible to upconing. The ability to shift UFA withdrawals to the west may be constrained by water bodies with adopted minimum flows and levels.

Recommendations

Saltwater intrusion can occur from seawater moving inland from the ocean through lateral or vertical movement or from relic saltwater migrating vertically near a pumping well (i.e., upconing). Saltwater intrusion can affect productivity of existing infrastructure, resulting in increased treatment and infrastructure costs. Degrading water quality can dictate back plugging, well inactivation and replacement, withdrawal point relocation, and conversion to alternative water supplies. Although saltwater intrusion poses a challenge for all affected water users, the issue is particularly acute for small public supply systems and self-supply water users that may have fewer options for infrastructure modifications.

Wellfield management plans and the further development of alternative water supplies such as reclaimed water, surface water, and brackish groundwater can reduce the potential for upconing and lateral intrusion. Additional alternative water supplies may be necessary in the future as utilities continue to shift withdrawals to the west to reduce water quality degradation. The SJRWMD Regulatory Program will continue to evaluate the potential for harmful upconing and lateral intrusion during CUP application review to ensure all permitting criteria are met prior to permit issuance. In addition, SJRWMD will investigate instances of unforeseen harmful water quality impacts potentially resulting from consumptive uses of water, and if verified, will require mitigation by the responsible permittee(s). Additionally, a density-dependent water quality model will be developed for this region to assess saltwater intrusion due to sea level rise (SLR) and other climate change impacts such as rainfall and evapotranspiration.

Attachment A

Methodology

Recent Chloride Concentration and Movement of the Saltwater Interface

Dataset Selection Overview

UFA groundwater quality data was evaluated to determine both the current status of chloride concentration and the movement of the freshwater/saltwater interface (SWI) through time. Two maps of the UFA were created - a recent chloride concentration map and a map showing the movement of the 250 mg/L isochlor. The five-year mean (or average (AVG) chloride concentration was used for these mapping exercises to capture average concentrations in the UFA rather than using concentration from a single year which may have reflected extreme climate conditions such as a drought or wet conditions.

The recent chloride concentration map is a regional representation of the 2016-2020AVG chloride concentration in the UFA. The movement of the 250 mg/L isochlor map was created by comparing a series of chloride concentration maps at five-year intervals from 2006 to 2020. Due to the relatively slow movement of groundwater, a 5-year interval was deemed sufficient to evaluate the movement of the SWI over time (Shaw and Zamorano 2020). The 5-year intervals used were 2006-2010AVG; 2011-2015AVG; and 2016-2020AVG.

Recent Chloride Concentration Map Development

The recent chloride concentration map is a regional representation of the average chloride concentration in the UFA from 2016 to 2020. Groundwater quality data from the 207 of the Districts' monitoring wells and 266 SJRWMD consumptive use permit (CUP) wells were used for creation of this map. Active monitoring wells were evaluated to determine total depth, casing depth, aquifer penetration, and period of record of available data.

Initial mapping of the 207 District monitoring wells highlighted some limitations in the spatial distribution of wells in the network. The SJRWMD's regional groundwater monitoring network is not specifically designed to monitor or track saltwater intrusion. Therefore, the availability and distribution of wells in the UFA may not be adequate to interpolate the location of the SWI interface.

To supplement the existing SJRWMD monitoring well network data, CUP production wells were used. Several CUP projects in the SJRWMD portion of the NFRWSP region are required to submit water quality data as a condition on their permit. CUP wells in the NFRWSP region were screened for suitability for inclusion in the mapping effort. Priority was given to CUP wells with similar construction to nearby SJRWMD monitor wells, and to wells with the most complete period of record. In well clusters with multiple wells of similar construction and chloride concentrations, one was chosen as representative of the area. The set of suitable CUP wells was limited by data availability.

All 473 wells were used when interpolating the map, even though only 259 wells are located inside the NFRWSP region (116 District monitoring wells and 143 CUP wells). Water quality data from wells outside the planning region were used in interpolation to prevent skewing of contours along the boundary. The final data was clipped to boundary of the NFRWSP for presentation purposes (Figures D7 and D7a; and Table D1).
The chloride concentration values used for each station were computed as follows:

1. For every calendar year (2016 through 2020), the ArcMap *Summary Statistics* tool was run with the following parameters:
    a. Input Table: collection of the chloride concentrations for all the stations over the study period (2016 through 2020).
    b. Statistics Field: Chloride Concentration (mg/L)
        i. Statistics Type: MEAN
    c. Case field: Year

    This was done to eliminate any bias that might occur if a particular station in a given year had multiple measurements over the course of that year.

2. Next, a field Year_Group was created in the resulting table and was set equal to time period (2016 through 2020) for each of the records in the resulting table.

3. The *Summary Statistics* tool was then run on the resulting table with the following parameters:
    a. Input Table: The table resulting from the first running of *Summary Statistics*.
    b. Statistics Field: Yearly Mean of Chloride Concentration (mg/l)
        i. Statistics Type: Mean
    c. Case field: Year_Group (time period)

The values in the *Mean of Mean Value* field in this resulting table were the values used for interpolating the map surface.

<u>The Interpolation Method</u>

Given the uneven distribution of data points, an interpolation method was used to produce the ArcMap surfaces. Since the various available interpolation methods operate differently and produce varying results, various methods were compared to determine which method would best represent the data. After comparing the results from the various methods, the spline interpolation method with the TENSION option and a weight of 5 was selected.

ESRI/ArcMap description of the spline method of raster interpolation (Esri Inc. 2020):

Summary

Interpolates a raster surface from points using a two-dimensional minimum curvature spline technique. The resulting smooth surface passes exactly through the input points.

Usage

- The REGULARIZED option of **Spline type** usually produces smoother surfaces than those created with the TENSION option.
  - With the REGULARIZED option, higher values used for the weight parameter produce smoother surfaces. The values entered for this parameter must be equal to or greater than zero. Typical values used are 0, 0.001, 0.01, 0.1, and 0.5. The **Weight** is the square of the parameter referred to in the literature as tau (t).
  - With the TENSION option, higher values entered for the weight parameter result in somewhat coarser surfaces, but surfaces that closely conform to the control points. The values entered must be equal to or greater than zero. Typical values are 0, 1, 5, and 10. The **Weight** is the square of the parameter referred to in the literature as phi (Φ).
- The greater the value of **Number of Points**, the smoother the surface of the output raster.
- Some input datasets may have several points with the same x,y coordinates. If the values of the points at the common location are the same, they are considered duplicates and have no effect on the output. If the values are different, they are considered coincident.

ArcMap's *Spline Interpolation Tool* was used to produce the chloride concentration surfaces for the 2016-2020AVG time-period. The following parameters were used:

- Output cell size: 250 meters
- Spline type: TENSION
- Weight: 5
- Number of points: 12

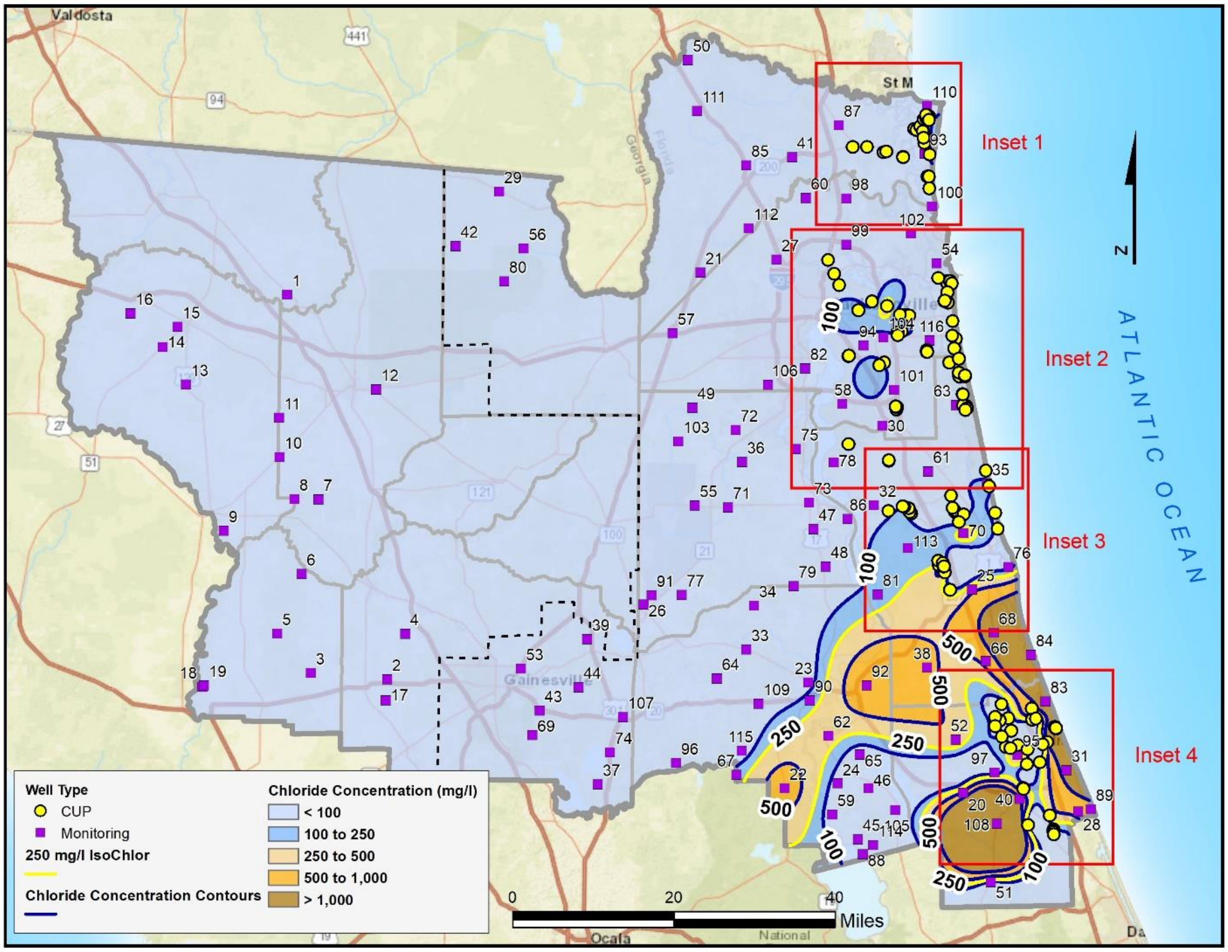

Figure D7. Recent (2016-2020 AVG) chloride concentrations in the Upper Floridan Aquifer Well Index

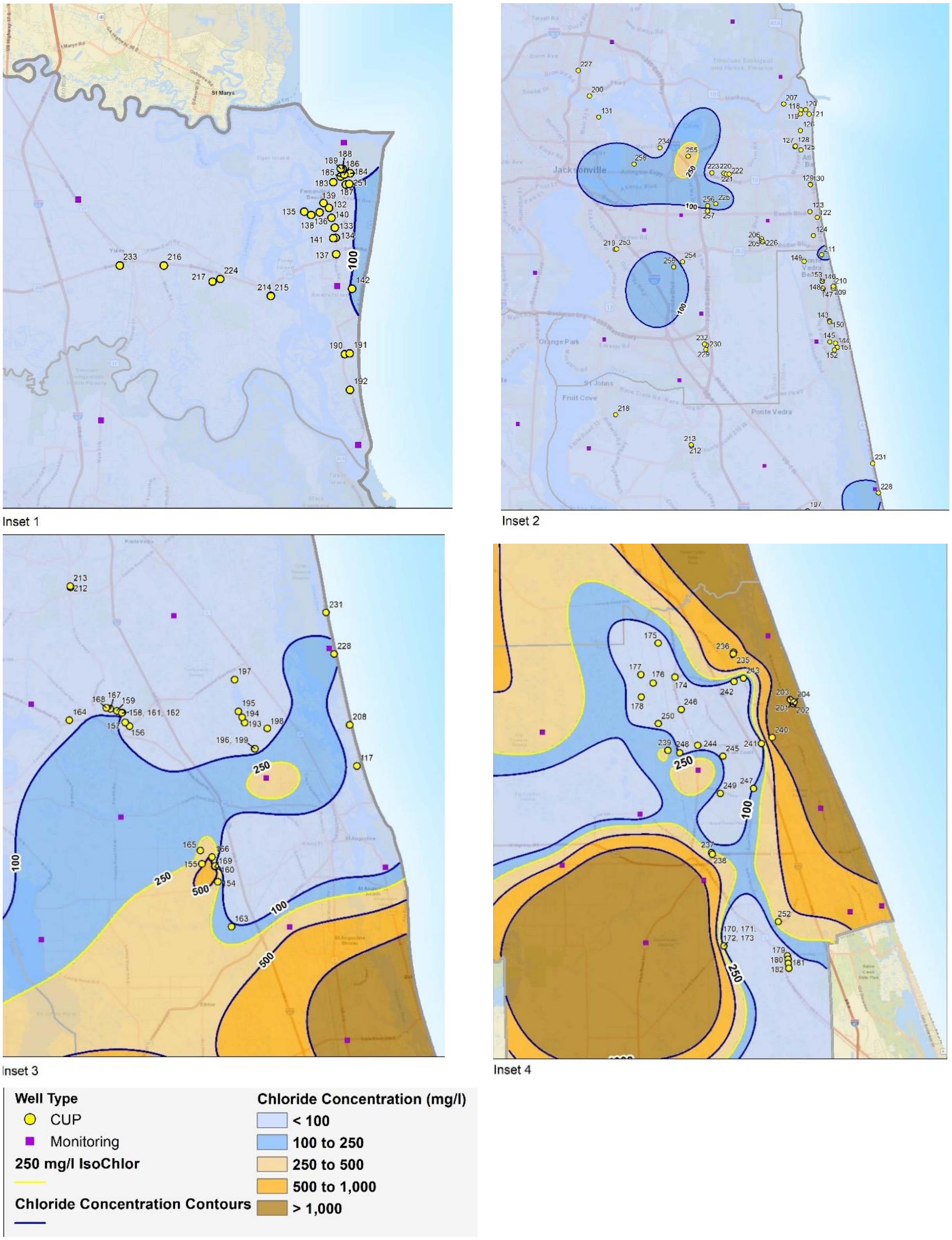

Figure D7a. Figure D7 Well Index Inset Maps

Table D1. Recent (2016-2020 AVG) Chloride Concentration Map Well Index

Map Index Number	Well Name	Chloride Concentration (mg/L)
1	S011535004	7
2	S091736001	6
3	S091628005	4
4	S081833003	13
5	S081535002	5
6	S071630002	7
7	S061610001	6
8	S061607001	5
9	S061434006	11
10	S051511002	6
11	S041523001	4
12	S031734011	6
13	S031335002	4
14	S031305005	6
15	S021322008	6
16	S021215001	6
17	S101713003	6
18	S101406011	9
19	S101405004	9
20	F-0353	612
21	N-0237	20
22	P-0472	656
23	P-0123	42
24	P-0408	17
25	SJ0824	425
26	C-0120	6
27	D-1309	20
28	F-0176	659
29	BA0057	26
30	D-1413	19
31	F-0064	1,225
32	SJ0324	17
33	P-4086	6
34	P-4083	6
35	SJ2574	116
36	C-1063	5
37	A-0725	9
38	SJ0408	587
39	A-0962	12
40	F-0384	974
41	N-0341	26

Map Index Number	Well Name	Chloride Concentration (mg/L)
42	BA0121	14
43	A-0973	24
44	A-0977	7
45	P-0469	43
46	P-0246	9
47	C-1056	5
48	C-1026	6
49	C-0583	6
50	N-0221	30
51	F-0251	37
52	F-0294	386
53	A-0693	9
54	D-1383	79
55	C-0128	7
56	BA0009	9
57	D-0254	8
58	D-1301	10
59	P-0270	10
60	D-1503	25
61	SJ2556	23
62	P-4043	330
63	SJ0355	20
64	P-0772	9
65	P-0817	9
66	SJ0602	631
67	P-0450	160
68	SJ0516	1,444
69	A-0750	8
70	SJ0331	341
71	C-0607	5
72	C-0592	5
73	C-0672	5
74	A-0421	7
75	C-0495	5
76	SJ0323	64
77	C-0453	5
78	SJ0508	6
79	C-0123	6
80	BA0018	10
81	SJ0320	158
82	D-1394	10
83	F-0200	2,033

Map Index Number	Well Name	Chloride Concentration (mg/L)
84	SJ0333	2,819
85	N-0220	28
86	C-0579	9
87	N-0320	29
88	P-0736	59
89	F-0209	848
90	P-0891	169
91	C-0707	5
92	P-0172	755
93	N-0344	27
94	D-1499	14
95	F-0208	427
96	P-0166	5
97	F-0395	18
98	D-0673	24
99	D-1307	21
100	N-0347	23
101	D-1350	17
102	D-1236	22
103	C-0599	5
104	D-0547	16
105	P-2037	25
106	D-1292	6
107	A-0071	10
108	F-0179	5,956
109	P-0510	6
110	N-0304	31
111	N-0334	27
112	N-0311	26
113	SJ0027	192
114	P-0410	24
115	P-0132	5
116	D-0259	12
117	15022	74
118	5924	27
119	5925	27
120	5926	17
121	33450	16
122	6342	18
123	6345	12
124	32013	11
125	6378	16

Map Index Number	Well Name	Chloride Concentration (mg/L)
126	6379	16
127	6381	16
128	6383	16
129	6413	38
130	6414	46
131	6441	13
132	11387	31
133	11391	30
134	11392	39
135	11393	40
136	11397	27
137	11398	26
138	11399	27
139	11400	36
140	11401	44
141	480689	26
142	11434	114
143	14640	23
144	14641	24
145	14642	24
146	14818	49
147	14819	46
148	14820	30
149	14822	26
150	15110	25
151	24083	25
152	24084	23
153	33882	39
154	14780	313
155	34243	409
156	34244	30
157	34245	33
158	34246	27
159	34247	28
160	35768	503
161	36325	26
162	36326	41
163	36327	128
164	36341	63
165	38399	289
166	38400	454
167	461256	27

Map Index Number	Well Name	Chloride Concentration (mg/L)
168	461257	39
169	484406	342
170	409798	31
171	409799	60
172	409800	8
173	409801	37
174	409815	38
175	409821	19
176	409822	56
177	409823	67
178	409824	66
179	6747	32
180	6748	24
181	6749	23
182	31977	27
183	11379	68
184	11381	40
185	11383	73
186	11384	52
187	11386	42
188	451851	32
189	451852	31
190	11419	23
191	11420	25
192	11406	22
193	995	52
194	996	51
195	997	51
196	39707	60
197	237545	42
198	237546	65
199	237548	60
200	35679	17
201	35974	1,780
202	35975	1,660
203	35976	1,690
204	36317	1,630
205	6081	13
206	6082	13
207	6208	15
208	14699	71
209	14726	27

Map Index Number	Well Name	Chloride Concentration (mg/L)
210	14727	24
211	14728	118
212	15112	40
213	15114	30
214	19912	23
215	19913	22
216	19914	23
217	19915	22
218	22058	17
219	22526	21
220	22567	38
221	22568	17
222	22569	16
223	34485	16
224	35838	22
225	38532	198
226	38606	14
227	38608	17
228	105544	106
229	223642	42
230	230916	18
231	243339	41
232	407883	18
233	407885	25
234	409701	28
235	WU070714033562	876
236	WU070714033563	986
237	WU001982040148	247
238	WU001982406338	288
239	WU001947409789	240
240	WU001947409805	1,200
241	WU001947409806	45
242	WU001947409809	35
243	WU001947409810	27
244	WU001947409811	24
245	WU001947409812	45
246	WU001947409813	33
247	WU001947409814	110
248	WU001947409816	85
249	WU001947409819	40
250	WU001947409820	65
251	Rock Tenn 50077_11380	81

Map Index Number	Well Name	Chloride Concentration (mg/L)
252	Flag Bch 59_34525	306
253	JEA Brierwood 88271_22525	23
254	JEA Deerwood 3 88271_22540	60
255	Monument-2 88271_5894	329
256	JEA Oakridge 88271_6060	187
257	JEA Oakridge 88271_6063	24
258	JEA Arlington 88271_6087	207
259	JEA Deerwood 3 88271_6097	177

Movement of the Saltwater Interface Map Development

Evaluation of CUP wells for filling the data gaps revealed that many CUP wells met the well construction criteria suitable for development of the recent concentration map but a more limited dataset was used in the comparison maps due to a lack of data in all three-time intervals. A consistent data set is critical for comparison mapping as the addition or removal of wells may alter the position of the mapped contours without an actual change in concentration and complicate interpretation of the movement of the SWI. Only stations common to all three time periods were used in the development of the comparison map series for a total of 213 wells (207 District monitoring wells and 6 CUP wells). All of the 213 common wells were used in interpolating the maps, with 107 wells (101 District monitoring wells and 6 CUP wells) located inside the boundary of the NFRWSP. Water quality data from wells outside the planning region were used in interpolation to prevent skewing of contours along the boundary. The final data was clipped to boundary of the NFRWSP for presentation purposes.

The chloride concentration values used for each station in each time-period were computed by:

1. For every calendar year in the study (2006 through 2020), the ArcMap *Summary Statistics* tool was run with the following parameters:
    a. Input Table: collection of the chloride concentrations for all the stations over the entire study period (2006 through 2020).
    b. Statistics Field: Chloride Concentration (mg/l)
        i. Statistics Type: MEAN
    c. Case field: Year

    This was done to eliminate any bias that might occur if a particular station in a given year had multiple measurements over the course of that year.

2. Next, a field Year_Group was created in the resulting table and was set equal to time period (“2006 to 2010”, “2011 to 2015”, “2016 to 2020”) for each of the records in the resulting table.

3. The *Summary Statistics* tool was then run on the resulting table with the following parameters:
    a. Input Table: The table resulting from the first running of *Summary Statistics*.
    b. Statistics Field: Yearly Mean of Chloride Concentration (mg/l)
        i. Statistics Type: Mean
    c. Case field: Year_Group (time period)

The values in the *Mean of Mean Value* field in this resulting table were the values used for interpolating the map surfaces.

Consistent with the comparison maps the surface was created using the spline interpolation method with the TENSION option and a weight of five.

ArcMap's *Spline Interpolation Tool* was used to produce the chloride concentration surfaces for the time period. The following parameters were used:

- Output cell size: 250 meters
- Spline type: TENSION
- Weight: 5
- Number of points: 12

For each concentration map produced (2006-2010AVG; 2011-2015AVG; and 2016-2020AVG), ArcMap's *Contour Tool* was used to create all the chloride concentration isolines (isochlors) using the chloride concentration surfaces as input rasters. The 250 mg/L isochlor for each time segment was then displayed on a single map. See Figure D8 and Table D2.

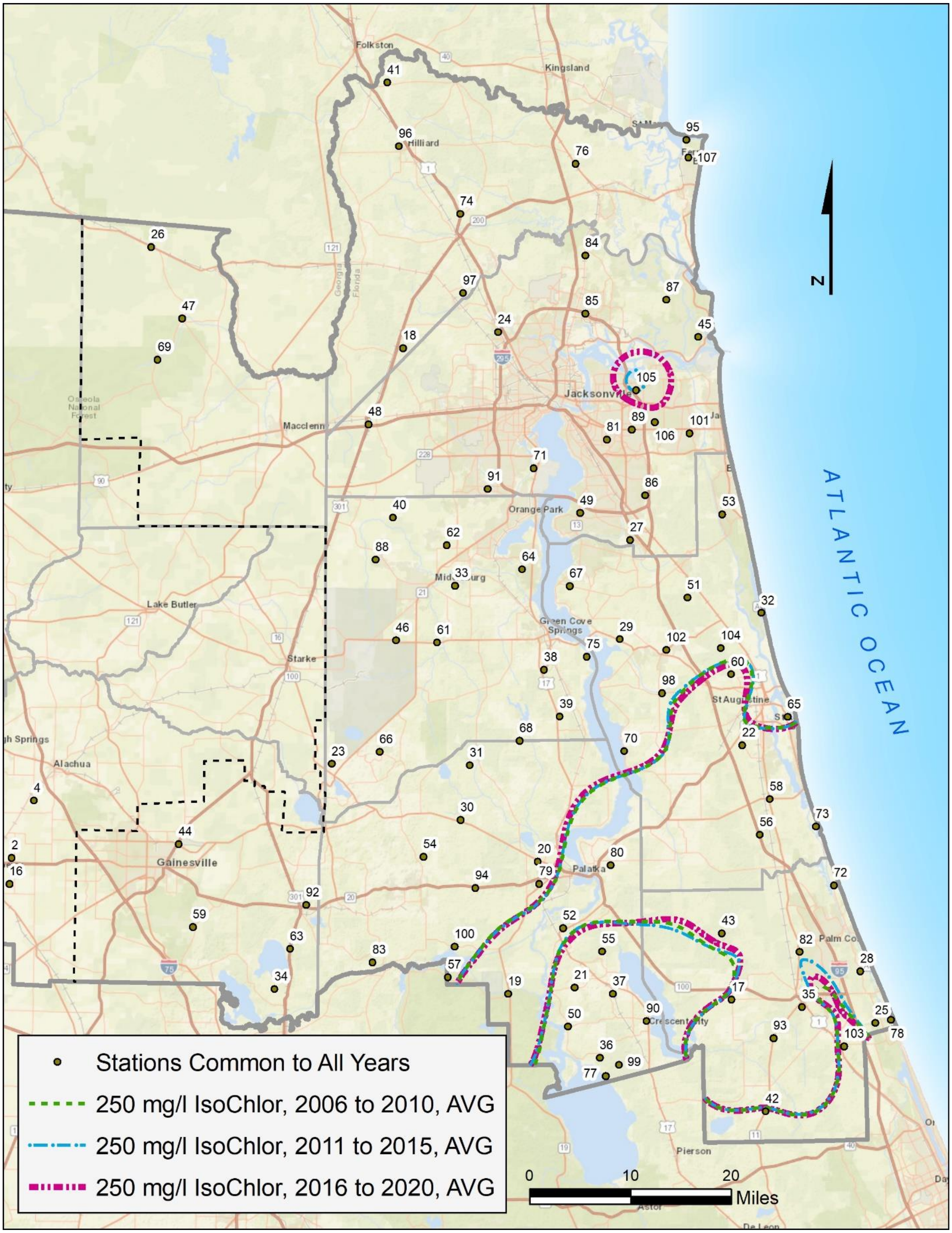

Figure D8. Movement of the Saltwater Interface in the Upper Floridan Aquifer Well Index

Table D2. Movement of the Saltwater Interface in the Upper Florida Aquifer Well Index

Map Index Number	Well Name	Mean Chloride Concentration (mg/L) 2006-2010	Mean Chloride Concentration (mg/L) 2011-2015	Mean Chloride Concentration (mg/L) 2016-2020
1	S011535004	6	7	7
2	S091736001	6	6	6
3	S091628005	5	5	4
4	S081833003	13	14	13
5	S081535002	5	5	5
6	S071630002	5	6	7
7	S061610001	5	6	6
8	S061607001	4	5	5
9	S061434006	14	12	11
10	S051511002	5	6	6
11	S031734011	5	6	6
12	S031335002	3	4	4
13	S031305005	5	7	6
14	S021322008	4	5	6
15	S021215001	5	6	6
16	S101713003	5	6	6
17	F-0353	587	550	612
18	N-0237	19	19	20
19	P-0472	701	691	656
20	P-0123	37	43	42
21	P-0408	7	7	17
22	SJ0824	404	382	425
23	C-0120	6	9	6
24	D-1309	18	18	20
25	F-0176	640	602	659
26	BA0057	26	26	26
27	D-1413	17	20	19
28	F-0064	1,211	1,068	1,225
29	SJ0324	16	17	17
30	P-4086	6	8	6
31	P-4083	5	8	6
32	SJ2574	115	120	116
33	C-1063	4	7	5
34	A-0725	9	10	9
35	F-0384	952	995	974
36	P-0469	59	53	43
37	P-0246	8	9	9
38	C-1056	5	7	5
39	C-1026	5	7	6

Map Index Number	Well Name	Mean Chloride Concentration (mg/L) 2006-2010	Mean Chloride Concentration (mg/L) 2011-2015	Mean Chloride Concentration (mg/L) 2016-2020
40	C-0583	5	7	6
41	N-0221	28	29	30
42	F-0251	35	36	37
43	F-0294	502	482	386
44	A-0693	8	9	9
45	D-1383	184	63	79
46	C-0128	6	9	7
47	BA0009	9	10	9
48	D-0254	35	8	8
49	D-1301	11	12	10
50	P-0270	9	10	10
51	SJ2556	21	24	23
52	P-4043	306	301	330
53	SJ0355	18	19	20
54	P-0772	8	10	9
55	P-0817	9	10	9
56	SJ0602	605	624	631
57	P-0450	155	161	160
58	SJ0516	1,792	1,699	1,444
59	A-0750	6	8	8
60	SJ0331	413	423	341
61	C-0607	4	6	5
62	C-0592	4	7	5
63	A-0421	7	8	7
64	C-0495	4	7	5
65	SJ0323	59	62	64
66	C-0453	4	7	5
67	SJ0508	5	7	6
68	C-0123	6	8	6
69	BA0018	10	10	10
70	SJ0320	161	162	158
71	D-1394	9	11	10
72	F-0200	1,966	1,990	2,033
73	SJ0333	2,610	2,754	2,819
74	N-0220	25	25	28
75	C-0579	8	9	9
76	N-0320	28	28	29
77	P-0736	61	61	59
78	F-0209	1,006	981	848
79	P-0891	170	170	169

Map Index Number	Well Name	Mean Chloride Concentration (mg/L) 2006-2010	Mean Chloride Concentration (mg/L) 2011-2015	Mean Chloride Concentration (mg/L) 2016-2020
80	P-0172	693	703	755
81	D-1499	14	15	14
82	F-0208	668	283	427
83	P-0166	5	6	5
84	D-0673	20	22	24
85	D-1307	19	20	21
86	D-1350	16	17	17
87	D-1236	20	21	22
88	C-0599	4	5	5
89	D-0547	16	16	16
90	P-2037	23	24	25
91	D-1292	5	7	6
92	A-0071	11	10	10
93	F-0179	5,787	5,643	5,956
94	P-0510	6	7	6
95	N-0304	30	29	31
96	N-0334	25	25	27
97	N-0311	23	24	26
98	SJ0027	203	213	192
99	P-0410	19	26	24
100	P-0132	5	6	5
101	D-0259	11	12	12
102	WU001198034244	30	39	30
103	WU001960006748	27	22	24
104	WU050299000995	64	51	52
105	WU088271005894	189	254	329
106	WU088271038532	50	59	174
107	WU050077011380	44	63	83

2021 Annual Assessment of Districts' Monitoring Networks – Status and Trends

Water quality monitoring provides a wealth of information to enable SJRWMD and SRWMD to accomplish their core mission of protecting the environment and restoring water quality. This water quality data helps to determine the health of groundwater, springs, rivers, and estuaries. Implemented in the 1980s, the SJRWMD water quality monitoring network includes over 450 groundwater stations throughout its entire 18-county District. The SRWMD water quality monitoring network was established in the 1970's and currently includes 106 groundwater stations throughout its entire 15-county District. Water quality data from these monitoring wells are obtained from samples collected by District staff and analyzed for a variety of water quality parameters using U.S. Environmental Protection Agency (EPA) methods.

The monitoring wells analyzed in this section consists of 97 SJRWMD wells and 20 SRWMD wells within the NFRWSP area. This analysis focuses on the water quality status and trend of chloride and TDS. The method briefly explained below applies to the network of wells from both Districts.

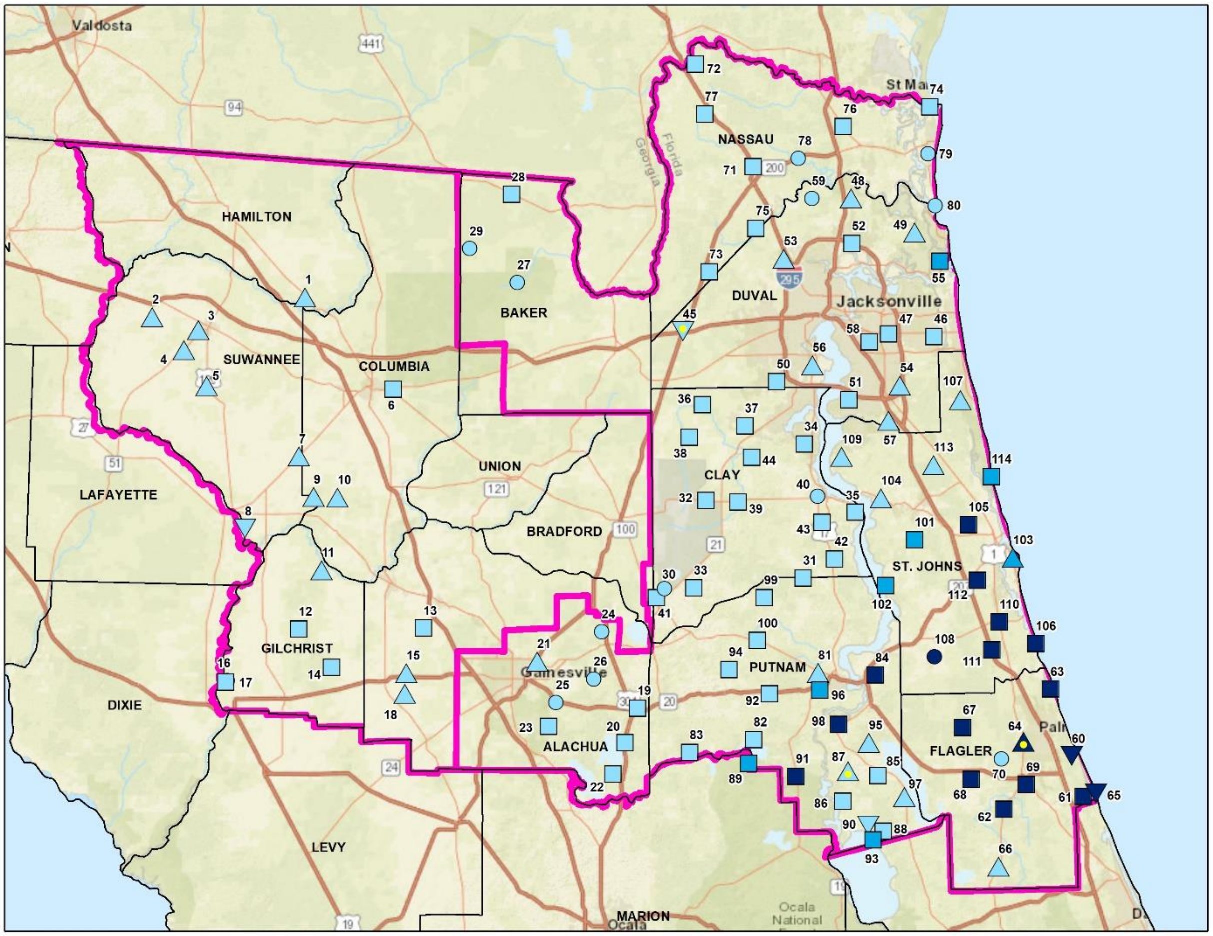

Figure D9. 2021 Annual Assessment of District Monitoring Networks – Status and Trends Well Index

Table D3. 2021 Annual Assessment of District Monitoring Networks – Status and Trends Well Index

Map Index	Station	Station ID
1	S011535004	NA
2	S021215001	NA
3	S021322008	NA
4	S031305005	NA
5	S031335002	NA
6	S031734011	NA
7	S051511002	NA
8	S061434006	NA
9	S061607001	NA
10	S061610001	NA
11	S071630002	NA
12	S081535002	NA

Map Index	Station	Station ID
13	S081833003	NA
14	S091628005	NA
15	S091736001	NA
16	S101405004	NA
17	S101406011	NA
18	S101713003	NA
19	A-0071	58028
20	A-0421	79502
21	A-0693	58039
22	A-0725	58056
23	A-0750	73511
24	A-0962	410566
25	A-0973	439915
26	A-0977	453044
27	BA0018	59128
28	BA0057	59162
29	BA0121	425707
30	C-0120	58958
31	C-0123	58961
32	C-0128	58976
33	C-0453	58892
34	C-0495	76637
35	C-0579	56611
36	C-0583	56620
37	C-0592	79007
38	C-0599	79155
39	C-0607	39625
40	C-0672	406450
41	C-0707	425102
42	C-1026	56615
43	C-1056	56612
44	C-1063	74516
45	D-0254	58680
46	D-0259	61025
47	D-0547	58702
48	D-0673	58710
49	D-1236	74275
50	D-1292	59539
51	D-1301	61029
52	D-1307	59482

Map Index	Station	Station ID
53	D-1309	59483
54	D-1350	78617
55	D-1383	39693
56	D-1394	56626
57	D-1413	74705
58	D-1499	406258
59	D-1503	409608
60	F-0064	76641
61	F-0176	58478
62	F-0179	39655
63	F-0200	58347
64	F-0208	150817
65	F-0209	161390
66	F-0251	58360
67	F-0294	58384
68	F-0353	58414
69	F-0384	241516
70	F-0395	435184
71	N-0220	57731
72	N-0221	57733
73	N-0237	57752
74	N-0304	39643
75	N-0311	39653
76	N-0320	105736
77	N-0334	242724
78	N-0341	244362
79	N-0344	431088
80	N-0347	453636
81	P-0123	57434
82	P-0132	74657
83	P-0166	76626
84	P-0172	57453
85	P-0246	57462
86	P-0270	57472
87	P-0408	57515
88	P-0410	57519
89	P-0450	57393
90	P-0469	57399
91	P-0472	57406
92	P-0510	57312

Map Index	Station	Station ID
93	P-0736	57349
94	P-0772	57286
95	P-0817	57292
96	P-0891	57243
97	P-2037	57188
98	P-4043	57148
99	P-4083	71778
100	P-4086	71777
101	SJ0027	57012
102	SJ0320	76634
103	SJ0323	76644
104	SJ0324	76645
105	SJ0331	73521
106	SJ0333	71774
107	SJ0355	105292
108	SJ0408	411235
109	SJ0508	56959
110	SJ0516	56961
111	SJ0602	56933
112	SJ0824	56921
113	SJ2556	56869
114	SJ2574	66008

Water quality status

The status assessment period was five years, extending from January 1, 2016, to December 31, 2020. At least three years of data during the five-year period were required to complete the status assessment, and the last year had to be 2020. In the analyses, the water quality status was represented by the median of the annual values from the five-year assessment period. Median values were chosen to represent water quality status, since they are not skewed by outliers, making them robust indicators of central tendency.

Ranges in water quality status were developed for chloride and Total Dissolved Solids (TDS) concentrations. The range was not based on a percentile distribution, but rather a numerical range. As a note, all ranges are expressed as low, medium, or high relative to each other, and high values do not necessarily indicate poor water quality.

Chloride Relative status

- Low (less than 50 mg/L)
- Medium (50 - 250 mg/L)
- High (greater than 250 mg/L

TDS Relative status

- Low (less than 250 mg/L)
- Medium (250 - 500 mg/L)
- High (greater than 500 mg/L)

Water quality trends

The assessment period for the trend analysis was 15 years, extending from January 1, 2006, to December 31, 2020. At least 10 years of data during this period were required to complete the analysis, and the last year had to be 2020. A given set of time series data that does not satisfy these criteria is considered to be insufficient. Insufficient data are not analyzed any further as their number of records are limited. In the presentation of results tables, such stations are classified as *insufficient data*. The assessment of the monitoring wells incorporated non-detect (ND) techniques using R code, as found in the NADA package for R programming software (Lopaka, 2020). Summary statistics were calculated using the *cenfit* function, while trend data were calculated using the *cenken* command. Results from ND techniques were only reported for those stations with more than 5% ND.

The Mann Kendall test (MKR) was used for trend assessment. Trend slopes were determined with the Sen slope method. If there were seasonality between seasons (months) as determined by the Kruskal Wallis test ($p<0.05$), then the seasonal version of the Mann Kendall test was used.

Trends indicate what has happened at a given water quality well over the assessment period. Water quality trend categories were developed to indicate whether the trend was increasing or decreasing and also identified those wells with trends that are changing more than 5% per year. Wells with statistically non-significant trends were given a separate designation as were wells with insufficient data. Stations may have insufficient data for a variety of reasons.

Additionally, the relative magnitude of statistically significant trends in chloride concentration was assigned for tabulated data to quantify the potential for saltwater intrusion:

- Low rate: *slope* < 1.0 mg/L/yr
- Medium rate: 3.0 mg/L/yr < *slope* > 1.0 mg/L/yr
- High rate: *slope* > 3.0 mg/L/yr

SRWMD Monitoring Wells Analysis

Twenty (20) monitoring wells were used for the current status and trend analysis (Table D4). The results of the analyses are summarized by county in Tables D5a and D5b for chlorides and TDS, respectively.

From the last row of Table D5a, 12 (67%) of the wells analyzed appear to be increasing in trend, 5 (28%) of the wells are stable, and only one (5%) well shows a decrease in trend in chloride concentration. In terms of status, all 19 of the wells analyzed have low chloride concentrations The TDS concentration in Table D5b, shows seven (39%) of the wells are increasing, while 10 (56%) of the wells are found to be stable. Only one (5%) well shows a decrease in trend. In terms of status, 10 (56%) of the wells were in low TDS concentration and eight (44%) of the wells have a medium concentration. None of the wells had reached a high TDS concentration. Detailed results for each well are shown in Tables D6a and D6b for chloride and TDS, respectively.

With respect to water quality status, chloride concentration does not appear to indicate a threat to the drinking water standards (250 mg/L). Chloride concentrations are extremely low, with about 60% of the wells showing rise in trend. TDS concentrations are a mix of low and medium; about 30% of the wells show a rise in trend at a higher rate of change, on the average, than chloride.

Table D4: SRWMD Monitoring wells used for the MKR Trend Analysis

	Chloride			TDS			
Station	Start Date	End Date	No. of Years	Start Date	End Date	No. of Years	Aquifer
S010920002	1/4/2006	7/28/2020	15	1/4/2006	7/28/2020	15	UFA
S011535004	2/1/2006	7/28/2020	14	2/1/2006	7/28/2020	15	UFA
S021215001	2/2/2006	11/5/2020	15	2/2/2006	11/5/2020	15	UFA
S021322008	2/1/2006	11/5/2020	14	2/1/2006	11/5/2020	14	UFA
S031035001	1/42006	11/16/2020	14	1/4//2006	11/16/2020	15	UFA
S031305005	2/2/2006	11/5/2020	15	2/2/2006	11/5/2020	15	UFA
S031335002	2/2/2006	11/5/2020	15	2/2/2006	11/5/2020	15	UFA
S031734011	3/2/2006	7/28/2020	12	3/2/2006	7/28/2020	12	UFA
S051511002	3/2/2006	7/29/2020	14	3/2/2006	7/29/2020	14	UFA
S061434006	2/2/2006	12/14/2020	15	2/2/2006	3/11/2020	15	UFA
S061607001	3/2/2006	11/23/2020	15	3/2/2006	8/12/2020	15	UFA
S061610001	3/2/2006	11/23/2020	15	3/2/2006	8/12/2020	15	UFA
S071630002	1/4/2006	3/12/2020	14	1/4/2006	3/12/2020	13	UFA
S081535002	7/6/2006	3/12/2020	14	7/6/2006	3/12/2020	14	UFA
S081833003	2/8/2006	12/14/2020	13	2/8/2006	3/11/2020	12	UFA
S091628005	1/4/2006	11/24/2020	15	1/4/2006	11/24/2020	15	UFA
S091736001	2/8/2006	12/14/2020	13	2/8/2006	3/11/2020	13	UFA
S101405004	3/15/2011	11/24/2020	9	3/15/2011	11/24/2020	9	UFA
S101406011	3/15/2011	11/24/2020	10	3/15/2011	11/24/2020	9	UFA
S101713003	2/8/2006	12/14/2020	13	2/8/2006	3/11/2020	13	UFA

Table D5a – Chloride Trend and Status summary for counties in SRWMD

	Trend				Status			
County	**No of decreasing wells**	**No of stable wells**	**No of increasing wells**	**No of insufficient data**	**No of wells at low concentration**	**No of wells at medium concentration**	**No of wells at High concentration**	**No of wells with insufficient data**
Gilchrist	0	2	2	2	5	0	0	1
Hamilton	0	0	1	0	1	0	0	0
Suwannee	1	1	4	0	6	0	0	0
Columbia	0	1	3	0	4	0	0	0
Alachua	0	1	2	0	3	0	0	0
Total	**1**	**5**	**12**	**2**	**19**	**0**	**0**	**1**

Table D5b – TDS Trend and Status summary for counties in SRWMD

	Trend				Status			
County	**No of decreasing wells**	**No of stable wells**	**No of increasing wells**	**No of insufficient data**	**No of wells at low concentration**	**No of wells at medium concentration**	**No of wells at High concentration**	**No of wells with insufficient data**
Gilchrist	0	2	2	2	4	0	0	2
Hamilton	0	1	0	0	0	1	0	0
Suwannee	1	3	2	0	2	4	0	0
Columbia	0	2	2	0	2	2	0	0
Alachua	0	2	1	0	2	1	0	0
Total	**1**	**10**	**7**	**2**	**10**	**8**	**0**	**2**

Table D6a: Chloride trend and status for selected SRWMD Monitoring wells

Well			POR		Statistics					Mann-Kendall test			
Station	**County**	**Aquifer**	**Start**	**End**	**No. of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
S010920002	Gilchrist	UFA	1/4/2006	7/28/2020	36	4.000	7.43	5.760	Low	0.077	0.0001	Increasing	Low
S011535004	Hamilton	UFA	2/1/2006	7/28/2020	37	4.889	13.40	6.200	Low	0.105	0.0005	Increasing	Low
S021215001	Suwannee	UFA	2/2/2006	11/5/2020	38	3.700	14.10	5.465	Low	0.135	0.0046	Increasing	Low
S021322008	Suwannee	UFA	2/1/2006	11/5/2020	39	3.000	7.20	4.840	Low	0.094	0.0013	Increasing	Low
S031035001	Suwannee	UFA	1/4/2006	11/16/2020	55	2.590	10.00	6.643	Low	0.072	0.0610	Stable	Low
S031305005	Suwannee	UFA	2/2/2006	11/5/2020	39	0.500	8.29	5.400	Low	0.123	0.0028	Increasing	Low
S031335002	Suwannee	UFA	2/2/2006	11/5/2020	39	2.420	5.31	3.400	Low	0.051	0.0092	Increasing	Low
S031734011	Columbia	UFA	3/2/2006	7/28/2020	29	4.000	7.47	5.300	Low	0.063	0.1323	Stable	Low
S051511002	Columbia	UFA	3/2/2006	7/29/2020	33	4.000	8.40	5.200	Low	0.079	0.0377	Increasing	Low
S061434006	Suwannee	UFA	2/2/2006	12/14/2020	39	9.357	17.10	13.000	Low	-0.313	0.0000	Decreasing	Low
S061607001	Columbia	UFA	3/2/2006	11/23/2020	58	3.000	6.73	4.700	Low	0.081	0.0003	Increasing	Low
S061610001	Columbia	UFA	3/2/2006	11/23/2020	57	4.000	7.86	5.920	Low	0.082	0.0247	Increasing	Low
S071630002	Gilchrist	UFA	1/4/2006	3/12/2020	36	3.000	10.40	5.535	Low	0.138	0.0012	Increasing	Low
S081535002	Gilchrist	UFA	7/6/2006	3/12/2020	34	4.000	6.50	4.950	Low	0.038	0.1220	Stable	Low
S081833003	Alachua	UFA	2/8/2006	12/14/2020	32	10.241	15.30	13.250	Low	0.064	0.3630	Stable	Low
S091628005	Gilchrist	UFA	1/4/2006	11/24/2020	51	3.000	6.38	4.580	Low	-0.009	0.5917	Stable	Low
S091736001	Alachua	UFA	2/8/2006	12/14/2020	33	4.700	7.71	5.700	Low	0.053	0.0371	Increasing	Low
S101405004	Gilchrist	UFA	3/15/2011	11/24/2020	30	2.544	11.45	9.780	Insufficient Data				
S101406011	Gilchrist	UFA	3/15/2011	11/24/2020	34	2.376	10.14	9.110	Low	0.074	0.1820	Stable	Low
S101713003	Alachua	UFA	2/8/2006	12/14/2020	28	4.000	7.32	5.210	Low	0.084	0.0305	Increasing	Low

Table D6b: TDS trend and status for selected SRWMD Monitoring wells

Well			POR		Statistics					Mann-Kendall test results			
Station	**County**	**Aquifer**	**Start**	**End**	**No. of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
S010920002	Gilchrist	UFA	1/4/2006	7/28/2020	35	187.000	226.000	200.000	Low	1.434	0.0058	Increasing	Medium
S011535004	Hamilton	UFA	2/1/2006	7/28/2020	34	271.000	314.000	285.500	Medium	-0.547	0.3424	Stable	Low
S021215001	Suwannee	UFA	2/2/2006	11/5/2020	37	246.000	323.500	290.000	Medium	-0.520	0.5646	Stable	Low
S021322008	Suwannee	UFA	2/1/2006	11/5/2020	37	303.000	457.000	366.000	Medium	1.620	0.4881	Stable	Medium
S031035001	Suwannee	UFA	1/4/2006	11/16/2020	53	202.000	290.000	221.000	Low	0.129	0.6016	Stable	Low
S031305005	Suwannee	UFA	2/2/2006	11/5/2020	39	279.000	391.000	326.000	Medium	5.171	0.0000	Increasing	High
S031335002	Suwannee	UFA	2/2/2006	11/5/2020	36	181.500	229.000	201.500	Low	1.193	0.0313	Increasing	Medium
S031734011	Columbia	UFA	3/2/2006	7/28/2020	29	183.000	207.000	190.000	Low	-0.249	0.3766	Stable	Low
S051511002	Columbia	UFA	3/2/2006	7/29/2020	33	261.000	316.667	276.000	Medium	2.564	0.017	Increasing	Medium
S061434006	Suwannee	UFA	2/2/2006	12/14/2020	36	270.000	338.000	296.500	Medium	-1.734	0.0092	Decreasing	Medium
S061607001	Columbia	UFA	3/2/2006	11/23/2020	53	170.000	223.000	187.000	Low	1.850	0.0000	Increasing	Medium
S061610001	Columbia	UFA	3/2/2006	11/23/2020	54	255.000	310.000	270.000	Medium	0.639	0.0861	Stable	Low
S071630002	Gilchrist	UFA	1/4/2006	3/12/2020	31	140.000	183.000	153.000	Low	0.898	0.0445	Increasing	Low
S081535002	Gilchrist	UFA	7/6/2006	3/12/2020	31	218.000	264.000	238.000	Low	0.828	0.3156	Stable	Low
S081833003	Alachua	UFA	2/8/2006	12/14/2020	27	208.000	269.000	236.000	Medium	1.393	0.1819	Stable	Medium
S091628005	Gilchrist	UFA	1/4/2006	11/24/2020	50	128.145	192.000	145.000	Low	-0.275	0.3153	Stable	Low
S091736001	Alachua	UFA	2/8/2006	12/14/2020	27	200.000	468.000	210.000	Low	1.719	0.0205	Increasing	Medium
S101405004	Gilchrist	UFA	3/15/2011	11/24/2020	27	245.000	360.000	289.000	Insufficient Data				
S101406011	Gilchrist	UFA	3/15/2011	11/24/2020	30	322.153	618.000	429.500	Insufficient Data				
S101713003	Alachua	UFA	2/8/2006	12/14/2020	24	164.000	436.000	178.500	Low	0.682	0.3438	Stable	Low

SJRWMD Monitoring Wells Analysis

Ninety-seven monitoring wells were used for the current status and trend analysis. The results are summarized by county in Tables D7a and D7b for chlorides and TDS, respectively. Table D7a shows that 21% of the wells have an increasing trend in chloride concentrations while 72% of the wells were stable. This same table shows that 72% of the monitoring wells have low chloride concentrations while 20% have high chloride concentrations, i.e., above the 250 mg/L limit. With respect to TDS concentration, Table D7b shows that only 10% of the monitoring wells showed an increasing trend, while 84% were stable. Twenty-five percent of the wells had a high concentration (above 500 mg/L) and 34% had a low concentration (below 250 mg/l). The remaining 41% of the wells fall between 250 and 500 mg/L. Tables D8a through D17b give a detailed output of the analyses by county.

Table D7a: Chloride Trend and Status summary for counties in SJRWMD

	Trend				Status			
County	**No. of Decreasing wells**	**No. of Stable wells**	**No. of Increasing wells**	**No. of wells Insufficient Data**	**No. of wells at Low concentration**	**No. of wells at Medium concentration**	**No. of wells at High concentration**	**No of wells Insufficient data**
Alachua	1	4	0	3	5	0	0	3
Baker	0	2	0	2	2	0	0	2
Clay	0	13	0	2	13	0	0	2
Duval	1	7	6	1	14	0	0	1
Flagler	2	6	2	1	1	0	9	1
Nassau	0	7	0	3	7	0	0	3
Putnam	1	14	5	0	14	3	3	0
St Johns	0	8	5	1	4	4	5	1
Total	**5**	**61**	**18**	**13**	**60**	**7**	**17**	**13**

Table D7b: TDS Trend and Status summary for counties in SJRWMD

	Trend				Status			
County	**No. of Decreasing wells**	**No. of Stable wells**	**No. of Increasing wells**	**No. of wells insufficient Data**	**No. of wells at Low concentration.**	**No. of wells at Medium concentration**	**No. of wells at High concentration**	**No. of wells Insufficient data**
Alachua	0	4	1	3	4	1	0	3
Baker	0	2	0	2	1	1	0	2
Clay	0	9	0	2	8	1	0	2
Duval	1	11	0	1	0	12	0	1
Flagler	2	7	1	1	0	1	9	1
Nassau	0	7	0	3	0	7	0	3
Putnam	1	14	5	0	12	5	3	0
St Johns	0	9	1	1	1	2	7	1
Total	**4**	**63**	**8**	**13**	**26**	**30**	**19**	**13**

Table D8a: Chloride trend and status for Alachua County Monitoring wells (UFA) – SJRWMD

	POR		Statistics					Mann-Kendall test results			
Station	**Start**	**End**	**No of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (Mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
A-0071	6/14/2006	8/10/2020	22	7.209	18	10.3	Low	0.0969	0.5728	Stable	Low
A-0421	6/14/2006	8/10/2020	23	5.716	11.59	7.24	Low	0.0755	0.107	Stable	Low
A-0693	6/14/2006	8/11/2020	21	6.49	10.39	8.63	Low	0.1274	0.0274	Increasing	Low
A-0725	6/14/2006	8/10/2020	20	6.64	13.57	9.5	Low	0.1516	0.3301	Stable	Low
A-0750	6/19/2007	8/10/2020	19	4.28	11.6	7.14	Low	0.1651	0.0863	Stable	Low
A-0962	3/3/2014	8/11/2020	7	11.72	15.86	12.31	Insufficient Data				
A-0973	8/4/2014	8/10/2020	9	6.13	28.8	26.63	Insufficient Data				
A-0977	9/29/2015	8/11/2020	6	4.82	10.43	6.295	Insufficient Data				

Table D8b: TDS trend and status for Alachua County Monitoring wells (UFA) – SJRWMD

	POR		Statistics					Mann-Kendall test results			
Station	**Start**	**End**	**No of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (Mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
A-0071	6/14/2006	8/10/2020	22	115	166	150	Low	0.075	0.075	Stable	Low
A-0421	6/14/2006	8/10/2020	23	177	194	184	Low	0.8115	0.8115	Stable	Low
A-0693	6/14/2006	8/11/2020	21	99	237	210.5	Low	0.0014	0.0014	Increasing	Low
A-0725	6/14/2006	8/10/2020	20	120	284	266	Medium	0.5803	0.5803	Stable	Low
A-0750	6/19/2007	8/10/2020	17	115.556	221	185.5	Low	0.387	0.387	Stable	Low
A-0962	3/3/2014	8/11/2020	7	211	250	235.556	Insufficient Data				
A-0973	8/4/2014	8/10/2020	8	327	374	338.25	Insufficient Data				
A-0977	9/29/2015	8/11/2020	6	141	188	170.361	Insufficient Data				

Table D9a: Chloride trend and status for Monitoring wells in Baker County (UFA) – SJRWMD

	POR		Statistics					Mann-Kendall test results			
Station	**Start**	**End**	**No of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (Mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
BA0009	2/13/2006	9/14/2020	12	7.95	10.9	9.665	Low	-0.0126	0.7317	Stable	Low
BA0018	2/13/2006	9/14/2020	9	9.126	12.03	10.2	Insufficient Data				
BA0057	2/13/2006	9/14/2020	12	24.5	27.8	26	Low	0.0534	0.6274	Stable	Low
BA0121	3/16/2015	9/14/2020	5	12.189	14.59	13.77	Insufficient Data				

Table D9b: TDS trend and status for Monitoring wells in Baker County (UFA) – SJRWMD

	POR		Statistics					Mann-Kendall test results			
Station	**Start**	**End**	**No of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (Mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
BA0009	2/13/2006	9/14/2020	12	211	266	223.889	Low	1.4764	0.3359	Stable	Medium
BA0018	2/13/2006	9/14/2020	9	218	247	237.5	Insufficient Data				
BA0057	2/13/2006	9/14/2020	12	353.333	398	385	Medium	0	1	stable	Low
BA0121	3/16/2015	9/14/2020	6	240.556	544	267.25	Insufficient Data				

Table D10a: Chloride trend and status for Clay County Monitoring wells (UFA) – SJRWMD

	POR		Statistics					Mann-Kendall test results			
Station	**Start**	**End**	**No of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (Mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
C-0120	5/29/2007	8/18/2020	13	4.944	11.47	6.42	Low	0.0174	1	Stable	Low
C-0123	7/1/2007	7/15/2020	13	4.73	10.39	6.49	Low	-0.0311	0.7603	Stable	Low
C-0128	5/23/2006	8/18/2020	14	5.03	11.05	6.625	Low	0.1121	0.2736	Stable	Low
C-0453	5/23/2006	8/19/2020	13	3.747	8.86	4.48	Low	0.1127	0.2001	Stable	Low
C-0495	2/15/2006	7/20/2020	14	3.594	9.4	4.485	Low	0.0212	0.6614	Stable	Low
C-0579	6/23/2006	7/20/2020	20	6.38	10.64	8.63	Low	0.0926	0.1941	Stable	Low
C-0583	11/8/2006	8/17/2020	12	3.737	8.58	4.835	Low	0.107	0.5371	Stable	Low
C-0592	2/28/2006	8/17/2020	18	3.778	9.21	4.6	Low	0.0364	0.5193	Stable	Low
C-0599	2/15/2006	8/17/2020	19	0.9	9.72	4.45	Low	0.0629	0.4622	Stable	Low
C-0607	5/4/2006	8/18/2020	20	3.692	9.32	4.41	Low	0.0494	0.2697	Stable	Low
C-0672	3/18/2013	7/20/2020	10	3.24	9.08	5.57	Insufficient Data				
C-0707	2/28/2014	8/18/2020	8	3.788	9.52	5.74	Insufficient Data				
C-1026	3/28/2006	7/20/2020	14	4.284	10.11	5.425	Low	0.0588	0.3244	Stable	Low
C-1056	3/28/2006	7/20/2020	13	4.15	9.66	5.01	Low	0.072	0.2464	Stable	Low
C-1063	2/28/2006	8/17/2020	14	3.634	8.66	4.515	Low	0.0178	0.6614	Stable	Low

Table D10b: TDS trend and status for Clay County Monitoring wells (UFA) – SJRWMD

	POR		Statistics					Mann-Kendall test results			
Station	**Start**	**End**	**No of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (Mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
C-0120	5/29/2007	8/18/2020	13	73	105	91.3	Low	0.6425	0.2198	Stable	Low
C-0123	7/1/2007	7/15/2020	12	38	143	125	Low	1.5625	0.4919	Stable	Medium
C-0128	5/23/2006	8/18/2020	14	155	236	184.667	Low	0.2493	0.8694	Stable	Low
C-0453	5/23/2006	8/19/2020	14	45.556	93	81.15	Low	-1.2373	0.3244	Stable	Medium
C-0495	2/15/2006	7/20/2020	16	84	108	98.1	Low	-0.4045	0.3674	Stable	Low
C-0579	11/8/2006	7/20/2020	19	181	513	449	Medium	-1.0224	0.5756	Stable	Medium
C-0607	5/4/2006	8/18/2020	19	73	106	87.778	Low	-0.1212	0.5279	Stable	Low
C-0672	9/23/2013	7/20/2020	10	74.5	116	99.25	Insufficient Data				
C-0707	8/22/2013	8/18/2020	9	70	97	81	Insufficient Data				
C-1026	3/28/2006	7/20/2020	13	107	129	117	Low	0.1899	0.7138	Stable	Low
C-1056	3/28/2006	7/20/2020	13	3	116.111	104	Low	0.1917	0.9027	Stable	Low

Table D11a: Chloride trend and status for Duval County Monitoring wells (UFA) – SJRWMD

	POR		Statistics					Mann-Kendall test results			
Station	**Start**	**End**	**No of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (Mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
D-0254	12/11/2006	9/15/2020	19	6.437	40.6	34.9	Low	-2.5517	0.0026	Decreasing	Medium
D-0259	12/7/2006	8/24/2020	14	9.858	15.269	11.2	Low	0.051	0.7011	Stable	Low
D-0547	12/16/2006	8/24/2020	14	13.645	18.7	15.735	Low	-0.0052	0.9128	Stable	Low
D-0673	12/7/2006	9/22/2020	13	18.8	25.68	21.282	Low	0.3202	0.0028	Increasing	Low
D-1236	12/7/2006	8/24/2020	14	18.4	24.44	21.02	Low	0.1819	0.0086	Increasing	Low
D-1292	12/11/2006	9/16/2020	13	4.33	8.98	5.318	Low	0.0851	0.2215	Stable	Low
D-1301	12/11/2006	7/27/2020	14	8.892	13.7	10.785	Low	-0.0799	0.4434	Stable	Low
D-1307	12/7/2006	9/22/2020	13	18.17	23.96	19.74	Low	0.1076	0.087	Stable	Low
D-1309	12/7/2006	9/21/2020	13	17.1	22.92	17.95	Low	0.1323	0.0041	Increasing	Low
D-1350	3/1/2006	7/28/2020	17	15.6	18.96	16.728	Low	0.0953	0.0168	Increasing	Low
D-1383	5/15/2006	8/25/2020	28	47.5	1,615	59.64	Low	1.4154	0.0505	Stable	Medium
D-1394	7/22/2006	9/16/2020	24	8.001	13.83	9.63	Low	0.1316	0.0161	Increasing	Low
D-1413	12/12/2006	7/27/2020	14	16.7	21.82	18.07	Low	0.1626	0.0285	Increasing	Low
D-1499	5/5/2010	8/24/2020	18	12.395	17.84	13.95	Low	0.0995	0.0686	Stable	Low
D-1503	6/29/2011	8/12/2020	13	22.06	26.39	23.78	Insufficient Data				

Table D11b: TDS trend and status for Duval County Monitoring wells (UFA) – SJRWMD

	POR		Statistics					Mann-Kendall test results			
Station	**Start**	**End**	**No of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (Mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
D-0254	12/11/2006	9/15/2020	19	6.437	40.6	34.9	Low	-2.5517	0.0026	Decreasing	Medium
D-0259	12/7/2006	8/24/2020	14	9.858	15.269	11.2	Low	0.051	0.7011	Stable	Low
D-0547	12/16/2006	8/24/2020	14	13.645	18.7	15.735	Low	-0.0052	0.9128	Stable	Low
D-0673	12/7/2006	9/22/2020	13	18.8	25.68	21.282	Low	0.3202	0.0028	Increasing	Low
D-1236	12/7/2006	8/24/2020	14	18.4	24.44	21.02	Low	0.1819	0.0086	Increasing	Low
D-1292	12/11/2006	9/16/2020	13	4.33	8.98	5.318	Low	0.0851	0.2215	Stable	Low
D-1301	12/11/2006	7/27/2020	14	8.892	13.7	10.785	Low	-0.0799	0.4434	Stable	Low
D-1307	12/7/2006	9/22/2020	13	18.17	23.96	19.74	Low	0.1076	0.087	Stable	Low
D-1309	12/7/2006	9/21/2020	13	17.1	22.92	17.95	Low	0.1323	0.0041	Increasing	Low
D-1350	3/1/2006	7/28/2020	17	15.6	18.96	16.728	Low	0.0953	0.0168	Increasing	Low
D-1383	5/15/2006	8/25/2020	28	47.5	1,615	59.64	Low	1.4154	0.0505	Stable	Medium
D-1394	7/22/2006	9/16/2020	24	8.001	13.83	9.63	Low	0.1316	0.0161	Increasing	Low
D-1413	12/12/2006	7/27/2020	14	16.7	21.82	18.07	Low	0.1626	0.0285	Increasing	Low
D-1499	5/5/2010	8/24/2020	18	12.395	17.84	13.95	Low	0.0995	0.0686	Stable	Low
D-1503	6/29/2011	8/12/2020	13	22.06	26.39	23.78	Insufficient Data				

Table D12a: Chloride trend and status for Flagler County Monitoring wells (UFA) – SJRWMD

	POR		Statistics					Mann-Kendall test results			
Station	**Start**	**End**	**No of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (Mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
F-0064	2/14/2006	6/17/2020	28	12.237	1,500	1,195.435	High	-7.4302	0.0379	Decreasing	High
F-0176	5/25/2006	6/17/2020	32	494.06	970	635	High	-4.1367	0.168	Stable	High
F-0179	5/26/2006	6/16/2020	31	3,472	6,561.57	5,802.05	High	8.7112	0.6219	Stable	High
F-0200	5/25/2006	6/8/2020	15	1,790	2210	1,999.79	High	6.0862	0.5195	Stable	High
F-0208	8/17/2009	6/15/2020	20	26.9	477.75	297.967	High	24.4322	0.0005	Increasing	High
F-0209	4/9/2008	6/17/2020	18	539	1,060	987.49	High	-10.8955	0.0089	Decreasing	High
F-0251	1/21/2006	6/16/2020	22	32	39.28	35.52	Low	0.2687	0.0482	Increasing	Low
F-0294	1/21/2006	6/15/2020	21	101.68	523	492	High	-2.2049	0.139	Stable	Medium
F-0353	1/21/2006	6/15/2020	21	0	628.27	606	High	1.6193	0.0967	Stable	Medium
F-0384	7/31/2008	6/16/2020	22	496	1100	982.5	High	0	1	Stable	Low
F-0395	2/19/2014	6/15/2020	9	17.28	21.65	18.061	Insufficient Data				

Table D12b: TDS trend and status for Flagler County Monitoring wells (UFA) – SJRWMD

	POR		Statistics					Mann-Kendall test results			
Station	**Start**	**End**	**No of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (Mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
F-0064	2/14/2006	6/17/2020	29	2,315	3,140	2,560	High	-11.2528	0.3108	Stable	High
F-0176	5/25/2006	6/17/2020	33	1,190	1,990.5	1,425	High	-15.3975	0.0101	Decreasing	High
F-0179	5/26/2006	6/16/2020	31	9,880	12,900	10,500	High	-13.759	0.4856	Stable	High
F-0200	5/25/2006	6/8/2020	15	3,580	4,540	4,220	High	-3.4353	0.6556	Stable	High
F-0208	8/17/2009	6/15/2020	21	80	4,420	774	High	24.7724	0.0462	Increasing	High
F-0209	4/9/2008	6/17/2020	19	1,202	2,490	2,093	High	-23.3078	0.025	Decreasing	High
F-0251	1/21/2006	6/16/2020	23	440	488	466	Medium	0.397	0.6154	Stable	Low
F-0294	1/21/2006	6/15/2020	23	168	1,714	1,375	High	-14.2305	0.0859	Stable	High
F-0353	1/21/2006	6/15/2020	22	1,260	1,760	1,440	High	-4.0156	0.3665	Stable	High
F-0384	7/31/2008	6/16/2020	22	1,780	2,420	2,120	High	-21.0307	0.0753	Stable	High
F-0395	2/19/2014	6/15/2020	9	260	301	283	Insufficient Data				

Table D13a: Chloride trend and status for Nassau County Monitoring wells (UFA) – SJRWMD

	POR		Statistics					Mann-Kendall test results			
Station	**Start**	**End**	**No of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (Mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
N-0220	1/16/2006	9/21/2020	14	23.6	30.17	25.89	Low	0.212	0.0892	Stable	Low
N-0221	1/16/2006	9/23/2020	14	26.5	32.75	28.88	Low	0.1747	0.0995	Stable	Low
N-0237	1/17/2006	9/15/2020	12	17.9	21.15	19	Low	0.0959	0.2714	Stable	Low
N-0304	3/15/2007	8/12/2020	26	24.4	57.8	28.8	Low	0.1471	0.2702	Stable	Low
N-0311	11/12/2007	9/21/2020	19	21.2	28.53	24.1	Low	0.1259	0.2329	Stable	Low
N-0320	8/13/2007	9/22/2020	20	24.2	32.87	27.47	Low	0.1195	0.2169	Stable	Low
N-0334	12/17/2008	9/23/2020	16	23.99	28.75	25.47	Low	0.1332	0.1254	Stable	Low
N-0341	3/14/2014	9/21/2020	7	23.99	60.39	29.8	Insufficient Data				
N-0344	3/27/2014	8/25/2020	9	24.04	35.55	24.63	Insufficient Data				
N-0347	7/30/2015	8/25/2020	6	20.53	30.57	22.05	Insufficient Data				

Table D13b: TDS trend and status for Nassau County Monitoring wells (UFA) – SJRWMD

	POR		Statistics					Mann-Kendall test results			
Station	**Start**	**End**	**No of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (Mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
N-0220	1/16/2006	9/21/2020	13	373	460	401.111	Medium	1.981	0.2001	Stable	Medium
N-0221	1/16/2006	9/23/2020	13	430.5	508	452.778	Medium	0.2613	0.6693	Stable	Low
N-0237	1/17/2006	9/15/2020	14	263.333	1,452	297.5	Medium	-2.2436	0.2284	Stable	Medium
N-0304	3/15/2007	8/12/2020	25	441	728	482	Medium	-1.5806	0.0718	Stable	Medium
N-0311	11/12/2007	9/21/2020	18	282	413	349.5	Medium	0.88	0.5439	Stable	Low
N-0320	8/13/2007	9/22/2020	19	394	520	449	Medium	-1.215	0.3809	Stable	Medium
N-0334	12/17/2008	9/23/2020	15	364	423	387.5	Medium	0.841	0.4285	Stable	Low
N-0341	3/14/2014	9/21/2020	7	384.5	450	397	Insufficient Data				
N-0344	3/27/2014	8/25/2020	9	390	476	421.667	Insufficient Data				
N-0347	9/21/2016	8/25/2020	5	311.111	346	320.556	Insufficient Data				

Table D14a: Chloride trend and status for Putnam County Monitoring wells (UFA) – SJRWMD

	POR		Statistics					Mann-Kendall test results			
Station	**Start**	**End**	**No of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (Mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
P-0123	9/24/2006	7/13/2020	14	34.8	47.39	39.98	Low	0.6412	0.0118	Increasing	Low
P-0132	3/28/2006	7/14/2020	24	3.99	9.6	4.89	Low	0.0324	0.2974	Stable	Low
P-0166	3/28/2006	7/14/2020	17	4.04	8.61	4.9	Low	0.0533	0.1275	Stable	Low
P-0172	3/28/2006	6/3/2020	23	388.19	828.45	722.71	High	4.7902	0.1538	Stable	High
P-0246	9/25/2006	6/3/2020	14	7.56	11.38	8.35	Low	0.0811	0.0693	Stable	Low
P-0270	6/23/2006	7/21/2020	22	7.74	13.15	9.32	Low	0.1354	0.0588	Stable	Low
P-0408	9/25/2006	7/21/2020	15	5.2	19.45	8.9	Low	1.0483	0.0047	Increasing	Medium
P-0410	2/18/2007	7/21/2020	14	0.25	27.68	25.15	Low	0.008	0.8694	Stable	Low
P-0450	1/10/2006	7/14/2020	23	139	166.38	159.33	Medium	0.5812	0.0096	Increasing	Low
P-0469	2/18/2007	7/21/2020	14	4.36	77.2	57.37	Low	-2.0771	0.0487	Decreasing	Medium
P-0472	9/27/2006	7/14/2020	14	618.9	732	686.3	High	-2.6838	0.1889	Stable	Medium
P-0510	9/24/2006	7/13/2020	14	4.55	9.46	5.62	Low	0.0087	0.8267	Stable	Low
P-0736	6/23/2006	7/21/2020	23	42.18	86.3	58.8	Medium	-0.4898	0.1256	Stable	Low
P-0772	9/24/2006	7/13/2020	14	6.5	12.31	8.5	Low	0.0742	0.2284	Stable	Low
P-0817	9/25/2006	6/3/2020	14	8.14	10.33	9	Low	0.1179	0.0325	Increasing	Low
P-0891	1/10/2006	7/13/2020	24	157	185	170	Medium	0.048	0.7279	Stable	Low
P-2037	2/18/2007	6/16/2020	13	22.65	26.75	23.5	Low	0.2307	0.0072	Increasing	Low
P-4043	1/10/2006	7/21/2020	24	10.24	360	331.5	High	-0.3749	0.5346	Stable	Low
P-4083	4/3/2007	7/15/2020	13	4.72	10.3	5.34	Low	0.0588	0.2997	Stable	Low
P-4086	4/3/2007	7/13/2020	13	5.1	10.11	5.85	Low	-0.0535	0.3601	Stable	Low

Table D14b: TDS trend and status for Putnam County Monitoring wells (UFA) – SJRWMD

	POR		Statistics					Mann-Kendall test results			
Station	**Start**	**End**	**No of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (Mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
P-0123	9/24/2006	7/13/2020	14	210	378	232	Low	1.9078	0.0246	Increasing	Medium
P-0132	3/28/2006	7/14/2020	23	77	305	104	Low	-0.0968	0.8948	Stable	Low
P-0166	3/28/2006	7/14/2020	16	68.5	134	112	Low	2.2285	0.0382	Increasing	Medium
P-0172	3/28/2006	6/3/2020	24	1,580	1,998	1,730	High	2.0417	0.5681	Stable	Medium
P-0246	9/25/2006	6/3/2020	15	110	151	139	Low	0.0341	1	Stable	Low
P-0270	2/18/2007	7/21/2020	21	160	209	177.5	Low	0.5508	0.3976	Stable	Low
P-0408	9/25/2006	7/21/2020	14	62	143.889	102.25	Low	3.2822	0.0052	Increasing	High
P-0410	2/18/2007	7/21/2020	14	263	316	281.75	Medium	-0.0942	1	Stable	Low
P-0450	1/10/2006	7/14/2020	23	0	420	365	Medium	1.4291	0.5262	Stable	Medium
P-0469	2/18/2007	7/21/2020	14	109	434	381.5	Medium	-7.1244	0.0798	Stable	High
P-0472	9/27/2006	7/14/2020	13	1,349	1,620	1,510	High	-7.075	0.1984	Stable	High
P-0510	9/24/2006	7/13/2020	14	37.3	170	137.5	Low	2.1405	0.1889	Stable	Medium
P-0736	2/18/2007	7/21/2020	22	232	322	302.5	Medium	-2.8506	0.0013	Decreasing	Medium
P-0772	9/24/2006	7/13/2020	14	120	200	142.5	Low	1.8811	0.0325	Increasing	Medium
P-0817	9/25/2006	6/3/2020	15	81.3	109	92	Low	0.5007	0.6198	Stable	Low
P-0891	1/10/2006	7/13/2020	23	433	671	471	Medium	1.7755	0.3977	Stable	Medium
P-2037	2/18/2007	6/16/2020	14	135	165	155	Low	1.0799	0.0619	Stable	Medium
P-4043	1/10/2006	7/21/2020	23	698.5	1,120	817	High	-2.2974	0.4128	Stable	Medium
P-4083	4/3/2007	7/15/2020	13	97	138	115	Low	0.8574	0.2712	Stable	Low
P-4086	4/3/2007	7/13/2020	12	89.3	151	116.5	Low	2.8384	0.0112	Increasing	Medium

Table D15a: Chloride trend and status for St Johns County Monitoring wells (UFA) – SJRWMD

	POR		Statistics					Mann-Kendall test results			
Station	**Start**	**End**	**No of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (Mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
SJ0027	2/22/2006	7/27/2020	23	170.72	280.435	206	Medium	0.2631	0.7713	Stable	Low
SJ0320	1/19/2006	6/3/2020	25	148.03	183.926	160	Medium	-0.1722	0.726	Stable	Low
SJ0323	6/30/2009	6/10/2020	16	58	69.8	61.25	Medium	0.5592	0.0131	Increasing	Low
SJ0324	1/12/2006	7/27/2020	23	15.4	19.92	16.7	Low	0.1324	0.0043	Increasing	Low
SJ0331	4/21/2006	6/10/2020	26	12.88	457	420	High	-0.5856	0.659	Stable	Low
SJ0333	1/19/2006	6/8/2020	15	2,290	3,034.95	2710	High	20.8017	0.0748	Stable	High
SJ0355	7/11/2007	7/29/2020	25	14.87	23.1	18.44	Low	0.1345	0.0043	Increasing	Low
SJ0408	2/27/2012	6/3/2020	11	84.02	1,022.7	644	Insufficient Data				
SJ0508	6/18/2006	7/27/2020	22	4.96	10.4	5.88	Low	0.1302	0.0178	Increasing	Low
SJ0516	4/21/2006	6/8/2020	15	654.83	2,222	1,620.23	High	-21.1806	0.235	Stable	High
SJ0602	4/28/2006	6/8/2020	21	529	716.33	621	High	2.2966	0.319	Stable	Medium
SJ0824	6/17/2006	6/9/2020	22	51.58	4,47.513	412.7	High	1.9687	0.055	Stable	Medium
SJ2556	6/18/2006	7/28/2020	20	19.5	25.5	22.29	Low	0.2447	0.0058	Increasing	Low
SJ2574	7/12/2006	7/29/2020	21	109	124.49	118.67	Medium	0.4807	0.1014	Stable	Low

Table D15b: TDS trend and status for St Johns County Monitoring wells (UFA) – SJRWMD

	POR		Statistics					Mann-Kendall test results			
Station	**Start**	**End**	**No of obs.**	**Min (mg/L)**	**Max (mg/L)**	**Median (Mg/L)**	**Status**	**Slope (mg/L/yr)**	**P-value**	**Trend**	**Rate of change**
SJ0027	2/22/2006	7/27/2020	25	1,500	1,925	1,561	High	1.9048	0.4262	Stable	Medium
SJ0320	1/19/2006	6/3/2020	26	1,606	1,915	1,690	High	0.8267	0.6913	Stable	Low
SJ0324	1/12/2006	7/27/2020	24	413	793	691.61	High	3.0624	0.0105	Increasing	High
SJ0333	1/19/2006	6/8/2020	15	5,310	6,410	5,804	High	-9.9918	0.6198	Stable	Low
SJ0355	7/11/2007	7/29/2020	23	347	449	404	Medium	0.4101	0.7916	Stable	Low
SJ0408	8/16/2012	6/3/2020	12	150	2,494	2,085	Insufficient Data				
SJ0508	6/18/2006	7/27/2020	22	95	593	123	Low	0.4493	0.6516	Stable	Low
SJ0516	4/21/2006	6/8/2020	15	3,532	4,828	3,796	High	-16.9295	0.1376	Stable	High
SJ0602	4/28/2006	6/8/2020	24	1,551	2,136	1,838.5	High	-0.5769	0.862	Stable	Low
SJ2556	6/18/2006	7/28/2020	22	464	572	491	Medium	-0.4402	0.5728	Stable	Low
SJ2574	7/12/2006	7/29/2020	24	137	674	600.25	High	-0.7698	0.5849	Stable	Low

SJRWMD CUP Production Well Water Quality Assessment

Overview

Chloride and total dissolved solids (TDS) are useful chemical indicators of groundwater quality (GWQ) degradation due to saltwater intrusion. Chloride is used as the “tracer” for saltwater intrusion because it is one of the principal chemical constituents in seawater and is unaffected by ion exchange (as is sodium, the other principal component). TDS is an additional chemical constituent that reflects overall changes in groundwater quality. Trends in chloride and TDS concentrations were quantified and interpreted based upon the results of nonparametric and multivariate statistical tests described in the following section.

Since statistically significant trends in chloride concentration can be an indicator of groundwater degradation due to saltwater intrusion, this evaluation focuses on chloride and TDS time series data. In the 2017 NFRWSP, 17 SJRWMD CUP production wells either exceeded the SDWS prior to 2015 (6 wells) or were projected to exceed the SDWS by 2035 (11 wells). The analysis completed for this plan focused on these 17 CUP wells (Figure D10 and Table D16).

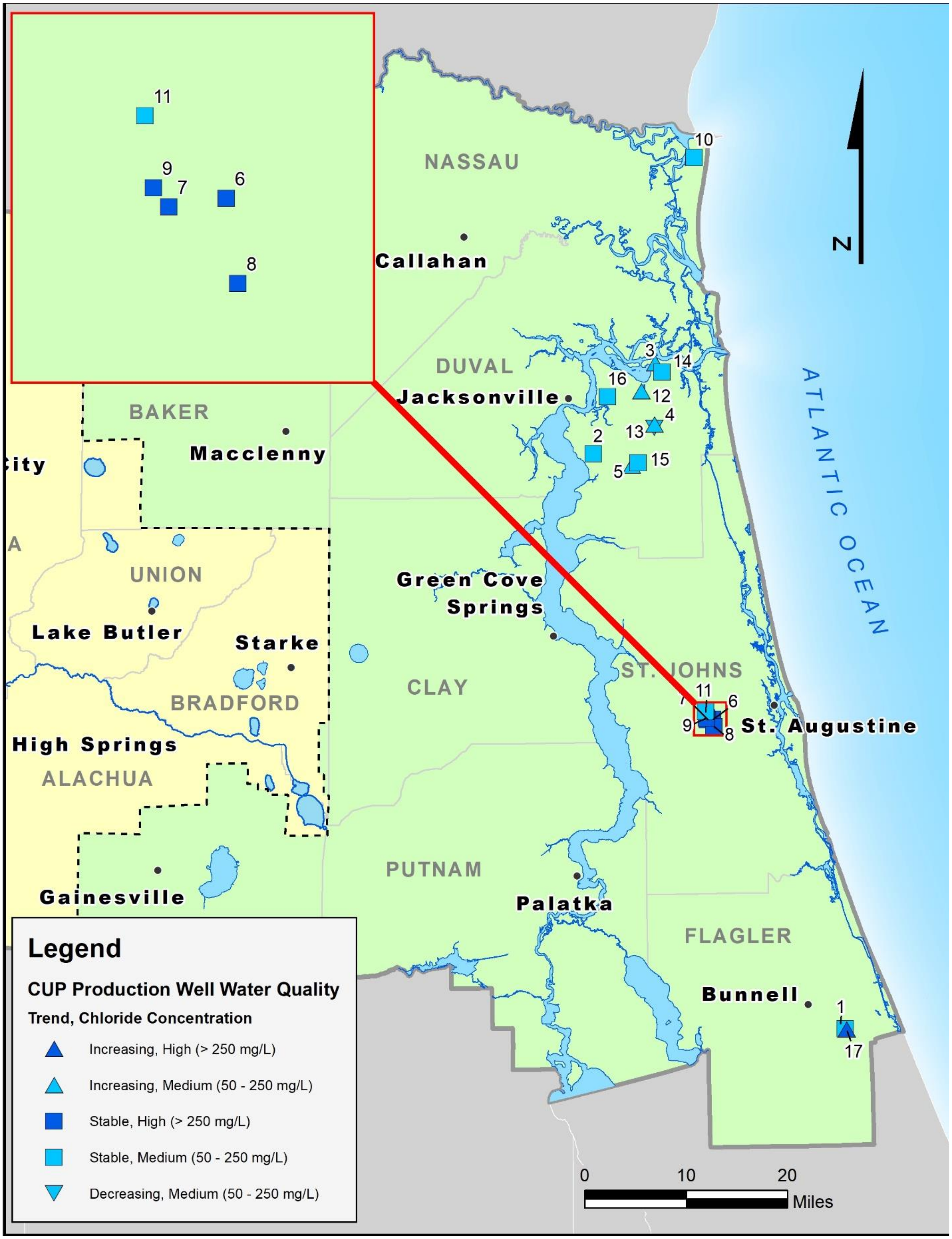

Figure D10. CUP Production Well Water Quality Assessment – Status and Trends Well Index

Table D16. CUP Production Well Water Quality Assessment – Status and Trends Well Index

Map Index Number	Station ID	Station Alias	Site Name	Trend	Chloride Concentration Group	Chloride Concentration (mg/L)
1	34525	10	City of Flagler Beach	Stable	Medium	100
2	22525	Brierwood - 4	Brierwood	Stable	Medium	50
3	6034	Beacon Hills 2	Beacon Hills	Increasing	Medium	130
4	6063	Oakridge - 5304	Oakridge	Decreasing	Medium	130
5	6097	Deerwood 3 - 5701	Deerwood 3	Increasing	Medium	95
6	34240	TR-43	Tillman Ridge Wellfield	Stable	High	368
7	34242	TR-45	Tillman Ridge Wellfield	Stable	High	346
8	14780	TR-42	Tillman Ridge Wellfield	Stable	High	271
9	34243	TR-46	Tillman Ridge Wellfield	Stable	High	290
10	11380	9	Fernandina Beach Mill	Stable	Medium	65
11	38399	TR-48	Tillman Ridge Wellfield	Stable	Medium	256
12	5894	Monument 2	Monument Rd	Increasing	Medium	212
13	6060	Oakridge - 5301	Oakridge	Increasing	Medium	90
14	6212	13 ARLINGTON (Well 3)	Hidden Hills	Stable	Medium	100
15	22540	Deerwood 3 - 5706	Deerwood 3	Stable	Medium	68
16	6087	Arlington - 5404	Arlington Wellfield	Stable	Medium	193
17	34526	11	City of Flagler Beach	Increasing	High	310

Methodology

Groundwater samples collected at the 17 CUP production wells in support of CUP groundwater quality monitoring requirements were submitted for laboratory chemical analyses of selected or all major ions (calcium, magnesium, potassium, sodium, bicarbonate, chloride, and sulfate). Sampling frequencies varied from quarterly to semi-annual and annual schedules. Trends in time series chloride and TDS concentration data were quantified and interpreted based upon the results of nonparametric statistical tests described in the following section. The subsections that follow present the methodology and analysis of the Mann-Kendall trend test used to investigate the current status (concentration) and trend (rate of change of concentration) of groundwater sampled from these wells.

Chloride and TDS water quality data was downloaded from the SJRWMD database and subsequently post-processed in Excel to create a format readable in the Python programming environment. Chloride and TDS water quality data collected for 10 years, or more were used in a Mann-Kendall statistical trend analysis (MKTA). One of the strengths of the MKTA is, it is a nonparametric statistical test that does not depend on the type of statistical distribution in the data (Mann 1945; Kendall 1975). It is also resistant to outliers and missing data. These qualities make the MKTA more suitable for the current data which has the possibility of harboring some missing data in the time series.

Test statistics generated by the MKTA include the Mann-Kendall correlation coefficient (τ), the median slope of the trend (in mg/L/yr), the z-value, and the p-value. The p-value is usually interpolated from statistical tables using the computed z-value. The two most important outputs of this analysis are the p-value (for identifying the significance of the trend) and the mean slope of the trend (for determining the rate at which the concentration status is changing). A trend is considered statistically significant if the p-value is less than a certain significance level (SL) value. Common SL values used in the literature are 0.1 (10%), 0.05 (5%), or 0.01 (1%) (Kamal and Pachauri, 2018). To be consistent with previous NFRWSP, a SL value of 0.05 (5%) was used in the current analysis. If the p-value of the test is lower than the SL, then there is statistically significant evidence that a trend is present in the time series data. The SL results were used to classify the results into stable, increasing, or decreasing.

A time series plot of chloride and TDS concentration, relative to the average rate of withdrawal (pumping) for each station, was visually interpreted to assess the presence of breaks over the entire period of record (POR) for a given production well. These breaks are inflection points in the time series where the slope of the trend changes direction or relative magnitude. A time series with no interpreted breakpoints was evaluated in the MKTA as a single segment over the entire POR. A time series with interpreted breakpoints was evaluated in the MKTA in a piecewise fashion over each segment of the entire data POR.

Figure D11 shows an example of a dataset series broken down into four segments. In this case, a separate MKTA was done for each segment. However, in a summary analysis, only the final segment was used to evaluate the current potential trend in the chloride or TDS concentration. Table D17 shows the segments with their associated sub-PORs for each segment. This segment-based method of analysis was applied only to the SJRWMD's 17 CUP production wells.

Water Quality Status

The water quality status of the 17 CUP production wells, with respect to both chloride and TDS concentration, was assessed by looking at their median recorded concentration values over the POR for each production well.

Using the median values and adopting criteria like that used in the previous NFRWSP, the status of the wells relative to chloride and TDS concentrations were defined respectively, as:

- Low rate: chloride > 50.0 mg/L and TDS < 250.0 mg/L
- Medium rate: 50.0 mg/L < chloride < 250.0 mg/L and 250.0 mg/L < TDS < 500.0 mg/L
- High rate: chloride > 250.0 mg/L/yr and TDS > 500.0 mg/L/yr

This relative classification was adopted to define the status of both CUP production and monitoring wells in this analysis.

Water Quality Trends

Using the pre-determined SL value of 0.05 (5%), the time series of data records of chloride or TDS data was input into the MKTA model. The p-value was used to determine whether there was a statistically significant trend to the data. If there was no statistically significant trend, then the water quality was considerable to be stable. If there was a statistically significant trend, then the calculated data slope was used to determine the direction and rate of the change as showing in the table. The orientation of the trend is indicated by a calculated median slope. A negative slope implies a decreasing trend in the data. A positive slope value means an increasing trend in data. The relative magnitude was assigned for statistically significant trends in chloride concentration to quantify the potential for saltwater intrusion:

- Low rate: *slope* < 1.0 mg/L/yr
- Medium rate: 3.0 mg/L/yr > *slope* > 1.0 mg/L/yr
- High rate: *slope* > 3.0 mg/L/yr

For the CUP production wells, the results of the of the MKTA are shown in Tables D18 and D19 for chloride and TDS, respectively. Each of these tables show a simple statistic of the raw data, followed by the output of the MKTA.

Table D20 presents the summary results of the analysis from the last segment of each time series data. This last segment is assumed to represent the current situation of the production well analyzed. While both TDS and chlorides were evaluated, the focus of this planning assessment is the chloride status and trend analysis Table D20b shows that only five of the 17 CUP production wells are showing an increasing trend in chloride. A summary of these wells is presented in Table D21a. Table D21b categorizes the wells with an increasing trend based on their relative chloride concentration status.

Table D17: SJRWMD CUP Production Wells - Segments for Chloride and TDS data used in trend analysis

				Segment's Period of Record (POR)							
CUP Number	**Station ID**	**No. of Segments**	**Analyte**	**1**		**2**		**3**		**4**	
1198	14780	4	CHLORIDE	2004.00	2006.75	2007.00	2010.50	2010.75	2017.75	2018.25	2021.75
			TDS	2004.00	2006.75	2007.00	2010.50	2010.50	2017.75	2018.25	2021.75
1198	34240	2	CHLORIDE	2005.00	2015.00	2015.75	2018.25	NA		NA	
			TDS	2005.00	2008.75	2009.00	2018.75				
1198	34242	4	CHLORIDE	2007.50	2009.25	2009.50	2010.75	2011.00	2014.25	2014.50	2021.75
			TDS	2007.50	2009.25	2009.50	2010.75	2011.00	2014.25	2014.50	2021.75
1198	34243	3	CHLORIDE	2007.50	2010.25	2010.50	2019.25	2019.50	2021.75	NA	
			TDS	2007.50	2010.25	2010.50	2019.25	2019.50	2021.75		
1198	38399	3	CHLORIDE	2009.50	2011.75	2012.50	2018.25	2019.00	2021.75	NA	
			TDS	2009.50	2011.75	2012.50	2018.25	2019.00	2021.75		
50077	11380	4	CHLORIDE	2006.25	2008.00	2008.25	2010.50	2010.75	2014.00	2014.25	2016.25
			TDS	2006.25	2008.00	2008.25	2010.75	2011.00	2014.00	2014.50	2016.25
59	34525	2	CHLORIDE	2009.25	2012.25	2018.00	2021.50	NA		NA	
			TDS	2009.25	2012.25	2018.00	2021.50				
59	34526	1	CHLORIDE	2009.00	2021.75	NA		NA		NA	
			TDS	2012.75	2021.75						
702	6212	2	CHLORIDE	2006.25	2015.25	2017.00	2019.00	NA		NA	
			TDS	2006.25	2015.25	2017.00	2019.00				
88271	22525	3	CHLORIDE	2000.25	2004.50	2006.25	2017.25	2018.25	2021.75	NA	
			TDS	2000.25	2004.50	2006.25	2017.25	2018.25	2021.75		
88271	22540	3	CHLORIDE	2000.00	2005.50	2006.00	2014.75	2017.50	2021.75	NA	
			TDS	2000.00	2005.50	2006.00	2014.75	2017.50	2021.75		
88271	5894	3	CHLORIDE	2004.50	2014.25	2014.50	2018.50	2018.75	2021.50	NA	
			TDS	2004.25	2014.25	2014.50	2018.50	2018.75	2021.50		
88271	6034	1	CHLORIDE	2004.50	2021.25	NA		NA		NA	
			TDS	2004.50	2021.25						
88271	6060	2	CHLORIDE	1998.00	2003.00	2004.00	2021.75	NA		NA	
			TDS	1998.00	2003.00	2004.00	2021.75				
88271	6063	2	CHLORIDE	1998.00	2015.00	2018.25	2021.75	NA		NA	
			TDS	1998.00	2015.00	2018.25	2021.75				
88271	6087	3	CHLORIDE	1998.00	2003.50	2004.25	2014.75	2015.25	2018.50	NA	
			TDS	1998.00	2003.00	2004.25	2014.75	2015.25	2018.50		
88271	6097	1	CHLORIDE	1998.00	2021.75	NA		NA		NA	
			TDS	1998.00	2021.75						

Table D18: MKTA Chloride Concentration Trend Results for Selected SJRWMD CUP Production wells

County	CUP #	CUP Name	Station	POR	Sample size	Min (mg/L)	Max (mg/L)	Median (mg/L)	Status	Segment	Tau (τ)	Slope (mg/L/yr.)	P-value	Trend
St Johns	1198	SJCUD Northwest & Tillman Ridge	14780	2004.00 2021.75	45	180	690	297.5	High	1	0.732	55.2	0.045	Increasing
										2	-0.385	-13.2	0.063	Stable
										3	0.57	2.13	<0.0001	Increasing
										4	-0.6	-3.51	0.221	Stable
St Johns	1198	SJCUD Northwest & Tillman Ridge	34240	2005.00 2018.25	49	267	470	372	High	1	0.757	4.629	<0.0001	Increasing
										2	-0.5	-10.933	0.108	Stable
St Johns	1198	SJCUD Northwest & Tillman Ridge	34242	2007.50 2021.75	51	250	654	382	High	1	0.619	11.667	0.072	Stable
										2	-0.8	-15.917	0.086	Stable
										3	0.308	8.607	0.161	Stable
										4	0.217	3.5	0.167	Stable
St Johns	1198	SJCUD Northwest & Tillman Ridge	34243	2007.50 2021.75	50	174	452	290	High	1	-0.455	-1.857	0.062	Stable
										2	0.732	7.103	<0.0001	Increasing
										3	-0.238	-6	0.548	Stable
St Johns	1198	SJCUD Northwest & Tillman Ridge	38399	2009.50 2021.75	39	200	314	279	High	1	0.074	0.2	0.9	Stable
										2	0.144	0.5	0.426	Stable
										3	0.022	0.733	1	Stable
Nassau	50077	RockTen	11380	2006.25 2016.25	38	34	94	47.5	Low	1	-0.733	-2.333	0.06	Stable
										2	0.556	1.333	0.048	Increasing
										3	0.923	1.655	<0.0001	Increasing
										4	-0.276	-2	0.566	Stable
Flagler	59	Flagler Beech	34525	2009.25 2021.50	25	28	340	100	Medium	1	0.753	3.829	<0.0001	Increasing
										2	-0.396	-0.396	0.146	Stable

County	CUP #	CUP Name	Station	POR	Sample size	Min (mg/L)	Max (mg/L)	Median (mg/L)	Status	Segment	Tau (τ)	Slope (mg/L/yr.)	P-value	Trend
Flagler	59	Flagler Beech	34526	2009.002021.75	46	31	760	310	High	1	0.816	10.851	<0.0001	Increasing
Duval	702	Hidden Hills	6212	2006.25 2019.00	21	58.7	160	110	Medium	1	0.585	1.2	0.004	Increasing
										2	-0.333	-6.333	0.734	Stable
Duval	88271	JEA	22525	2000.25 2021.75	56	14	206	49.11	Low	1	0.849	0.679	<0.0001	Increasing
										2	0.922	3.662	<0.0001	Increasing
										3	0.345	0.267	0.161	Stable
Duval	88271	JEA	22540	2000.00 2021.75	59	12.7	172.83	45.3	Low	1	0.055	0	0.877	Stable
										2	0.803	3.748	<0.0001	Increasing
										3	-0.056	-0.78	0.917	Stable
Duval	88271	JEA	5894	2004.50 2021.50	51	134.41	364	267.69	High	1	0.757	5.438	<0.0001	Increasing
										2	0.733	5.563	0.004	Increasing
										3	0.584	3	0.025	Increasing
Duval	88271	JEA	6034[a]	2004.50 2021.25	48	61.29	342	160.42	Medium	1	0.463	2.187	<0.0001	Increasing
Duval	88271	JEA	6060	1998.00 2021.75	62	14.1	429	108.22	Medium	1	-0.143	-4.286	0.508	Stable
										2	0.637	2.715	<0.0001	Increasing
Duval	88271	JEA	6063[a]	1998.00 2021.75	64	15.9	234.94	118.62	Medium	1	0.707	1.782	<0.0001	Increasing
										2	-0.654	-0.37	0.002	decreasing
Duval	88271	JEA	6087	1998.00 2021.75	61	35	233	191	Medium	1	0.478	1.742	0.006	Increasing
										2	0.419	0.986	0.001	Increasing
										3	0.067	0.5	0.857	Stable
Duval	88271	JEA	6097[a]	1998.00 2021.75	60	9.18	232	117.16	Medium	1	0.803	2.045	<0.0001	Increasing

[a] UFA and LFA, all other wells are UFA

Table D19: MKTA TDS Concentration Trend Results for Selected SJRWMD CUP production wells

County	CUP #	CUP Name	Station	POR	Sample size	Min (mg/L)	Max (mg/L)	Median (mg/L)	Status	Segment	Tau (τ)	Slope (mg/L/yr.)	P-value	Trend
St Johns	1198	SJCUD Northwest & Tillman Ridge	14780	2004.00 2021.75	52	823	2,250	1,065	High	1	0.514	13	0.158	Stable
										2	-0.42	-26	0.042	Decreasing
										3	0.578	6.118	<0.0001	Increasing
										4	-0.6	0.038	1	Stable
St Johns	1198	SJCUD Northwest & Tillman Ridge	34240	2005.00 2018.25	49	932	1,500	1,150	High	1	0.605	16.769	0.002	Increasing
										2	0.393	3.333	0.002	Increasing
St Johns	1198	SJCUD Northwest & Tillman Ridge	34242	2007.50 2021.75	51	804	1,870	1,200	High	1	0.619	40	0.072	Stable
										2	-0.4	-20	0.462	Stable
										3	0.051	8.75	0.855	Stable
										4	0.228	10	0.149	Stable
St Johns	1198	SJCUD Northwest & Tillman Ridge	34243	2007.50 2021.75	50	776	1,460	1,000	High	1	-0.345	-7.2	0.161	Stable
										2	0.736	14.205	<0.0001	Increasing
										3	-0.429	-23.857	0.23	Stable
St Johns	1198	SJCUD Northwest & Tillman Ridge	38399	2009.50 2021.75	39	470	1,250	968	High	1	-0.429	-7.964	0.174	Stable
										2	0.362	6.1	0.041	Increasing
										3	-0.225	-5.556	0.419	Stable
Nassau	50077	RockTen	11380	2006.25 2016.25	38	470	730	527	High	1	-0.788	-10	0.051	Stable
										2	0.549	7.375	0.041	Increasing
										3	0.646	4.586	0.005	Increasing
										4	0.276	5	0.566	Stable
Flagler	59	Flagler Beech	34525	2009.25 2021.50	25	410	1,200	590	High	1	0.641	10	0.003	Increasing
										2	0.045	2	0.928	Stable
Flagler	59	Flagler beech	34526	2012.75 2021.75	35	610	1,600	1,100	High	1	0.51	19.259	<0.0001	Increasing
Duval	702		6212		21	320	580	512	High	1	0.332	1.667	0.1	Increasing

County	CUP #	CUP Name	Station	POR	Sample size	Min (mg/L)	Max (mg/L)	Median (mg/L)	Status	Segment	Tau (τ)	Slope (mg/L/yr.)	P-value	Trend
		Hidden Hills		2006.25 2019.00						2	-0.333	-24.583	0.734	Stable
Duval	88271	JEA	22525	2000.25 2021.75	56	370	870	526	High	1	-0.078	-0.496	0.782	Stable
										2	0.809	10.235	<0.0001	Increasing
										3	-0.127	-0.5	0.64	Stable
Duval	88271	JEA	22540	2000.00 2021.75	59	350	676	470	Medium	1	0.032	0	0.944	Stable
										2	0.77	6.333	<0.0001	Increasing
										3	-0.343	-6	0.246	Stable
Duval	88271	JEA	5894	2004.50 2021.50	51	201	1,003	823	High	1	0.714	8.396	<0.0001	Increasing
										2	0.422	6.5	0.107	Stable
										3	0.778	12.5	0.002	Increasing
Duval	88271	JEA	6034[a]	2004.50 2021.25	48	439	976	629	High	1	0.459	4.06	<0.0001	Increasing
Duval	88271	JEA	6060	1998.00 2021.75	62	188	1,200	549.5	High	1	-0.143	-9.286	0.511	Stable
										2	0.525	3.692	<0.0001	Increasing
Duval	88271	JEA	6063[a]	1998.00 2021.75	64	305	737	552	High	1	0.62	1.782	<0.0001	Increasing
										2	-0.423	-0.37	0.05	Stable
Duval	88271	JEA	6087	1998.00 2021.75	61	65	850	664	High	1	0.228	5.063	0.214	Stable
										2	0.419	3.05	0.001	Increasing
										3	0.556	9.455	0.032	Increasing
Duval	88271	JEA	6097[a]	1998.00 2021.75	60	200	891	650	High	1	0.695	4.224	<0.0001	Increasing

[a] UFA and LFA, all other wells are UFA

Table D20: Summary Trend of CUP production wells based on the Final Segment of the data series

						Chloride			TDS		
County	**CUP #**	**CUP Name**	**Station ID**	**Aquifer**	**Segment #**	**Slope (mg/L/yr.)**	**P-value**	**Trend**	**Slope (mg/L/yr.)**	**P-value**	**Trend**
St Johns	1198	Tillman	14780	UFA	4	-3.150	0.221	Stable	0.038	1.000	Stable
St Johns	1198	Tillman	34240	UFA	2	-10.933	0.108	Stable	3.333	0.002	Increasing
St Johns	1198	Tillman	34242	UFA	4	3.500	0.167	Stable	10.000	0.149	Stable
St Johns	1198	Tillman	34243	UFA	3	-6.000	0.548	Stable	-23.857	0.230	Stable
St Johns	1198	Tillman	38399	UFA	3	0.733	1.000	Stable	-5.556	0.419	Stable
Nassau	50077	RockTen	11380	UFA	4	-2.000	0.566	Stable	5.000	0.566	Stable
Flagler	59	Flg Beech	34525	UFA	2	-0.396	0.146	Stable	2.000	0.928	Stable
Flagler	59	Flg Beech	34526	UFA	1	0.816	<0.0001	Increasing	0.510	<0.0001	Increasing
Duval	702	Hidden Hi	6212	UFA	2	-6.333	0.734	Stable	-24.583	0.734	Stable
Duval	88271	JEA	22525	UFA	3	0.267	0.161	Stable	-0.500	0.640	Stable
Duval	88271	JEA	22540	UFA	3	-0.780	0.917	Stable	-6.000	0.246	Stable
Duval	88271	JEA	5894	UFA, LFA	3	3.000	0.025	Increasing	12.500	0.002	Increasing
Duval	88271	JEA	6034	UFA	1	2.187	<0.0001	Increasing	4.060	<0.0001	Increasing
Duval	88271	JEA	6060	UFA	2	2.715	<0.0001	Increasing	3.692	<0.0001	Increasing
Duval	88271	JEA	6063	UFA, LFA	2	-0.370	0.002	Decreasing	-0.370	0.050	Stable
Duval	88271	JEA	6087	UFA	3	0.500	0.857	Stable	9.455	0.032	Increasing
Duval	88271	JEA	6097	UFA, LFA	1	2.045	<0.0001	Increasing	4.224	<0.0001	Increasing

Table D21a: CUP production wells with increasing chloride trends

County	CUP Number	Station	Median conc (mg/L)	Slope (mg/L/year)	Trend	Status	Rate of change
Duval	88271	5894	267.69	3.000	Increasing	High	High
Duval	88271	6034	160.42	2.187	Increasing	Medium	Medium
Duval	88271	6060	108.22	2.715	Increasing	Medium	Medium
Duval	88271	6097	117.16	2.045	Increasing	Medium	Medium
Flagler	59	24526	310.0	0.816	Increasing	High	Low

Table 21b: Summary of CUP production wells with increasing chloride trends – Chloride Concentration Status and Rate of Change

Chloride Trend Category	Wells that Currently Exceed 50 mg/L but are <250 mg/l		Wells that Currently Exceed 250 mg/L	
	Number	County	Number	County
High rate of change (slope > 3.0 mg/L/yr)	N/A	N/A	1	Duval
Medium rate of change (3.0 mg/L > *slope* > 1.0 mg/L/yr)	3	Duval	N/A	N/A
Low rate of change (slope < 1.0 mg/L/yr)	N/A	N/A	1	Flagler

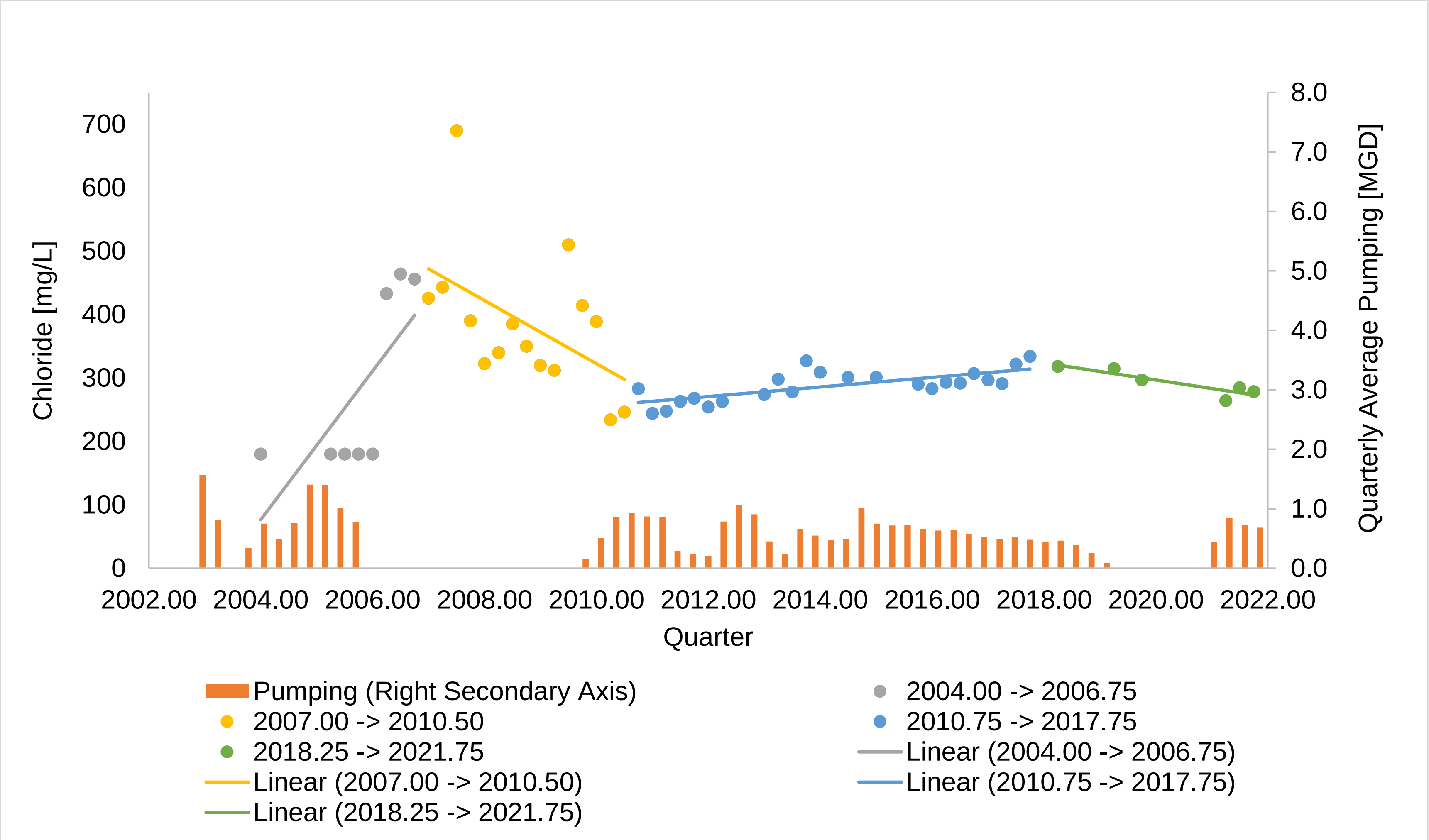

Figure D11. Example chloride time series graph showing four time segments

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Appendix E

Adopted Minimum Flows and Levels (MFLs)

Introduction

Minimum Flows and Levels (MFLs) are the minimum water flows and/or minimum levels adopted by water management district Governing Boards or the Florida Department of Environmental Protection (DEP) to prevent significant harm to the water resources or the ecological structure and function of an area resulting from groundwater or surface water withdrawals. MFLs characterize water resource values (WRVs) for individual waterbodies and define the critical flows and levels necessary to protect these WRVs from significant harm. MFLs inform decisions regarding water use permitting, water shortages, assessments of water supply sources, and development of water resource and water supply projects.

Methods

Establishing MFLs is required pursuant to subsection 373.042(3), Florida Statutes (F.S.). Adoption is typically a four- to six-month process that involves public workshops, review by DEP and publication in the Florida Administrative Register. MFLs are to be reviewed periodically and revised as necessary under subsection 373.0421(5), F.S.

Results

As of March 2023, the St. Johns River Water Management District (SJRWMD), Suwannee River Water Management District (SRWMD), and DEP have established 73 MFLs in the North Florida Regional Water Supply Plan (NFRWSP) area; 48 lakes in the SJRWMD and three lakes, three rivers (four river gages), and 20 springs in the SRWMD (Table E1 and Figure E1). The full list of adopted MFLs within the SJRWMD and SRWMD can be found in chapters 40C-8 and 40B-8, respectively, and section 62-42.300, Florida Administrative Code (F.A.C.).

Although there are 48 lakes with MFLs in the SJRWMD portion of the NFRWSP area, only 20 were assessed in the NFRWSP. The SJRWMD lake MFL assessment methodology only applies to lakes that have a significant connection to the Floridan aquifer. Lakes without such a connection (four total within the NFRWSP area) are noted in Table E1 as having “no significant Floridan aquifer connection” (NSFAC). The remaining non-assessed lakes (24 total) lacked sufficient data for assessment at the time of analysis. For the majority of these systems, surface water models have not yet been developed to assess whether MFLs are being met. The SJRWMD is evaluating the development of surface water models for systems with MFLs that currently lack them and will prioritize model development or updates for systems in areas of high projected UFA drawdown. In south Putnam County, where many of these non-assessed lakes are located, surface water models have been developed and MFLs assessed for nearby lakes help ensure regional protection of water resources from consumptive use impacts.

This approach is considered conservative because MFLs systems being assessed are in areas with higher projected UFA change, and the majority of those systems are meeting their MFLs. Many of the MFLs not assessed are in areas of similar projected UFA drawdown with those that are assessed and meeting their MFLs. However, some systems that are not assessed are in areas of high projected change and do not have adjacent assessed MFLs systems. These waterbodies will be prioritized for assessment before completion of the next NFRWSP.

Additionally, Columbia Spring and GIL1012973 (Siphon Creek Rise) were not assessed because they are resurgences. Falmouth Spring is a karst window and is not represented in the NFSEG model. Falmouth Spring has documented connections to Lime Spring, Lime Sink Rise, and Suwanacoochee Spring and was assessed based on the average of flow changes at those springs.

Table E1: SJRWMD and SRWMD Adopted MFLs within the NFRWSP Area

Waterbody Type	Waterbody Name	County/Basin	District	Assessed in NFRWSP
Lake	Argenta	Putnam	SJR	No – Insufficient data
Lake	Banana	Putnam	SJR	Yes
Lake	Bell	Putnam	SJR	Yes
Lake	Bird Pond	Putnam	SJR	No – Insufficient data
Lake	Blue Pond	Clay	SJR	No – NSFAC
Lake	Brooklyn	Clay	SJR	Yes
Lake	Broward	Putnam	SJR	Yes
Lake	Clear	Putnam	SJR	No – Insufficient data
Lake	Como	Putnam	SJR	Yes
Lake	Cowpen	Putnam	SJR	Yes
Lake	Crystal/Baker/Ida	Putnam	SJR	No – Insufficient data
Lake	Deep	Putnam	SJR	No – Insufficient data
Lake	Disston	Flagler	SJR	No – NSFAC
Lake	Dream Pond	Putnam	SJR	Yes
Lake	Echo	Putnam	SJR	No – Insufficient data
Lake	English/Nettles	Putnam	SJR	No – NSFAC
Lake	Estella	Putnam	SJR	No – Insufficient data
Lake	Geneva	Clay	SJR	Yes
Lake	Georges	Putnam	SJR	Yes
Lake	Gore	Flagler	SJR	Yes
Lake	Grandin	Putnam	SJR	Yes
Lake	Howell	Putnam	SJR	No – Insufficient data
Lake	Little Como	Putnam	SJR	Yes
Lake	Little Mall	Putnam	SJR	No – Insufficient data
Lake	Lizzie	Putnam	SJR	No – Insufficient data
Lake	Lochloosa	Alachua	SJR	Yes
Lake	Lowry/Sand Hill	Clay	SJR	No – Insufficient data
Lake	Magnolia	Clay	SJR	No – Insufficient data
Lake	Margaret	Putnam	SJR	No – Insufficient data
Lake	Marvin	Putnam	SJR	No – Insufficient data
Lake	McGrady	Putnam	SJR	No – Insufficient data
Lake	McKasel	Putnam	SJR	No – Insufficient data
Lake	Melrose	Putnam	SJR	No – NSFAC
Lake	North Como Park	Putnam	SJR	No – Insufficient data
Lake	Omega	Putnam	SJR	No – Insufficient data

Waterbody Type	Waterbody Name	County/Basin	District	Assessed in NFRWSP
Lake	Orio	Putnam	SJR	Yes
Lake	Pam	Putnam	SJR	No – Insufficient data
Lake	Prior	Putnam	SJR	No – Insufficient data
Lake	Sand	Putnam	SJR	No – Insufficient data
Lake	Silver	Putnam	SJR	Yes
Lake	South Como Park	Putnam	SJR	No – Insufficient data
Lake	Star	Putnam	SJR	No – Insufficient data
Lake	Stella	Putnam	SJR	Yes
Lake	Swan	Putnam	SJR	Yes
Lake	Tarhoe	Putnam	SJR	Yes
Lake	Trone	Putnam	SJR	Yes
Lake	Tuscawilla	Alachua	SJR	Yes
Lake	Wauberg	Alachua	SJR	No – Insufficient data
Lake	Butler	Union	SR	Yes
Lake	Hampton	Bradford	SR	Yes
Lake	Santa Fe	Alachua	SR	Yes
River	Ichetucknee River at U.S. Highway 27	Ichetucknee River	SR	Yes[2]
River	Santa Fe River at Worthington Springs	Upper Santa Fe River	SR	Yes
River	Santa Fe River near Ft. White	Lower Santa Fe River	SR	Yes[2]
River	Santa Fe River Near Graham	Upper Santa Fe River	SR	Yes
Spring	ALA112971 (Treehouse) (OFS)[1]	Lower Santa Fe River	SR	Yes
Spring	Blue Hole Spring (OFS)[1]	Ichetucknee River	SR	Yes[2]
Spring	COL101974 - Unnamed[1]	Lower Santa Fe River	SR	Yes[2]
Spring	Columbia Spring (OFS)[1]	Lower Santa Fe River	SR	Not assessed
Spring	Devil's Ear Spring (Ginnie Group) (OFS)[1]	Lower Santa Fe River	SR	Yes[2]
Spring	Devil's Eye Spring (OFS)[1]	Ichetucknee River	SR	Yes[2]
Spring	Falmouth Spring (OFS)[1]	Middle Suwannee River	SR	Yes - Emergency Rule
Spring	GIL1012973 (Siphon Creek Rise)[1]	Lower Santa Fe River	SR	Not assessed
Spring	Grassy Hole Spring (OFS)[1]	Ichetucknee River	SR	Yes[2]
Spring	Hornsby Spring (OFS)[1]	Lower Santa Fe River	SR	Yes[2]
Spring	Ichetucknee Headspring (OFS)[1]	Ichetucknee River	SR	Yes[2]
Spring	July Spring[1]	Lower Santa Fe River	SR	Yes[2]
Spring	Lafayette Blue Spring (OFS)[1]	Middle Suwannee River	SR	Yes - Emergency Rule
Spring	Mill Pond Spring (OFS)[1]	Ichetucknee River	SR	Yes[2]
Spring	Mission Spring (OFS)[1]	Ichetucknee River	SR	Yes[2]

Waterbody Type	Waterbody Name	County/Basin	District	Assessed in NFRWSP
Spring	Peacock Springs (OFS)[1]	Middle Suwannee River	SR	Yes - Emergency Rule
Spring	Poe Spring (OFS)[1]	Lower Santa Fe River	SR	Yes[2]
Spring	Rum Island Spring[1]	Lower Santa Fe River	SR	Yes[2]
Spring	Santa Fe River Rise[1]	Lower Santa Fe River	SR	Yes[2]
Spring	Troy Spring (OFS)[1]	Middle Suwannee River	SR	Yes - Emergency Rule

NSFAC = No significant Floridan aquifer connection
OFS = Outstanding Florida Spring
[1]Springs on the SRWMD Priority List
[2]Assessed based on adopted Recovery Strategy

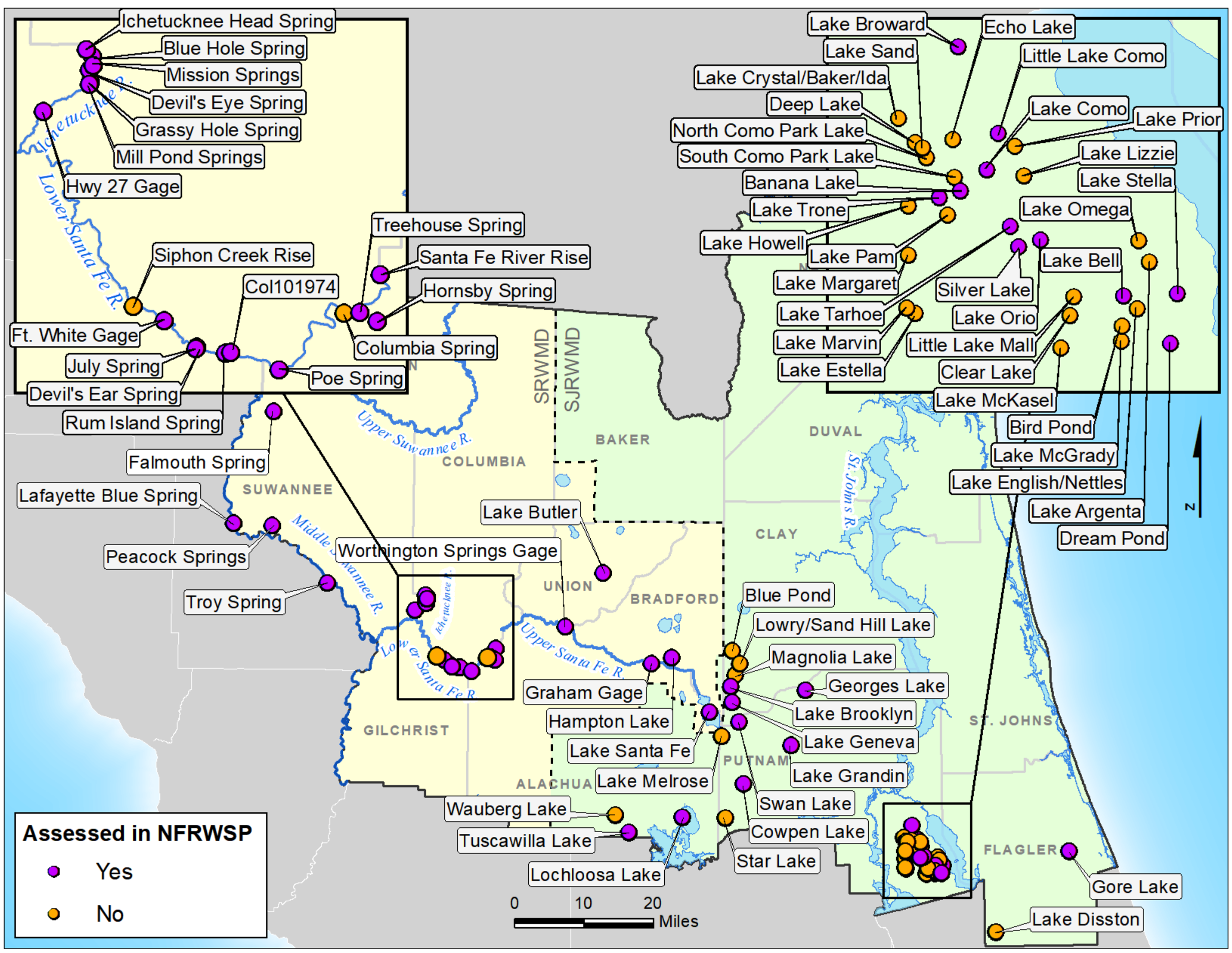

Figure E1: Locations of SJRWMD and SRWMD adopted MFLs within the NFRWSP area

Appendix F

Minimum Flows and Levels (MFLs) Assessment

Introduction

Minimum Flows and Levels (MFLs) were evaluated during the North Florida Regional Water Supply Plan (NFRWSP) process in order to determine whether adopted river or spring flows and/or lake levels would be achieved under current or projected groundwater withdrawals at the planning horizon (2045). If analyses determine that a waterbody is not currently meeting its MFLs or is projected to fall below its MFLs during the planning horizon, that waterbody is said to be in recovery or prevention, respectively, with regards to its MFL. In both cases, the districts are required to “expeditiously adopt a recovery or prevention strategy” and either achieve recovery to the established MFL “as soon as practicable” or prevent the flow or level from falling below the established MFL (subsection 373.0421(2), F.S.). This document includes a review of the basic methodology used to assess MFLs status for the different types of waterbodies evaluated within the NFRWSP area, followed by a summary of the results.

Methodology

The methodology used to assess the rivers, springs, and lakes in the NFRWSP area is reviewed in this section. The North Florida-Southeast Georgia groundwater flow model (NFSEG) was used to simulate changes in aquifer potentiometric surfaces based on differences between 2009 pumps off (PO), and 2014 to 2018 average groundwater withdrawals which is referred to as current pumping (CP), and 2045 projected withdrawal scenarios. River flow, spring flow, and UFA levels were extracted and analyzed. Lakes Brooklyn and Geneva are the exception in that the Keystone Heights Transient Groundwater Flow Model v2.0 (KHTM), a semi-integrated groundwater-surface water model, was also used to assess changes in lake levels from CP to 2045 withdrawal conditions (Meridth et al. 2020).

SRWMD Methodology

River and Spring MFLs

The minimum flows for the Lower Santa Fe and Ichetucknee Rivers and associated priority springs (LSFI) were evaluated in 2014 and ratified by the legislature in 2015. Based on that evaluation, the LSFI are in Recovery (rule 62-42.300, Florida Administrative Code (F.A.C.)). For planning purposes, the status as of 2015 for these MFL waterbodies is incorporated from the adopted Lower Santa Fe River Basin Recovery Strategy (LSFRB Recovery Strategy (Appendix L). If projected future demands indicate a greater need for projects than what was documented in the initial strategy, that additional demand will be incorporated into this planning process. The minimum flows for the LSFI are in the process of being re-evaluated. The re-evaluation may result in new or revised MFLs for the LFSI waterbodies which upon status assessment may be in prevention or recovery. In such a case, the plan will be amended concurrently with the relevant portions of the recovery or prevention strategy to include any WSD project or WRD project identified in that strategy.

For the remaining MFL waterbodies in the SRWMD, the impact of demand projections within the NFRWSP area through the planning horizon were evaluated by comparing the PO condition to CP and PO to the 2045 projection. These percentages were then compared to the reference criteria, specific to the waterbody of interest, to determine the current and future status. This planning evaluation is separate from the re-evaluation of the established MFLs (subsection 62-42.300(1)(e), F.A.C.).

Lake MFLs

The NFSEG model was used to derive predicted UFA drawdowns beneath each MFL lake from PO to CP and CP to 2045. The change in aquifer level between these scenarios was used to evaluate MFL lakes based on lake specific criteria.

SJRWMD Methodology

For all types of MFL waterbodies, freeboard is commonly used to describe the quantity of additional water available for consumptive uses of water, which would not cause a violation of a waterbody's adopted MFLs. Freeboard can be expressed in terms of Upper Floridan aquifer (UFA) drawdown or lake level drawdown (for MFL lakes) or flow (for MFL rivers and springs). A positive value, or freeboard, indicates the availability of additional groundwater or surface water for future withdrawals, while a negative value, or deficit, indicates that an MFL is not met under the current pumping condition. Each MFL assessment includes a current freeboard or deficit calculation and a projected freeboard or deficit calculation at 2045 pumping conditions. A deficit at current conditions indicates a waterbody is in recovery with regard to its MFLs. Freeboard at current conditions with a deficit at 2045 projected conditions indicates a waterbody is in prevention with regard to its MFLs. Freeboard at current conditions and at the 2045 projected conditions indicates the MFLs are met throughout the planning horizon.

River and Spring MFLs

The SJRWMD does not have any river and spring MFLs in the NFRWSP area.

Lake MFLs

Current Pumping Status

For the majority of assessed SJRWMD MFL lakes, a previously estimated freeboard value corresponding to a withdrawal condition year associated with the lake's surface water model, ranging from 1995 to 2009, was brought forward to one of the three existing NFSEG groundwater flow model simulations (2001, 2009 or CP) as described below.

If the MFL lake had a surface water model year of 2004, 2008 or 2009 (Banana, Como, Gore, Little Como, Tarhoe, and Trone), the previously estimated freeboard associated with the surface water model was brought forward to the NFSEG 2009 withdrawal condition. The assessment of the MFLs for Cowpen Lake adopted in 2016 was based on a 2009 pumping condition, so the NFSEG 2009 withdrawal condition was used for this lake as well. If the MFL lake had a surface water model year of 2000, 2001 or 2002 (Broward, Georges, and Grandin), the surface water model year freeboard was brought forward to the NFSEG 2001 withdrawal condition. For MFL lakes with surface water model years before 2000 (Bell, Dream Pond, Orio, Silver, Stella, Swan or Tuscawilla), the freeboards from their latest assessments (2012 for Tuscawilla and 2008 for the others) were used due to lack of modeling tool to simulate pre-2000 pumping impact conditions. The assumption was then made that freeboard values would not have changed significantly between 2008 and 2009 or between 2012 and CP, so freeboard values for these lakes were brought forward to these NFSEG withdrawal conditions accordingly. The freeboards for these MFL lakes were then updated to the CP condition by calculating the change in the UFA potentiometric surface from either 2001 or 2009 withdrawal conditions to the CP withdrawal condition, accordingly.

The assessment of MFLs for Lake Lochloosa, adopted in 2019, was based on 2011-2015 average pumping condition, so the freeboard value was brought forward to the CP withdrawal condition. The assessment of MFLs for Lakes Brooklyn and Geneva, adopted in 2021, was based on 2014-2018 average pumping condition which is the same withdrawal condition as the planning assessment.

2045 Status Methodology

The NFSEG model was then used to derive predicted UFA drawdown beneath each MFL lake from CP to 2045. Lakes Brooklyn and Geneva were the exception, where the KHTM was used to calculate the lake level drawdown from CP to 2045. The differences in drawdown were applied to the CP condition MFL status (freeboard or deficit values) to determine 2045 MFL status.

Results

This section discusses the results of the river, spring, and lake MFLs assessment. A summary of the results of the MFLs assessment under the CP and 2045 withdrawal conditions can be found in Tables F1-F3. Figure F1, below shows a map of the locations and names of the waterbodies assessed. Figure F2 shows a map of the results for each waterbody.

River and Spring MFLs

In the SRWMD, there were five springs, 15 Outstanding Florida Springs (OFS), and four river reaches assessed. The water resource evaluation determined that four waterbodies are currently achieving their MFLs and were projected to achieve their MFLs at 2045, two waterbodies were determined to be in prevention, and 18 were in recovery. The waterbodies that are meeting their MFL and predicted to meet their MFLs are the Santa Fe River at Worthington Springs, the Santa Fe River Near Graham, Peacock Springs, and Troy Spring (Table F1).

There are four Outstanding Florida Springs (OFS) on the Suwannee River that are currently under an emergency rule (rule 40BER 17-01, F.A.C.) which went into effect in 2017. The springs covered under this emergency rule are Falmouth Spring, Lafayette Blue Spring, Peacock Springs, and Troy Spring. The existing emergency rule shows that these four MFLs are being met. The analysis conducted for the 2023 NFRWSP, identified that Lafayette Blue Spring and Falmouth Spring as being in prevention. However, these four OFS are on the SRWMD 2022 MFL Priority List, and technical work is underway to establish the updated MFLs (SRWMD, 2022). Upon finalization of the updated MFLs, the status of these OFS on the Suwannee River will be re-assessed.

The Lower Santa Fe and Ichetucknee rivers and associated priority springs (LSFI) are in recovery based on the current adopted Lower Santa Fe River Basin (LSFRB) Recovery Strategy. The analyses to support this determination can be found within the MFL document for these waterbodies (Appendix L).

Lake MFLs

In the NFRWSP, there are 23 lakes with adopted MFLs that were assessed as part of this planning effort. Three of them are located in the SRWMD and 20 are located in the SJRWMD. Additionally, 24 SJRWMD MFLs lakes were not assessed as part of this planning effort due to there being no significant Floridan aquifer connection or insufficient data (Appendix E).

The three lakes assessed in the SRWMD are all meeting their MFL and are projected to meet their MFL in 2045. These lakes are Lake Butler, Lake Hampton, and Lake Santa Fe (Table F2).

The analysis indicated that in the SJRWMD, 17 of the lakes are currently meeting and are projected to meet their MFLs in 2045. Lakes Brooklyn and Geneva were determined to be in recovery in 2020 resulting in adoption of the Recovery Strategy for the Implementation of Lakes Brooklyn and Geneva Minimum Levels (B-G Recovery Strategy), in 2021 (Appendix M). The assessment of lakes with MFLs also shows that Lakes Brooklyn and Geneva will continue to be in Recovery because they are currently not meeting their respective MFLs and are projected to not meet their MFLs in 2045. Lake Cowpen is in Prevention because although it is currently meeting its MFLs under the CP withdrawal condition, it is projected to not meet its MFLs by 2045. However, the impacts for Lakes Brooklyn, Geneva and Cowpen will be addressed by the Black Creek Water Resource Development Project, which is under construction. (Table F3).

Table F1: SRWMD Rivers & Springs Assessment Summary

Waterbody Type	Waterbody Name	Basin	Reference Criteria (%)	NFSEG Pumps off Flow Estimate (cfs)	Modeled Change from PO to CP (%)	Status at CP	Modeled Change from PO to 2045 (%)	Status at 2045
River	Ichetucknee River at U.S. Highway 27[2]	Ichetucknee River	3.1%	285.2	-5.7%	Recovery	-8.2%	Recovery
River	Santa Fe River at Worthington Springs	Upper Santa Fe River	15.0%	45.4	-4.3%	Met	-6.2%	Met
River	Santa Fe River near Ft. White[2]	Lower Santa Fe River	8.0%	792.3	-9.3%	Recovery	-12.5%	Recovery
River	Santa Fe River near Graham	Upper Santa Fe River	15.0%	3.1	6.9%	Met	3.0%	Met
Spring	Blue Hole Spring (OFS)[2]	Ichetucknee River	3.0%	81.5	-5.1%	Recovery	-7.2%	Recovery
Spring	COL101974 – Unnamed Spring[2]	Lower Santa Fe River	8.0%	13.6	-3.4%	Recovery	-4.7%	Recovery
Spring	Devil's Ear Spring (OFS)[2]	Lower Santa Fe River	8.0%	118.0	-3.3%	Recovery	-4.8%	Recovery
Spring	Devil's Eye Spring (OFS)[2]	Ichetucknee River	3.0%	36.4	-4.4%	Recovery	-6.3%	Recovery
Spring	Falmouth Spring (OFS)[1]	Middle Suwannee River	9.9%	25.8	-9.4%	Met	-11.5%	Prevention
Spring	Grassy Hole Spring (OFS)[2]	Ichetucknee River	3.0%	2.0	-3.2%	Recovery	-4.6%	Recovery
Spring	Hornsby Spring (OFS)[2]	Lower Santa Fe River	8.0%	19.1	-12.7%	Recovery	-16.8%	Recovery
Spring	Ichetucknee Headspring (OFS)[2]	Ichetucknee River	3.0%	56.9	-11.5%	Recovery	-16.3%	Recovery
Spring	July Spring[2]	Lower Santa Fe River	8.0%	63.7	-3.3%	Recovery	-4.7%	Recovery
Spring	Lafayette Blue Spring (OFS)	Middle Suwannee River	9.9%	59.1	-6.6%	Met	-10.5%	Prevention

Waterbody Type	Waterbody Name	Basin	Reference Criteria (%)	NFSEG Pumps off Flow Estimate (cfs)	Modeled Change from PO to CP (%)	Status at CP	Modeled Change from PO to 2045 (%)	Status at 2045
Spring	Mill Pond Spring (OFS)[2]	Ichetucknee River	3.0%	15.4	-3.2%	Recovery	-4.6%	Recovery
Spring	Mission Spring (OFS)[2]	Ichetucknee River	3.0%	76.3	-4.2%	Recovery	-6.0%	Recovery
Spring	Peacock Springs (OFS)	Middle Suwannee River	9.9%	14.7	-2.8%	Met	-4.3%	Met
Spring	Poe Spring (OFS)[2]	Lower Santa Fe River	8.0%	44.0	-3.9%	Met	-5.4%	Met
Spring	Rum Island Spring[2]	Lower Santa Fe River	8.0%	26.0	-3.4%	Recovery	-4.7%	Recovery
Spring	Santa Fe River Rise[2]	Lower Santa Fe River	8.0%	0.5	-2.1%	Recovery	-2.8%	Recovery
Spring	Treehouse Spring (OFS)[2]	Lower Santa Fe River	8.0%	4.2	-29.7%	Recovery	-40.1%	Recovery
Spring	Troy Spring (OFS)	Middle Suwannee River	9.9%	95.7	-3.6%	Met	-5.9%	Met

[1]Assessed based on average flows from Lime Spring, Lime Sink Rise, and Suwanacoochee Spring
[2]Assessed based on the current LSFRB Recovery Strategy

Table F2: SRWMD Lake Assessment Summary

Waterbody Type	Waterbody Name	County	Reference Criteria (ft)	NFSEG Pumps off Aquifer Level Estimate (ft)	Modeled Change from PO to CP (ft)	Status at CP	Modeled Change from PO to 2045 (ft)	Status at 2045
Lake	Butler	Union	13.6	61.77	-7.1	Met	-8.8	Met
Lake	Hampton	Bradford	23.5	72.53	-5.9	Met	-7.2	Met
Lake	Santa Fe	Alachua	22.0	84.52	-5.2	Met	-6.3	Met

Table F3: SJRWMD Lake Assessment Summary

Waterbody Type	Waterbody Name	County	CP Freeboard (ft)	Status at CP	2045 Freeboard or Deficit (ft)	2045 Freeboard or Deficit (ft)	Status at 2045
Lake	Banana	Putnam	1.8	Met	1.4	0.4	Met
Lake	Bell	Putnam	2.5	Met	1.9	0.6	Met
Lake	Brooklyn[1]	Clay	-1.6	Recovery	1.5	-3.1	Recovery
Lake	Broward	Putnam	3.8	Met	1.1	2.7	Met
Lake	Como	Putnam	2.0	Met	1.4	0.6	Met
Lake	Cowpen[1]	Putnam	0.7	Met	0.8	-0.1	Prevention
Lake	Dream Pond	Putnam	2.4	Met	2.0	0.4	Met
Lake	Geneva[1]	Clay	-0.3	Recovery	0.7	-1.0	Recovery
Lake	Georges	Putnam	4.6	Met	1.7	2.9	Met
Lake	Gore	Flagler	3.7	Met	1.2	2.5	Met
Lake	Grandin	Putnam	3.0	Met	0.9	2.1	Met
Lake	Little Como	Putnam	2.9	Met	1.4	1.5	Met
Lake	Lochloosa	Alachua	1.9	Met	0.1	1.8	Met
Lake	Orio	Putnam	1.8	Met	1.6	0.2	Met
Lake	Silver	Putnam	1.8	Met	1.5	0.3	Met
Lake	Stella	Putnam	2.4	Met	2.0	0.4	Met
Lake	Swan	Putnam	2.4	Met	1.0	1.4	Met
Lake	Tarhoe	Putnam	1.7	Met	1.5	0.2	Met
Lake	Trone	Putnam	2.9	Met	1.4	1.5	Met
Lake	Tuscawilla	Alachua	1.0	Met	0.3	0.7	Met

[1]Impacts to Lakes Brooklyn, Geneva and Cowpen will be addressed by the Black Creek Project, which is under construction. When this project is fully implemented these lakes will no longer be in recovery or prevention, respectively.

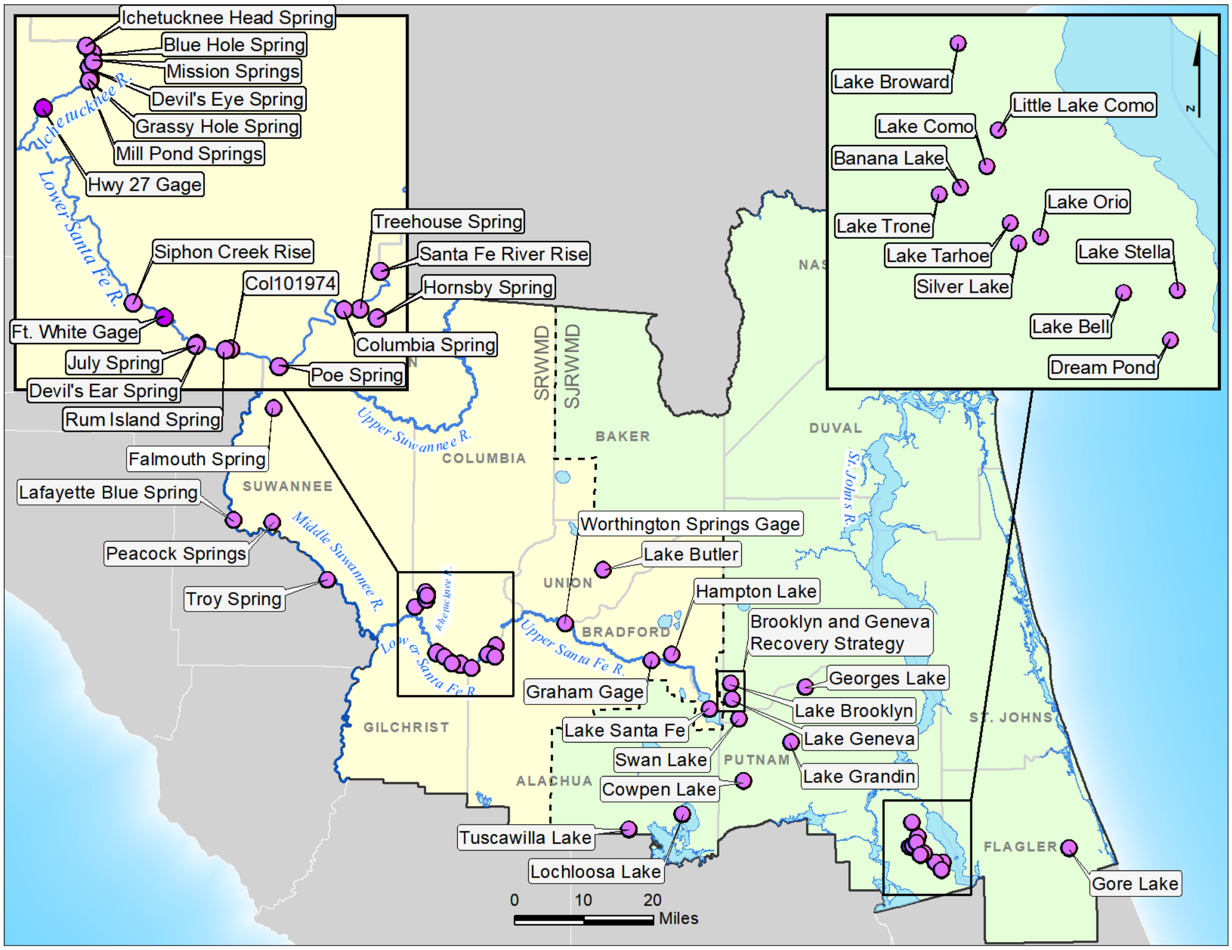

Figure F1. Names and locations of MFL rivers, springs, and lakes in the NFRWSP area

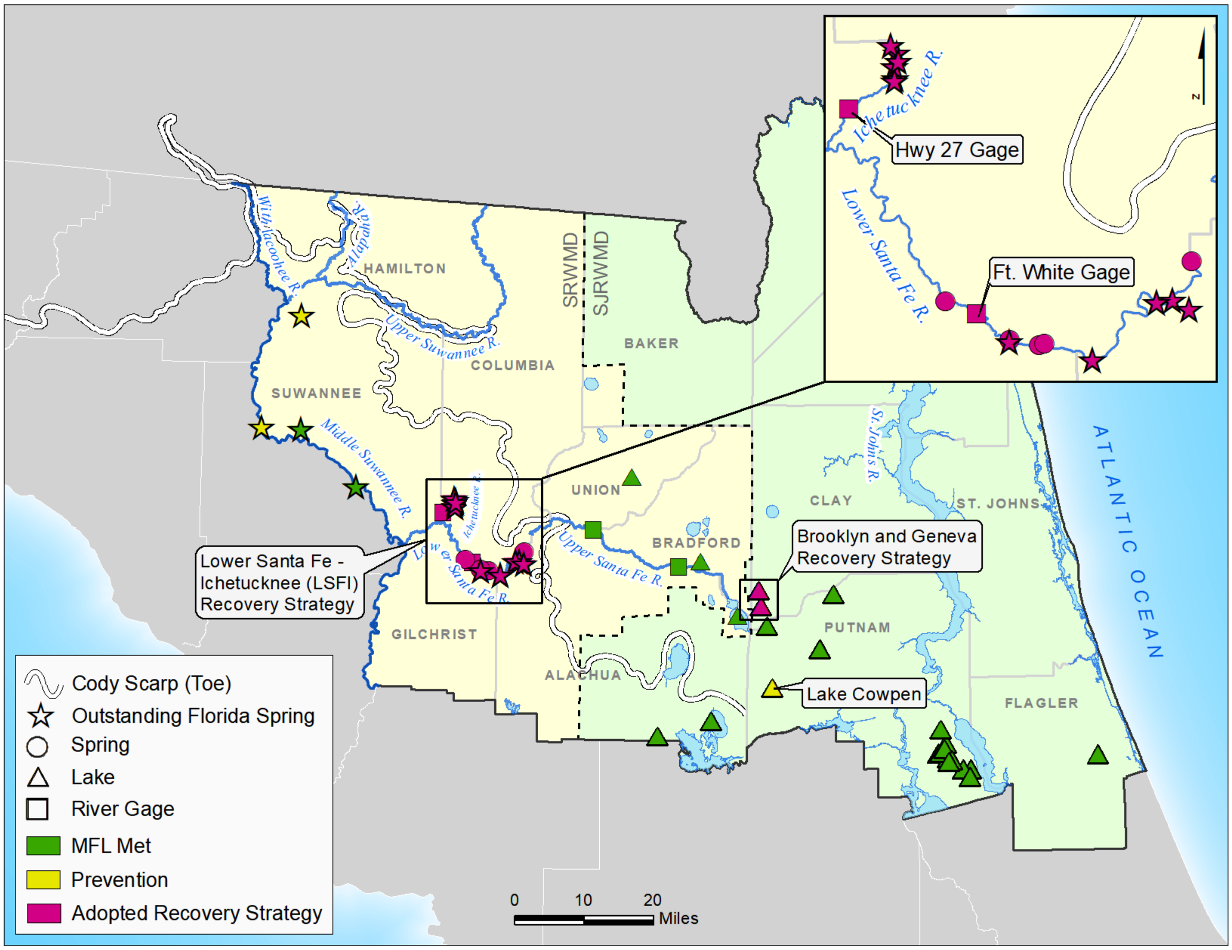

Figure F2. River, spring, and lake MFLs assessment

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Appendix G

Waterbodies without Adopted Minimum Flows and Levels (MFLs) Assessment

Introduction

Rivers, springs, and lakes without adopted MFLs were evaluated during the North Florida Regional Water Supply Plan (NFRWSP) process. This assessment provides a screening evaluation of the potential for water resource impacts in portions of the planning area where Minimum Flows and Levels (MFLs) have not been adopted. This document reviews the basic methodology used to evaluate these waterbodies without adopted MFLs within the NFRWSP area followed by a summary of the results.

Methodology

Reference conditions for the waterbodies without adopted MFLs were calculated using the NFSEG model 2009 pumps off (PO) scenario. Predicted river flows and spring flows under this reference condition were compared to the simulated withdrawal conditions at the 2045 planning horizon. Rivers with a simulated groundwater flow reduction greater than or equal to 10% and springs with a flow reduction greater than or equal to 10% from PO to 2045 were identified. The change in aquifer level from the PO to 2045 projection was used to evaluate lakes and was based on lake specific criteria.

A 10% reduction in flow does not necessarily correspond to an ecological threshold beyond which significant harm would occur. Conversely, waterbodies experiencing less than a 10% reduction in flow may still experience significant harm. The 10% threshold does, however, provide a high level of ecological protection for environmental flows and highlights areas where resource constraints may occur (Richter et al. 2012).

The MFL development process accounts for the unique hydrologic and ecological conditions of individual springs, and links changes in flow to a quantitatively significant harm threshold. Subsequent versions of the NFRWSP will include any newly adopted or reevaluated MFLs.

Results

Within the NFRWSP area, there were six river gages and 36 springs assessed. Of these, there are 20 waterbodies that are meeting the 10% screening criteria at 2045 and 22 waterbodies that are exceeding the screening criteria at 2045 (Table G1 and G2). Figure H1 shows the names and locations of the waterbodies assessed in this analysis and Figure H2 displays the results.

Rivers and Springs

In the SRWMD, there are 15 springs and two river gages that are meeting the screening criteria in 2045 (Table G1). The springs include Allen Mill Pond, Anderson, Bell, Bonnet, Hart, Little River, Otter, Pothole, Rock Bluff, Rock Sink Spring, Royal, Ruth, Telford, and Turtle, which are all on the Middle Suwannee River, and Gilchrist Blue, which is on the Lower Santa Fe River. The river gages that are meeting are Alapaha River near

Jennings and Suwannee River at White Springs on the Upper Suwannee River.

Conversely, there are 16 springs and four river gages that exceed the screening criteria in 2045. The springs on the Upper Suwannee River that exceed the screening criteria in 2045 are Alapaha River Rise, Blue Sink (Suwannee), Blue Spring at Boys Ranch, Hamilton Unnamed (Ham1023971), Holton Creek Rise, Seven Sisters, Stevenson, Suwannee, and White Sulphur. The springs on the Middle Suwannee that exceed the screening criteria are Branford, Charles, Guaranto, Lime Sink Rise, Lime, and Suwanacoochee. Santa Fe Spring is the only spring without an adopted MFL assessed on the Upper Santa Fe River and it exceeds the screening criteria. There are also four river gages that exceed the screening criteria. They are the Santa Fe River at US 441 on the Lower Santa Fe River, Suwannee River at Suwannee Springs on the Upper Suwannee River, and Suwannee River at Branford and Suwannee River at Ellaville on the Middle Suwannee River (Table G1).

Of the five springs assessed in the SJRWMD, three springs are meeting the screening criteria Croaker Hole Spring, Satsuma Spring, and Welaka Spring. The two springs that are exceeding the screening criteria at 2045 are Beecher Spring and Green Cove Spring (Table G2). Beecher Spring is described as having a spring pool that is bordered on the north and west by a concrete walk and retaining wall (Rosenau et al. 1977 and Scott et al. 2004). The spring is not open to the public and ultimately discharges to the St. Johns River via a 1.25-mile run after it is diverted to numerous man-made holding ponds for a fish hatchery. Green Cove Spring, located in a city park, is bounded by a brick wall (Rosenau et al. 1977 and Scott et al. 2004). The flow from the spring discharges into a swimming pool then overflows to a spring run which ultimately discharges into the St. Johns River. The elevated spring pool levels resulting from retaining walls at both spring locations, coupled with limited discharge data, makes evaluation of impacts to these springs challenging (Rosenau et al. 1977 and Scott et al. 2004). Additional investigation will be initiated during the implementation phase of the NFRWSP to evaluate the impact of elevated spring pool levels on spring flow suppression.

Springs in the SJRWMD with a flow of less than one cubic feet per second (cfs) were not evaluated as part of this assessment due to the significant uncertainty in the estimates of low spring discharges. These small springs have limited discharge data. SJRWMD will investigate other potential approaches for evaluation of small springs in the SJRWMD portion of the NFRWSP region.

Lakes

There were no lakes without adopted MFLs assessed in the NFRWSP area.

Table G1: SRWMD waterbodies without adopted MFLs assessment results

Waterbody Type	Waterbody Name	Basin	Reference Criteria (%)	NFSEG Pumps off Flow Estimate (cfs)	Modeled Change from PO to 2045 (%)	Exceeds Screening Criteria at 2045
River	Alapaha River near Jennings	Alapaha	10.0	803.3	0.0%	No
Spring	Alapaha River Rise	Upper Suwannee	10.0	298.0	-27.8%	Yes
Spring	Allen Mill Pond Springs	Middle Suwannee	10.0	5.6	-9.3%	No
Spring	Anderson Spring	Middle Suwannee	10.0	11.1	-8.4%	No
Spring	Bell Spring	Middle Suwannee	10.0	8.3	-4.7%	No
Spring	Blue Sink Spring (Suwannee)	Upper Suwannee	10.0	4.4	-134.3%	Yes
Spring	Blue Spring at Boys Ranch	Upper Suwannee	10.0	42.1	-37.4%	Yes
Spring	Bonnet Spring	Middle Suwannee	10.0	30.3	-4.3%	No
Spring	Branford Spring	Middle Suwannee	10.0	11.2	-10.7%	Yes
Spring	Charles Spring	Middle Suwannee	10.0	5.5	-17.0%	Yes
Spring	Gilchrist Blue Spring	Lower Santa Fe	10.0	35.3	-4.6%	No
Spring	Guaranto Spring	Middle Suwannee	10.0	8.4	-11.1%	Yes
Spring	Hamilton Unnamed Spring (Ham1023971)	Upper Suwannee	10.0	23.7	-56.8%	Yes
Spring	Hart Springs	Middle Suwannee	10.0	48.3	-5.5%	No
Spring	Holton Creek Rise	Upper Suwannee	10.0	88.2	-34.6%	Yes
Spring	Lime Sink Rise	Middle Suwannee	10.0	31.0	-12.0%	Yes
Spring	Lime Spring	Middle Suwannee	10.0	14.7	-10.3%	Yes
Spring	Little River Spring	Middle Suwannee	10.0	48.3	-5.6%	No
Spring	Otter Spring	Middle Suwannee	10.0	9.0	-4.2%	No
Spring	Pothole Spring	Middle Suwannee	10.0	26.5	-5.3%	No
Spring	Rock Bluff Springs	Middle Suwannee	10.0	17.4	-5.3%	No
Spring	Rock Sink Spring	Middle Suwannee	10.0	10.5	-7.5%	No
Spring	Royal Spring	Middle Suwannee	10.0	1.7	-6.1%	No
Spring	Ruth Spring	Middle Suwannee	10.0	5.4	-6.6%	No
River	Santa Fe River at US HWY 441 near High Springs	Lower Santa Fe	10.0	196.0	-34.3%	Yes
Spring	Santa Fe Spring	Upper Santa Fe	10.0	107.4	-54.0%	Yes

Waterbody Type	Waterbody Name	Basin	Reference Criteria (%)	NFSEG Pumps off Flow Estimate (cfs)	Modeled Change from PO to 2045 (%)	Exceeds Screening Criteria at 2045
Spring	Seven Sisters Spring	Upper Suwannee	10.0	8.4	-13.1%	Yes
Spring	Stevenson Spring	Upper Suwannee	10.0	101.4	-15.7%	Yes
Spring	Suwanacoochee Spring	Middle Suwannee	10.0	31.7	-12.1%	Yes
River	Suwannee River at Branford	Middle Suwannee	10.0	4,247.9	-12.8%	Yes
River	Suwannee River at Ellaville	Middle Suwannee	10.0	3,319.1	-14.4%	Yes
River	Suwannee River at Suwannee Springs	Upper Suwannee	10.0	266.3	-23.1%	Yes
River	Suwannee River at White Springs	Upper Suwannee	10.0	162.5	-0.3%	No
Spring	Suwannee Springs	Upper Suwannee	10.0	6.7	-49.6%	Yes
Spring	Telford Spring	Middle Suwannee	10.0	29.8	-5.5%	No
Spring	Turtle Spring	Middle Suwannee	10.0	17.2	-5.1%	No
Spring	White Sulphur Springs	Upper Suwannee	10.0	2.0	-492.5%	Yes

Table G2: SJRWMD waterbodies without adopted MFLs assessment results

Waterbody Type	Waterbody Name	County	Reference Criteria (%)	NFSEG Pumps off Flow Estimate (cfs)	Modeled Change from PO to 2045 (%)	Exceeds Screening Criteria at 2045
Spring	Beecher Spring	Putnam	10.0	6.4	-17.6%	Yes
Spring	Croaker Hole Spring	Putnam	10.0	72.7	-1.4%	No
Spring	Green Cove Spring	Clay	10.0	4.0	-45.2%	Yes
Spring	Satsuma Spring	Putnam	10.0	1.1	-4.4%	No
Spring	Welaka Spring	Putnam	10.0	8.1	-4.6%	No

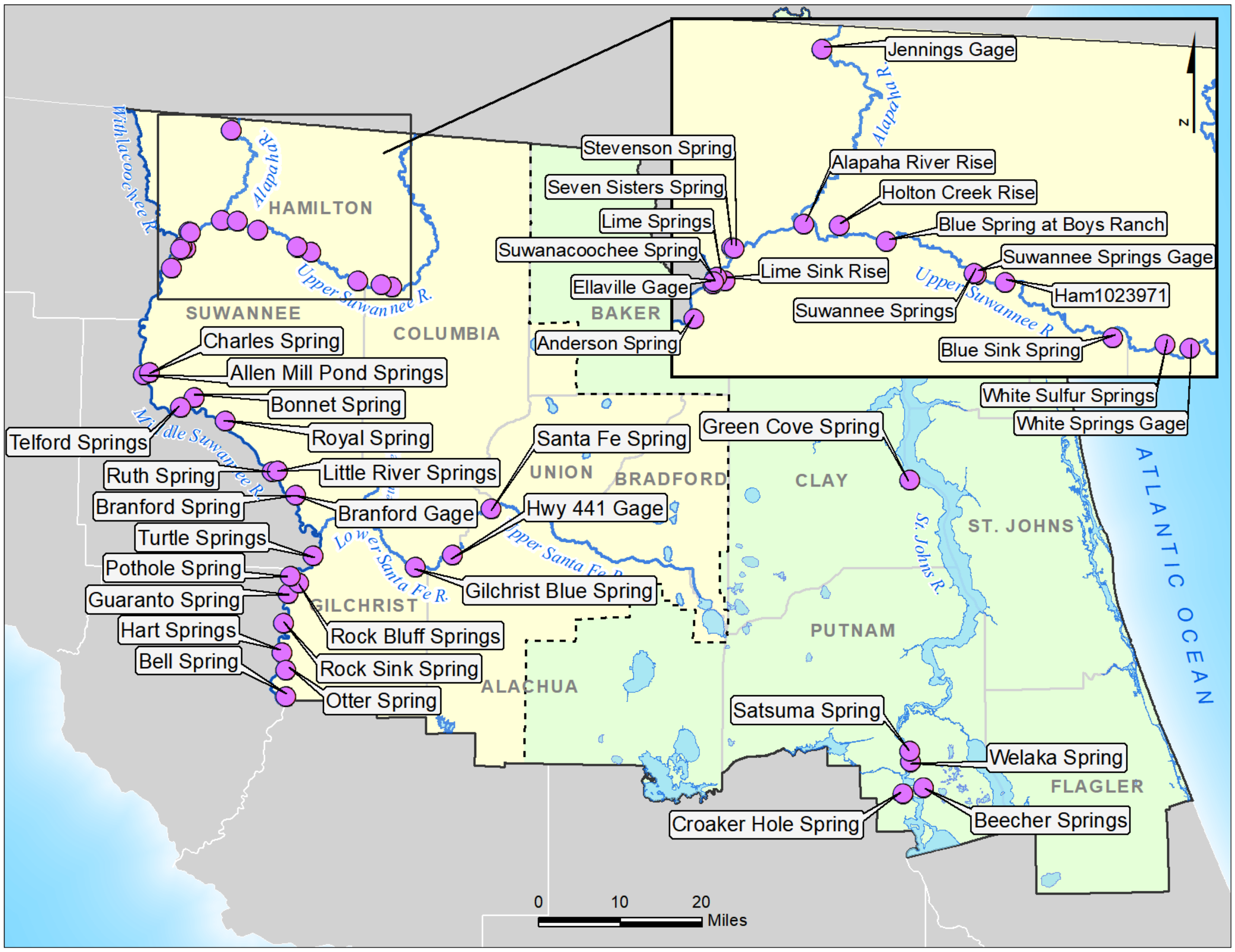

Figure G1: Names and locations of waterbodies without adopted MFLs in the NFRWSP area

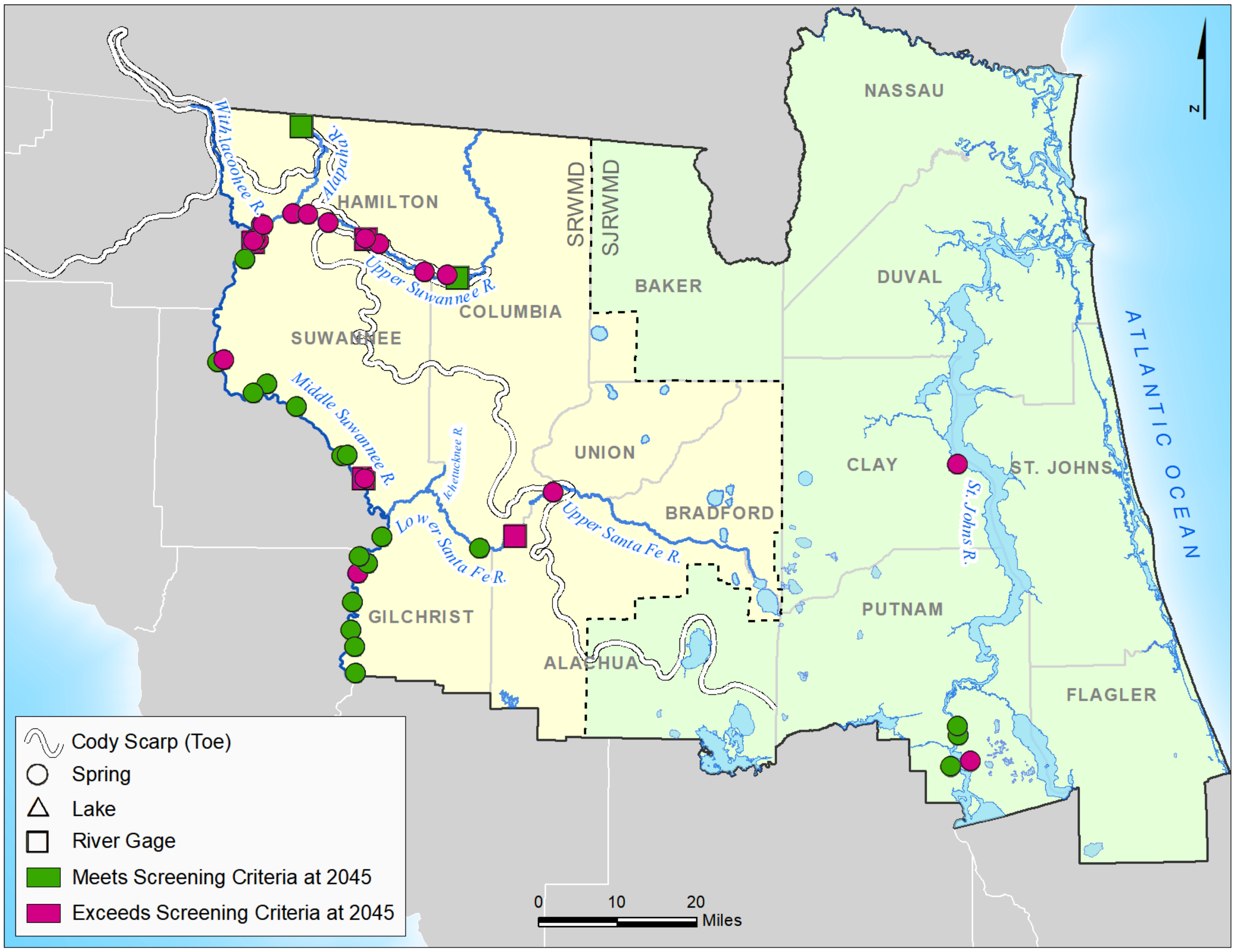

Figure G2: Waterbodies without adopted MFLs meeting or exceeding screening criteria

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Appendix H

Potential Adverse Change to Wetland Function Assessment

Introduction

As part of North Florida Regional Water Supply Plan (NFRWSP) development, the St. Johns River Water Management District (SJRWMD) and Suwannee River Water Management District (SRWMD) (Districts) assessed the extent to which water resources and related natural systems may be impacted in the projected increase in groundwater use through 2045. Adverse Change to wetland function is one component of the water resource assessment, along with saltwater intrusion/upwelling, minimum flows and levels (MFLs), waterbodies without adopted MFLs, and water reservations. This information helps guide the delineation of water resource caution areas and the formulation of project options.

This document details the methods used to assess wetlands in the NFRWSP area associated with projected groundwater demand at the planning horizon (2045) and the assessment results. Although significantly altered wetlands have occurred in the past due mainly to farmland conversion and urbanization, wetlands can be altered by factors other than groundwater withdrawals (e.g., modification of surface water hydrology). However, this analysis focused exclusively on assessing the potential for adverse change to existing wetlands only due to predicted changes in groundwater levels resulting from projected increases in groundwater demand. The outcome of this assessment was used with other factors in determining whether traditional water supply (i.e., fresh groundwater) sources are sufficient to meet future water demands.

Background

In previous Water Supply Plans and Assessments, the probability of adverse change in wetland functions was determined using variations of the Kinser-Minno method incorporated into a GIS model (Kinser and Minno, 1995; Kinser et. al., 2003). The Kinser-Minno method provides an estimation of the magnitude (acres), degree (high, moderate, low), and spatial distribution of the potential for future adverse change to wetlands throughout the planning region. The GIS model conducts a matrix analysis utilizing conditional statements dependent on soil permeability, sensitivities of plant communities to dewatering, and modeled declines in the surficial aquifer (SA) to estimate the potential adverse change to individual plant communities that may occur if future water demands were met with traditional sources. The model was updated in 2003 and 2008, which included the depth to the Upper Floridan Aquifer (UFA) potentiometric surface as an additional screening parameter for the areas of unconfined UFA. The additional steps of incorporating the depth to the UFA potentiometric surfaces with respect to the unconfined UFA provide further analysis depending on whether or not the area is hydraulically connected to the UFA and therefore, would or would not be influenced by changes in UFA levels. Since then, the model has received many minor updates such as the inclusion of a digital elevation model (DEM).

The Kinser-Minno GIS Model was reviewed and updated in 2022. The soils data, vegetation layer, and the Digital Elevation Model (DEM) data were updated. Another screening parameter, depth to water table or SAS, was introduced for the areas where the UFA is confined. An additional tool was added to the workflow to make the thresholds for depth to water table and depth to potentiometric surfaces adjustable. The updates to the model are described in detail in Attachment A.

Methodology

The 2022 Kinser-Minno tool (Attachment A) was used to simulate potential adverse change in wetlands based on increased groundwater withdrawals (drawdown) between current pumping (CP) and 2045 projected withdrawals. Due to the way in which the Kinser-Minno applies the screening criteria, the tool was run using the 2009 “pumps-off” (PO) baseline conditions. Therefore, the tool used both PO to CP drawdown, and PO to 2045 drawdown. The difference in spatial and numerical results were subsequently used to estimate the effects of CP to 2045 drawdown. The area of potential adverse change to wetlands was summarized by county for the NFRWSP area. Furthermore, the Kinser-Minno tool predicts low, moderate, and high potential for adverse change, but only the moderate and high potentials for adverse change were considered in the analysis. Areas with a low potential for adverse wetland change were not included in the results because this classification indicates that plants are drought tolerant or the soils are not susceptible to dewatering (Kinser and Minno, 1995). Descriptions of the moderate and high classifications can be found in Attachment A.

Results of CP to 2045 Assessment

Out of over 900,000 acres assessed in the NFRWSP area (Figure H1), the analysis identified a total of 8,129 acres of wetlands with a moderate to high potential for adverse change based on increased groundwater withdrawals between CP and the 2045 projection (Table H1 & Figure H2). Of the total area, 1,828 acres were in the SRWMD, and 6,303 acres were in the SJRWMD. Flagler county had the highest potential for adverse wetland change with 4,201 acres identified. No potential adverse change to wetlands was predicted for Baker, Bradford, Duval, or Union counties.

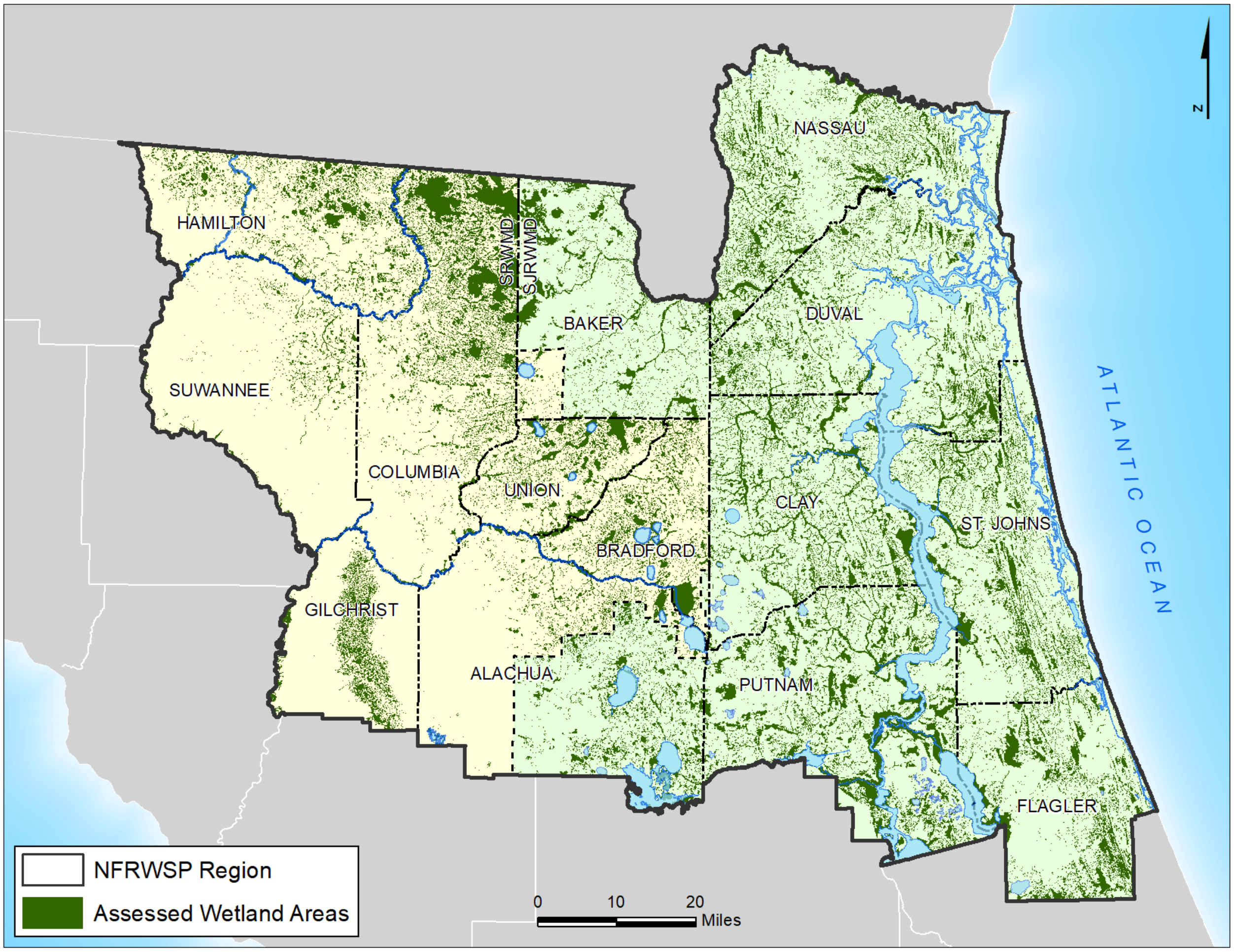

Figure H1. Total wetland acreage assessed in the NFRWSP area

Table H1. Wetland acreage identified as having moderate or high potential for adverse change to wetland function between CP and 2045 projected withdrawals

County	District	Potential Adverse Wetland Change (acres)
Alachua	SJR	557
Alachua	SR	168
Baker	SJR	0
Baker	SR	0
Bradford	SJR	0
Bradford	SR	0
Clay	SJR	494
Columbia	SR	68
Duval	SJR	0
Flagler	SJR	4,201
Gilchrist	SR	1,288
Hamilton	SR	157
Nassau	SJR	62

County	District	Potential Adverse Wetland Change (acres)
Putnam	SJR	309
St. Johns	SJR	680
Suwannee	SR	147
Union	SR	0
Total	NA	8,129

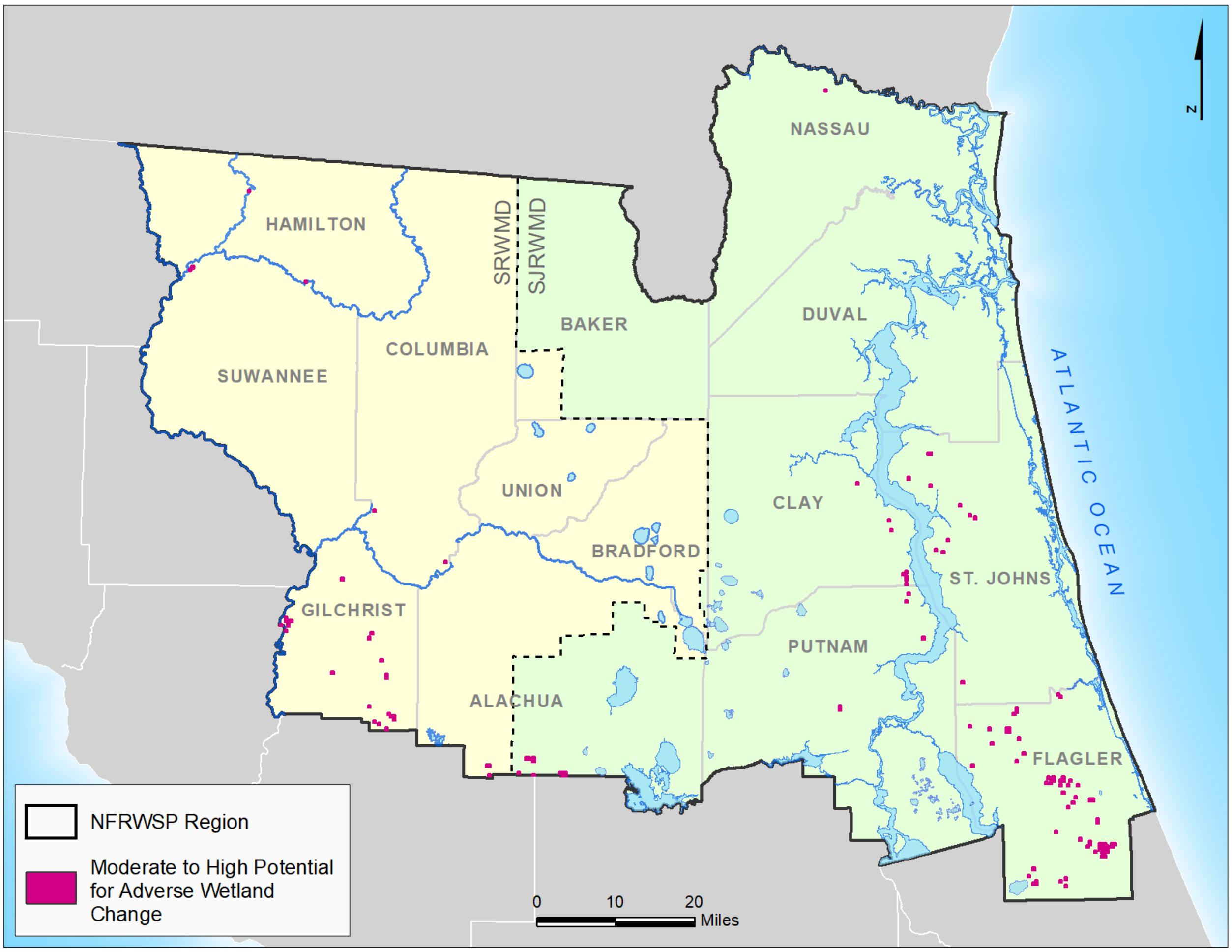

Figure H2. Locations with moderate to high potential for adverse change to wetlands

See Attachment A

2022 Kinser-Minno Wetland Assessment Tool

12/9/22 Update

Attachment A
2022 Kinser-Minno Wetland Assessment Tool

12/9/22 Update

by

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St. Johns River Water Management District
Palatka, Florida

2022

The St. Johns River Water Management District was created in 1972 by passage of the Florida Water Resources Act, which created five regional water management districts. The St. Johns District includes all or part of 18 counties in northeast and east-central Florida. Its mission is to preserve and manage the region's water resources, focusing on core missions of water supply, flood protection, water quality and natural systems protection and improvement. In its daily operations, the district conducts research, collects data, manages land, restores and protects water above and below the ground, and preserves natural areas.

This document is published to disseminate information collected by the district in pursuit of its mission. Electronic copies are available at *www.sjrwmd.com/documents/technical-reports* or by calling the district at the number below.

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St. Johns River Water Management District
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Introduction

One of the responsibilities of the St. Johns River Water Management District (District) is to conduct "resource assessments, including identification of regionally significant water resource issues and problems within the "District" (Section 62-40.520, *Florida Administrative Code).* As part of this responsibility, the District developed a geoprocessing workflow as a ModelBuilder tool, an application to create and manage geoprocessing models within ArcGIS (ESRI, 2022), in 1995 to predict the likelihood of potential adverse change to wetlands, lakes and related vegetation due to predicted groundwater level changes resulted from projected groundwater withdrawals (Kinser and Minno 1995; Kinser et al. 2003). This geoprocessing tool, also known as Kinser-Minno Geographic Information System (GIS) tool, helps guide the delineation of water resource caution areas and the formulation of project options.

The Kinser-Minno GIS tool provides an estimation of the magnitude (acres), degree (high, moderate, low), and spatial distribution of the potential for future adverse change to wetlands throughout the District. In previous District water supply assessments, the probability of adverse change in wetland functions was determined using variations of the Kinser-Minno method. The tool was updated in 2003 and 2008, which included the depth to the Upper Floridan aquifer (UFA) potentiometric surface as an additional screening parameter for the areas of unconfined UFA. Since then, the tool received many minor updates such as the inclusion of a Digital Elevation Model (DEM). The most recent version prior to this update is the 2018 Kinser-Minno model builder found in the *Vegharm2018* GIS toolbox.

The Kinser-Minno GIS tool conducts a matrix analysis utilizing conditional statements dependent on soil permeability, sensitivities of plant communities to dewatering, and projected declines in the surficial aquifer system (SAS) to estimate the potential adverse change to individual plant communities that may occur if future water demands were met with traditional sources. The additional step of incorporating the depth to the UFA potentiometric surfaces with respect to the unconfined UFA provides further analysis depending on whether the area is hydraulically connected to the UFA and therefore, would or would not be influenced by changes in UFA levels.

This report describes the recent improvements including addition of another screening parameter, the depth to water table or SAS, for the areas of confined UFA, updating soil, vegetation and topographic layers and making the thresholds adjustable within the tool. These updates are referred to as the 2022 Kinser-Minno tool.

Existing Data Review

The most recent documentation and in-depth information regarding the development of the 2018 Kinser-Minno tool was found in Appendix H of the 2022 Central Springs/East Coast (CSEC) Regional Water Supply Plan (SJRWMD 2022). District staff reviewed the tool, input data, and other documentation to determine if updates to the tool were required. The reviewed tool was referred to as *vegharm2018* in the CSEC plan and is shown in Figure 1.

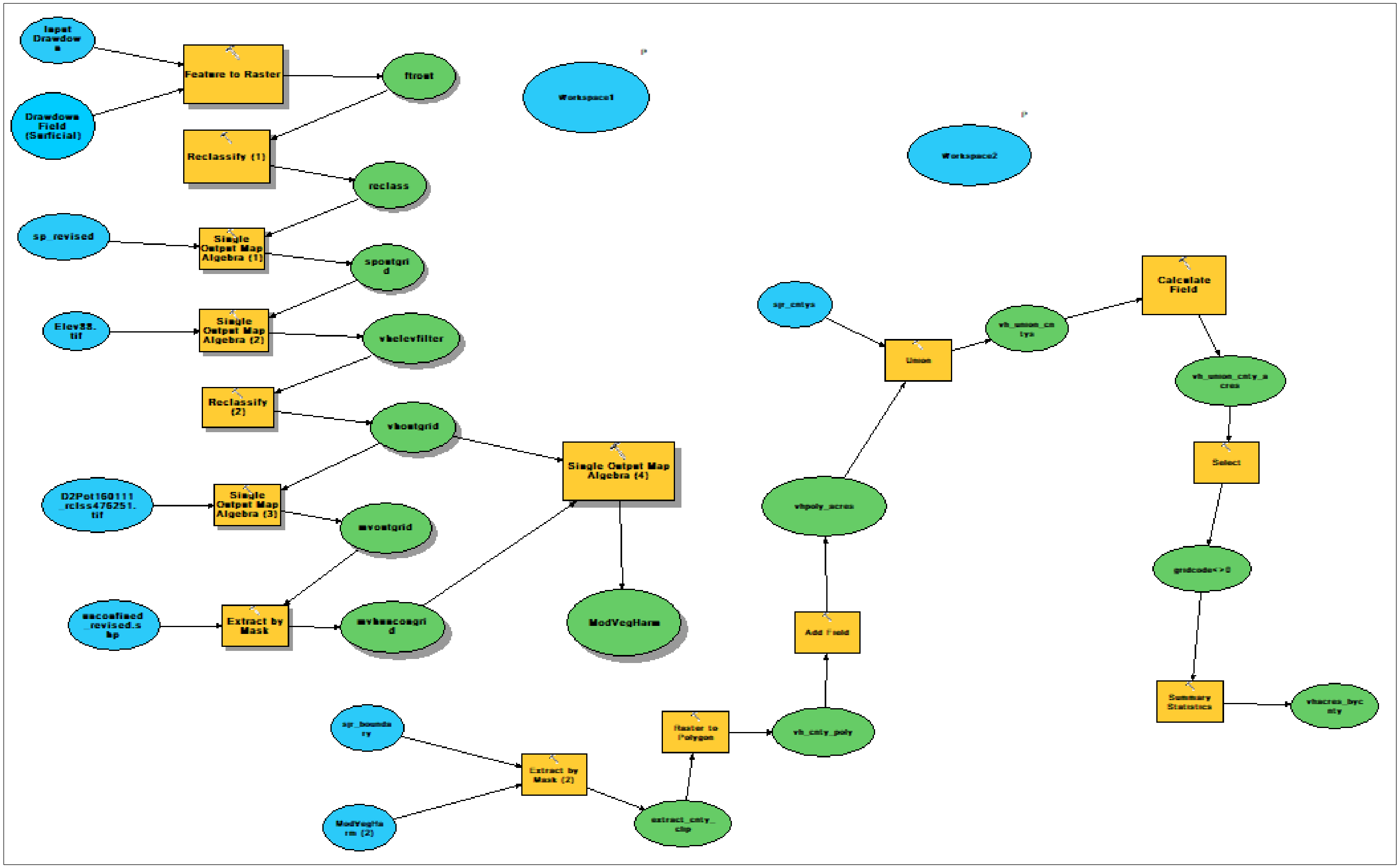


Figure 1. The 2018 Kinser-Minno model builder

The following GIS data, used in the tool listed in the CSEC Appendix H, was reviewed.

1. 2012 Soil Survey Geographic Database for Florida (SSURGO)
2. 2009 Land Cover/Land Use GIS Data Layer, SJRWMD
3. Unconfined Floridan Aquifer System Boundary, United States Geologic Survey (Miller 1986)
4. 2008 Digital Elevation Model for the State of Florida, Florida Department of Environmental Protection (FDEP)
5. May 2014 UFA Potentiometric Surface GIS Data Layer, SJRWMD

Soil Permeability Classification

The 2012 Soil Survey Geographic Database for Florida (SSURGO) was reported to be used to derive the soil permeability classification layer. Soil permeability refers to the capacity of a soil to allow water to pass through. This is a key component for assessing wetlands because it dictates how quickly an area of sensitive vegetation is dewatered when the water table declines.

The soil permeability was used to create the integrated soil and vegetation layer as an input in the workflow. The National Resources Conservation Service (NRCS) provides estimates of the inches of water per hour that can move downward through a saturated soil based on laboratory measurements. The soil permeability layer was made into a raster and then grouped into high, moderate, and low categories based on infiltration rate, as shown in Table 1.

Table 1. Soil Permeability Classification

Soil Permeability Class	Soil Permeability Rate (inches/hour)	CSEC RWSP Class
Very Slow	Less than 0.06	Low sensitivity to drawdown (1)
Slow	0.06 – 0.2	Low sensitivity to drawdown (1)
Moderately Slow	0.2 – 0.6	Low sensitivity to drawdown (1)
Moderate	0.6 – 2.0	Moderate sensitivity to drawdown (2)
Moderately Rapid	2.0 – 6.0	Moderate sensitivity to drawdown (2)
Rapid	6.0 – 20	High sensitivity to drawdown (3)
Very Rapid	Greater than 20	High sensitivity to drawdown (3)

Vegetation Classification

The SJRWMD 2009 Land Cover/Land Use GIS Data Layer was used to create the integrated soil and vegetation layer as an input in the workflow. This layer was used to identify current wetland areas to be screened for sensitivity to SAS drawdown. Areas that are not wetlands are excluded from the screening process. The layer was first made into a raster. Then, the vegetation types were classified into high, moderate, or low sensitivity as seen in Table 2.

Table 2. Classification of Sensitive Vegetation Types

Land Use Code	**CSEC RWSP Class** 1 = Low Sensitivity 2 = Moderate Sensitivity 3 = High Sensitivity
4100: Upland Coniferous Forests	1
4110: Pine Flatwoods	1
4120: Longleaf Pine - Xeric Oak	1
4130: Sand Pine	1
4140: Pine - Mesic Oak	1
4190: Hunting Plantation Woodlands	1
4200: Upland Hardwood Forests	2
4210: Xeric Oak	1
4270: Live Oak	1
4271: Oak - Cabbage Palm Forests	1
4280: Cabbage Palm	2
4340: Upland Mixed - Coniferous / Hardwood	2
4400: Tree Plantations	1
4410: Coniferous Plantations	2
4420: Hardwood Plantations	1
4430: Forest Regeneration Areas	2
6100: Wetland Hardwoods Forests	3
6110: Bay Swamps	3
6111: Bayhead	3
6120: Mangrove Swamps	1
6130: Gum Swamps	3
6140: Titi Swamps	3
6150: Stream and Lake Swamps (bottomland)	3
6170: Mixed Wetland Hardwoods	3
6172: Mixed Shrubs	3
6180: Cabbage Palms	3
6181: Cabbage Palm Hammock	3
6182: Cabbage Palm Savannah	3
6200: Wetland Coniferous Forests	3
6210: Cypress	3
6215: Cypress- Domes/Heads	3

Land Use Code	CSEC RWSP Class 1 = Low Sensitivity 2 = Moderate Sensitivity 3 = High Sensitivity
6216: Cypress - Mixed Hardwoods	3
6220: Pond Pine	3
6240: Cypress - Pine - Cabbage Palm	3
6250: Hydric Pine Flatwoods	3
6260: Pine Savannah	3
6300: Wetland Forested Mixed	3
6400: Vegetated Non-Forested Wetlands	3
6410: Freshwater Marshes	3
6411: Freshwater Marshes – Sawgrass	3
6420: Saltwater Marshes	1
6430: Wet Prairies	3
6440: Emergent Aquatic Vegetation	3
6460: Mixed Scrub-shrub Wetland	3
6500: Non-Vegetated Wetlands	3
6510: Tidal Flats	1
6520: Shoreline	1
6530: Intermittent Ponds	3
6600: Salt Flats	1

Integrated Soil and Vegetation

The classified soil and classified vegetation layers were integrated to create a single raster file to be used as an input into the workflow. This method is shown in Table 3.

This layer assigns sensitivity ranks to vegetation communities that have high sensitivity to water table drawdown, which is the wetlands (Table 3).

Table 3. Potential for Wetland Change Classification (Integrated Soil Permeability and Vegetation Type Sensitivity)

	High Vegetation Sensitivity	Moderate Vegetation Sensitivity	Low Vegetation Sensitivity
High Soil Permeability	High	Low	Low
Moderate Soil Permeability	Moderate	Low	Low
Low Soil Permeability	Low	Low	Low

Drawdown and Potential for Wetland Change Classification in Unconfined Areas

Regional groundwater models are used to predict change in the SAS elevation (drawdown). The drawdown shapefile is rasterized and then reclassified as follows; greater than 1.2 ft as a 3 (high), 0.35 to 1.2 ft as a 2 (moderate), and less than 0.35 ft as a 1 (low). The integrated soil and vegetation classification layer and the projected drawdown in the SAS were combined into a layer for potential future wetland change classification (Table 4).

Table 4. Potential Future Wetland Change Classification (Confined) (Integrated Potential for Wetland Change and Projected SAS Drawdown

	High Potential for Wetland Change	Moderate Potential for Wetland Change	Low Potential for Wetland Change
Projected SAS Drawdown > 1.2 ft	High	High	Low
Projected SAS Drawdown from 0.35 – 1.2 ft	High	Moderate	Low
Projected SAS Drawdown < 0.35 ft	Low	Low	Low

Depth to Unconfined Aquifer

Within the areas where the UFA is unconfined or exposed at the surface, the depth from land surface to the 2014 potentiometric surface was calculated. The depth from land surface to the potentiometric surface layer is combined with the potential for wetland change layer (Table 5) to determine changes to wetlands in areas where the UFA is unconfined.

Table 5. Potential Future Wetland Change Classification above the Unconfined UFA (Integrated Potential for Future Change for Confined Areas and Depth to the Unconfined UFA) (Kinser and Minno 2003)

	High Potential for Future Change	Moderate Potential for Future Change
0 – 15 ft to Unconfined UFA	High	Moderate
15 – 30 ft to Unconfined UFA	Moderate	Low
>30 ft to Unconfined UFA	Low	Low

Output

The final output of these combined layers was a raster file titled *modvegharm*. This file shows the areas for potential adverse change to wetland function with respect to drawdown. Areas that are classified as three have the highest potential for adverse change while areas classified as one have the lowest potential for adverse change (Table 6). This raster output is put into the second portion of the model builder.

The second portion of the tool uses the SJRWMD boundary and the county boundaries to determine the acreage in each county for each classification. The output from the second portion of the tool is presented in a geodatabase table.

Table 6. Classification of the potential for adverse wetland change (Kinser and Minno, 1995)

Potential for Adverse Change	Description
Low (1)	Plants are drought tolerant or the soils are not susceptible to dewatering
Moderate (2)	Plants are moderately sensitive to drought or the soils are only moderately susceptible to dewatering
High (3)	Plants are drought sensitive and the soils are susceptible to dewatering

Tool Updates

After completing a thorough review of the tool that was presented in the 2022 CSEC Appendix H, SJRWMD determined updates were needed, including an additional screening parameter to further refine the results to better determine which wetlands had the highest potential for adverse change due to future groundwater drawdown. The section below outlines the updates that were made to the 2018 tool version.

Data Updates

As shown in Table 7, the soils data, vegetation layer, and DEM were updated. The soils and vegetation classifications were unchanged and are still grouped based on infiltration rate (high, moderate, low). The new soils and the vegetation layer were integrated to create the new input (Figure 2).

Table 7. GIS Data Updates Made to the Kinser-Minno Tool

	2018 Model	2022 Model
SSURGO Soils	2012 SSURGO soils	2017 SSURGO soils layer
Vegetation Layer	2009 Statewide Cooperative Land Cover	Compilation of of datasets 2019-2020 SRWMD and 2013-2016 SJRWMD
DEM	2008 Florida DEM	15m Florida DEM

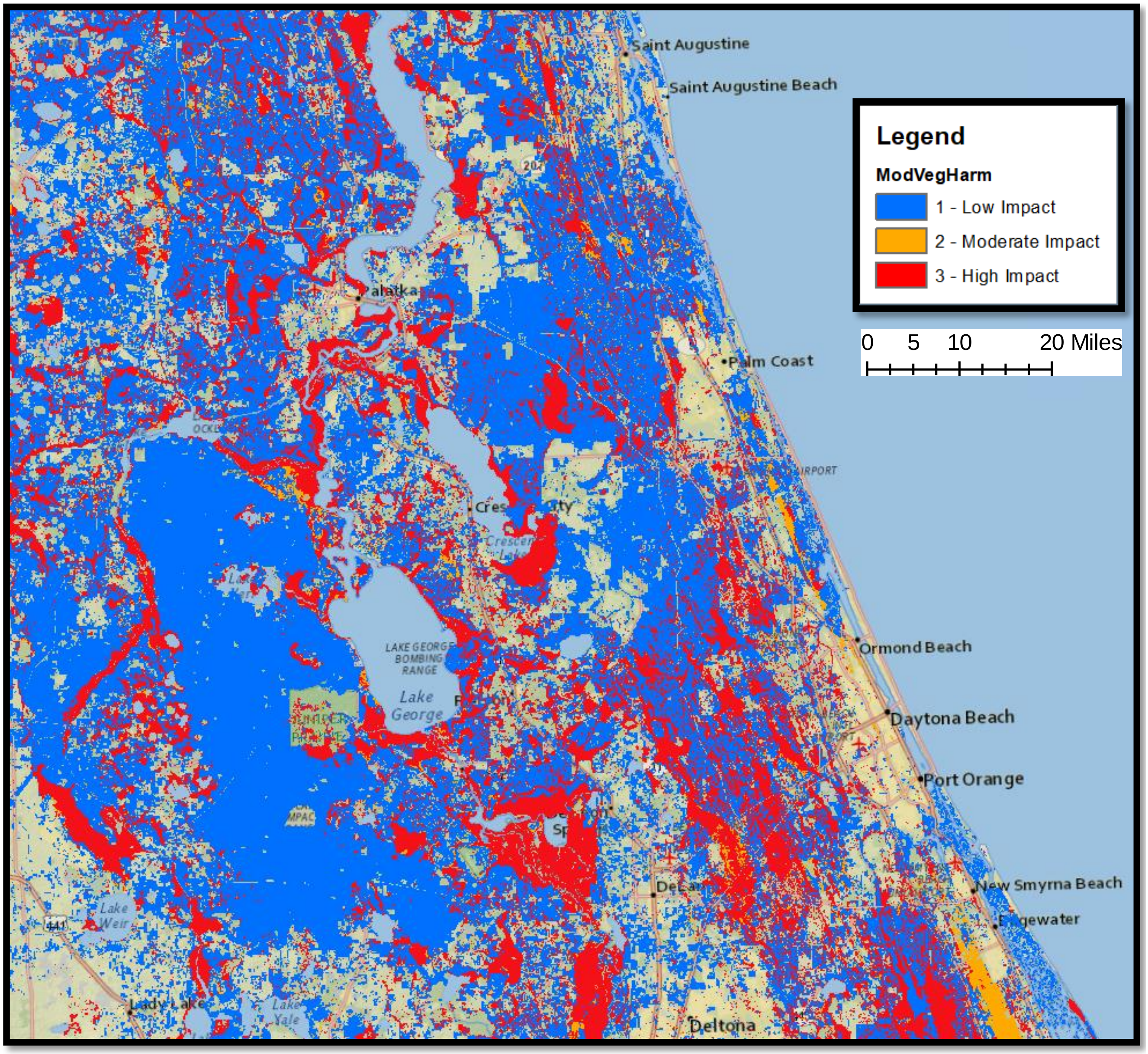


Figure 2. A portion of the District showing the updated integrated soils and vegetation layer. Three indicates high potential for adverse change to wetlands, two for moderate potential, and one for low potential.

Depth to Water Table Update

The 2022 Kinser-Minno tool incorporated an additional screening parameter for the areas where the UFA is confined. Wetland vulnerability was further classified based on depth to water table or SAS (Table 8). This additional step of incorporating the depth to water table in the areas of confined UFA provides further screening to ensure the area is hydraulically connected to the SAS and therefore, would or would not be influenced by changes in SAS levels. The depth to water table used in this analysis was calculated using the simulated SAS levels from the 2009 simulation of North Florida Southeast regional groundwater model (NFSEG v1.1).

Vulnerability classes of High, Moderate and Low were set based on a review of extinction depths for different soil and land cover types estimated by Shah et al. (2007). Vulnerability thresholds of "Moderate" and "High" are set for sites where the water table is below 20 and 10 ft, respectively.

Vulnerability classes are also different for wetlands with high versus moderate potential for future change based on other criteria (i.e., soil permeability and vegetation type; Table 8). A feature was added to the workflow to allow users to adjust the depth to water table threshold.

Table 8. Potential Future Wetland Change Classification above the Confined UFA (Integrated Potential for Future Change for Confined Areas and Depth to water table)

	High Potential for Future Change	Moderate Potential for Future Change
0 – 10 ft to Water Table	High	Moderate
10 – 20 ft to Confined UFA	Moderate	Low
>20 ft to Confined UFA	Low	Low

2022 Kinser-Minno Workflow

Figure 3 shows the 2022 updated Kinser-Minno tool, which includes the updated soils data, vegetation layer, DEM, and depth to water table. This tool used the drawdown shapefile to create a raster. The raster is reclassified, which means having the values grouped, into three classes. These three classes are the basis for the computations in the model. The rasterized drawdown layer is then combined with the integrated soils and vegetation raster which is also reclassified into three classes. The two are combined based on a conditional statement to create a new output raster. This new output is then combined with the digital elevation data (DEM) to remove areas of 10ft or less.

This process step is where the tool branches off into two sections. One section is for the unconfined aquifer. This portion reclassifies the depth to the UFA potentiometric surfaces. The other section is for the confined aquifer. This portion of the workflow reclassifies the depth to water table (surficial aquifer). After each of these layers are reclassified within their respective areas, they are merged based on a conditional statement to create a raster layer that depicts the areas with potential for adverse wetland change. The output raster goes into the next portion of the model builder, which takes the potential for adverse wetland change raster, and creates a table that calculates the acreage of the potential for adverse wetland change (high, moderate, low) within each county in the area of interest.

Results

The North Florida Regional Water Supply Plan was the first project for which the updated tool was utilized. The tool utilized the output from the NFSEG v1.1 model simulation. The Kinser-Minno tool results include the updated soils, vegetation, DEM inputs and depth to water table. Table 9 shows the results for utilizing the Pumps Off (PO) to 2045 pumping scenario results as input to the 2022 Kinser-Minno tool. Figure 4 displays the results of the scenario.

Table 9. Comparison of the results for acres of potential adverse wetland change for each county in the of the NFRWSP region. The results are for the PO to 2045 NFSEG shapefile.

County	Low	Moderate	High	Moderate/High
Alachua	103,618	540	247	787
Baker	2,273	0	0	0
Bradford	1,937	0	0	0
Clay	38,545	1,544	371	1,915
Columbia	42,656	62	62	124
Duval	27,964	0	0	0
Flagler	133,114	7,413	432	7,846
Gilchrist	76,807	1,050	1,473	2,523
Hamilton	26,101	424	758	1,182
Nassau	35,662	62	0	62
Putnam	114,352	2,222	185	2,408
St. Johns	98,782	1,114	494	1,608
Suwannee	108,109	317	1,034	1,351
Union	3,478	0	0	0
Total	813,397	14,950	5,251	20,201

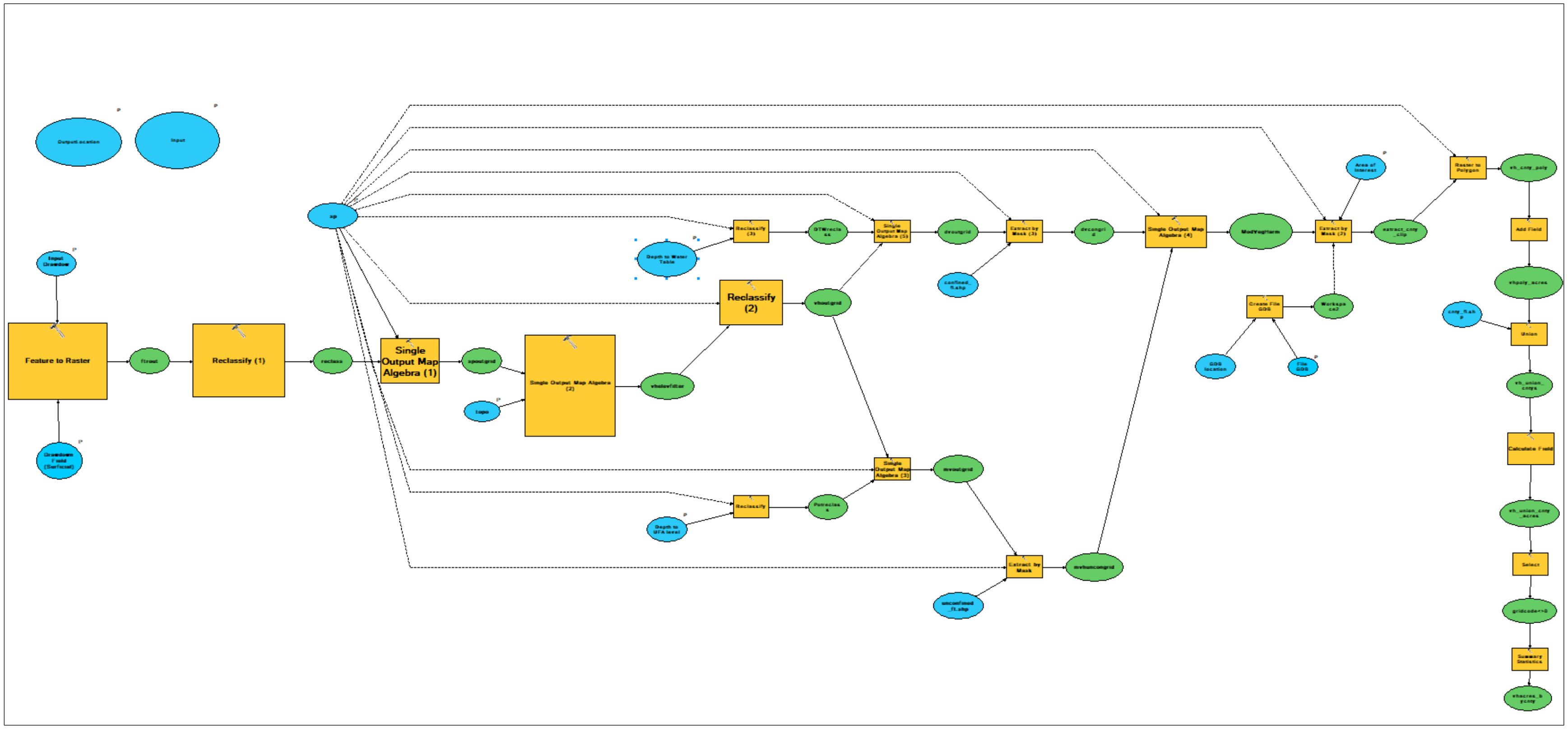
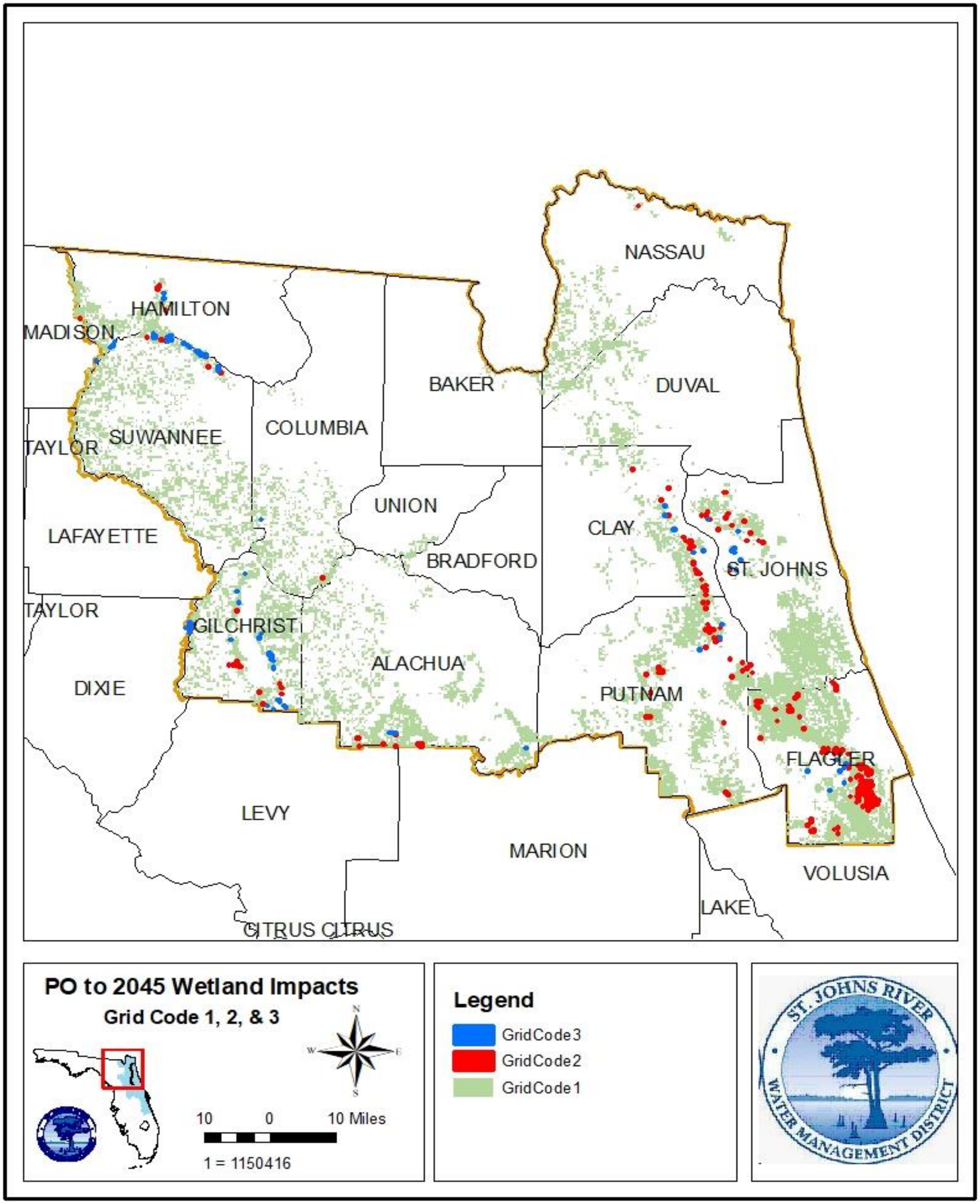


Figure 3. The updated 2022 Kinser-Minno Model Builder.

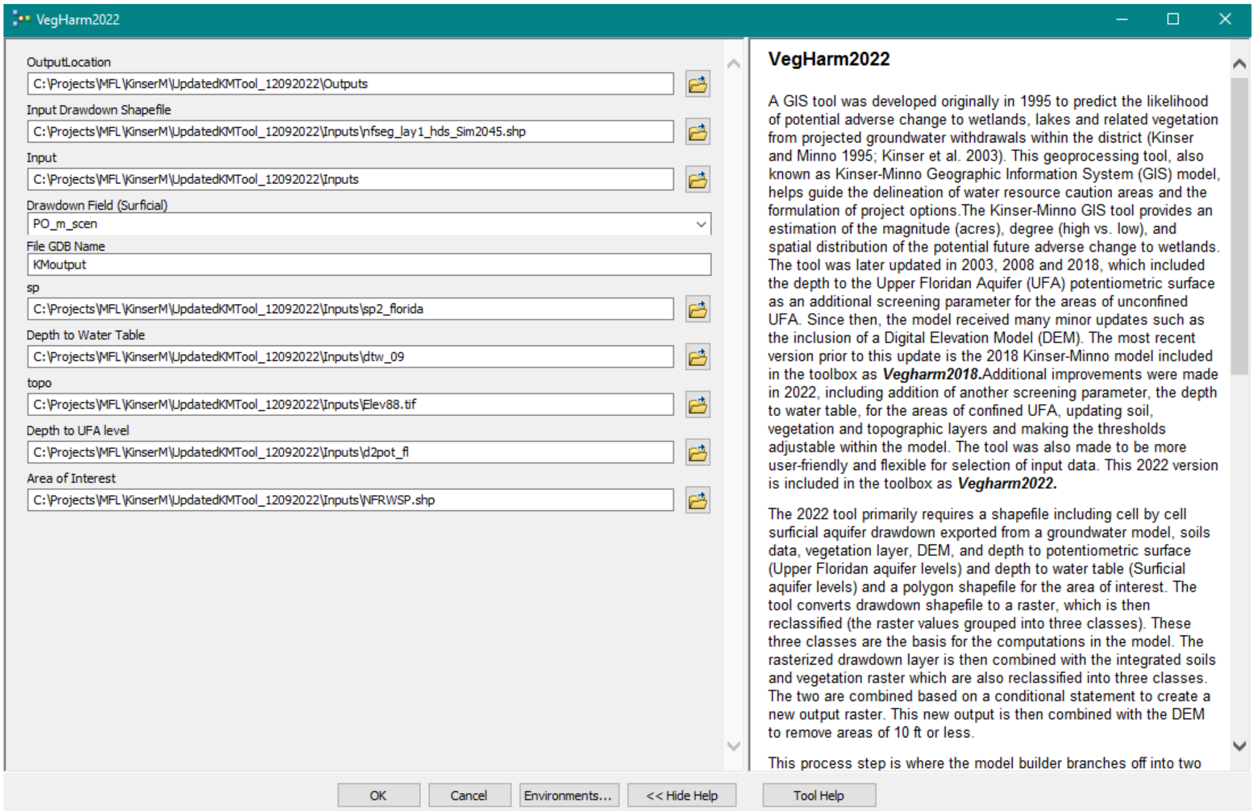


Author:, Source:C:\WetlandHarmModel\FGordu\VegHarmAnalysis\KM_Tool.mxd, Time:12/20/2022 11:38:24 AM

Figure 4. PO to 2045 Potential for Adverse Wetland Change (PO to 2045 NFSEG drawdown shapefile for the NFRWSP area) (Note: GridCode 1= Low; GridCode 2=Moderate; GridCode 3= High).

Kinser Minno Wetland Assessment Tool 2022 12/9/22 Revision

1. Open KM Tool.mxd
2. Add “KMVegharm2022.tbx” to Arctoolbox if it is not already there.
3. Activate spatial analyst extension if it is not already active.
4. Double click “VegHarm2022”. The following window will pop up.



5. Enter the output folder location where the results will be stored. You can create your own folder or use “Outputs” folder already created.
6. Enter the surficial aquifer system (SAS) drawdown file location. The SAS drawdown from NFSEG model already exists in the input folder.
7. Enter the input folder location. This folder already exists so you just need to put the path there.
8. Choose the SAS drawdown scenario. For NFRWSP, *PO_m_scen* is for pumps off minus 2045 and CP*_m_scen* is Current Pumping minus 2045 in “*nfseg_lay1_dd_nfrwsp.shp*”.
9. Enter the name of the output geodatabase file the tool will create and save into output folder. You can keep the name as it is or change it if you want.
10. Enter soil permeability layer location. This layer already exists in the input folder. Change it if you want to use a different one.
11. Enter depth to water table layer location. This layer already exists in the input folder. Change it if you want to use a different one.
12. Enter DEM location. This layer already exists in the input folder. Change it if you want to use a different one
13. Enter depth to UFA level layer location. This layer already exists in the input folder. Change it if you want to use a different one

14. Enter the location of a shapefile including the area of interest. NFRWSP region layer already exists in the input folder. Change it if you want to run the tool for a different area
15. Hit OK.
16. Once it is successfully run, add the output files stored in the output gdb file into the mxd.

Important Note

Due to the way the screening criteria are applied, the input SAS drawdowns should be based on pumps off condition. The tool will not correctly predict the likelihood of potential adverse change to wetlands from projected groundwater withdrawals if drawdowns are calculated using a baseline other than pumps-off condition. If a different baseline is desired, the following steps should be followed:

For example, assume the prediction of likelihood of potential adverse change to wetlands from 2020 to 2045 is desired:

1. Run the tool using the drawdown from pumps-off to 2020 (2020 results)
2. Run the tool using the drawdown from pumps-off to 2045 (2045 results)
3. Calculate the difference between the 2045 results and the 2020 results

Disclaimer

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Appendix I

Resiliency Assessment

Purpose

The Districts conducted a planning level assessment to determine if fresh water supplies in the NFRWSP area are constrained or likely to become constrained due to flooding from sea level rise (SLR) throughout the planning horizon.

Methodology

Based on guidance established by the Resilient Florida Grant Program (section 380.093, F.S.), this assessment evaluated the effects of both intermediate-low and intermediate-high SLR projections reported by the National Oceanic and Atmospheric Administration (NOAA) for the year 2050 (Sweet et al. 2017). The University of Florida (UF) GeoPlan Center developed a model to map NOAA's SLR projections by county in the state of Florida, which added the projected increase in sea levels for a range of scenarios to mean higher-high water (MHHW) conditions (UF GeoPlan Center 2020). Only coastal counties or counties with tidally influenced surface waterbodies were represented by the model, which included Clay, Duval, Flagler, Nassau, Putnam, and St. Johns counties in the NFRWSP area. The GeoPlan Center's model indicated that across the NFRWSP area, SLR projections range from 0.8 to 1.0 ft and 1.9 to 2.1 ft for the intermediate-low and intermediate-high projections, respectively. In the NFRWSP area, the intermediate-low projection represents an average of 1.0 ft of SLR, and the intermediate-high projection represents an average of 2.1 ft of SLR. This assessment used the GeoPlan Center's hydro-connectivity inundation model and excluded isolated inundated areas that were not hydrologically connected to an ocean or bay via a major waterway.

Using geographic information systems (GIS) software, the spatial extent of surface inundation for the intermediate-low and intermediate-high SLR scenarios was intersected with the locations of current water treatment plants (WTP), wastewater treatment plants (WWTP), and permitted consumptive use permit (CUP) wells to determine potential constraints posed by SLR. For any infrastructure that directly intersected with the inundation surfaces, site-specific information was gathered and summarized to assist with the development of any necessary water supply development (WSD) or water resource development (WRD) project. It should be noted, each county in the region is developing a vulnerability assessment (VA) of critical infrastructure that includes WTPs and WWTPs. These VA's will be completed in the coming years and will provide a more detailed analysis of each facility.

Results

In the NFRWSP area, eight CUP wells may be affected by flooding due to SLR based on the intermediate-low projection of SLR. This includes one Commercial/Industrial/Institutional (CII) well in Nassau County, three Public Supply (PS) wells and one Agricultural (AG) well in Putnam County, and two CII wells and one Environmental (ENV) well in St. Johns County (Tables I1-I3; Figure I1).

Eleven additional CUP wells (for a total of 19 CUP wells) one WWTP, and two WTPs are likely to be flooded based on the intermediate-high projection of SLR. This includes one PS and one Landscape/Recreational (LR) well in Duval County, three additional CII wells in Nassau County, one additional PS well and three AG wells in Putnam County, and two LR wells in St. Johns County. Two WTPs, one in Flagler County and the other in Nassau County, and one WWTP located in Putnam County may also be flooded (Tables I1-I3; Figures I2-I7). No water supply infrastructure is potentially affected in Clay County. Site-specific information will be used to determine the need for WSD or WRD projects to mitigate or prevent adverse impacts caused by projected SLR.

Table I1. Potentially impacted wells at the intermediate-low and intermediate-high projections of SLR

County	Use Type	Status	Permit ID	Station ID
Nassau	CII	Active	50077	11379
Putnam	PS	Active	1627	13928
Putnam	PS	Active	1627	23227
Putnam	PS	Active	1627	23228
Putnam	AG	Active	7903	13557
St. Johns	CII	Active	1236	14863
St. Johns	CII	Active	1236	14862
St. Johns	ENV	Active	1358	33638

Table I2. Potentially impacted wells at the intermediate-high projection of SLR

County	Use Type	Status	Permit ID	Station ID
Duval	PS	Active	88271	6105
Duval	LR	Active	622	35357
Nassau	CII	Active	915	11393
Nassau	CII	Active	50077	11379
Nassau	CII	Active	955	34766
Nassau	CII	Active	955	11483
Putnam	PS	Active	1627	13928
Putnam	PS	Active	1627	23227
Putnam	PS	Active	1627	23228
Putnam	PS	Active	1627	23226
Putnam	AG	Active	7903	13557
Putnam	AG	Inactive	7963	13706
Putnam	AG	Inactive	7963	13705
Putnam	AG	Inactive	7963	13701
St. Johns	CII	Active	1236	14863
St. Johns	CII	Active	1236	14862
St. Johns	LR	Proposed	83274	34541
St. Johns	ENV	Active	1358	33638
St. Johns	LR	Active	38	5984

Table I3. Potentially impacted water and wastewater treatment infrastructure at the intermediate-high projections of SLR

County	Facility Type	Status	Facility ID
Flagler	WTP	Active	2184250
Nassau	WTP	Active	2454319
Putnam	WWTP	Active	FL0043176

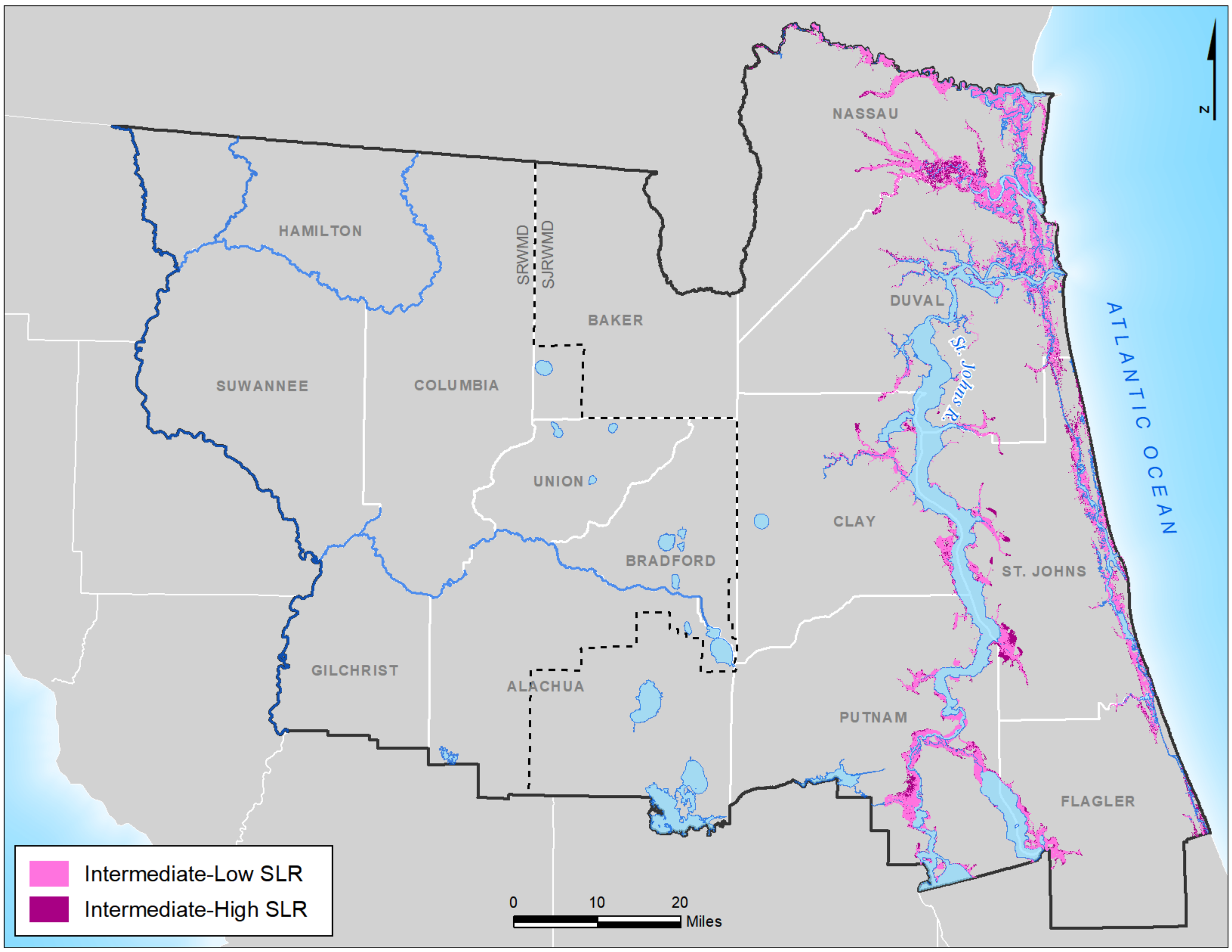

Figure I1. Map of projected SLR inundation surfaces in the NFRWSP area

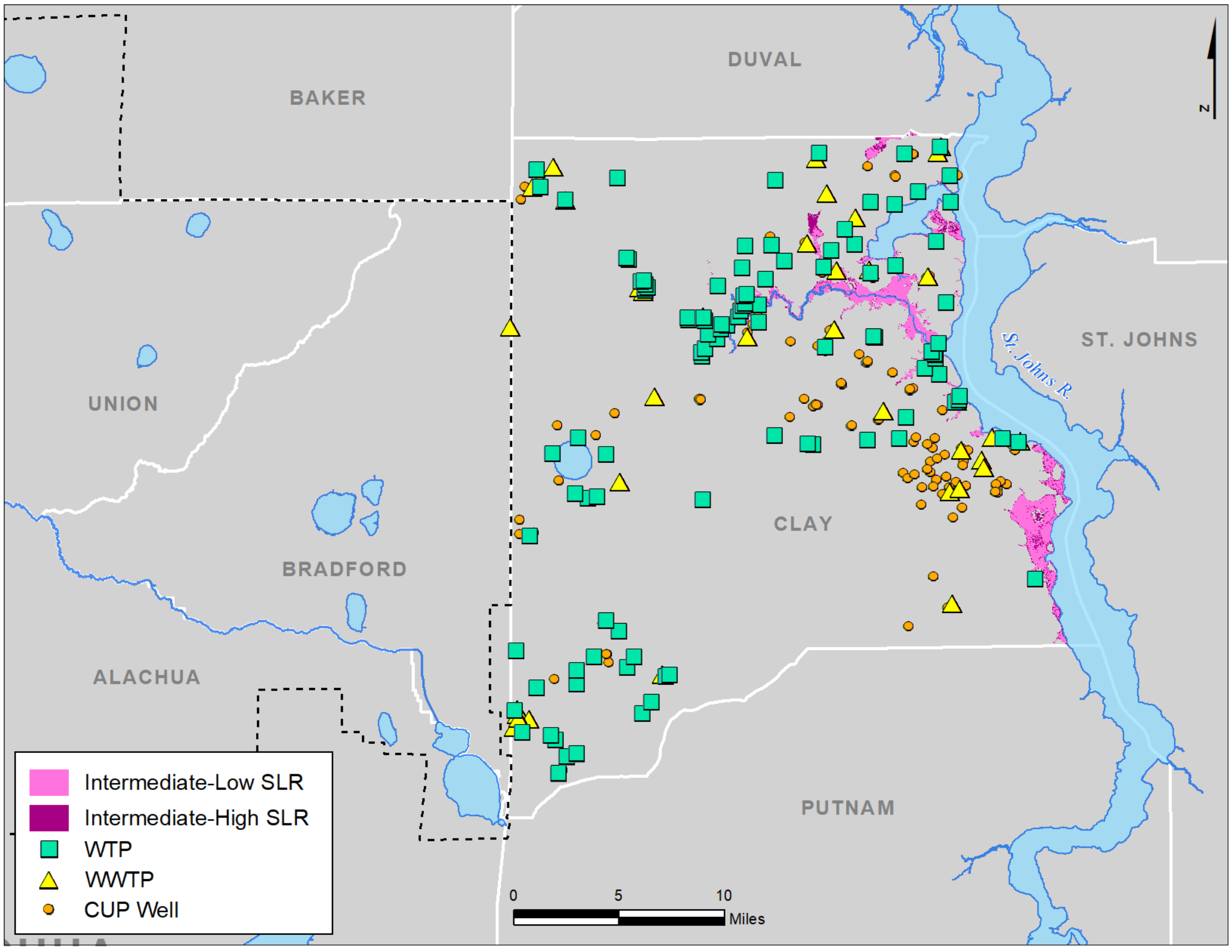

Figure I2. Map of projected SLR inundation surfaces and water supply infrastructure in Clay County

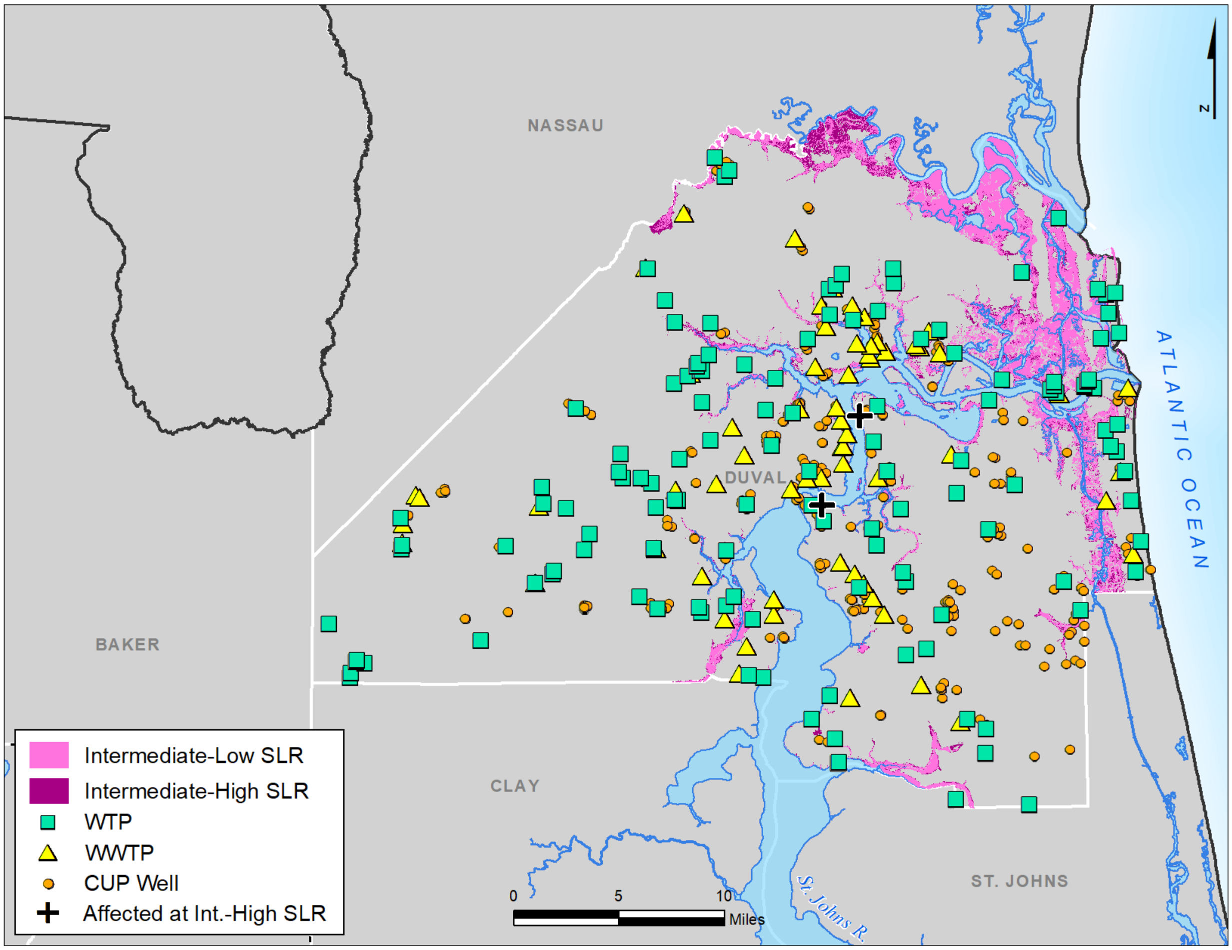

Figure I3. Map of projected SLR inundation surfaces and water supply infrastructure in Duval County

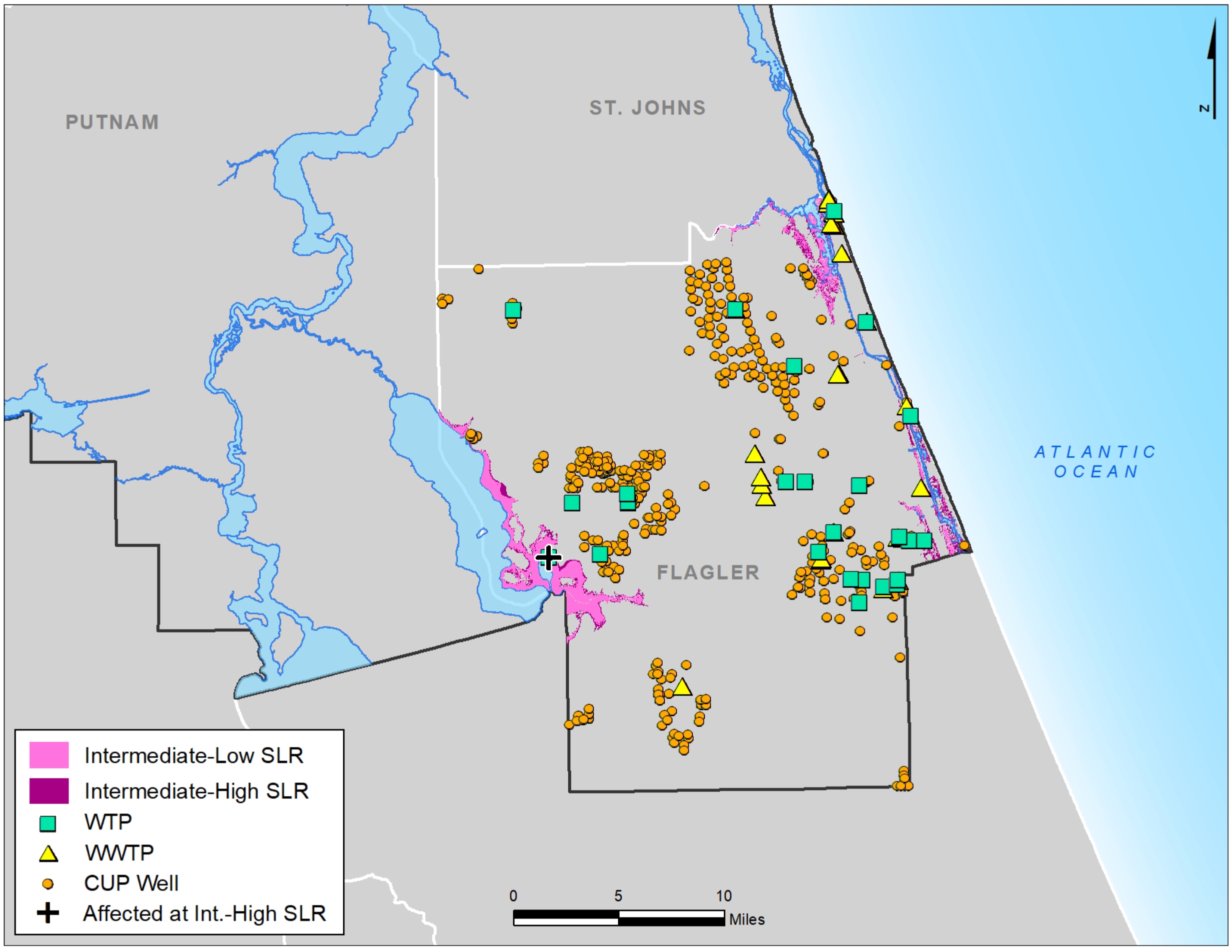

Figure I4. Map of projected SLR inundation surfaces and water supply infrastructure in Flagler County

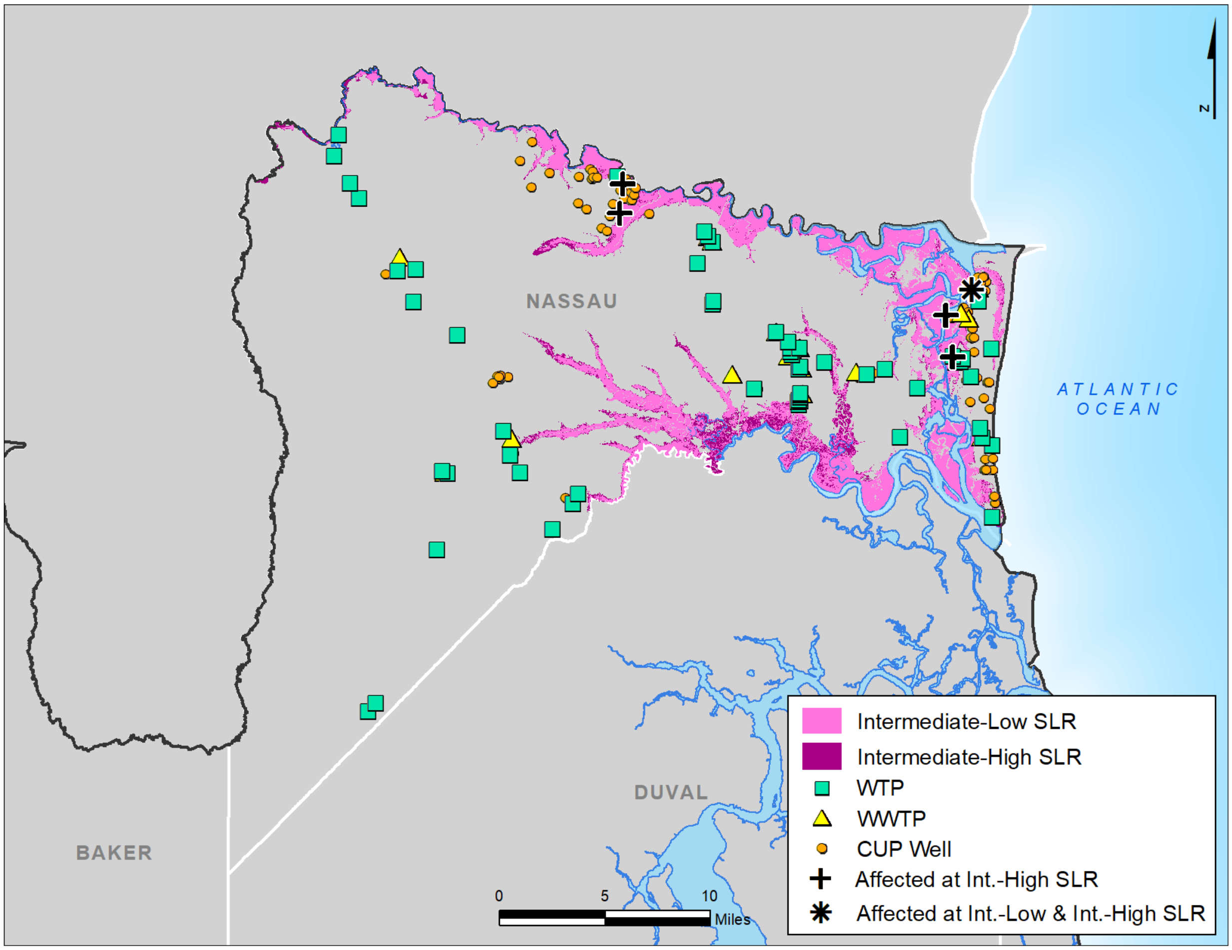

Figure I5. Map of projected SLR inundation surfaces and water supply infrastructure in Nassau County

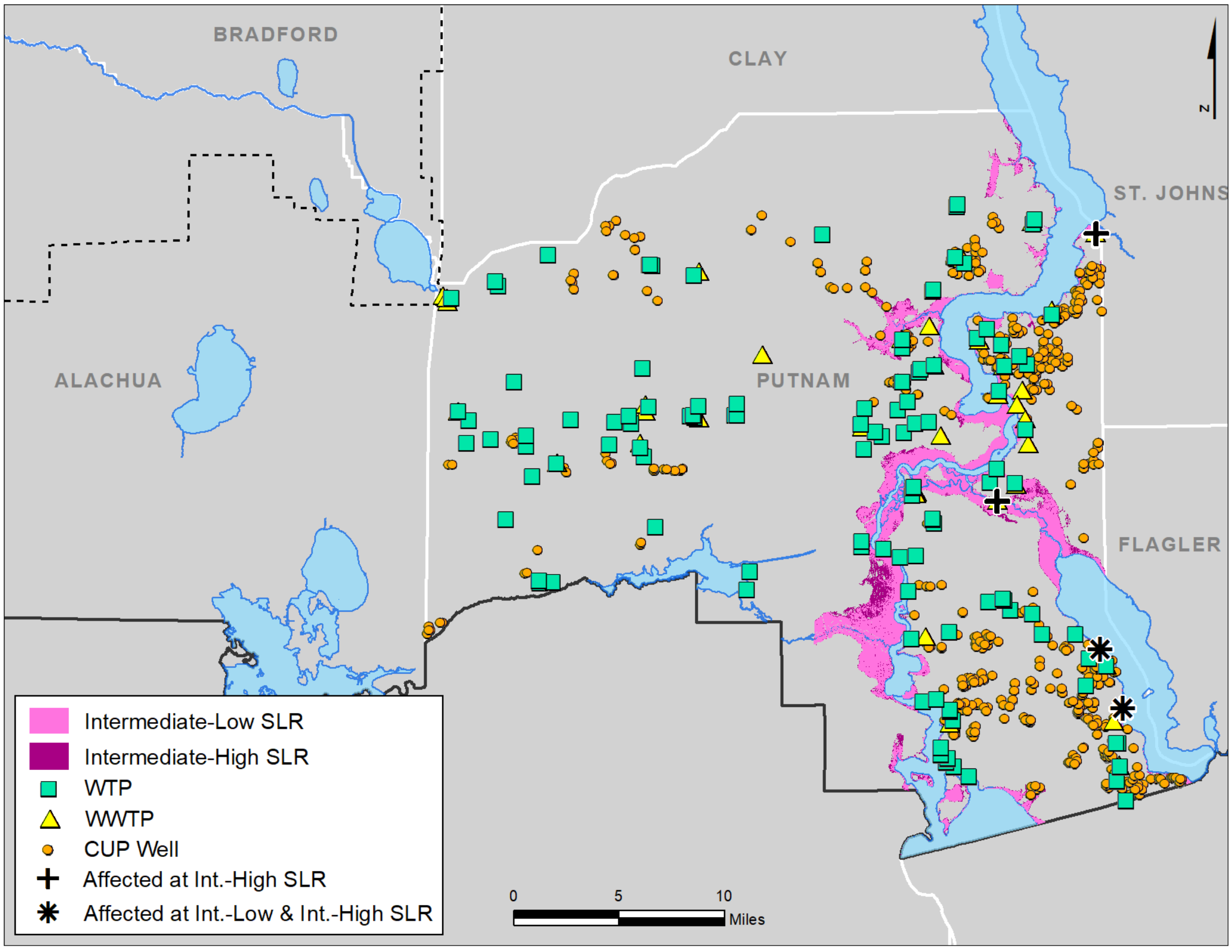

Figure I6. Map of projected SLR inundation surfaces and water supply infrastructure in Putnam County

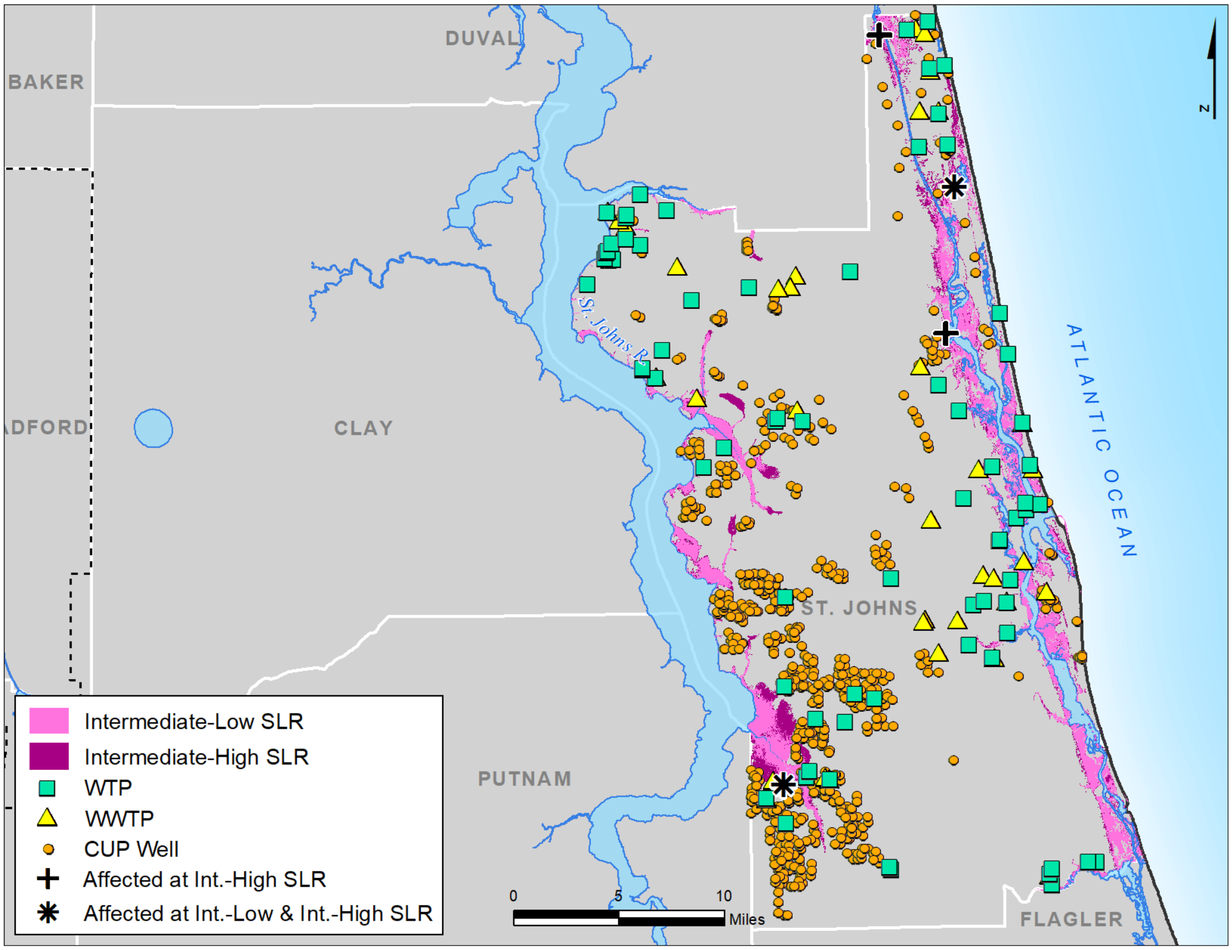

Figure I7. Map of projected SLR inundation surfaces and water supply infrastructure in St. Johns County

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Appendix J

Land Reclamation Assessment

Introduction

Mining sites provide an opportunity for water supply development (WSD) or water resource development (WRD) projects through the process of land reclamation (paragraph 373.709(2)(j), F.S.). These projects may help meet future water supply demands or assist in meeting the goals of MFL prevention or recovery strategies.

Methodology

The Districts completed an analysis, using geographic information system (GIS) software, that identified current mining sites in the planning area by compiling the spatial coverage from three Florida Department of Environmental Protection (DEP) sources. These sources included the Florida Statewide Land Use-Land Cover (DEP, 2022b), Mandatory Phosphate Boundaries 2019 (DEP, 2021) Mandatory Non-Phosphate (DEP, 2022a) datasets. Spatial coverage for these layers was restricted to the NFRWSP area.

First, the spatial data layers were projected, if necessary, to the Florida State Plane coordinate reference system (EPSG:2883) for consistency in geoprocessing. Land use data was then filtered to include only land use codes associated with mining activities (Table J1). Next, the processed land use and mandatory non-phosphate layers were combined into a single layer, and instances of redundant spatial overlap were eliminated. The results were exported to a spreadsheet and processed to summarize the acreage results by county.

Table J1. Selected land use codes related to mining activities in Florida

Land Use Code	Description
1530	Mineral Processing
1531	Clays
1532	Phosphate
1533	Limerock
1534	Magnesia
1535	Heavy Minerals
1600	Extractive
1610	Strip Mines
1611	Clays
1612	Peat
1613	Heavy Minerals
1620	Sand and Gravel Pits
1630	Rock Quarries
1631	Limerock
1632	Dolomite
1633	Phosphate
1634	Heavy Minerals
1650	Reclaimed Lands

Land Use Code	Description
1670	Abandoned Mining Lands
7420	Borrow Area (Borrow Pit)

Results

In summary, 112,823 acres of mining area were identified in the planning area (Table J2; Figure J1). Clay County had the largest total mining land area (36,545 ac; 32%) and Union County has the least total area (73 ac; <1%). Mining sites will be evaluated, as needed, in areas where WSD or WRD projects may provide an improvement in water availability in the basin and do not cause adverse impacts to water resources in the basin.

Table J2. Mining parcel area by county in the NFRWSP area

County	Mining Area (acres)
Alachua	4,885
Baker	9,353
Bradford	9,628
Clay	36,545
Columbia	529
Duval	1,236
Flagler	481
Gilchrist	220
Hamilton	34,944
Nassau	96
Putnam	11,815
St. Johns	773
Suwannee	2,245
Union	73
Total	**112,823**

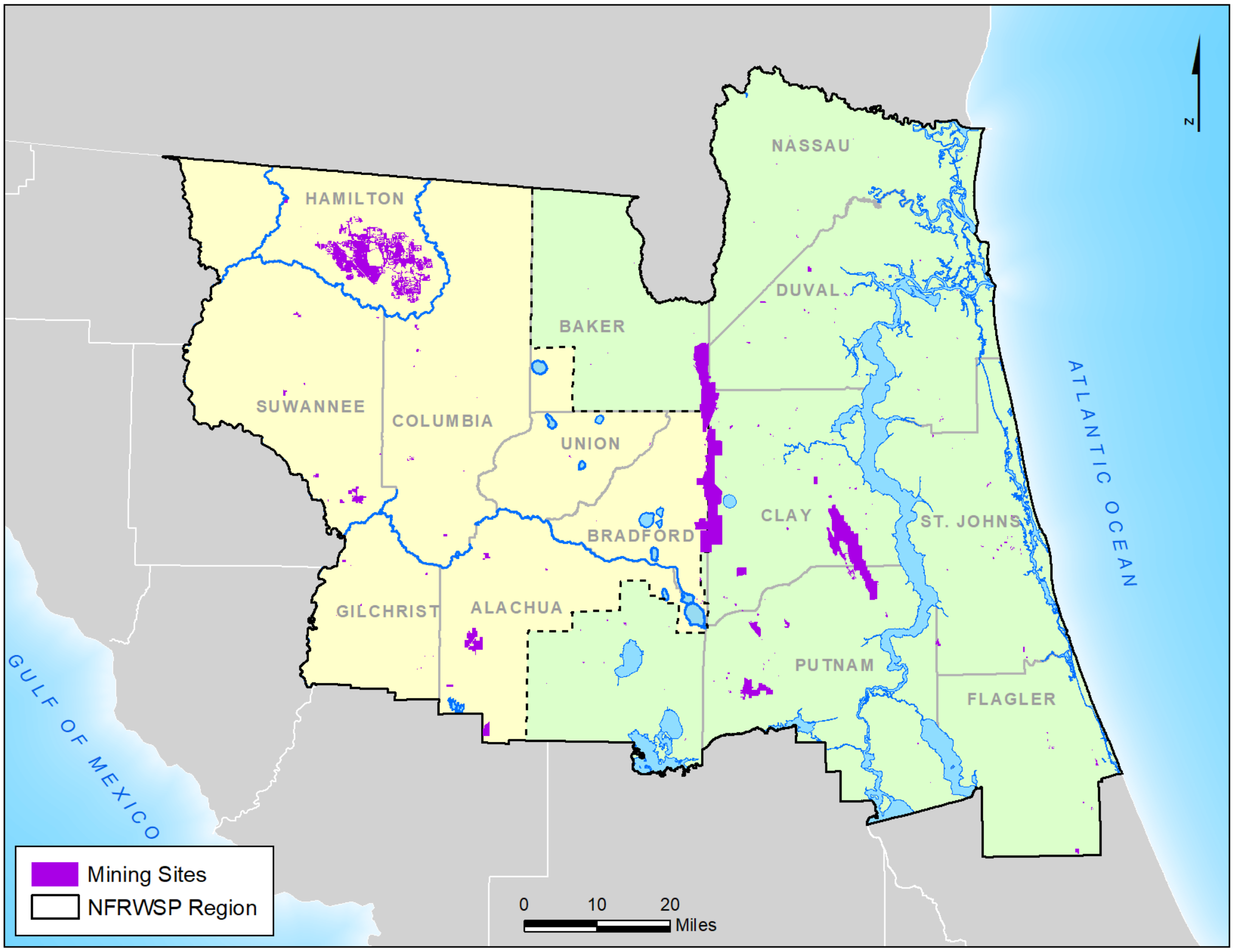

Figure J1. Mining sites in the NFRWSP area

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Appendix K

Project Options

Introduction

This appendix provides a list of 99 potential water supply development (WSD), water resource development (WRD), and water conservation project options for the NFRWSP area, as well as 19 conceptual project options. The project options listed include projects that were still in progress from the 2017 NFRWSP and new projects identified by the Districts or submitted by stakeholders. The Districts solicited new projects from area water users via targeted letters to municipalities and permittees, stakeholder email lists, and press releases. A standard project submittal form or project submittal portal was made available to ensure consistent submittals from SJRWMD and SRWMD stakeholders, respectively.

There are 52 WSD projects with a total estimated benefit of 92.4 mgd and a total estimated cost of $1,061.4 million. For WRD projects, there are 23 projects with a total estimated benefit of 51.2 mgd and a total estimated cost of approximately $1,152.2 million. Additionally, the 24 water conservation projects are estimated to have a total estimated benefit of 16.8 mgd, incurring a total estimated cost of $57.5 million. This appendix also includes 19 conceptual projects, where the estimated benefit and cost are yet to be determined (TBD). Overall, these project options offer a comprehensive approach to water management and supply, providing 118 projects that lead to an estimated total benefit of 160.4 mgd and an estimated total cost of $2,271.1 million. There are sufficient project options for the development of water supplies to meet future demand while sustaining the natural systems in the NFRWSP area through 2045.

Projects options are arranged by project category:

- Water Supply Development (Figure K-1 and Table K-2)
- Water Resource Development (Figure K-2 and Table K-2)
- Water Conservation (Figure K-3 and Table K-3)
- Conceptual (Table K-4)

The locations of projects are not exact but are in general areas where projects were submitted. Some projects do not yet have locations assigned; therefore they are not mapped. Indirect Potable Reuse (IPR) projects are shown at the location of the proposed IPR plant since the location of UFA recharge has not yet been determined.

Within each project category, projects are organized by project type. The SJRWMD projects from the 2017 NFRWSP are numbered as “2017” followed by a project number. Any new SJRWMD projects for this 2023 NFRWSP are numbered as “2023” followed by a newly assigned number. The SRWMD projects are numbered based on the SRWMD’s project database tracking system.

These projects are in different phases of construction or planning (project status). For those projects in the planning, proposed, or feasibility review phase, their actual water supply yield may change after the project is implemented. The conceptual project options listed in the NFRWSP do not have water supply benefit estimates or cost evaluations (Table K4). However, they may offer innovative approaches to address future water demands and ensure sustainable water supplies. The conceptual projects are included to provide more options of potential projects that may become feasible if they address environmental, technical, and/or permit criteria.

A project identified for inclusion in this 2023 NFRWSP document might not necessarily be selected for development by the listed water supplier. In accordance with subsection 373.0361(6), Florida Statutes (F.S.), nothing contained in the water supply component of a RWSP should be construed as a requirement for local governments, public or privately owned utilities, special districts, self-suppliers, multi-jurisdictional entities, or other water suppliers to select that identified project.

Table K1: Abbreviations and descriptions for Appendix K: Project Options

Abbreviation	Description
AADF	Annual average daily flow
ACT	Alachua Conservation Trust
BAF/O3	Ozone/biologically active filtration
CCUA	Clay County Utility Authority
DRI	SJCUD specific 2023_46 re: Silverleaf
ERCs	Equivalent residential connections
GRU	Gainesville Regional Utilities
KWRF	Kanapaha Water Reclamation Facility
MG	Million gallons
MSWRF	Main Street Water Reclamation Facility
NA	Not applicable
RCW	Reclaimed water
SCADA	Supervisory control and data acquisition
SEQ	Southeast Quadrant development (I-295 and SR-202)
SJCUD	St. Johns County Utility Department
SWDE	Surface Water Discharge Elimination
TBD	To be determined
WRF	Wastewater reclamation facility

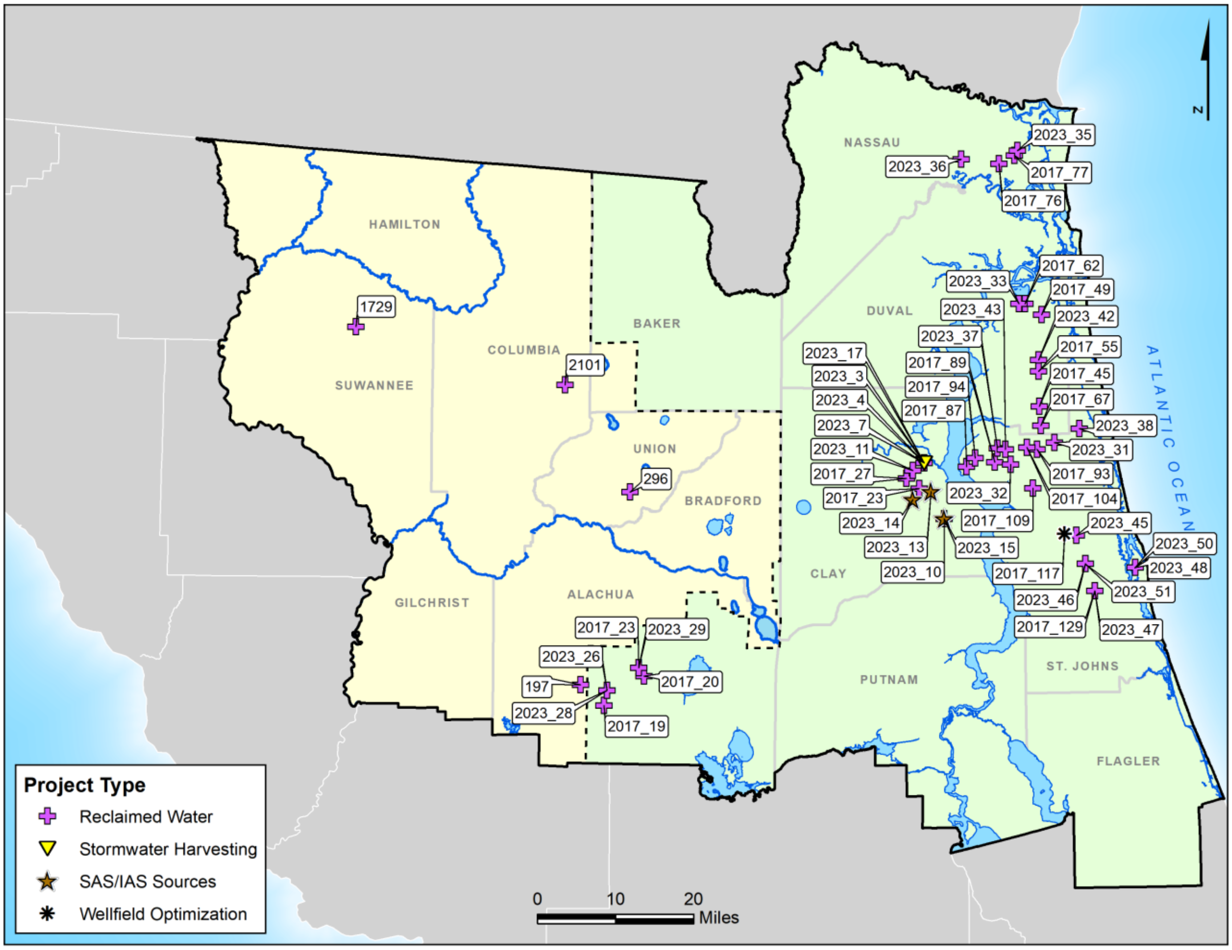


Figure K-1. Proposed water supply development projects in the NFRWSP area

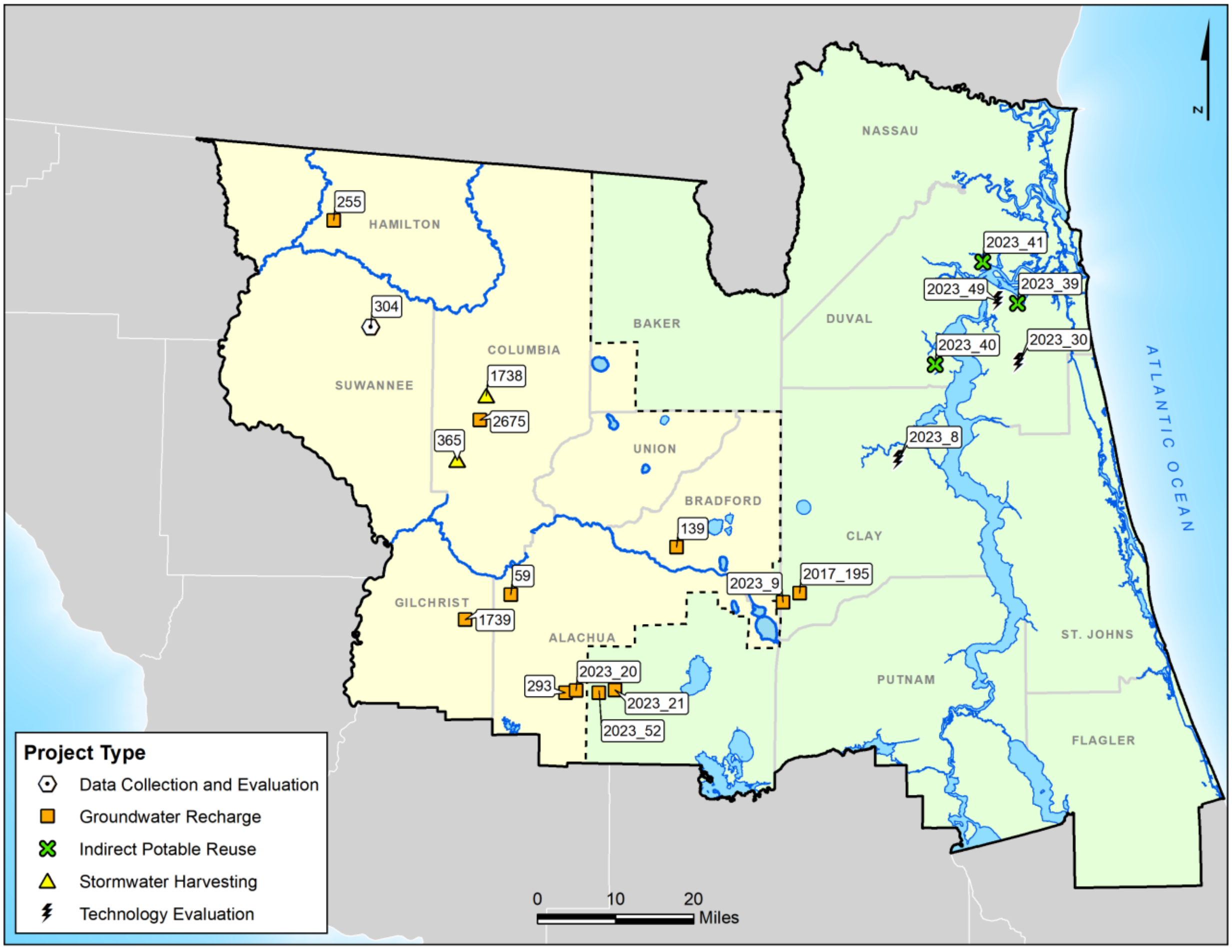


Figure K-2. Proposed water resource development projects in the NFRWSP area

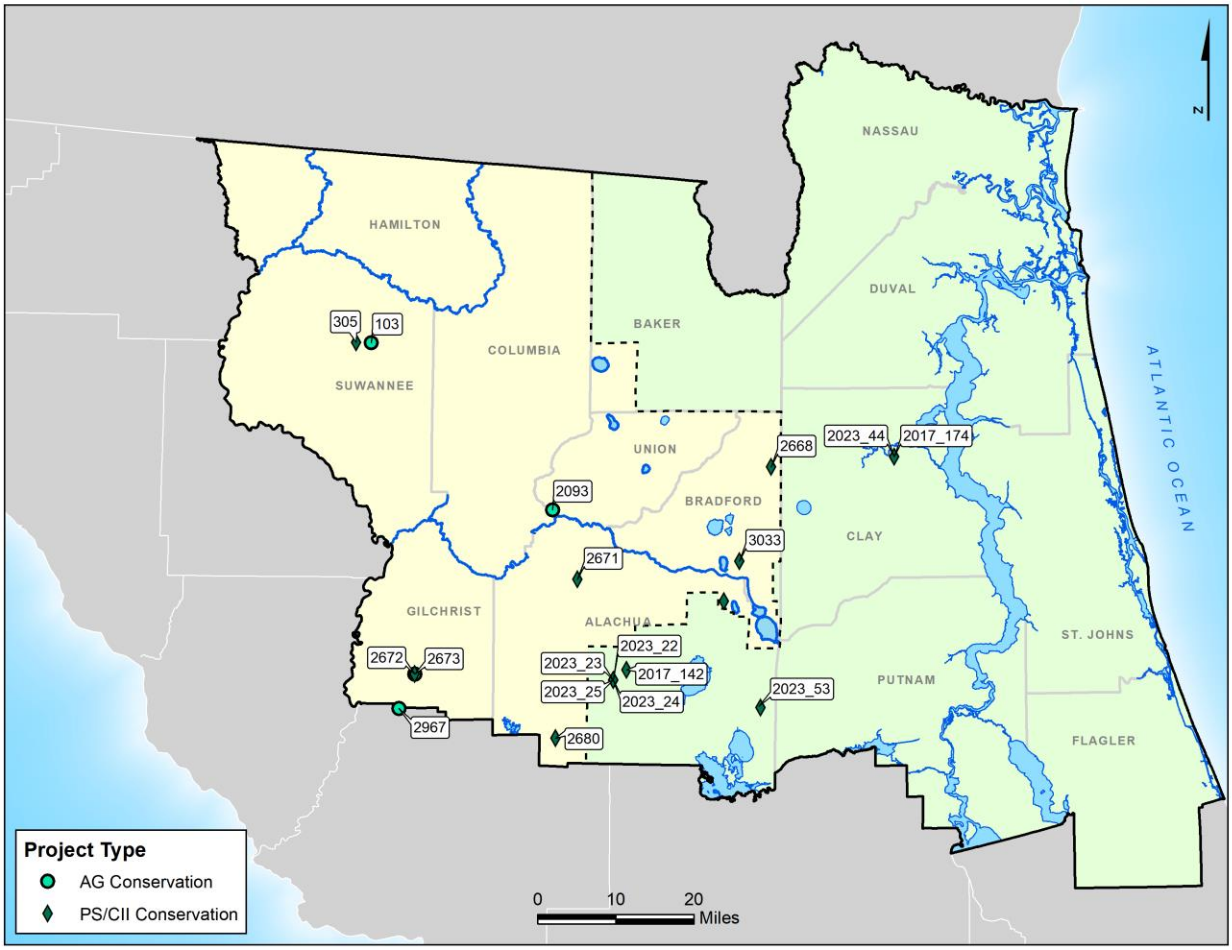


Figure K-3. Proposed water conservation projects in the NFRWSP area

Table K1. Water Supply Development Project Options

RWSP Project No.	DEP Project ID	District	County	Project Type	Project Name/Description (two columns if needed)	Implementing Agency or Entity	Project Description	Project Status	Estimated Completion Date	Estimated Benefit (mgd)	Storage Capacity Increased (MG)	Total Capital Cost ($M)	Estimated Annual O&M ($M)	Unit Cost ($/1,000 gallons)
2017_19	NA	SJRWMD	Alachua	Reclaimed Water (for potable offset)	Brytan subdivision Reclaimed Water system expansion	GRU	This project includes expansion of reclaimed water distribution system pipelines ir Brytan subdivision to offset use of potable water for irrigation. Related to Project No. 2023_28.	Proposed	2030	0.12	NA	$1.23	$0.003	$1.80
2017_20	NA	SJRWMD	Alachua	Reclaimed Water (for potable offset)	Innovation District Reclaimed Water system expansion	GRU	This project consists of expansion of reclaimed water distribution system pipelines to offset use of potable water for industrial cooling and irrigation in the Innovation District as it develops. RCW comes from MSWRF (rather than from KWRF)	Proposed	2035	0.11	NA	$1.50	$0.004	$2.50
2023_26	NA	SJRWMD	Alachua	Reclaimed Water (for potable offset)	RCW Extension to Future University of Florida Golf Course	GRU	This project consists of an extension of RCW transmission and distribution to future UF Golf Course and includes upgrades to RCW pump station and RCW transmission backbone which is needed to support this project. Project site has not been identified.	Proposed	2026	1.00	NA	$1.80	$0.050	$0.47
2017_23	NA	SJRWMD	Alachua	Reclaimed Water (for potable offset)	Reclaimed Water System Expansion into New Neighborhoods	GRU	This project consists of potential future expansion of RCW distribution system into new neighborhoods	Feasibility Review	2045	0.35	NA	$6.50	$0.01	$3.29
2023_28	NA	SJRWMD	Alachua	Reclaimed Water (for potable offset)	RCW Storage Tank & Pumping Upgrade	GRU	This project consists of a RCW storage tank needed to support buildout of Brytan and extension of RCW into future new neighborhoods. Conserved/AWS benefit nominally estimated at 500,000 gpd based on the approximate sum of the volume from the 2 projects this project supports (Brytan RCW Expansion + RCW Expansion to New Neighborhoods). Related to Project No. 2017_19	Feasibility Review	2040	0.50	NA	$5.00	$0.005	$1.75
2023_2	NA	SJRWMD	Clay	Reclaimed Water (for potable offset)	Regional Reclaimed Storage Reservoir (build as 200MG)	CCUA	Reclaimed water storage - This project consists of creation of wet weather storage to be used during dry season peak demand. Conceptual project assumes one or more large storage ponds (60-200 MG) for seasonal storage of surplus reclaimed water (4 months) to meet peak demand shortages at a minimum of 1 mgd delivery from ponds.	Feasibility Review	2035	1.0 - 2.0	NA	$100.00	$0.183	NA
2023_3	NA	SJRWMD	Clay	Reclaimed Water (for potable offset)	Reclaimed Storage Tanks	CCUA	Reclaimed distribution storage - This project consists of seven reclaimed ground storage tanks over five years (5.6 million gallons total). Additional reclaimed storage capacity will allow the utility to store more treated water during peak hours rather than discharging to surface waters. This will also reduce the use of augmentation well and maximize the use of RIBs.	Planning	2029	5.60	NA	$13.11	$0.23	NA
2023_4	NA	SJRWMD	Clay	Reclaimed Water (for potable offset)	Reclaimed Transmission Optimization for Isolation Projects	CCUA	Transmission system optimization to maximize reuse delivery - This project consists of four projects that will install transmission pipelines to isolated transmission and distribution systems. In conjunction with the Reclaimed Storage Tanks and SCADA projects, this will allow the utility to store more treated water during peak hours rather than discharging to surface waters. This will also reduce the use of augmentation well and maximize the use of RIBs. The Transmission/SCADA/Storage tank suite of projects collectively will position CCUA from an approximately 70% reuse utility to nearly 100% reuse this decade. This represents 2-3 mgd of additional beneficial reuse by the end of the decade	Planning	2025	2.0 - 3.0	NA	$8.51	$0.00	NA
2017_27	NA	SJRWMD	Clay	Reclaimed Water (for potable offset)	Lake Asbury Reclaimed Mains Expansion	CCUA	This project will expand the reclaimed distribution system with over six miles of new reclaimed distribution mains in the Lake Asbury Master Planned Area (LAMPA). The expansion is expected to serve the equivalent of an additional 8,800+ single family residences.	Design	2029	NA	NA	$8.51	$0.00	NA
2017_23	NA	SJRWMD	Clay	Reclaimed Water (for potable offset)	Peters Creek WRF, Ponds, Reclaimed Storage & Pipeline (formerly Green Cove Regional RW WTP)	CCUA	This project consists of a new 1.5 MGD AADF Advanced Nutrient Removal WRF producing public access quality reclaimed water, 1.5 MGD wet weather storage ponds, approximately 0.8 MGD onsite reclaimed augmentation, 0.5 MGD RIBs for alternate discharge, and reuse water transmission pipes from the PC WRF to the Governors Park service area. The Peters Creek and Governors Park Reclaimed facilities are expandable, and will ultimately serve approximately 50,000 ERCs at buildout. Related to Project No. 2023_5 and 2023_10.	Construction/ Underway	2024	1.50	NA	$70.58	$1.91	$6.87
2023_10	NA	SJRWMD	Clay	Reclaimed Water (for potable offset)	Governor's Park Reclaimed Storage and Pumping	CCUA	This project consists of a new reclaimed distribution facility to serve the Governor's Park service area. The facility will include a 0.750 MG ground storage tank and high service pump station. The facility will receive water treated to reclaimed standards from the Peters Creek WRF. Related Project No. 2017_23	Construction/ Underway	2024	0.75	NA	$5.37	$0.26	NA
2023_11	NA	SJRWMD	Clay	Reclaimed Water (for potable offset)	Saratoga Springs Reclaimed augmentation well, Storage and Pumping	CCUA	This project consists of a new reclaimed distribution facility to serve the Central Clay County service area. The facility will include a 0.750 MG ground storage tank, high service pump station, and an augmentation well. The facility will receive water treated to reclaimed standards from the CCUA Mid-Clay WRF.	Construction/ Underway	2024	2.30	NA	$6.18	$0.81	$1.15
2023_17	NA	SJRWMD	Clay	Reclaimed Water (for potable offset)	Reclaimed SCADA System Optimization	CCUA	This project will optimize use of reclaimed water system by use of SCADA and programming improvements to the reclaimed distribution system. These improvements will include operational changes and infrastructure additions (e.g. additional flow meters) to optimize the use of reclaimed water and reduce the use of water from augmentation wells.	Planning	2024	1.00	NA	$0.68	$0.00	$0.05
2023_29	NA	SJRWMD	Duval	Reclaimed Water (for potable offset)	Arlington East WRF - Reclaimed Water Filtration Expansion - Increase Capacity from 8.0 to 10.0 MGD	JEA	This project consists of a 2.0 MGD water reclamation facility filter expansion to support increased reclaimed water demands (project combined with SWDE - Arlington East WRF – Reclaimed Water and Disinfection System Upgrades). Related to Project No. 2017_62	Planning	2025	2.00	NA	$2.80	$0.01	NA
2023_42	NA	SJRWMD	Duval	Reclaimed Water (for potable offset)	SEQ to Gate Parkway - Trans - New - R	JEA	This project will install 5,000 feet of 30" reclaimed water main to serve as a transmission pipeline.	Planning	2030	0.12	NA	$4.00	$0.001	$3.56
2017_45	NA	SJRWMD	Duval	Reclaimed Water (for potable offset)	Greenland Reclaimed Water Repump Facility - Storage Tank and Booster Pump Station	JEA	This project consists of 12.0 MG in storage tanks and high service pumps. Related to Project No. 2017_67 and 2023_31.	Construction/ Underway	2025	12.00	NA	$40.00	$0.004	$0.40
2017_49	NA	SJRWMD	Duval	Reclaimed Water (for potable offset)	Ridenour WTP - Reclaimed Water Storage and Repump	JEA	This project consists of a 3.0 MG storage tank and high service pumps.	Design	2026	3.00	NA	$17.35	$0.004	$0.69
2017_55	NA	SJRWMD	Duval	Reclaimed Water (for potable offset)	Davis - Gate Pkwy to RG Skinner - Reclaimed Water System Expansion	JEA	This project will install 13,700 feet of 30" reclaimed water main to serve as a transmission pipeline.	Planning	2025	0.12	NA	$15.10	$0.001	$13.39
2017_62	NA	SJRWMD	Duval	Reclaimed Water (for potable offset)	Monument Rd - Arlington East WRF to St Johns Bluff Rd - Reclaimed Water System Expansion	JEA	This project will install 7,900 feet of 20" reclaimed water main to serve as a transmission pipeline. Related to Project No. 2023_29	Planning	2026	0.06	NA	$10.06	$0.001	$17.86
2023_33	NA	SJRWMD	Duval	Reclaimed Water (for potable offset)	SWDE - Arlington East WRF – Reclaimed Water and Disinfection System Upgrades	JEA	This project will increase the reclaimed water production capacity from 8 to 25 mgd at the SWDE-Arlington East WRF. Related to Project No. 2023_39.	Planning	2027	17.00	NA	$111.00	$0.004	$1.15

Table K1, Continued. Water Supply Development Project Options

RWSP Project No.	DEP Project ID	District	County	Project Type	Project Name/Description (two columns if needed)	Implementing Agency or Entity	Project Description	Project Status	Estimated Completion Date	Estimated Benefit (mgd)	Storage Capacity Increased (MG)	Total Capital Cost ($M)	Estimated Annual O&M ($M)	Unit Cost ($/1,000 gallons)
2017_67	NA	SJRWMD	Duval/St. Johns	Reclaimed Water (for potable offset)	US 1 - Greenland WRF to CR 210 - Reclaimed Water System Expansion	JEA	This project will install 30,000 feet of 20" reclaimed water main to serve as a transmission pipeline. Related to Project No. 2017_45 and 2023_31.	Construction/ Underway	2023	0.06	NA	$33.80	$0.001	$59.89
2017_76	NA	SJRWMD	Nassau	Reclaimed Water (for potable offset)	Nassau Area - Radio Av - Reclaimed Water Storage Tank and Booster Pump Station	JEA	This project consists of a 1.5 MG storage tank and 1,000 gpm high service pumps.	Construction/ Underway	2023	1.44	NA	$7.27	$0.005	$0.61
2017_77	NA	SJRWMD	Nassau	Reclaimed Water (for potable offset)	Nassau Regional WRF - Expansion to 3 MGD	JEA	This WRF capacity expansion includes 1.0 MG storage tank, 1,500 gpm high service pumps, and high level UV disinfection (estimated cost is for the RW component, not the WRF expansion). Related to Project No. 2023_35	Construction/ Underway	2025	2.16	NA	$10.00	$0.020	$0.57
2023_35	NA	SJRWMD	Nassau	Reclaimed Water (for potable offset)	JP - Nassau - Chester Rd - David Hallman to Pages Dairy Rd - R	JEA	This project will install 1,700 feet of 20" reclaimed water main to serve as a transmission pipeline. Related to Project No. 2017_77	Construction/ Underway	2025	0.06	NA	$1.48	$0.001	$2.66
2023_36	NA	SJRWMD	Nassau	Reclaimed Water (for potable offset)	SR200 - William Burgess Blvd to Police Lodge Rd - Trans - R	JEA	This project will install 14,250 feet of 16" reclaimed water main to serve as a transmission pipeline.	Construction/ Underway	2023	0.04	NA	$6.63	$0.001	$18.60
2017_87	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	RiverTown WTP - New Storage and Pumping System	JEA	This project consists of a 2.0 MG storage tank and high service pumps.	Planning	2027	2.00	NA	$12.00	$0.002	$0.71
2023_31	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	Twin Creeks Reclaimed Water Storage Tank and Booster Pump Station	JEA	This project consists of a 2.0 Mgal storage tank and high service pumps. Related to Project No's 2017_45 and 2017_67.	Construction/ Underway	2023	2.00	NA	$9.02	$0.002	$0.54
2017_89	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	CR210 - Longleaf Pine Pkwy to Shearwater - Reclaimed Water System Expansion	JEA	This project will Install 11,600 feet of 30" and 2,300 feet of 16" reclaimed water main to serve as a transmission pipeline.	Planning	2026	0.16	NA	$6.86	$0.001	$4.63
2023_32	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	CR210 - South Hampton to Shearwater - Trans - Reclaimed Water System Expansion	JEA	This project will install 7,400 feet of 12" reclaimed water main to serve as a transmission pipeline.	Construction/ Underway	2024	0.02	NA	$3.34	$0.001	$17.85
2017_93	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	CR210 - Twin Creeks to Russell Sampson Rd - Reclaimed Water System Expansion	JEA	This project will install 12,000 feet of 20" reclaimed water main to serve as a transmission pipeline. Related to Project No. 2017_14.	Planning	2029	0.06	NA	$7.63	$0.001	$13.56
2017_94	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	Greenbriar Rd - Longleaf Pine Pkwy to Spring Haven Dr - Reclaimed Water System Expansion	JEA	This project will install 13,500 feet of 20" reclaimed water main to serve as a transmission pipeline	Planning	2027	0.06	NA	$8.19	$0.001	$14.54
2017_104	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	Russell Sampson Rd - St. Johns Pkwy to CR210 - Reclaimed Water System Expansion	JEA	This project will install 12,000 feet of 20" reclaimed water main to serve as a transmission pipeline. Related to Project No. 2017_93.	Planning	2028	0.06	NA	$4.27	$0.001	$7.60
2023_37	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	Blacks Ford WRF - Expansion from 6 to 12 mgd	JEA	This project will add 6 MG of storage and pumping. Related to Project No. 2023_43.	Planning	2027	6.00	NA	$30.00	$0.004	$0.88
2023_38	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	Nocatee North - Reclaim Water Storage Tank	JEA	This project will construct a new 3.5 MG storage tank.	Planning	2026	3.50	NA	$10.37	$0.001	$17.11
2023_43	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	Blacksford WRF to Veterans Pkwy – Trans – RW	JEA	This project will install 11,000 feet of 24" reclaimed water main to serve as a transmission pipeline. Related to Project No. 2023_27	Planning	2028	0.08	NA	$5.00	$0.001	$6.86
2017_109	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	CR 2209 Corridor Reclaimed Water System Expansion	SJCUD	Construction of aproximately 12,700 feet of 20" reuse main along the future County Road 2209 in two segments. The first segment is to connect to existing infrastructure between SR 16 and International Golf Parkway. The Second Segment runs from the NW WRF Facility north to connect to the existing Reuse main in Silverleaf. Project helps faciiltate SB 64 goals to interconnect reclaimed water systems. Project will reduce the discharge from the Northwest Wastewater Treatment Plant to Mill Creek, a tributary of Six Mile Creek and the lower St. Johns River.	Design	2024	0.57	NA	$4.00	$0.780	$0.50
2023_45	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	SR 16 Corridor Reuse Transmission Main Expansion	SJCUD	Project to replace approximately 6.7 miles of existing 8-inch reuse main with a new 16-inch and 20-inch reuse main along State Rd 16 to facilitate transmission of reuse water between the SR 16 WRF and the NW WRF grids. Project currently being advertised for design build.	Design	2025	1.00	NA	$11.00	TBD	$0.81
2023_46	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	NW WRF Expansion & Silverleaf DRI Reuse System, Phase 1	SJCUD	Installation of Reuse infrastructure including Filtration, Transmission Infrastructure, Storage, Booster Pumps, and Augmentation sources which will be installed in various phases of the development. Project supplies reclaimed water to Northwest Service area and Silverleaf DRI.	Planning	2027	2.25	NA	$8.00	TBD	$0.58
2023_51	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	NW WRF Expansion & Silverleaf DRI Reuse System, Phase 2	SJCUD	Expansion of NW WRF from 3.75 MGD to 7.5 MGD and Construction of AWS Facility near Trout Creek to augment and support Silverleaf and NW reclaimed water service area.	Planning	2030	5.75	NA	$128.00	TBD	$2.95
2017_129	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	SR 207 WRF Expansion	SJCUD	Construction to expand existing SR 207 WWTP into a 3.25 MGD facility with the intent to provide reclaimed water to nearby new developments. Project creates a hub for reclaimed water service to comply with SB 64	Construction/ Underway	2025	2.75	NA	$195.00	TBD	$7.92
2023_47	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	SR 207 WRF Reuse Transmission Mains	SJCUD	Construction of approximately 8 miles of reuse transmission main (24"/20") to connect the new SR 207 WRF to the NW and SR 16 reuse grids. Project is required to comply with SB 64.	Construction/ Underway	2025	2.00	NA	$20.00	TBD	$4.38
197	SRWS00032C	SRWMD	Alachua	Reclaimed Water (for potable offset)	Oakmont Subdivision Reclaimed Water System Expansion	GRU	Expansion of reclaimed water distribution system pipelines in Oakmont Subdivision to offset use of potable water for irrigation. Includes additional transmission and storage/pumping facilities to facilitate addition of groundwater recharge wetlands. This project includes all phases of the Oakmont Subdivision project.	Design	2033	0.40	NA	$8.40	$0.103	$3.00
2101	NA	SRWMD	Columbia	Reclaimed Water (for potable offset)	North Florida Mega Industrial Park	Columbia County	Retrofit proposed WWTF to meet AWT for future Public Access Reuse (PAR)	Design	2024	0.25	NA	$27.00	$0.50	$17.27
1729	NA	SRWMD	Suwannee	Reclaimed Water (for potable offset)	Live Oak Reuse	Live Oak, City of	Construct extensions to the Live Oak wastewater collection infrastructure which will provide additional reuse.	Design	2024	0.01	NA	$3.24	$0.008	$37.47
296	SRWS00141A	SRWMD	Union	Reclaimed Water (for potable offset)	Lake Butler Wastewater Treatment Facility AWT Upgrade Phase 1	Lake Butler, City of	Funding for this Phase I will complete a feasibility study, design, and permitting for construction of an AWTF, storage surge tank, and wetland that will ultimately be used to construct a new 1.0 MGD WWTF to AWT treatment standards over three phases.	Design	2025	1.00	NA	$3.40	$0.800	$2.52
2023_7	NA	SJRWMD	Clay	Stormwater	Onsite Stormwater Harvesting at WRFs	CCUA	This project will augment the reclaimed water supply by harvesting stormwater from CCUA WRFs with existing stormwater retention ponds - Fleming Island, Mid-Clay, Miller Street, Ridaught and Spencers Crossing. Harvested stormwater would be pumped to the onsite facility and treated to public access reuse standards before being distributed into the reclaimed system.	Planning	2026	0.24	NA	$2.90	$0.026	$1.11

Table K1, Continued. Water Supply Development Project Options

RWSP Project No.	DEP Project ID	District	County	Project Type	Project Name/Description (two columns if needed)	Implementing Agency or Entity	Project Description	Project Status	Estimated Completion Date	Estimated Benefit (mgd)	Storage Capacity Increased (MG)	Total Capital Cost ($M)	Estimated Annual O&M ($M)	Unit Cost ($/1,000 gallons)
2023_5	NA	SJRWMD	Clay	Surficial Aquifer System/Intermediate Aquifer System Water Sources	Peters Creek-Governor's Park Shallow Aquifer Augmentation of Reclaimed Water Supply -	CCUA	This project will utilize SAS ground water and recovered Rapid Infiltration Basin (RIB) water to augment the reclaimed supply, particularly during peak demand months. Construction of SAS wells near RIBs at Peters Creek Water Reclamation Facility (PCWRF), and along the approximately 7 mile transmission pipeline between Peters Creek and Governor's Park reclaimed storage and pumping sites. Raw water will be disinfected and added to the reclaimed storage tanks or along the reclaimed transmission line. Related to Project 2017_23.	Feasibility Review	2032	2.20	NA	$13.60	$0.33	$0.83
2023_13	NA	SJRWMD	Clay	Surficial Aquifer System/Intermediate Aquifer System Water Sources	Peters Creek WTP & Production Well # 3 -2.02 MGD Expansion	CCUA	This project consists of an expansion of the Peters Creek potable water distribution facility which uses the SAS. A new 1,400 gpm well, 1.25 MG ground storage tank and related appurtenances will be added.	Permitted	2027	2.02	NA	$4.60	$0.71	$1.12
2023_14	NA	SJRWMD	Clay	Surficial Aquifer System/Intermediate Aquifer System Water Sources	Pier Station WTP Expansion	CCUA	This project consists of a an expansion of the Pier Station potable WTP as growth in area occurs. This WTP uses the SAS as its source water.	Planning	2026	0.25	NA	$2.70	$0.09	$1.70
2023_15	NA	SJRWMD	Clay	Surficial Aquifer System/Intermediate Aquifer System Water Sources	Governor's Park WTP	CCUA	This project consists of a new potable water treatment and distribution facility to serve the Governor's Park service area. The facility will include two new dual zone (SAS and IAS), 1,770 gpm wells, a 0.500 MG ground storage tank, high service pump station and related appurtenances	Design	2025	0.50	NA	$9.00	$0.18	$2.20
2023_50	NA	SJRWMD	St. Johns	Reclaimed Water (for potable offset)	AI WWTP Reclaimed Process Improvements	SJCUD	Upgrade treatment process to supply 100% public-access reuse	Planning	2032	2.00	NA	$25.00	TBD	$1.39
2017_117	NA	SJRWMD	St. Johns	Wellfield Optimization	CR 214 Water Blending Station (NW to Mainland PWS 2 MGD Transfer)	SJCUD	This project will improve water quality to the CR 214 WTP site by conditioning of the water transferred from the NW Grid that is blended and distributed into the Mainland Water System. Project helps to meet growing demands and helps sustain water quality in the Tillman Ridge Wellfield. Phase I for a 1 mgd Blending Station is complete. Phase II to transfer 2 mgd of flow facilitated by CR 208 Booster and NW WTP PhB expansion is in progress.	Construction/ Underway	2023	0.00	NA	$10.47	TBD	$0.74
Total										**92.44**	**0.00**	**$1,061.44**	**$7.06**	**$308.01**

*The estimated benefits for project 2023_2 and 2023_4 were assumed to be 1.5 mgd and 2.5 mgd, respectively, for the purposes of calculating total benefits across all projects

Table K2. Water Resource Development Project Options

RWSP Project No.	DEP Project ID	District	County	Project Type	Project Name/Description (two columns if needed)	Implementing Agency or Entity	Project Description	Project Status	Estimated Completion Date	Estimated Benefit (mgd)	Storage Capacity Increased (MG)	Total Capital Cost ($M)	Estimated Annual O&M ($M)	Unit Cost ($/1,000 gallons)
304	SRWS00156A	SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Data Collection and Evaluation	Alternative Water Supply Feasibility Studies	Local Governments, Water Authorities, Wastewater Treatment Facilities	Conduct AWTF analysis and feasibility studies including treatment wetlands and reclaimed water alternatives.	Construction/ Underway	2024	0.00	NA	$4.00	NA	NA
2023_52	NA	SJRWMD	Alachua	Groundwater Recharge	GRU KWRF RCW Pump station and Transmission Backbone Improvement	GRU	The Transmission Backbone Improvement project is a necessary component to increase capacity of the KWRF RCW pumping station and transmission pipeline to 8 mgd in order to support Project No. 2023_20 GW Recharge Wetland Phase 2 (2 mgd) , Project No. 2023_26 RCW Extension to Future UF Golf Course (1 mgd), and Project No. 2023_21 Future GW Recharge Wetlands (5 mgd). The actual benefit for this project is shown as 0.0 mgd, since the benefit to the water resources is reflected in the related projects as noted above. Unit production costs for this project were calculated based on the 8 mgd of transmission volume.	Planning	2025	0.00	NA	$3.00	$0.20	$0.14
2023_20	NA	SJRWMD	Alachua	Groundwater Recharge	Groundwater Recharge Wetland Phase 2	GRU	This project consists of Phase 2 of the recharge wetland using RCW from Kanapaha WRF on the 75 ac site that was purchased in Phase 1. RCW Pump Station and Transmission Backbone Improvement needed to support this project. Related to Project No. 293	Planning	2034	2.00	NA	$5.00	$0.10	$0.59
2023_21	NA	SJRWMD	Alachua	Groundwater Recharge	Future Groundwater Recharge Project	GRU	This project will recharge groundwater using RCW. Project site not identified. May be co-located with UF Golf Course. RCW Pump Station and Transmission Backbone Improvement needed to support this project.	Feasibility Review	2040	5.00	NA	$20.00	$0.30	$0.88
2017_195	NA	SJRWMD	Clay	Groundwater Recharge	Black Creek WRD Project	SJRWMD / JEA, CCUA, SJCUD, GRU and other local cooperators	The primary goal of the Black Creek Water Resource Development Project is to increase recharge to the UFA in northeast Florida using excess flow from Black Creek. The project will divert up to 10 mgd from the South Fork of Black Creek during wet weather high flow periods. Diversions will only be made when there is sufficient flow available to ensure the protection of natural resources within the creek. The water will be pumped through a transmission system before eventually discharging into Alligator Creek. Alligator Creek flows into Lake Brooklyn, which will increase recharge to the UFA through the lake bottom.	Construction/ Underway	2024	8.04	NA	$100.00	$5.00	$2.90
2023_9	NA	SJRWMD	Clay	Groundwater Recharge	Keystone WWTP and RIB Expansion	CCUA	This project consists of a new or expanded groundwater recharge plant in the Keystone Heights capable of treating up to 0.300 mgd of increasing wastewater flows from residential, commercial, and industrial wastewater.	Feasibility Review	2027	0.30	NA	$11.10	$0.38	$6.01
59	SRWS00076A	SRWMD	Alachua	Groundwater Recharge	Infiltrative Wetlands for WWTF Effluent Treatment Disposal	City of High Springs	Convert the City of High Springs existing sprayfield into infiltrative wetlands.	Construction/ Underway	2024	0.48	NA	$12.35	$1.20	$9.66
293	SRWS00129B	SRWMD	Alachua	Groundwater Recharge	Groundwater Recharge Wetland Phase 1 (Southwest Nature Park)	GRU	This project consists of Phase 1 of constructing a groundwater recharge wetland using RCW from Kanapaha WRF on 75-acre site. Related to Project No. 2023_20.	Design	2026	3.00	NA	$12.00	$0.20	$0.90
409	NA	SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Groundwater Recharge	Ecosystem Services	SRWMD	This project will focus on establishing a framework to implement silvicultural management practices on forested lands to benefit the NFRWSP and additional areas benefitting OFS. Reducing forest evapotranspiration (ET) will result in increased aquifer recharge (targeted to the UFA), spring flows, and water yield to nearby streams and wetlands.	Proposed	2045	9.00	NA	$54.00	TBD	TBD
3034	NA	SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Groundwater Recharge	Upper Santa Fe Stormwater Capture Project	SRWMD	This project will evaluate methods to enhance the beneficial use of stormwater. A series of studies are underway to provide storage and recharge options to support LSFRB Recovery Strategy. Linked to conceptual projects 358, 359, 360, 361, 362, 364, 367, 372, 375, 378.	Proposed	2045	2.50	NA	$35.00	TBD	TBD
139	SRWS00092A	SRWMD	Bradford	Groundwater Recharge	Brooks Sink Ph II	SRWMD	Redirect flow to a natural sink.	Proposed	2045	0.20	NA	$0.50	$0.05	$0.05
2675	NA	SRWMD	Columbia	Groundwater Recharge	Lake City Recharge wetland expansion	Lake City, City of	Convert the Steedly sprayfield to a created treatment wetland to reduce nutrients and provide recharge	Construction/ Underway	2026	0.23	NA	$6.10	$0.025	$2.92
1739	SRWS00149A	SRWMD	Gilchrist County	Groundwater Recharge	Devil's Ear Spring Recharge Land Acquisition Project	FWC	Less-than-fee simple acquisition (conservation easement) of approximately 2,742 acres within the Devil's Ear Spring (OFS) PFA under the Santa Fe River Basin Management Action Plan. This property accounts for about 2% of the total acreage of the Devil's Complex PFA. Approximately 75% of the property is considered to have high recharge value with the remaining portion of the property being either medium-high or low-medium. The project consists of seven individual parcels in Gilchrist County owned by one individual and all required pre-acquisition costs to complete transactions. Currently the property is used for timber and once acquired the conservation easement will be monitored by FWC.	Design	2026	0.00	NA	$5.26	TBD	TBD
255	SRWS00147A	SRWMD	Hamilton	Groundwater Recharge	Hamilton County Aquifer Recharge Replacement Wells and Water Quality Improvement	SRWMD	This project concept is to replace two 12-inch drainage wells to provide recharge to the UFA and flood protection in the Alapaha Basin. The wells would allow up to 2 MGD of natural aquifer recharge to the Upper Floridan aquifer and the potential for increased recharge contribution in the form of alternative water supplies from the City of Jasper and surrounding communities. Positive flows into the wells will provide a benefit to springs Along the Upper Suwannee River.	Proposed	2045	2.00	NA	$0.70	$0.003	$0.05
2023_6	NA	SJRWMD	Clay	Indirect Potable Reuse	Indirect Potable Reuse	CCUA	This project consists of an IPR Plant including recharge wells (1 mgd). Reclaimed water will be treated to potable standards, and used to directly recharge the UFA (IPR). This project is related to a demonstration project (Project No.2023_8).	Feasibility Review	2038	1.00	NA	$2.25	$1.16	$4.73
2023_39	NA	SJRWMD	Duval	Indirect Potable Reuse	SWDE - Arlington East WRF Purification Facility	JEA	This project consists of a 6.0 mgd water purification facility (capacity conceptual, subject to change) and UFA Recharge Wells. Discharge will be used to replenish the aquifer. Related to Project No. 2023_33.	Design	2031	6.00	NA	$284.00	$0.019	$8.33
2023_40	NA	SJRWMD	Duval	Indirect Potable Reuse	SWDE - Southwest WRF Purification Facility	JEA	This project consists of a 8.0 mgd water purification facility (capacity conceptual, subject to change) and UFA Recharge Wells. Discharge will be used to replenish the aquifer.	Planning	2031	8.00	NA	$300.00	$0.025	$6.60

Table K2, Continued. Water Resource Development Project Options

RWSP Project No.	DEP Project ID	District	County	Project Type	Project Name/Description (two columns if needed)	Implementing Agency or Entity	Project Description	Project Status	Estimated Completion Date	Estimated Benefit (mgd)	Storage Capacity Increased (MG)	Total Capital Cost ($M)	Estimated Annual O&M ($M)	Unit Cost ($/1,000 gallons)
2023_41	NA	SJRWMD	Duval	Indirect Potable Reuse	SWDE - Cedar Bay Purification Facility	JEA	This project consists of a 2.4 mgd water purification facility (capacity conceptual, subject to change) and UFA Rechage Wells. Discharge will be used to replenish the aquifer.	Planning	2031	2.40	NA	$202.00	$0.008	$14.80
365	NA	SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Stormwater	Dispersed Storage for Recharge and Alternative Water Supply	SRWMD	This project will evaluate methods to enhance the beneficial use of stormwater with a focus on retrofitting and enhancing stormwater management systems. This beneficial use could be in the form of enhanced recharge and/or implementation of storm ponds or other storage as an alternative water supply. The primary benefit will be capturing more stormwater as beneficial recharge and reducing runoff. In some cases, stormwater may also serve as an available water source for an alternative water supply. (Linked from results of 360).	Construction/ Underway	2027	NA	3.00	$2.10	TBD	TBD
1738	NA	SRWMD	Columbia	Stormwater	Quail Heights Regional Pond	FDOT/Columbia County	Construction of a regional stormwater pond near I-75 and SR247 interchange to alleviate flooding and benefit Cannon Creek and the Ichetucknee Trace.	Construction/ Underway	2025	0.03	NA	$8.95	$0.001	$35.60
2023_8	NA	SJRWMD	Clay	Technology Evaluation	Mid-Clay WRF Potable Reuse Pilot Demonstration	CCUA	This is a pilot-scale potable reuse demonstration project. A reuse demonstration facility is being constructed at the Mid-Clay WRF. The technology train will be BAF/O3, and will not produce a brine or reject stream needing disposal. Instead, BAF/O3 will produce filter backwash that will go back through plant headworks. CCUA will use the facility to demonstrate the quality of water that can be produced (permitting driver), for operator training, and for public engagement. Related to Project No. 2023_6.	Construction/ Underway	2024	NA	NA	$4.54	$0.90	NA
2023_30	NA	SJRWMD	Duval	Technology Evaluation	Water Purification Demonstration Facility (previously named Water Treatment Pilot/Demonstration Phase 1 and 2)	JEA	This project is a purified water pilot and demonstration project.	Construction/ Underway	2025	1.00	NA	$72.51	$0.003	$12.75
2023_49	NA	SJRWMD	Duval	Technology Evaluation	JEA Ozone-Wetland Treatment Pilot Testing	JEA / SJRWMD / DEP	SJRWMD is collaborating with JEA and FDEP on a pilot study project utilizing water from JEA's Buckman wastewater treatment facility (WWTF) to evaluate the potential for future use of Buckman effluent for UFA recharge and/or alternative water supply. The Buckman wastewater influent contains wastewater discharges from a significant number of industrial customers. Prior to implementing a project for treating Buckman WWTF effluent as a supply for aquifer recharge, a pilot study is necessary to determine if pre-treatment with ozone is effective in breaking down industrial chemicals sufficiently to facilitate assimilation of the organic contaminants in the treatment wetland. The pilot study will be conducted over a two-year period following construction of the pilot wetland basins and appurtenant pilot components. A minimum of 6 months will be required to allow the wetland plants establish. Cost to design/permit/construct $4.2M and 2.825 for monitoring/sampling/lab analysis/report. The project will begin design and permitting by October 1, 2023.	Design	2026	NA	NA	$6.83	NA	NA
Total										**51.18**	**3.00**	**$1,152.18**	**$9.58**	**$106.91**

Table K3. Water Conservation Project Options

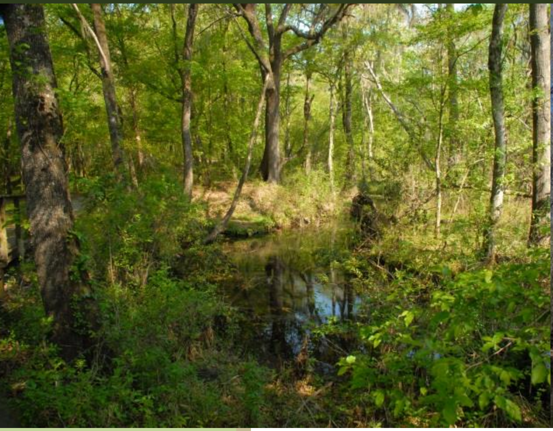
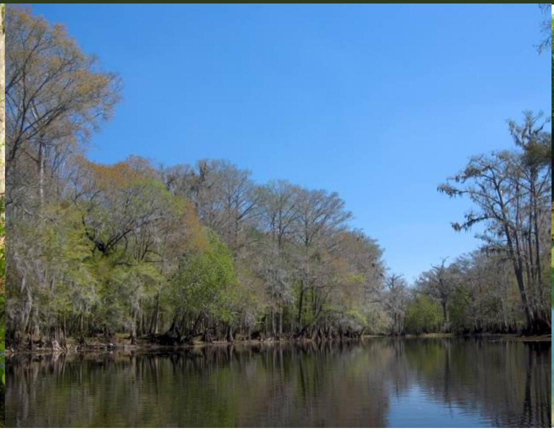
RWSP Project No.	DEP Project ID	District	County	Project Type	Project Name/Description (two columns if needed)	Implementing Agency or Entity	Project Description	Project Status	Estimated Completion Date	Estimated Benefit (mgd)	Storage Capacity Increased (MG)	Total Capital Cost ($M)	Estimated Annual O&M ($M)	Unit Cost ($/1,000 gallons)
2760	NA	SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Agricultural Conservation	Agriculture Springs Protection	Producers	District wide Cost-share to reduce nutrient load and water usage in the BMAPs and WRCAs.	Construction/ Underway	2027	3.00	NA	$3.75	TBD	TBD
103	SRWS00082A	SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Agricultural Conservation	Sustainable Suwannee Ag Pilot Program - Low Input*	FDEP	Pilot program for agricultural operations, landowners, counties and cities, private companies, and other entities within specific geographical areas to submit proposals to reduce water use and improve water quality by reducing and removing nutrients	Construction/ Underway	2026	2.55	NA	$2.50	TBD	TBD
228	SRWS00108B	SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Agricultural Conservation	Accelerating Suwannee River Restoration and Silviculture Management	ACT; Rayonier Conservation Trust	Incentivize silviculture and rural land conservation to reduce groundwater pumping and nitrogen loading in the Middle Suwannee springshed.	Construction/ Underway	2025	3.03	NA	$2.38	TBD	TBD
2093	NA	SRWMD	Columbia	Agricultural Conservation	Graham Farm Acquisition	ACT	Acquire acreage in the NFRWSP area to support MFL recovery and preserve land use from development changes. Remove agricultural irrigation well.	Construction/ Underway	2026	0.29	NA	$1.80	$0.005	$1.99
2673	NA	SRWMD	Gilchrist	Agricultural Conservation	Piedmont Dairy Conversion	Alliance Grazing Group, LLP	Conversion from grazing to free-stall barns to reduce nutrients and groundwater pumping	Construction/ Underway	2025	0.45	NA	$5.59	$0.60	$5.50
2967	NA	SRWMD	Gilchrist	Agricultural Conservation	Smart Soakers	UF/IFAS	Reduce water usage through the use of Smart soaker for cattle cooling.	Planning	2026	0.04	NA	$0.49	$0.003	$18.75
2023_22	NA	SJRWMD	Alachua	PS and CII Conservation	Advanced Metering Infrastructure (AMI)	GRU	This project will replace existing meters with smart meters that can help detect leaks on the customers side of the meter, while also replacing service laterals that are made of polybutylene which are prone to leaking.	Construction/ Underway	2024	1.00	NA	$16.40	$0.20	$3.45
2023_23	NA	SJRWMD	Alachua	PS and CII Conservation	Large meter replacement	GRU	This project will replace existing large meters with more accurate new meters. Greater accuracy will promote conservation.	Construction/ Underway	2023	0.09	NA	$0.40	$0.00	$0.81
2023_24	NA	SJRWMD	Alachua	PS and CII Conservation	Toilet/Indoor Plumbing Retrofit Phase 2	GRU	This project is Phase 2 of the Plumbing Retro-fit Program and will replace toilets, sink aerators, and shower heads with low flow units.	Design	2025	0.04	NA	$0.11	$0.00	$0.43
2023_25	NA	SJRWMD	Alachua	PS and CII Conservation	Toilet/Indoor Plumbing Retrofit Future Phases	GRU	This project is a future phase of the Plumbing Retro-fit Program and will replace toilets, sink aerators, and shower heads with low flow units	Proposed	2035	0.13	NA	$0.32	$0.00	$0.43
2017_142	NA	SJRWMD	Alachua	PS and CII Conservation	Future GRU Water Conservation Projects	GRU	This future project will Implement cost effective projects that may include but are not limited to public education, advanced metering, indoor plumbing retrofit, commercial water efficiency programs and outdoor irrigation efficiency programs.	Feasibility Review	2035	0.80	NA	$2.00	$0.00	$0.40
2023_16	NA	SJRWMD	Clay	PS and CII Conservation	Advanced Metering with Customer Dashboard	CCUA	This project will provide customers with water savings tools by expanding the capabilities of its existing Advanced Metering Infrastructure to increase the savings realized through customer-side notifications of excessive or abnormal water use. Customers will be able to view water use in short term intervals, and the automated system will alert users the same day they occur. Customers can also gain insight into water use patterns and behaviors which can result in reductions in water use. The project is being performed in as part of a major ERP platform upgrade.	Construction/ Underway	2024	0.45	NA	$0.75	$0.025	$0.27
2023_18	NA	SJRWMD	Clay	PS and CII Conservation	Customer DSM Programs (take midpoint or water prod)	CCUA	This project is a Demand Side Management Programs Composite in which CCUA has identified a number of demand side management programs that can reduce potable and reclaimed usage. These programs will be adding the DSM portfolio over the next decade. Costs and water savings from these programs occur over the entire life of the program. Programs may include single family high efficiency toilet rebates, high efficiency clothes washer rebates, commercial ice machine and restaurant pre-rinse spray valve rebates, smart irrigation controller rebates, and new development turf reduction ordinance.	Feasibility Review	2033	1.27	NA	$1.59	$0.00	$0.37
2017_174	NA	SJRWMD	St. Johns	PS and CII Conservation	Promote Cost-Effective Conservation Programs	SJCUD	This is an on-going project to reduce demands through conservation. Focus will include retrofits to indoor and outdoor fixtures, improving customer education, irrigation efficiency programs, and utilizing soil moisture sensing devices to reduce irrigation demands. Programs and projects will be evaluated using the H20 SAV tool.	Construction/ Underway	2025	1.80	NA	$0.18	$0.18	$0.06
2023_44	NA	SJRWMD	St. Johns	PS and CII Conservation	NW Wellfield VFD addition	SJCUD	This project is part of the effort to optimize operation of the Northwest Well Field in accordance with SJCUD's Wellfield Optimization Plan. Phase I of this project will install VFD pump controls on new wells as part of the current expansion project. Phase II will retro-fit existing wells. Assumes a 20% supply benefit.	Construction/ Underway	2025	1.55	NA	$1.00	TBD	$0.24
2023_53	NA	SJRWMD	Alachua	PS and CII Conservation	Water Main Replacement, Phase 4	Hawthorne	This project is Phase 4 and 5 of a city-wide water distribution system replacement effort by the City. All phases have been designed, and Phase 1-3 & 5 have been constructed. The remaining portions of the water distribution system consists mostly of approximately 16,600 linear feet of cast iron and galvanized steel pipe that is over 60 years old and has exceeded its useful life. Project completion will conserve precious water resources by significantly reducing water losses and need for frequent flushing.	Construction/ Underway	TBD	0.01	NA	$3.27	$0.005	$37.19
2680	NA	SRWMD	Alachua	PS and CII Conservation	Archer Water System Improvements	Archer, City of	Replacement of aging infrastructure to reduce water loss in the NFRWSP area.	Planning	2027	0.00	NA	$4.80	$0.005	$268.79
2671	NA	SRWMD	Alachua	PS and CII Conservation	Reducing Impacts from Urban Landscapes	Alachua County EPD	Reduction of water use in landscape irrigation in the NFRWSP area.	Planning	2027	0.07	NA	$0.45	$0.009	$1.46
2669	NA	SRWMD	Alachua	PS and CII Conservation	DH/DHR water sharing	GRU	Reduce groundwater pumping by connecting a shared water system at the GRU power plants to conserve water	Construction/ Underway	2030	0.20	NA	$0.93	$0.007	$0.70
2672	NA	SRWMD	Alachua	PS and CII Conservation	High Springs Limerock Mine	Alachua County	Acquire acreage in the NFRWSP area to support MFL recovery and preserve land use from development changes.	Construction/ Underway	2026	0.01	NA	$1.60	$0.014	$17.58
305	SRWS00158A	SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	PS and CII Conservation	Water Supply Infrastructure Improvements	Public Water Supply Entities	Includes replacement of aging infrastructure, distribution and safety improvements.	Proposed	2033	0.00	NA	$4.00	$0.04	NA
3033	NA	SRWMD	Bradford	PS and CII Conservation	Hampton AMR water meter replacement	Hampton, City of	Installation of AMR meters to reduce water loss in the NFRWSP area.	Construction/ Underway	2023	0.01	NA	$0.18	$0.003	$28.97
2668	NA	SRWMD	Bradford	PS and CII Conservation	Lawtey Water Main Replacement	Lawtey, City of	Replacement of aging infrastructure to reduce water loss in the NFRWSP area.	Planning	2026	0.02	NA	$2.80	$0.06	$23.50

Table K3, Continued. Water Conservation Project Options

RWSP Project No.	DEP Project ID	District	County	Project Type	Project Name/Description (two columns if needed)	Implementing Agency or Entity	Project Description	Project Status	Estimated Completion Date	Estimated Benefit (mgd)	Storage Capacity Increased (MG)	Total Capital Cost ($M)	Estimated Annual O&M ($M)	Unit Cost ($/1,000 gallons)
NA	NA	SRWMD	Bradford	PS and CII Conservation	Waldo AMR water meter replacement	Waldo, City of	Installation of AMR meters to reduce water loss in the NFRWSP area.	Proposed	2025	0.01	NA	$0.20	$0.005	$4.88
Total										**16.81**	**0.00**	**$57.48**	**$1.16**	**$415.77**

Table K4. Conceptual Project Options

RWSP Project No.	DEP Project ID	District	County	Project Type	Project Name	Implementing Agency or Entity	Project Description	Project Status	Estimated Completion Date	Estimated Benefit (mgd)	Storage Capacity Increased (MG)	Total Capital Cost ($M)	Estimated Annual O&M	Unit Cost ($/1,000 gallons)
33	SRWS00074A	SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Agricultural Conservation	Agricultural Efficiency Improvements	SRWMD/Producers	Implement water savings measures in the Eastern Planning Region.	Construction/ Underway	2045	TBD	NA	TBD	TBD	TBD
2023_12		SJRWMD/SRWMD	TBD	Groundwater Recharge	North Florida RWSP Project Conceptualization Partnership	CCUA, JEA, SJCUD, and GRU	Develop a list of feasible, conceptual regional projects or programs for the NFRWSP and MFL prevention/recovery strategies for the LSFIR and the Suwannee River. Tasks include 1. collection and review of utility IWRP and WW discharge records; 2. individual utility conceptual project ideas review; 3. identification and screening of projects for further conceptual development and 4. project list refinement and prioritization.	Proposed	2024	TBD	NA	TBD	TBD	TBD
217	SRWS00131A	SRWMD	Bradford	Groundwater Recharge	Rayonier South Water Supply Project	SRWMD	Restore natural flows with or without enhanced storage or aquifer recharge to UFA.	Proposed	2045	0.00	NA	$3.50	TBD	TBD
142	SRWS00094A	SRWMD	Bradford	Groundwater Recharge	WestRidge	TBD	Restore natural flows with or without enhanced storage or aquifer recharge to UFA.	Proposed	2045	1.00	NA	$2.79	TBD	TBD
240		SRWMD	Bradford	Groundwater Recharge	Bradford County Silviculture & Recharge	University of Florida	The purpose of this project is to enhance opportunities for aquifer recharge to UFA for the silvicultural lands and areas with surplus surface waters.	Conceptual	2045	TBD	NA	$2.00	TBD	TBD
358		SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Groundwater Recharge	Municipal Stormwater Discharge Project	SRWMD	The purpose of this project will be focused on identifying locations where towns/cities discharge to open subbasins that then discharge to the Santa Fe River.	Conceptual	2045	TBD	NA	$0.04	TBD	TBD
359		SRWMD	Alachua	Groundwater Recharge	Open to Closed Basin Project	SRWMD	The purpose is to determine which basins, that are closed in smaller storm events, but are open in larger events, could be closed for the larger storm events such that the extra volume stored could be recharged into the aquifer through percolation.	Conceptual	2045	TBD	NA	$0.06	TBD	TBD
360		SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Groundwater Recharge	Retention Pond Project Phase I	SRWMD	The purpose of this Project will be to determine if existing retention ponds were modified to store more water, would they be able to still meet permitting criteria, on average, how much would it cost to modify them, how much water could be recharged, and if there were cost effective things that could be done to increase the amount of water percolating in ponds.	Conceptual	2045	TBD	NA	$0.07	TBD	TBD
361		SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Groundwater Recharge	Santa Fe Basin Sinkhole Recharge Evaluation	SRWMD	The purpose of these projects will be to find locations to place storage ponds to assist with increasing rechange to the groundwater or to be used as alternative water supply.	Conceptual	2045	TBD	NA	$0.12	TBD	TBD
362		SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Groundwater Recharge	City Stormwater Recharge Study Phase II	SRWMD	The purpose of this project will be focused on identifying locations where storage ponds could be located adjacent or within towns/cities that are in open subbasins that discharge to the Santa Fe River.	Conceptual	2045	TBD	NA	$0.05	TBD	TBD
364		SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Groundwater Recharge	LaCrosse Stormwater Recharge Project Investigation Phase II	SRWMD	The purpose is to evaluate the regulatory feasibility, estimated benefits, and project costs of increased recharge of stormwater in LaCrosse from capturing water from Rocky Creek.	Conceptual	2045	TBD	NA	$0.08	TBD	TBD
366 linked to 409		SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Groundwater Recharge	Ecosystem Services	University of Florida	This project will focus on establishing a framework to implement silvicultural management practices on forested lands to benefit the NFRWSP and additional areas benefitting OFS. Reducing forest evapotranspiration (ET) will result in increased aquifer recharge (targeted to the UFA), spring flows, and water yield to nearby streams and wetlands. (linked to project 409)	Conceptual	2037	TBD	NA	$2.00	TBD	TBD
367		SRWMD	Bradford	Groundwater Recharge	Starke-Bradford Master Plan Project	SRWMD	The purpose of this project will be focused on identifying locations where projects can be undertaken within the City of Starke or in Bradford County to enhance core missions of the District .	Conceptual	2045	TBD	NA	$0.08	TBD	TBD
372		SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Groundwater Recharge	Retention Pond Project Phase II	SRWMD	The purpose of this Project will be to determine if increasing the amount of stormwater stored in retention ponds will have an adverse impact on groundwater, downstream wetlands, water levels and/or Minimum Flows at nearby gauges.	Conceptual	2045	TBD	NA	$0.20	TBD	TBD
374		SRWMD	Hamilton	Groundwater Recharge	Cooperative Aquifer Recharge Project	Agricultural Chemicals	The purpose of this project is to identify UFA recharge locations based on water quality and water availability metrics.	Conceptual	2045	TBD	NA	TBD	TBD	TBD
375		SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Groundwater Recharge	Santa Fe River Basin and Stream Storage Investigative Project	SRWMD	The purpose is to identify and prioritize potential pond sites within open subbasins in the Lower Santa Fe and Ichetucknee (LSFI) basin watersheds that can be used to hold additional stormwater and will percolate the excess water to recharge groundwater levels.	Conceptual	2045	TBD	NA	$0.09	TBD	TBD
378		SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	Groundwater Recharge	Cow Creek Project	SRWMD	The purpose of this project will be to develop projects that provide storage and recharge to the groundwater that build off results from the Open to Closed Basin Project (0359) and the Santa Fe Basin Sinkhole Rechange Evaluation (0361).	Conceptual	2045	TBD	NA	TBD	TBD	TBD
194	SRWS00120A	SRWMD	Alachua, Bradford, Columbia, Gilchrist, Hamilton, Suwannee, Union	PS and CII Conservation	SRWMD PS/CII Conservation Potential	SRWMD	Water conservation to be achieved through the replacement of inefficient fixtures with high efficiency fixtures to reduce commercial water consumption.	Proposed	2045	TBD	NA	TBD	TBD	TBD
2023_1		SJRWMD	Duval	PS and CII Conservation	Water Conservation Education Program	Atlantic Beach	Working with the City's Environmental Stewardship Committee and with technical assistance from SJRWMD staff, the City of Atlantic Beach Public Utilities Department will implement a voluntary water use bench-marking program and educational outreach program with the goal of reducing per capita water use within the City by 15%.	Conceptual	TBD	0.35	NA	TBD	TBD	NA
Total										**1.35**	**0.00**	**$11.07**	**$0.00**	**$0.00**


Recovery Strategy:

Lower Santa Fe River Basin

Lower Santa Fe and Ichetucknee Rivers and
Priority Springs
Minimum Flows and Levels

April 8, 2014

Recovery Strategy:

Lower Santa Fe River Basin

Lower Santa Fe and Ichetucknee Rivers and Priority Springs Minimum Flows and Levels

Suwannee River Water Management District
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386.362.1001
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April 8, 2014

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1.0 INTRODUCTION

This Recovery Strategy for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs presents the methods and approaches intended to recover and maintain the streamflows and springflows in the Lower Santa Fe River Basin to the Minimum Flows and Levels (MFLs) adopted by the Florida Department of Environmental Protection (Department) in coordination with the Suwannee River Water Management District (SRWMD or District) and the St. John's River Water Management District (SJRWMD) on DATE. This introductory chapter provides the statutory background relevant to establishing MFLs, a general description of the Lower Santa Fe River Basin, and the basis for creating the Recovery Strategy.

1.1 MFL PROGRAM OVERVIEW

The State of Florida's Water Resource Act of 1972 requires the five Water Management Districts (WMDs) of the State to establish MFLs to ensure that water bodies do not experience significant harm as a result of water withdrawals. Specifically, Section 373.042, Florida Statutes [F.S.], states that minimum flows are to be established at "the limit at which further withdrawals would be significantly harmful to the water resources and ecology of the area." Once established, MFLs provide a metric to guide the WMDs water use planning and permitting processes for the protection and sustainable use of Florida's water resources.

Subsection 373.0421(2), F.S., specifies that an MFL Prevention or Recovery Strategy be undertaken under the following conditions concerning an established MFL:

> *(2) If the existing flow or level in a water body is below, or is projected to fall within 20 years below, the applicable minimum flow or level established pursuant to s. 373.042, the department or governing board, as part of the regional water supply plan described in s. 373.709, shall expeditiously implement a recovery or prevention strategy, which includes the development of additional water supplies and other actions, consistent with the authority granted by this chapter, to:*
>
> *(a) Achieve recovery to the established minimum flow or level as soon as practicable; or*
> *(b) Prevent the existing flow or level from falling below the established minimum flow or level.*
>
> *The recovery or prevention strategy shall include phasing or a timetable which will allow for the provision of sufficient water supplies for all existing and projected reasonable-beneficial uses, including development of additional water supplies and implementation of conservation and other efficiency measures concurrent with, to the extent practical, and to offset, reductions in permitted withdrawals, consistent with the provisions of this chapter.*

The Lower Santa Fe and Ichetucknee Rivers and Priority Springs MFLs and Recovery Strategy were developed by the SRWMD, in conjunction with the Department and SJRWMD, pursuant to these statutory directives.

1.2 ESTABLISHMENT OF THE BASIN RECOVERY STRATEGY

In May 2013, the SRWMD presented a draft technical report to establish MFLs for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs, (see **Table 2-3.** MFLs for Priority Springs on the Lower Santa Fe and Ichetucknee Rivers, for a listing of priority springs). The District elected to have the proposed MFLs voluntarily peer reviewed by the University of Florida Water Institute, and in November 2013, the District utilized the findings and recommendations of the peer review panel to develop the final proposed MFLs for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs. The MFLs are briefly summarized in Section 2 of this report, and are discussed in detail in "Minimum Flows and Levels for the Lower Santa Fe and Ichetucknee Rivers," published by the District, and dated November 22, 2013. The SRWMD assessed the streamflows observed in the recent historical record and recent trends in the flow regime, and concluded that the Lower Santa Fe River MFL as measured at the Fort White Gage and Ichetucknee River MFL as measured at the US Highway 27 Gage are not currently being met. Based on this circumstance and the legislative directive established in Section 373.0421, F.S., the SRWMD and the Department have determined that the Lower Santa Fe and Ichetucknee Rivers and their priority springs are in recovery and will require a Recovery Plan to restore their stream and springflows to the proposed MFLs.

To fulfill the legislative directive to restore the stream and springflows on the Lower Santa Fe and Ichetucknee Rivers to the proposed MFLs, the SRWMD, in conjunction with the Department and the SJRWMD, has developed this Recovery Strategy for the Lower Santa Fe River Basin. This Recovery Strategy is designed to implement preliminary regulatory measures to initiate the MFL recovery process, and provide a path forward to implement long-term water management strategies to restore and maintain minimum flows in the Lower Santa Fe and Ichetucknee Rivers and their priority springs while providing for adequate water supplies to meet current and future water use needs.

1.3 BACKGROUND

This Section provides a brief summary of the recent water resource analysis and planning actions that preceded the development of the MFLs for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs.

Water Supply Planning

In December 2010, the SRWMD Governing Board accepted the District's 2010 Water Supply Assessment (Assessment) in accordance with Section 373.036, F.S. The Assessment concluded that groundwater levels in the Upper Floridan aquifer had declined significantly during the past 75 years as a result of regional groundwater withdrawals in both the Suwannee River and St. Johns River Water Management Districts, and southeast Georgia. The Assessment also concluded that the water resources in the northeastern portion of the SRWMD are declining, or predicted to decline, during the 2010–2030 planning period. As a result, the northeast portion of the SRWMD was subdivided into four Water Supply Planning Regions, which included the Lower Santa Fe River Basin planning region. The analysis conducted in the Assessment indicated that unacceptable impacts to flows in the Lower Santa Fe River and springs were predicted for the 2010–2030 planning period. Pursuant to Rule 62-40.520(2), Florida Administrative Code [F.A.C.], the SRWMD Governing Board designated the four Water Supply Planning Regions (including the Upper and Lower Santa Fe River Basins) as Water Resource Caution Areas (WRCAs) on October 11, 2011.

Rule 62-40.531, F.A.C., specifies that a Regional Water Supply Plan should be developed for each Water Supply Planning Region. Based on the unique geology of the District, and the fact that the impacts to springflows and springfed rivers are linked to regional groundwater trends, both within and outside of the SRWMD, District staff concluded that water supply planning for the Lower Santa Fe Basin should be conducted as part of a broader multi-region planning effort with the SJRWMD.

Upper Santa Fe River MFLs

On December 10, 2007, the SRWMD established and adopted MFLs for the Upper Santa Fe River. At that time, the SRWMD determined that streamflows in the Upper Santa Fe River had not fallen below the established MFL. For the purpose of establishing that MFL, the SRWMD defined the Upper Santa Fe as the Santa Fe River upstream of the USGS Worthington Springs Gage. The SRWMD currently monitors the status of streamflows in the Upper Santa Fe River, and continues to evaluate its status with regard to its established minimum flows.

Existing Agreements

To better protect and manage the shared water resources of north Florida, on September 13, 2011 the SRWMD, SJRWMD, and the Department entered into an agreement to formalize the coordination of regional water resource management. This Interagency Agreement (IAA) resulted in the creation of the North Florida Regional Water Supply Partnership (NFRWSP), which includes the two water management districts, the Department, the Florida Department of Agriculture and Consumer Services (FDACS), as well as local elected officials and area stakeholders. The NFRWSP works to develop joint water resource protection strategies and focuses on communication with stakeholders across district boundaries during the preparation of a joint regional water supply plan between the SRWMD and SJRWMD.

A major element of the IAA is the North Florida Regional Water Supply Plan (Plan), which is scheduled for draft completion in late 2015. The Plan study area includes the four WRCAs in the SRWMD and the northern nine counties of the SJRWMD. Observed impacts to water resources in the Lower Santa Fe and Ichetucknee Rivers and their priority springs will be discussed in the Plan, as well as solutions to mitigate those impacts and recover the region’s water resources. The Plan is discussed in greater detail in Section 5 of this report.

Recent Legislative Developments

In the 2013 Florida Legislative Session, the State Legislature passed Senate Bill 244 (SB244), which primarily relates to the adoption of MFLs and the associated Recovery and Prevention strategies. SB244 was approved by the Governor of Florida on June 28, 2013, and subsequently adopted into law as Chapter 2013-229, Laws of Florida. This law amended s. 373.042, F.S. so that any MFL and related recovery or prevention strategy adopted by the Department shall be applied by all relevant WMDs without the need for further rulemaking. Additionally, Chapter 2013-229 expands the ability of the WMDs to coordinate management efforts and jointly fund recovery strategies and projects to address regional water resource issues. The addition of this legislation to the MFL program provides an important mechanism for the State’s WMDs to establish MFLs in a manner that addresses regional impacts to water resources. This is particularly significant in the protection of groundwater-based resources, such as springs and springflow dominated rivers, as the impacts to these systems can be regional in nature, and may extend across district boundaries. This legislation provides a basis to further expand the partnership between the SRWMD and SJRWMD to better address regional trends in the Upper Floridan aquifer and to achieve MFL targets where cross-boundary effects have been identified. This will also achieve water supply goals in the joint planning area of both districts.

MFL and Recovery Strategy Rule Adoption

In light of the new provisions provided in SB244, now codified in 373.042, F.S., and the regional nature in the management of groundwater systems, the SRWMD Governing Board requested in June 2013 that the Department adopt both the Lower Santa Fe and Ichetucknee Rivers and Priority Springs MFLs and the Lower Santa Fe and Ichetucknee Rivers and Priority Springs Recovery Strategy. As such, the Department will adopt the MFLs, as well as the regulatory portion of the Recovery Strategy by rule, which will thereafter be implemented by the WMDs with no further rulemaking required. The remaining non-rule portions of the Recovery Strategy will then be implemented jointly and cooperatively by the WMDs.

1.4 SANTA FE RIVER BASIN

The following sections provide a brief overview of the Santa Fe River Basin's general setting, hydrogeology, and the regional and local water use regime, which form the foundation upon which the Recovery Strategy was developed. The information contained in these sections is generally derived from the District's Technical Report, "Minimum Flows and Levels for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs" (SRWMD, 2013).

General Setting

The Santa Fe River Basin is located in the easternmost portion of the SRWMD, and primarily lies in Alachua, Columbia, Union, Bradford, and Gilchrist Counties, as well as smaller portions of Suwannee, Baker, Clay, and Putnam Counties. These areas are mostly rural in nature, with several small municipalities and communities located within the basin. The more developed and populated communities of Lake City and Gainesville, which are located to the north and south of the watershed boundaries, play a significant role in regional water demand and hydrology. The City of Gainesville and the associated metropolitan area have experienced significant growth and development in recent decades, driven by the presence of the University of Florida and its associated institutions.

The Santa Fe River Basin features several popular recreational areas containing springs, swallets, and river rises, including Ichetucknee Springs State Park, O'Leno State Park, and River Rise State Park. Several significant springs are also present in the basin, including Ichetucknee Head Springs, Blue Hole, Cedar, Mission, Grassy, Mill Pond, and Coffee Springs on the Ichetucknee River, and Ginnie, Poe, Hornsby, Rum Island, Devil's Eye, and Gilchrist Blue Springs along the Santa Fe River. Recreational uses of the Santa Fe and Ichetucknee Rivers and their associated springs, which include tubing, snorkeling, fishing, cave diving, and the use of small watercraft, represent an important economic resource in the region.

For the development of the proposed Lower Santa Fe and Ichetucknee MFLs, the Lower Santa Fe River Basin study area was defined as: Olustee Creek, the Santa Fe River downstream from the mouth of Olustee Creek, the Ichetucknee River, and the watersheds associated with these streams, as shown in **Figure 1-1.** This area includes the Lower Santa Fe River and its tributaries downstream of the USGS Worthington Springs Gage, which was the lower extent of the presently adopted Upper Santa Fe River MFLs.

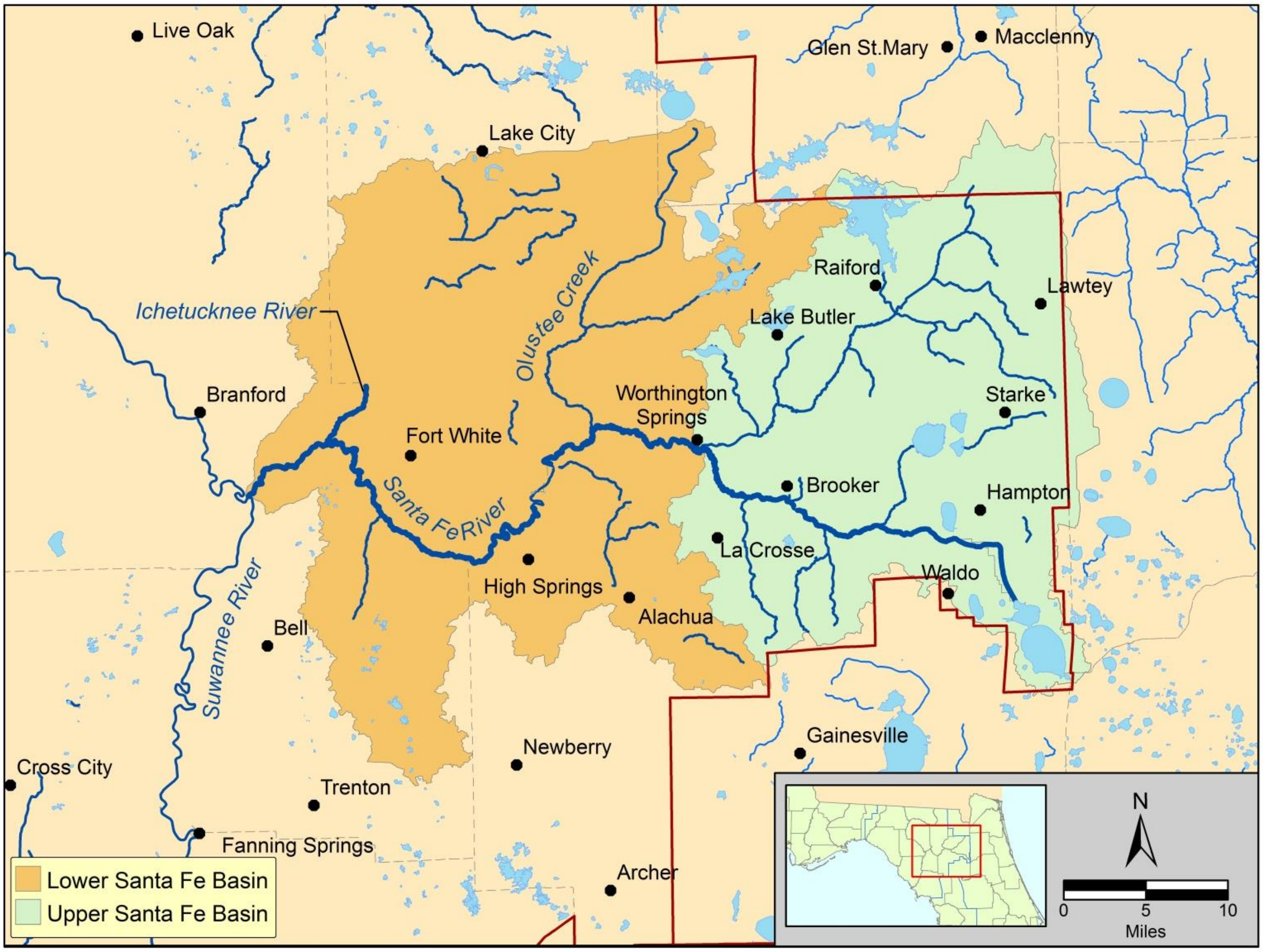


Figure 1-1. Location and Extent of the Lower Santa Fe River Basin MFL Study Area

Hydrogeology

The Santa Fe River Basin straddles two major physiographic provinces which greatly affect the hydrology of the area: the Northern Highlands and the Gulf Coastal Lowlands, separated by the Cody Escarpment (Upchurch, 2007);(White, 1970). These features, along with the underlying Upper Floridan aquifer, dominate the local hydrologic regimes of the Santa Fe River Basin. A generalized description of the hydrogeology of the basin is provided in this section, and a detailed description of the geology of the Santa Fe Basin can be found in the Lower Santa Fe and Ichetucknee Rivers MFL document (SRWMD, 2013).

NORTHERN HIGHLANDS

The Northern Highlands (White, 1970) are present in the eastern and northern portions of the Lower Santa Fe River Basin in parts of Columbia, Union, and Alachua Counties. The Northern Highlands consist of a plateau made up of a thick sequence of relatively low-permeability Miocene Hawthorn Group sediments, which are capped in some areas by undifferentiated Pleistocene-age sandy sediments. Due to the relatively low permeability sediments at or near the surface, local rainfall drainage in the Northern Highlands is dominated by surface water features, with numerous lakes, swamps, and streams present. The Upper Santa Fe River and its tributaries (such as Olustee Creek) convey surface water runoff from the Northern Highlands as evidenced by the drainage patterns illustrated in **Figure 1-2**.

GULF COASTAL LOWLANDS PROVINCE

The Gulf Coastal Lowlands extend inland from the Gulf of Mexico shoreline, a distance of approximately 50 miles, terminating in the western portion of the Lower Santa Fe River Basin. The Gulf Coastal Lowlands are characterized by broad and flat marine plains blanketed by thin Pleistocene sands, which overlie the porous Ocala Limestone of the Upper Floridan aquifer (Rupert, 1988).

As a result of the thin sediment cover over porous limestone, karst features are numerous in the Gulf Coastal Lowlands, and the Lower Santa Fe Basin is punctuated by various depressional features, such as sinkholes. This extensive karst development creates a groundwater-dominated drainage pattern; consequently, the Lower Santa Fe River Basin in the Gulf Coastal Lowlands is largely devoid of stream channels. Furthermore, surface water features in this area of the Lower Santa Fe Basin, including the Santa Fe and Ichetucknee Rivers, generally exhibit a high degree of connectivity to the Upper Floridan aquifer.

CODY ESCARPMENT

The Cody Escarpment (Scarp) is a physiographic feature that represents the largest continuous topographic break in Florida. The Cody Scarp generally separates the Northern Highlands from the Gulf Coastal Lowlands, as shown in **Figure 1-2**. The geomorphologic features of the Cody Scarp and similar physiographic features are unique, and developed due to a combination of headward erosion by streams and dissolution of carbonate rocks by streams and groundwater. The land surface along the Cody Scarp typically contains sinkholes, sinking streams, and other large and well-developed karst features.

The hydrology of the Lower Santa Fe River Basin is markedly influenced by the karst terrain. In the vicinity of the Cody Scarp, the Santa Fe River flows into a swallet (a sinkhole where streams go underground) at O'Leno State Park (north of High Springs) and reappears (resurges) approximately three miles south-southwest at River Rise Preserve State Park. The flows in the Santa Fe River consist of a combination of stormwater runoff and groundwater discharge. The upper portion of the Santa Fe River (above Worthington Springs) is dominated by stormwater runoff. Downstream of this reach the river flows through a transitional area of increasing groundwater influence, with the lower portion of the Santa Fe River and the entirety of the Ichetucknee River dominated by springflow.

UPPER FLORIDAN AQUIFER

The Upper Floridan aquifer is the primary source of water supply for all water use types in the Lower Santa Fe River Basin, and also provides the baseflow in the Lower Santa Fe and Ichetucknee Rivers and priority springs. The primary Upper Floridan aquifer production zone in the Lower Santa Fe Basin is the upper portion of the Ocala Limestone, where dissolution processes have greatly increased the porosity and productivity of the limestone. The Upper Floridan aquifer is generally well confined or semi-confined by Hawthorn Group sediments in the Northern Highlands, and is generally unconfined in the Gulf Coastal Lowlands. In the Lower Santa Fe River Basin, the Upper Floridan aquifer discharges to the Santa Fe and Ichetucknee Rivers and their springs under most conditions (with the exception of flood events). As a result, maintaining Upper Floridan aquifer water levels in the Lower Santa Fe River

Basin is critical to maintaining flow in the springs and baseflow in the Lower Santa Fe and Ichetucknee Rivers.

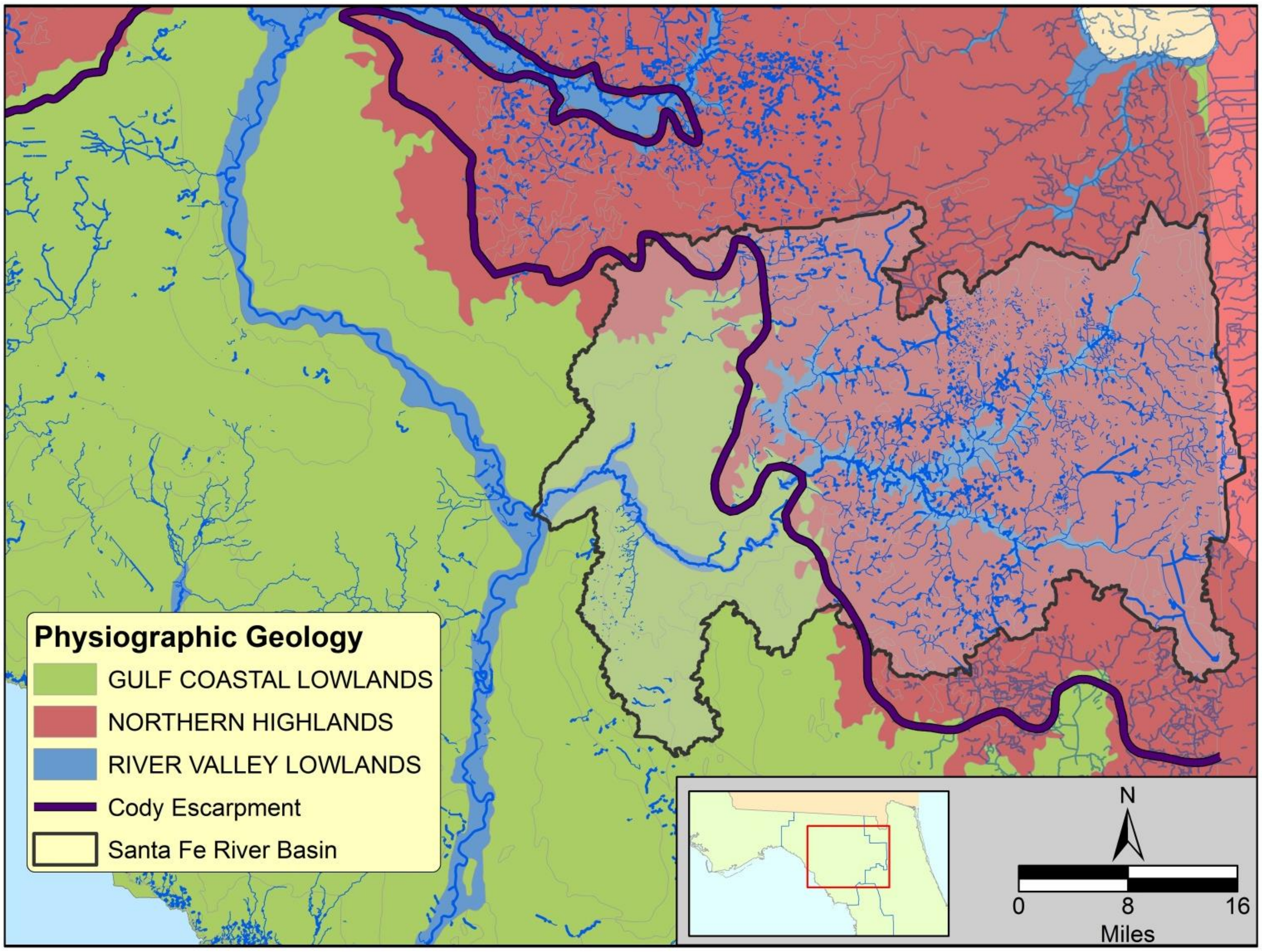


Figure 1-2. Physiography of the Lower Santa Fe River Basin

1.5 REGIONAL WATER USE

In the Santa Fe Basin and throughout the north Florida region, the Upper Floridan aquifer remains the primary source of water for all uses by a wide margin. Presently, within the SRWMD and the nine northernmost counties of the SJRWMD, groundwater withdrawals make up an estimated 581 Million Gallons per Day (MGD) of a total estimated water use of 753 MGD (data compiled by Marella, USGS Florida Water Science Center). Historically, the majority of groundwater use in this region was centered in the more developed areas along the east coast, but in recent years, agricultural water uses have increased significantly in the inland areas, particularly in the Suwannee River Basin. This groundwater-based water use regime has persisted in north Florida for much of the twentieth century to the present, and has contributed to significant regional groundwater declines (Grubbs, 2007). These regional groundwater level declines have been identified in the Upper Floridan aquifer throughout the north Florida region, and have impacted groundwater-based water resources in this area, including freshwater springs and their contributions to baseflow in streams and rivers.

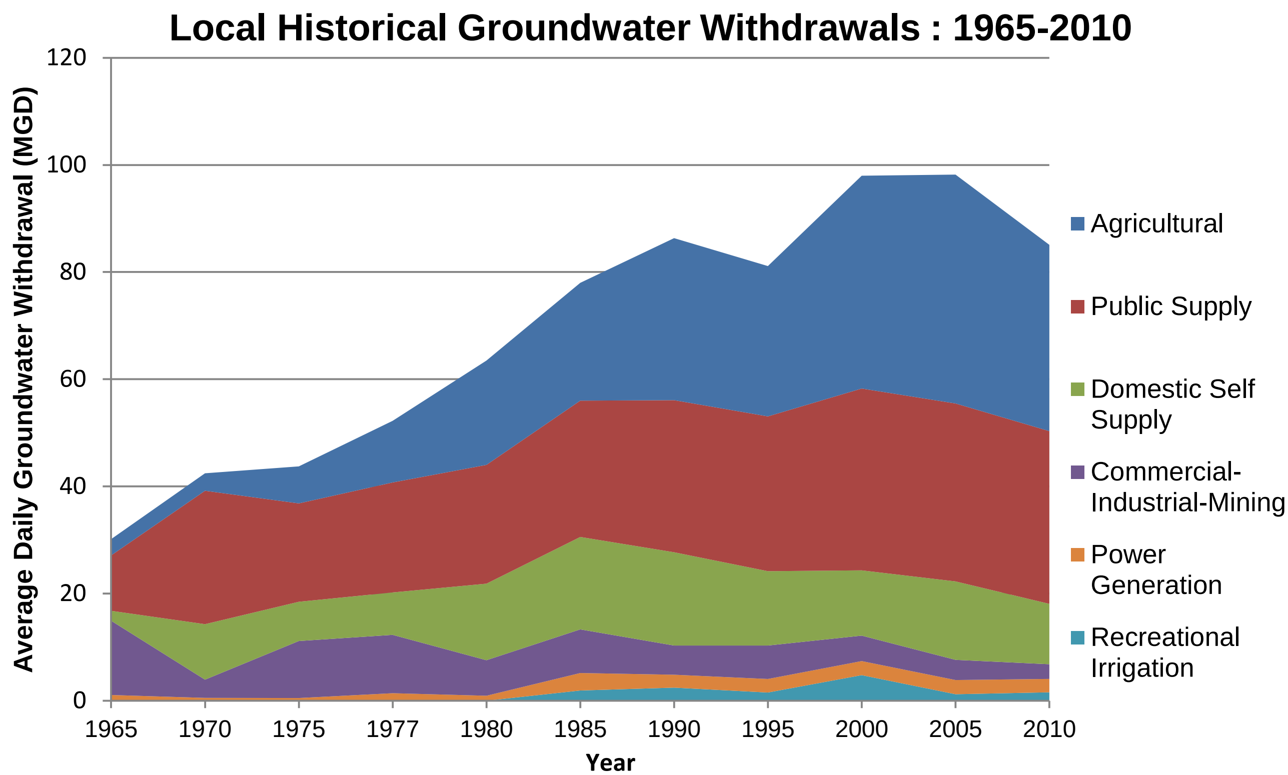
Although climatologic trends have affected the hydrologic regime, analyses conducted by SRWMD during the development of the Lower Santa Fe Basin MFLs indicated that regional groundwater use had contributed to observed stream and springflow impacts within the Santa Fe Basin. Regional impacts to the Lower Santa Fe Basin are discussed in Section 3.0 of this report.

Historical Water Use

This section provides a brief overview of the historical local water use regime in the Santa Fe River Basin. Although regional drivers have contributed to water resource impacts in the Santa Fe Basin, an understanding of local water use patterns is critical to the implementation of a successful Recovery Strategy. To examine historical trends in water use in the Santa Fe River Basin, the District utilized historical estimated water use data compiled by the United States Geological Survey (USGS) Florida Water Science Center for Alachua, Bradford, Columbia, Gilchrist, and Union Counties, which comprise the majority of the Santa Fe River Basin. The historical water use data record extended from 1965 to 2010, with records available for every fifth calendar year. The records utilized in this analysis can be found as an appendix in the MFL document, and are also available from the USGS Florida Water Science Center**.** It should be noted that at the time of this publication, the 2010 records are still preliminary and subject to future revision by the USGS.

In 1965, total water use in the five county area of the Santa Fe River Basin was approximately 31.4 MGD. Groundwater withdrawals accounted for 96% of this use. The major water use groups were commercial-industrial-mining and public supply, which utilized approximately 13.9 MGD and 10.4 MGD respectively. Self-supplied agricultural irrigation accounted for a relatively low percentage of total use, at approximately 4.3 MGD, or 14% of total use. It is noteworthy that in 1965 over one quarter (1.2 MGD) of agricultural demand was satisfied by surface water withdrawals.

Since 1965, water use has changed significantly in this five county area. Based on 2010 preliminary water use estimates, total water use in this area has increased to 85.9 MGD, with groundwater usage constituting 99% of all withdrawals. To date, several of the counties in this area have relatively little overall water use, namely Union, Bradford, and Gilchrist Counties, which used only an estimated 3.1 MGD, 5.3 MGD, and 9.2 MGD of fresh groundwater in 2010. Among the various user groups, agricultural use within the Santa Fe River Basin has increased significantly since the late 1970s due to advances in irrigation technology. Currently, self-supplied agriculture is the largest user of water in the Santa Fe Basin, accounting for approximately 41% of total freshwater withdrawals in 2010 at an estimated 35.3 MGD. Water withdrawals for public supply have also grown significantly in association with increasing population in this five county area, now totaling approximately 32.2 MGD. Domestic self-supply experienced similar growth in this period, but has remained relatively steady since the 1980s, now totaling approximately 11.3 MGD. It should also be noted that commercial-industrial-mining uses have decreased significantly since 1965, and now account for only 2.7 MGD, or 3% of total withdrawals in this five county area. These reductions have been offset by growth in other areas, with agriculture and public supply increasing greatly in this period.



[1]Data Source: USGS Florida Water Science Center

Figure 1-3 Historical Groundwater Withdrawals for Various Uses in Alachua, Bradford, Columbia, Gilchrist, and Union Counties

In summary, agriculture, public supply, and domestic self-supply currently exert the greatest demand for water in the Santa Fe River Basin region. Together, these three water use groups account for nearly 91% of estimated freshwater withdrawals. Based on current data, the vast majority of these demands are expressed in the form of groundwater withdrawals from the Upper Floridan aquifer, such that all demands are from fresh groundwater sources. Therefore, the strategies developed by the SRWMD to recover and maintain stream and springflows in the Lower Santa Fe and Ichetucknee Rivers, in accordance with the proposed MFLs, will be designed to address and ameliorate the effects of these local withdrawals.

Local Land Use

The dominant land cover of the Santa Fe Basin is forest and rangeland, which makes up approximately 57% of the basin land cover (based on SRWMD generalized Florida Land Use, Land Cover Classification System, FLUCCS, data from 2008). **Figure 1-4** depicts the generalized land use in the Santa Fe River Basin. Much of the forested land in the basin has been modified or managed for silviculture, although this is believed to have a minimal impact on the overall basin water use. Approximately 19% of the land cover of the basin is agricultural, and is generally utilized for rowcrop production such as peanut and corn operations, as well as some cattle and dairy operations and plant nurseries. Together, agriculture and silviculture account for much of the economic activity in the basin. Urban and transportation land uses make up a small but significant portion (approximately 9%) of the basin land cover. The largest concentrations of urban land within the Santa Fe River Basin are located near Lake City and near the eastern boundary of the District (the US Highway 301 corridor including the City of Starke in Bradford County).

Table 1-1. Historical Land Use within the Santa Fe River Basin

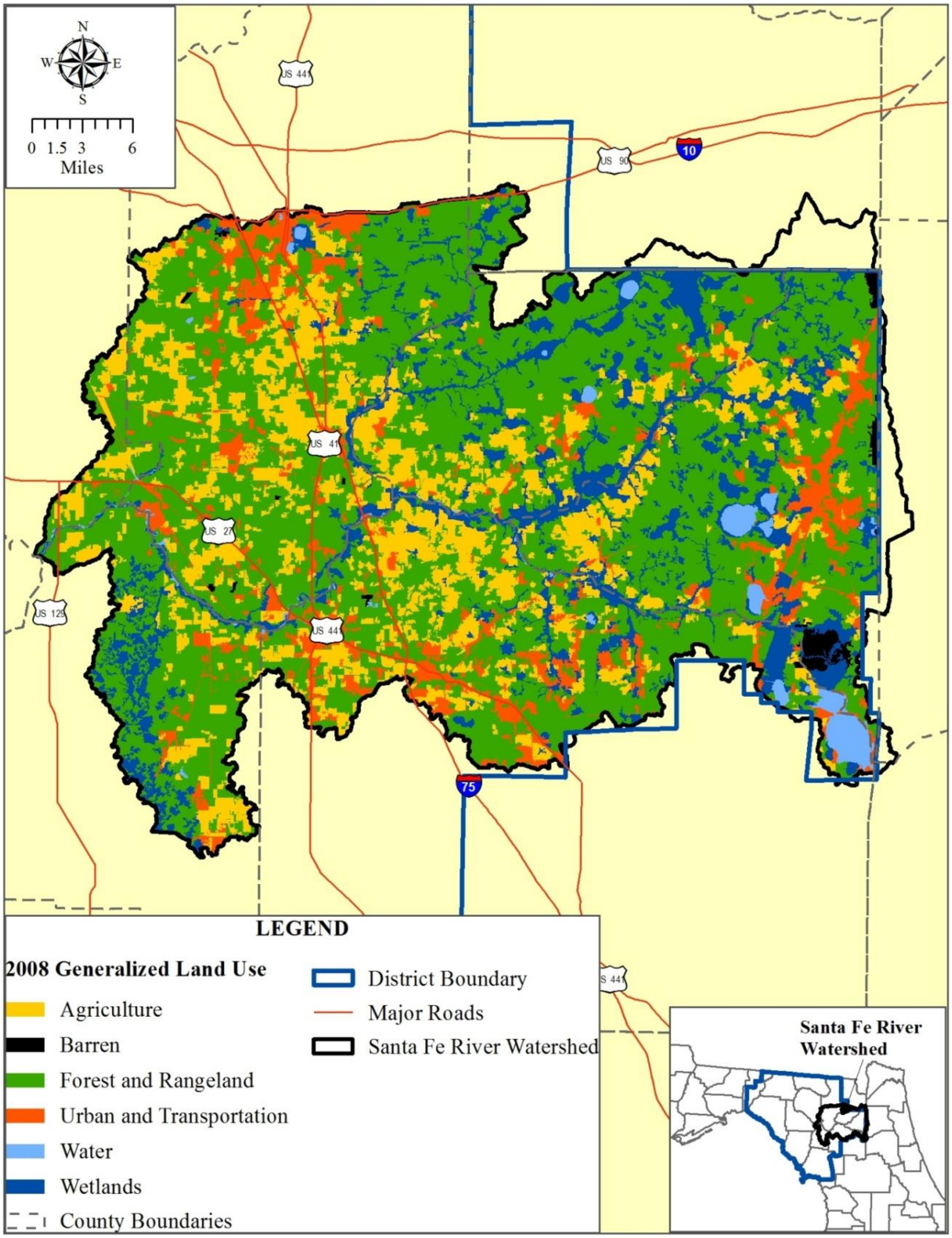
FLUCCS[1] Code	Land Use Description	1970s		1988		2008	
		Area (ac)	Percent	Area (ac)	Percent	Area (ac)	Percent
1000	Urban and Transportation	16,655	1.9	26,218	3.1	80,710	9.4
2000	Agriculture	252,836	29.5	212,803	24.8	159,420	18.6
3000 and 4000	Forest and Rangeland	489,689	57.2	516,860	60.3	488,384	57.0
5000	Water	11,935	1.4	14,731	1.7	14,485	1.7
6000	Wetlands	80,983	9.5	85,040	9.9	107,531	12.6
7000	Barren	4,468	0.5	907	0.1	6,071	0.7
	Total	856,567	100.0	856,558	100.0	856,601	100.0

[1] Florida Land Use and Cover Classification System

The Santa Fe Basin has also experienced shifts in historical land use in recent decades. **Table 1-1,** provides a summary of the historical land use coverages in the Santa Fe Basin. The amount of land in agricultural production decreased significantly in recent decades, shifting from approximately 30% of the basin area in the 1970s, to only 19% of land cover by 2008. This trend lies in sharp contrast to the trend in self-supplied agricultural water use, which has increased greatly since the 1970s. This inverse relationship partially reveals the increased water demand created in the Lower Santa Fe region subsequent to the introduction of more intensive irrigation practices since the late 1970s. It should be noted that a minor portion of the changes in land use acreages in the Florida Land Use and Cover Classification System may be attributed to uncertainty in the development of this data from aerial photography; however, this data provides the best available information about the general historical changes in land use in the Santa Fe Basin over the last several decades.

The Santa Fe Basin has also experienced a significant increase in urban and transportation land use in recent years (**Figure 1-4**). In the 1970s, residential, commercial, industrial, and transportation land uses collectively comprised approximately 2% of the basin area. By 2008, it had risen to approximately 9%. Part of this increase in urban land use was associated with increased development in Lake City and Columbia County, as well as along the Interstate 75 corridor. This increase in urban land corresponds to increased water withdrawals for both the public supply and domestic self-supply water use groups.

In summary, the dominant land cover in the Santa Fe Basin, forest and rangeland, has remained relatively constant over the last several decades. Additionally, the basin has experienced a trend toward the smaller agricultural acreage totals, which are managed at higher irrigation intensity, while urban areas have experienced modest but steady growth. These trends in land use within the Santa Fe Basin provide a basis for formulating local recovery measures, and also illustrate the need to plan for future changes in the types and quantities of the water use in implementing the Recovery Strategy.



[1] Source: SRWMD generalized *Florida Land Use, Land Cover Classification System,* 2008

Figure 1-4. 2008 Land Use within the Santa Fe River Basin

2.0 SUMMARY OF PROPOSED MFLS

The following sections provide a brief overview of the MFLs proposed for the Lower Santa Fe and Ichetucknee Rivers and their Priority Springs. For a complete description of the development of the proposed MFLs, refer to “Minimum Flows and Levels for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs,” published by the District, and dated November 22, 2013.

State policy guidance established in Rule 62-40.473, F.A.C., lists ten environmental and water resource values that must be considered in establishing MFLs. These values, referred to in this report as Water Resource Values or WRVs, are specific aspects or specific uses of the natural system to be considered during MFL development. Two WRVs were relevant to the study area and had sufficient available information to allow for an evaluation of the relationship between the WRVs and system hydrology: (1) Recreation in and on the water, and (2) Fish and wildlife habitats and the passage of fish. The predominant metrics used for these values include:

- Santa Fe River near Fort White:
    - Fish and wildlife habitat and the passage of fish: fish passage, floodplain vegetation inundation, floodplain hydric soils, bankfull flows, in-stream habitat;

- Ichetucknee River at US Highway 27:
    - Fish and wildlife habitat and the passage of fish: fish passage, bankfull flows, floodplain hydric soils, in-stream habitat.
    - Recreation in and on the water: recreational tubing

The District developed a continuous MFL flow regime that incorporated the available information relating to these values. During the establishment of the MFL, District staff utilized the historical streamflow record prior to 1990 as a historical baseline, since significant streamflow reductions due to anthropogenic impacts were not readily discernable in the flow record during that timeframe. This historical baseline flow regime was utilized to develop the MFL flow regime, and also provided a mechanism for evaluating the compliance status of the rivers. Given the characteristics of the rivers and the available flow data, MFLs were developed at two river gages, the Fort White Gage on the Lower Santa Fe River and the US Highway 27 Gage for the Ichetucknee River. Based on flow records, District staff determined that the Lower Santa Fe River is in recovery with an estimated streamflow deficit of 17 cubic feet per second (cfs) as of 2010. Likewise, District staff also determined that the Ichetucknee River is in recovery, with an estimated streamflow deficit of 3 cfs.

2.1 PROPOSED MFL CRITERIA

The following tables provide a numerical summary of the proposed MFL flow regime for the Lower Santa Fe and Ichetucknee Rivers, on a percent exceedance basis (the percentage of time that each flow listed is expect to be exceeded). The baseline (built on the historical flow record prior to 1990) flows from the MFL analysis are provided for comparison.

Table 2-1. MFL Flow Values and Baseline Flows for the Lower Santa Fe River near Fort White

Flow Duration Curve	Discharge Exceedance Amounts (cfs)						
	5%	10%	25%	50%	75%	90%	95%
Baseline	**3,230**	**2,630**	**1,860**	**1,320**	**1,050**	**885**	**810**
MFL	**3,101**	**2,523**	**1,768**	**1,214**	**920**	**749**	**672**

Table 2-2. MFL Flow Values and Baseline Flows for the Ichetucknee River at US Highway 27

Flow Duration Curve	Discharge Exceedance Amounts (cfs)						
	5%	10%	25%	50%	75%	90%	95%
Baseline	**483**	**457**	**395**	**354**	**328**	**304**	**280**
MFL	**473**	**448**	**386**	**343**	**318**	**282**	**246**

In addition to developing MFLs for the Lower Santa Fe and Ichetucknee Rivers, the District also established MFLs for each of the priority springs associated with these rivers. The Priority Springs MFLs were expressed as a cumulative allowable percent reduction in baseline springflow discharge for each listed spring. The allowable reduction was developed based on the allowable reduction in streamflow from the associated river flow at median conditions (i.e., at the 0.5 exceedance probability). This method ensures that the maximum change at any individual priority spring contributing to flow in either river will continue to provide the same proportional flow contribution to the river under the MFL regime that it did under baseline conditions.

Table 2-3. MFLs for Priority Springs on the Lower Santa Fe and Ichetucknee Rivers

Spring	Allowable Reduction from Baseline at Median Springflow
Santa Fe Rise	8%
ALA112971 (Treehouse)	
Hornsby	
Columbia	
Poe	
COL101974	
Rum Island	
July	
Devil's Ear (Ginnie Group)	
Siphon Creek Rise	
Ichetucknee Head	3%
Blue Hole	
Mission	
Devil's Eye	
Grassy Hole	
Mill Pond	

2.2 PEER REVIEW

As previously stated, the SRWMD elected to conduct voluntary, independent, scientific peer review of the technical analysis used to develop the MFLs. In accordance with Section 373.042, F.S., SRWMD contracted with the University of Florida's Water Institute to conduct the peer review of the initial draft MFL technical report in July 2013. During the peer review period the District also solicited comments on the draft MFLs from stakeholders. The draft peer review report was submitted to the SRWMD on September 11, 2013, and the final peer review report, entitled "Peer Review of the Proposed Minimum Flows and Levels for the Lower Santa Fe and Ichetucknee Rivers and Associated Priority Springs," was submitted to the SRWMD on October 11, 2013.

According to the Peer Review Report, the peer review panel "supports the general approach that the SRWMD has adopted to develop MFLs for the Lower Santa Fe and Ichetucknee Rivers" and further concluded that "the panel believes that, with relatively minor and easily reconcilable exceptions noted in the report, the SRWMD utilized the best available data and information in their analyses." The peer review report further provided a number of comments, recommendations, and suggestions for SRWMD staff to consider or evaluate in finalizing the proposed MFLs. The SRWMD addressed the comments of the peer review and utilized the findings and recommendations to develop the final proposed MFL to ensure that MFLs are based on the best available information. Additionally, as the stakeholder comments were received, SRWMD staff worked to incorporate those comments into the final MFL report to the extent practical. A complete summary of the District's response to the peer review and other public comments received can be found in "The Minimum Flows and Levels for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs Peer Review and Public Comment Resolution Document," published on December 17, 2013, which is available on the SRWMD's website (www.mysuwanneeriver.com).

2.3 MFL COMPLIANCE STATUS

To evaluate the current regulatory status of the Lower Santa Fe and Ichetucknee Rivers with respect to the MFL flow regimes, the District utilized several physical and empirical hydrologic models; observed streamflow and climate data were used to assess the degree of historic impacts to the water resources. By examining several metrics for impacts to streamflows, the District built a body of scientific evidence to ascertain the compliance status of the priority water bodies. By comparing this weight of evidence of estimated impacts to streamflows in the Lower Santa Fe and Ichetucknee Rivers to the MFL flow regimes, the District assessed whether the Lower Santa Fe and Ichetucknee Rivers are currently meeting their MFLs. A full technical description of these analyses is provided in the MFL report.

Comparison of the weight of evidence of streamflow impacts for the Lower Santa Fe River with the proposed MFL indicated that the Lower Santa Fe River had an estimated flow deficit of 17 cfs in 2010. Thus the MFL being proposed for the Lower Santa Fe River is not currently being met. *Based on the estimated streamflow deficit of 17 cfs (approximately 11 MGD) below the proposed MFL, the SRWMD has determined that the Lower Santa Fe River is not currently meeting the MFL*, *and requires a Recovery Strategy to achieve the restoration of minimum flows.*

Similar comparison of the weight of evidence of streamflow impacts for the Ichetucknee River with the proposed MFL indicated that the Ichetucknee River currently has an estimated streamflow deficit of 3 cfs (approximately 2 MGD). *Based on the estimated streamflow deficit of 3 cfs (approximately 2 MGD)* *below the proposed MFL, the SRWMD has determined that the Ichetucknee River is not meeting the MFL, and requires a Recovery Strategy to achieve the restoration of minimum flows.*

Chapter 373.0421(2), F.S., provides clear direction in the event the existing flow in a water body is below the applicable minimum flow. Consistent with Section 373.0421, F.S., these circumstances necessitate the development of a Recovery Strategy for the Lower Santa Fe and Ichetucknee Rivers and their associated priority springs.

3.0 ASSESSMENT OF REGIONAL HYDROLOGIC INFLUENCE

In order to effectively develop and direct the components of the Recovery Strategy, the origins and causes of the impacts to streamflows and springflows must be examined. Previous work conducted in the 2010 Water Supply Assessment indicated that groundwater withdrawals throughout the north Florida and southeast Georgia region were contributing to trends in regional groundwater levels. To assess the potential effects of regional groundwater withdrawals on streamflow reductions in the Lower Santa Fe Basin, the SRWMD conducted an analysis to examine the effects of groundwater withdrawals outside of the SRWMD boundaries on the flows in the Lower Santa Fe and Ichetucknee Rivers and priority springs. A detailed summary of this analysis is included in the MFL document. The results of the District's analysis indicated that a significant portion of the stream and springflow impacts to the Lower Santa Fe and Ichetucknee Rivers and priority springs are the result of groundwater withdrawals originating outside of the SRWMD's boundaries.

ANALYSIS APPROACH AND METHODOLOGY

The primary tool the District employed to examine the effects of regional groundwater withdrawals on the Lower Santa Fe River and Ichetucknee River streamflows and springflows was the District's North Florida Model (NFM). The NFM is a finite difference, numerical groundwater flow model which the District developed for the north Florida region. The geographic extent of the NFM is shown in **Figure 3-1.** The NFM can be used to examine the effects of various groundwater withdrawals on regional groundwater levels and flows in springs and baseflows in groundwater dominated rivers. The model can also be used to estimate the benefits of proposed recovery projects and programs within the District. The WMDs intend to continue to utilize the best available modeling tools within their respective boundaries to direct the development and implementation of recovery measures until a joint model is available for use throughout the planning area.

To develop an understanding of the impact of existing groundwater withdrawals within the north Florida region on Lower Santa Fe Basin streamflows and springflows, District staff used the NFM to evaluate several theoretical groundwater conditions. Initially, the current flows of the Lower Santa Fe and Ichetucknee Rivers were examined with current estimated groundwater use included in the model (the "pumps on" condition). District staff then evaluated several hypothetical "pumps-off" scenarios, which were created by removing various groundwater withdrawals from the model. Initially, the District established several theoretical predevelopment flow scenarios by removing groundwater pumping from the model across the entire model domain. Staff then created comparable scenarios in which only groundwater withdrawals within SRWMD boundaries were removed from the model. This allowed the District to examine the theoretical impact of groundwater withdrawals outside of SRWMD boundaries on the Lower Santa Fe River and Ichetucknee River streamflows if no local withdrawals were present. By comparing the theoretical streamflows from the various "pumps-on" and "pumps-off" modeling scenarios, the District was able to assess the potential for regional groundwater uses both within and outside of the SRWMD to impact streamflows in the Lower Santa Fe and Ichetucknee Rivers.

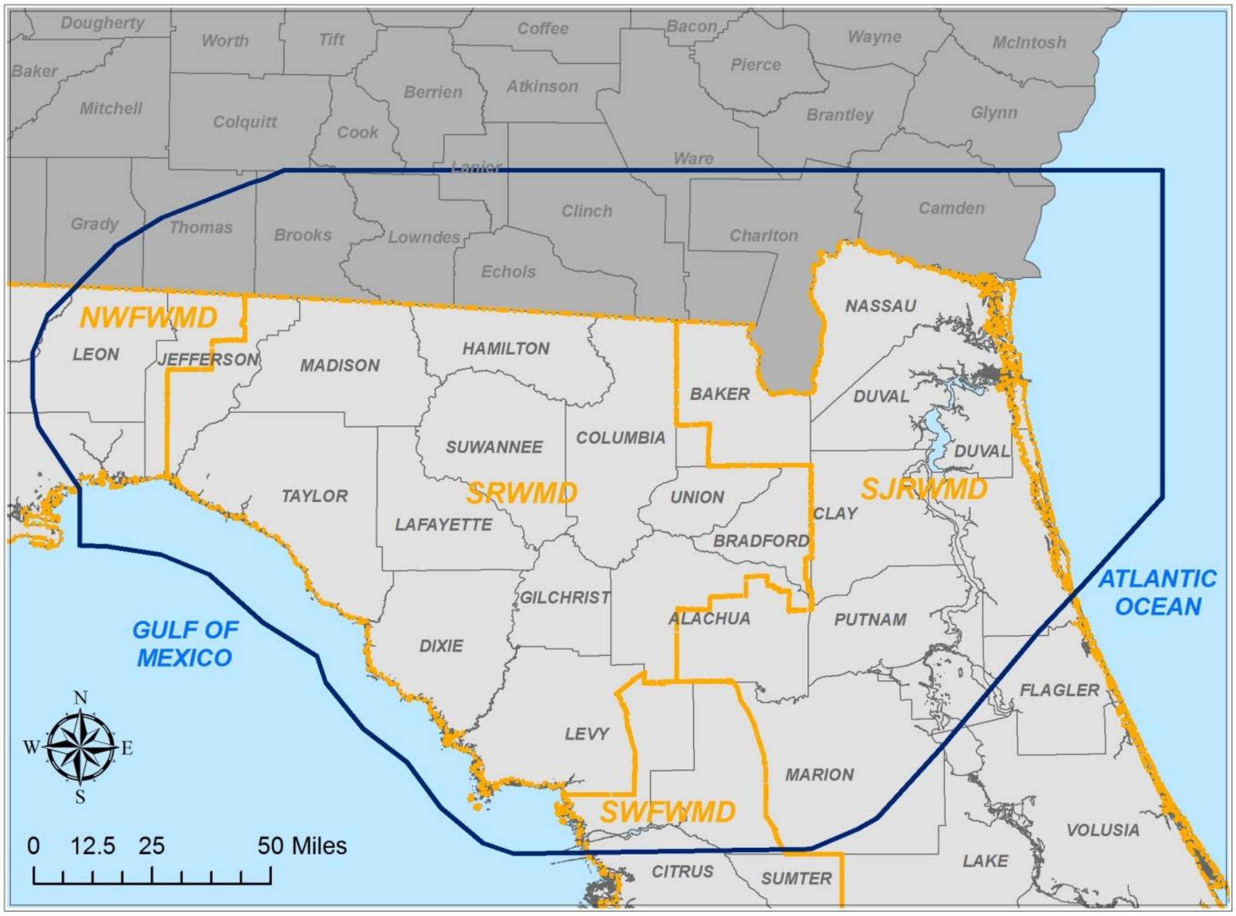


Figure 3-1. Geographic Extent of the North Florida Model.

REGIONAL IMPACTS

Although there are some technical limitations associated with this type of analysis, the use of the District's current groundwater model can provide qualitative insight into general regional hydrologic effects on the Lower Santa Fe River Basin. Current findings and modeling results indicate that impacts to streamflows and springflows in the Lower Santa Fe Basin are the result of groundwater withdrawals both within and outside of SRWMD boundaries. This conclusion mirrors the findings of the 2010 Assessment.

Based on these findings, it is clear that groundwater use in both the SWRMD and SJRWMD contribute to the current status and thus, the cross boundary MFLs and Recovery Strategies are appropriate to achieve long-term recovery and maintenance of minimum flows in the Lower Santa Fe Basin. This emphasizes the importance of continuing to work with other regional water agencies and user groups, particularly the SJRWMD. As previously mentioned, the passage of new legislation in Chapter 2013-229 of the Laws of Florida will further increase the ability of the SRWMD and SJRWMD to coordinate recovery efforts to address these regional groundwater trends and achieve MFL recovery in the Lower Santa Fe Basin and other priority water bodies.

The SRWMD and SJRWMD are currently working on the development of broader, regional groundwater modeling tools, particularly the North Florida Southeast Georgia Model (NFSEG). Once completed, the WMDs will continue to utilize the best available tools to further assess regional water use and hydrologic trends.

4.0 RECOVERY STRATEGY GOALS AND APPROACH

Based on the findings in the proposed MFLs for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs, streamflows and springflows on the Lower Santa Fe and Ichetucknee Rivers have fallen below the proposed MFLs. This circumstance has necessitated the development of a Recovery Strategy, consistent with Section 373.0421, F.S. The purpose of this Recovery Strategy is to develop near-term managerial practices to address these streamflow impacts, and provide a framework to identify long-term water management strategies, water resource development projects, and conservation measures, which can be implemented to recover and maintain the flows in these water bodies at the proposed minimum flow criteria.

GUIDING PRINCIPLES

To maximize the effectiveness of the Recovery Strategy, the SRWMD, in conjunction with the Department and SJRWMD, developed the following principles to guide the design and execution of the Recovery Strategy:

- Use the best available information.
- Strategy components and projects should contribute significantly to resource management and recovery.
- Ensure the Recovery Strategy is implemented as expeditiously as practicable.
- Seek consistency with other prevention or recovery strategies, the NFRWSP, and other state and regional water management programs.
- Recovery strategies should not adversely impact water bodies in adjacent basins and counties of north Florida.
- Protect the investment of existing water use permit holders.
- Provide the flexibility needed to allow economic growth.
- Provide incentives to maximize the benefits of public/private partnerships.

These guiding principles support the creation and implementation of an effective and practical strategy for the recovery and maintenance of minimum flows in the Lower Santa Fe and Ichetucknee Rivers and Priority Springs, as defined by the proposed MFLs.

RECOVERY GOALS

To further guide the development of this Recovery Strategy and ensure clarity of its intent, the SRWMD, in conjunction with the Department and SJRWMD, enumerated the following goals:

1. Achieve the restoration of the Lower Santa Fe and Ichetucknee Rivers and their priority springs to their proposed minimum flows.
2. Develop measures to provide sufficient water supplies for existing and projected reasonable-beneficial uses as practical.

TIME-TABLE FOR STRATEGY IMPLEMENTATION

In coordination with the SJRWMD and the Department, the SRWMD has established a timeframe for implementation of the Recovery Strategy, which extends from rule adoption through 2035. This schedule coincides with the planning timeframe of the North Florida Regional Water Supply Plan, and will be divided into two phases of implementation. A brief summary of the recovery measures to be conducted in the two phases of the Recovery Strategy is provided in **Table 4-1**, and the components of the Recovery Strategy are detailed in Sections 5 and 6 of this document. The focus of the first phase will be the implementation of the preliminary regulatory strategies to protect the MFL water bodies from additional harm, creation of water resource development project concepts, and the implementation of water conservation measures. Phase I will extend from rule adoption until the development of the long-term recovery measures with the completion of the North Florida Regional Water Supply Plan, expected to be finalized in late 2015.

Phase II of the Recovery Strategy will focus on the implementation of the recommendations in the North Florida Regional Water Supply Plan, the adoption of long-term regulatory measures, and the identification and execution of any necessary water resource development and alternative water supply projects. Phase II will be divided into five-year project cycles, beginning in 2015. After each five-year period, a general assessment of water resource conditions and program efficacy will be conducted in cooperation with the SJRWMD. These five-year cycles will include assessment of the success of the recovery measures implemented to date, and will provide a basis for continuing refinement of the Recovery Strategy and for adaptive management to new hydrologic conditions and water use patterns, as detailed in Section 7 of this document.

Table 4-1. Prevention and Recovery Strategy Implementation

	Action	Regulatory Action Required
Phase I (2013-2015)	**FDEP will adopt preliminary Recovery Strategy Regulatory Measures:** • Implement supplemental review criteria for individual water use permit applicants: offset of new impacts to recovering MFL water bodies and limited duration permits for existing impacts • Implement special condition to ensure uses comply with future recovery measures. • Implement special water use permit condition for MIL evaluation every five years for applicable agricultural uses.	FDEP adopt regulatory measures into Rule 62-42 F.A.C.
	Work with user groups to implement water conservation measures and ensure public participation in the planning process.	No regulatory action required for implementation
	Direct SRWMD agricultural cost-share funding to implement enhanced agricultural conservation practices based on MIL evaluations.	No regulatory action required for implementation
	Planning: • Complete NFSEG model. • Examine impacts of regional user groups on MFLs throughout the north Florida region (Keystone-area, Ichetucknee, Lower Santa Fe, or other). • Identify and investigate potential water resource development projects and water supply projects that can contribute to resource recovery • Use regional model analysis, MFLs constraints, project concepts, and related information to establish regional water availability for existing and new quantities, concurrently with the North Florida Regional Water Supply Plan. • Develop long-term regulatory measures to address regional impacts to MFLs and achieve regional water supply goals of the North Florida Regional Water Supply Plan.	No regulatory action required for implementation
Phase II (2015-forward)	**Based on results of regional model analysis, assessment for major users/groups, and magnitude of prevention/recovery needed, identify water supply measures needed to achieve MFLs.**	No regulatory action required
	Use regional model analysis, MFLs constraints, project concepts, and related information to determine regional water availability for existing and new sources. Implement long-term regulatory measures as required to achieve MFLs.	FDEP adopt rules in 62-42 F.A.C.
	Further develop and implement water resource development projects and water supply projects throughout the north Florida region to restore and maintain MFLs and to provide sufficient water supplies for existing and projected reasonable-beneficial uses.	No regulatory action anticipated for implementation

5.0 RECOVERY STRATEGY COMPONENTS

In order to restore and maintain streamflows to the proposed MFLs, the SRWMD, with support from the Department and SJRWMD, identified five strategic components to be evaluated and incorporated into the Recovery Strategy. The components are:

- **Planning Component**: Development of the North Florida Regional Water Supply Plan.
- **Water Conservation Component**: Increase the Efficiency of Existing Water Use.
- **Water Supply Development Component**: Projects to Implement Alternative Water Supplies.
- **Water Resources Development Component**: Projects to Enhance or Protect the Water Resources of the Lower Santa Fe River Basin.
- **Regulatory Component**: Utilizing Existing Rules to Ensure Compliance with the Proposed MFLs.

Based on the recent publication of the proposed MFLs for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs, the SRWMD considers these strategy components to represent a basic foundation for minimum flows recovery in the Lower Santa Fe River Basin. A list of current and conceptual regional projects currently being assessed for each component is provided in Appendix A. A preliminary timeline for implementing these components is provided as Appendix B.

5.1 PLANNING COMPONENT: DEVELOPMENT OF THE NORTH FLORIDA REGIONAL WATER SUPPLY PLAN

As previously discussed, there have been significant impacts to the water resources of the Lower Santa Basin from water uses both within and outside of the SRWMD. The reductions in streams and springflows in the Lower Santa Fe River Basin are the result of both the local impacts within the Santa Fe Basin and regional declining trends in Upper Floridan aquifer groundwater levels that have occurred throughout north Florida. As such, projects, conservation measures, and regulatory strategies to achieve recovery of the Lower Santa Fe and the Ichetucknee Rivers and priority springs must address regional impacts. These measures are best considered in a regional water supply planning context. To create effective programs and measures to achieve recovery, the Planning Component of the Recovery Strategy is being conducted concurrently and as a component of the North Florida Regional Water Supply Plan.

The SRWMD and SJRWMD are working together to draft the North Florida Regional Water Supply Plan (Plan), under the IAA. The planning region, shown in **Figure 5-1**, will address the projected regional water use demand for the 2015–2035 planning horizon, as well as the water resource impacts that could occur based on future projected population growth and estimated increased water demands. Upon completion, the Plan will also identify potential water conservation initiatives, water supply development projects, including alternative water supply projects, and water resource development projects that collectively will provide sufficient water to meet all existing and future reasonable-beneficial needs while sustaining the water resources and natural systems, which includes offsetting predicted water resource impacts. The Plan will provide guidance to effectively manage the water resources of the Lower Santa Fe Basin in a holistic manner, and provide the framework to create long-term strategies to address regional impacts to the Lower Santa Fe River Basin.

In addition to the current North Florida Regional Water Supply Plan initiative, the SRWMD will continue to pursue future agreements and partnerships with federal, state, and local agencies, and resource stakeholders for participation in planning efforts.

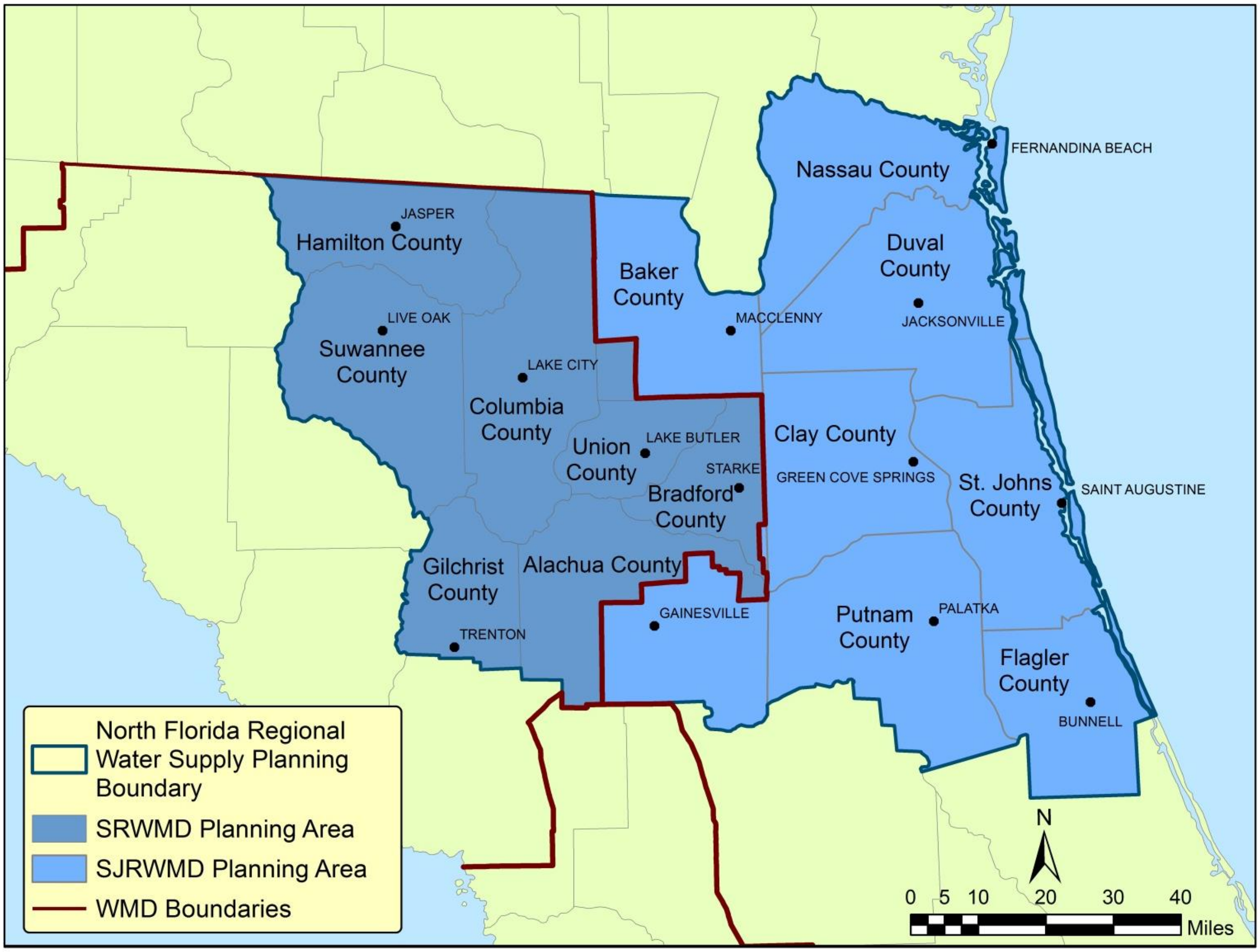


Figure 5-1. North Florida Regional Water Supply Planning Area

5.2 WATER CONSERVATION COMPONENT

Increased emphasis on water conservation programs is one of the primary tools the District will employ to meet the requirements for MFL Recovery in the Lower Santa Fe River Basin. These programs will focus on increasing the efficiency of water use throughout the Lower Santa Fe River Basin, and will be tailored to the various water use categories. Legislative findings provided in Subsection 373.227(1), F.S. state: *"The Legislature recognizes that the proper conservation of water is an important means of achieving the economical and efficient utilization of water necessary, in part, to constitute a reasonable-beneficial use."* As such, it should be noted that water conservation is expected of all users, and that successful conservation practices among specific users as part of the Recovery Strategy, will not preclude the responsibility for other users to maintain sound water conservation practices. The success of the Recovery Strategy will be contingent upon maintaining present conservation practices and continued improvement of conservation practices and programs throughout the north Florida region.

Agricultural Water Conservation

Currently, agricultural groundwater use accounts for an estimated 40% of the total water use in the Santa Fe River Basin. Although the historical impacts to Santa Fe Basin streamflows and springflows are the result of both regional and local water use, local agricultural water conservation practices will be an essential component towards achieving MFL Recovery in the Lower Santa Fe River Basin. There are currently several existing agricultural water conservation programs within the SRWMD, and the District plans to utilize these programs and also explore new strategies to reduce agricultural groundwater consumption within the Lower Santa Fe River Basin.

The primary approach to water conservation amongst agricultural water users is to minimize water use to what the producer needs to meet product requirements for their operation. Several strategies to optimize agricultural water use processes are:

- Continual improvement of Best Management Practices maintained by FDAC and DEP in conjunction with the industry to minimize water use needs for agricultural operations.
- Irrigation technology improvements to improve water use efficiency.
- Supporting implementation of water conservation practices among agricultural water users with Mobile Irrigation Labs and WMD agricultural outreach programs.
- Support continued refinement of science based modeling of water use requirements for agricultural commodities to efficiently apply water only on an as needed basis per the BMP process. These efforts could be coordinated with such entities as the SRP, IFAS, the UF Water Institute, and industry to maintain and continuously improve the model(s). Support efforts to improve real-time water use efficiencies through the use of Weather/Eco stations which could incorporate on site rainfall, ET and soil moisture into individual producers irrigation practices.

This section provides a brief summary of the estimated potential for agricultural water conservation, and how the District has implemented these water conservation strategies and intends to utilize them in support of the Lower Santa Fe and Ichetucknee Rivers and Priority Springs Recovery Strategy.

AGRICULTURAL WATER CONSERVATION POTENTIAL

During the development of this Recovery Strategy, the District conducted a local assessment of water conservation potential within the five counties comprising the majority of the Santa Fe Basin. Current USGS water use data estimated that annual irrigation demand accounts for approximately 30.3 MGD of water use in these counties (note that the values in this section only include the portions of these counties located within the SRWMD). Using potential water savings data compiled by Mobile Irrigation Labs (MILs) and 2010 agricultural acreage data, the District developed an estimate of total agricultural conservation potential in this area based on crop type. This information is summarized in **Table 5-1**.

Table 5-1 Potential Agricultural Water Savings by Crop Type for Alachua, Bradford Columbia, Gilchrist, and Union Counties

Crop Type	2010 Irrigated Acres	Use per Acre (MGD)	Total Irrigation Use (MGD)	Savings per Acre (MGD)	Potential Total Savings (MGD)
Vegetables (Mixed Vegetables, Melons)	6,617	0.00098	6.51	0.00010	0.66
Nursery (Fern and Ornamentals)	1,369	0.00942	12.90	0.00083	1.14
Blueberries and Grapes	1,231	0.00096	1.18	0.00025	0.31
Field Crops (Corn, Soy, etc.)	6,282	0.00105	6.62	0.00038	2.37
Sod, Pasture, Grass	3,649	0.00086	3.12	0.00027	1.00
Total	**19,148**		**30.33**		**5.48**

[1]Analysis based on 2010 USGS Water Use Estimate Data

The results of this analysis indicate that of the approximately 30.3 MGD of water use for agricultural irrigation in these counties, up to 5.5 MGD of water use could be saved by implementing standard measures to increase irrigation efficiency for existing irrigation systems. Typical practices which would be implemented to achieve this potential water savings include: center-pivot retrofits, replacement of worn irrigation nozzles, and other measures that improve the efficiency of existing irrigation systems. In order to achieve these water savings, it is essential that agricultural users within the Santa Fe Basin undergo MIL evaluations, providing a quantitative basis to direct District cost-share funding, and for area farmers to optimize their irrigation practices. Presently, the SRWMD estimates that the two MILs currently operating in this area have sufficient capacity to conduct evaluations for the permitted agricultural operations in this area within a five year window.

It should be noted that the data presented here on potential irrigation efficiency is only based on the potential efficiency improvements of existing irrigation systems, as evaluated previously by the MILs. As such, this analysis does not take into account other potential water conservation practices aside from improving the delivery of water in existing systems. The District recognizes that there is considerable additional potential for water conservation beyond the efficiency data supplied by the MIL evaluations and intends to continue to pursue increases in agricultural irrigation conservation through future programs. Conservation practices which the District has encouraged in the past or is currently evaluating include switching to more efficient irrigation systems (i.e. replacing overhead irrigation with drip irrigation), adjusting agricultural practices to less water intensive methods (i.e. conservation tillage), and utilizing alternative water supplies (such as farm ponds or tailwater recovery).

AGRICULTURAL WATER CONSERVATION COST-SHARE PROGRAMS

One of the primary tools the SRWMD will utilize to achieve increases in water conservation among agricultural users is the use of cost-share programs. The SRWMD has recently implemented several successful cost-share programs for agricultural water conservation practices, in conjunction with FDEP and FDACS. Conservation practices for which the SRWMD has offered cost-share funds include: center pivot irrigation retrofits, installation of subsurface drip irrigation, installation of soil moisture probes and weather stations, and upgrades to irrigation pumps and irrigation control systems. In October 2012, the SRWMD initiated a cost-share program with a value of $1.5 million. During the first four phases of this cost-share program, over $1.2 million were distributed, resulting in the implementation of conservation projects that are projected to save an estimated 5.2 MGD in agricultural water use district-wide. This program was administered throughout the District. Based on the results of current cost-share programs, the typical cost of achieving and maintaining these water conservation practices over a twenty-year cycle would be approximately $0.20 per 1,000 gallons of water savings, representing an efficient cost recovery program when compared to infrastructure improvements or other large projects. In order to achieve increases in agricultural water conservation in the Santa Fe Basin as expeditiously as possible, the SRWMD intends to prioritize its current agricultural efficiency cost-share programs to the most sensitive areas of the Santa Fe Basin.

SRWMD AGRICULTURAL ASSISTANCE TEAM

The SRWMD Agricultural Assistance Team (“Ag Team”) is an agricultural outreach program that was created to assist agricultural operations with water use and environmental resource permits, Best Management Practices (BMPs), and cost-share programs. The Ag Team implements the SRWMD’s cost-share programs for agricultural water conservation projects and acts as a liaison for agricultural cost-share programs operated by other state agencies.

The District envisions Ag Team participation as a critical component of MFL recovery in the Lower Santa Fe River Basin. As the MFL Recovery Strategy is implemented, the Ag Team will assist agricultural operators in compliance with recovery measures and their water use permit conditions. Furthermore, the Ag Team will work with agricultural users within the basin to achieve higher participation rates in water conservation practices. When dispensing cost-share funding, the Ag Team will prioritize projects that offer the greatest contributions to priority water bodies in the MFL Recovery areas.

SUWANNEE RIVER PARTNERSHIP

Another partner the District will rely on to assist in the ongoing implementation of the MFL Recovery Strategy is the Suwannee River Partnership (Partnership). The Partnership is a coalition of state, federal, and regional agencies, local governments, and private industry representatives formed in 1999 to address nitrate levels in the surface waters and groundwater of the Middle Suwannee River Basin. The District, FDACS, and the Department are members of the Partnership. One of the hallmarks of the Partnership is its history of voluntary or incentive-based programs for water quality protection in the local agricultural industry. The Partnership works to increase agricultural participation in these voluntary and incentive-based nutrient reduction BMP programs, as an alternative to regulatory enforcement.

Based on the Partnership’s past success in increasing BMP enrollment and the use of environmental management plans, the District will continue to work with the Partnership to increase participation in agricultural water conservation measures in the Lower Santa Fe River Basin.

COORDINATION WITH OTHER AGENCY PROGRAMS AND GRANTS

One method which the District has employed in the past to reduce agricultural water use is coordinating involvement between agricultural producers and other state and regional agencies. For example, in February 2012, the Department established a Basin Management Action Plan (BMAP) to reduce nutrient loadings to the Santa Fe River, under the Total Maximum Daily Loads (TMDL) program. The Department subsequently made cost-share funding available for BMP implementation within the Santa Fe River Basin. The District shares regulatory authority for the BMAP, and is administering the BMP cost-share program. As the BMPs implemented address both water quality and water conservation, the District was able achieve an estimated 1.2 MGD potential reduction in agricultural water use, in addition to a significant reduction in fertilizer use.

In addition to the BMAP program, the District coordinated with agricultural users to participate in cost-share programs offered by FDACS and the Environmental Quality Incentives Program (EQIP), administered by the US Department of Agriculture's Natural Resource Conservation Service (NRCS). By continuing to coordinate with other agencies and water quality programs, the District can provide access to cost-share funds for the implementation of conservation practices to reduce agricultural water use in the Lower Santa Fe River Basin.

WORK WITH IFAS AND USER GROUPS

Many of the water conservation practices currently employed by agricultural users were developed years ago and may not fully account for the advances in agricultural technology and research that have taken place in the last few decades. As such, the University of Florida's Institute of Food and Agricultural Sciences (IFAS) continues to do research on new agricultural conservation practices. The District may partner with IFAS and other agencies to ensure that new and innovative water conservation practices are implemented as they are developed. The District will also explore opportunities for cost-sharing between IFAS and producers in the Lower Santa Fe River Basin as part of research or pilot study efforts to improve water conservation.

Non-Agricultural Water Conservation

In order to achieve restoration and maintenance of minimum flows in the Lower Santa Fe and Ichetucknee Rivers and priority springs, the District will also implement water conservation measures for non-agricultural water user groups. This section provides a brief overview of the potential conservation measures that can be implemented with publicly supplied domestic users, self-supplied users, utilities, and commercial, industrial, and institutional users. The District anticipates working with local municipalities and utilities to implement these conservation programs and encourages adoption by the residents and water users of the affected areas.

NON-AGRICULTURAL WATER CONSERVATION POTENTIAL

To provide a general estimation of the recovery potential for non-agricultural water conservation, the District relied on the results of the 2010 Assessment. The Assessment included District-wide projected water demands for the 2030 timeframe, as well as estimations of potential conservation for each user group. It should be noted that the water use estimates in this section represent total District-wide use, and do not include permitted uses in the SJRWMD portion of Alachua County. The data are summarized in **Table 5-2.**

Based on the 2010 estimates, under a no-action scenario, demand for water for public supply, domestic self-supply, and recreational irrigation uses within the SRWMD would increase by an estimated 9.4 MGD. However, estimates of water conservation potential for these uses indicate that up to 8.8 MGD of this projected demand could be offset by potential water conservation. Thus, if the estimated conservation potential for public supply, domestic self-supply, and recreational irrigation uses is realized in the 2030 timeframe, increases in new withdrawal for these uses would be limited to minor increases (approximately 0.6 MGD cumulatively). This analysis indicates that achieving the maximum potential water conservation among these user groups is likely an important strategy to reduce the need to increase groundwater withdrawals within the SRWMD, thus minimizing additional impacts to the water resources of the Lower Santa Fe River Basin.

Additionally, the results of the 2010 Assessment indicate that among commercial, industrial, and institutional users, there is a potential for a net reduction in water use of nearly 4 MGD, if the estimated water conservation potential is achieved. It should also be noted that the commercial, industrial, and institutional conservation potential was estimated as 5% of total projected use for individual users, and the potential for conservation or water reuse could be significantly higher among commercial, industrial, and institutional users than indicated by this analysis. Based on these results and current initiatives with existing commercial, industrial, and institutional operations, the District believes that achieving improved water conservation and reuse among this user group could provide significant reductions in groundwater use to aid the recovery of the water resources of the Lower Santa Fe Basin. As such, the District intends to continue to work with commercial, industrial, and institutional users to achieve improvements in water conservation to benefit the water resources of the Lower Santa Fe Basin.

Table 5-2. Non-Agricultural Water Conservation Potential within the SRWMD

	2010 Estimated Water Use	2030 Projected Water Use	Projected Increase	2030 Conservation Potential	Net Water Use Change after Conservation
Public Supply	23.30	27.37	4.07	3.70	0.37
Commercial/Industrial/ Institutional	84.72	85.70	0.98	4.94	-3.96
Domestic Self Supply	18.87	23.76	4.89	4.75	0.14
Recreational Irrigation	1.81	2.20	0.39	0.31	0.08
Total	128.70	139.03	10.33	13.70	-3.37

[1]All values provided in MGD

The SRWMD and SJRWMD are currently developing improved estimates of water conservation potential as a part of the North Florida Regional Water Supply Plan. As these estimates are developed, they will be incorporated into the Recovery Strategy to improve the direction and implementation of conservation measures.

EDUCATIONAL PROGRAMS AND PUBLIC AWARENESS

One of the primarily challenges in implementing water conservation programs is encouraging resident participation. As such, the District will implement educational programs aimed at increasing the public's general knowledge about water conservation and its ecological and economic benefits. In particular, the District will reach out to local municipalities and schools to provide a forum for conservation education presentations. Additionally, the District will seek to form working relationships with local interest groups and charities, such as the Ichetucknee Partnership, to aid in the dissemination of water conservation educational materials. The educational programming will not only provide information about water conservation, but also provide specific information about the ecological health and economic importance of the Lower Santa Fe and Ichetucknee Rivers and priority springs, as well as their MFL recovery status. This will aid in linking the water conservation measures being implemented to specific community natural resources, with the goal of increasing public participation in water conservation programs.

To further increase public participation in domestic and commercial water conservation, the District will issue water conservation notices during periods of drought in the Santa Fe River Basin. These conservation notices will primarily serve as a form of public outreach, seeking to inform water users about water conservation measures the District is recommending, or temporary rules restricting irrigation for lawns and ornamental landscape and other outdoor water uses. The water conservation notices will include practical water conservation recommendations for domestic and commercial users.

HIGH EFFICIENCY FIXTURES AND APPLIANCES

High efficiency fixtures and appliances can potentially save hundreds of gallons of water per month per application. The District will examine the potential to work with local utilities and local plumbing and home improvement retailers to implement rebate programs for high efficiency fixtures and appliances. Where practicable, rebate programs can result in significant reductions in domestic water use at a minimal cost to the District, while increasing business for local retailers. The District will also examine the feasibility of high-efficiency fixture (such as showerheads) giveaways which achieve material reductions in water use, and can also spur public interest and participation in other domestic water conservation practices.

SRWMD LAWN AND LANDSCAPE IRRIGATION RULE

In many areas of Florida, home landscape irrigation is estimated to make up roughly 50% of domestic water use. Although the proportion of water use for home irrigation in the District is generally considered to be lower due to the rural nature of the region, landscape irrigation still contributes significantly to groundwater withdrawals.

To address landscape irrigation, on January 6, 2010, the District implemented a lawn and landscape irrigation rule which limits irrigation to two days per week during Daylight Savings Time and one day per week during Standard Time. The rule also requires that watering not be conducted between 10 AM and 4 PM, when evaporation is greatest. During periods in which a Water Shortage Order was declared by the District, additional irrigation restrictions were implemented, such as limiting irrigation to one day per week during Daylight Savings Time and assigning specified lawn watering days based on home address, as was the case in the summer of 2012. As demonstrated by the Southwest Florida Water Management District, adjusting watering restrictions from two days to one day per week can achieve public supply water use reductions of 9% to 20% (Whitcomb, 2005). To aid in MFL Recovery, the District will continue to implement the lawn and landscape irrigation rule. The District will work with local governments and utilities to develop a long-term enforcement plan to ensure stakeholders are informed of and comply with the landscape irrigation rule.

FLORIDA FRIENDLY LANDSCAPE AND LOW IMPACT DEVELOPMENT

In addition to water conservation via watering restrictions, lawn and landscape irrigation demand can also be reduced by the use of Florida Friendly Landscaping. Florida Friendly Landscaping is defined in the Florida Statutes as "landscapes that conserve water, protect the environment, are adaptable to local conditions, and are drought tolerant…" To date, many guidance documents and techniques for maintaining Florida Friendly Landscaping have been developed by IFAS. In accordance with legislative directive, the District will continue to encourage local municipalities and county governments to enact ordinances that promote Florida Friendly Landscape practices.

Although residential development in Florida has slowed since the economic downturn in 2008, it is expected to continue in the region for the foreseeable future. In order to minimize the impact that future development may have on groundwater resources in the Lower Santa Fe River Basin, the District will work with local municipalities and county governments to promote Low Impact Development. Low Impact Development is a set of design principles for new construction which seek to conserve water and natural resources, minimize impervious area, and manage stormwater in a manner that maintains natural hydrologic patterns. The principals of Low Impact Development sometimes require amendments to local building ordinances, but if implemented, can assist in maintaining water resources and reducing water demand from future growth within the Lower Santa Fe Basin.

PUBLIC SUPPLY INFRASTRUCTURE IMPROVEMENT

One method of reducing water withdrawals for public supply is addressing water losses within public distribution systems. Previous studies have indicated some North American utilities are impacted by water losses of 20-50% (Brothers, 2001). Identifying sources of water loss within public distribution systems can not only significantly reduce withdrawals by utilities, but also significantly reduce utilities operating costs, while causing little to no impact to public supply users. The District is currently working with the cities of Newberry, Alachua, and High Springs to address leakage and losses through the SRWMD’s RIVER cost-share program. Some of the projects being implemented to assess and reduce water losses in these public supply systems include metering efforts to identify locations of water losses, and the replacement of aging valves and leaky distribution infrastructure. The District will continue to work with local utilities within the Lower Santa Fe River Basin to determine if significant water losses are occurring in public water supply systems, and work to identify sources of funding or cost-sharing mechanisms to remedy these losses.

WATER CONSERVING RATE STRUCTURES

Another tool which can be implemented by area utilities to reduce water consumption is a water conservation rate structure. Water conservation rate structures typically utilize a block pricing approach, with water rates increasing with increasing water use. This incentivizes water conservation by encouraging users to restrain water consumption to maintain a lower billing rate. Studies in Florida have shown that increasing the water rate from $1.20 to $2.00 per thousand gallons can lead to a decrease in water demand of up to 17% among public supply users (although some of this reduction can be attributed to use of an alternative water supply rather than conservation). Block rate structures can be set up in such a way as to reward low demand water users for conservation, while using higher rates among less conservative users, to maintain the utility’s current average billing rate and revenue stream (Whitcomb, 2005).

Currently, Gainesville Regional Utilities (GRU), and the Cities of Archer, Newberry, Alachua, High Springs, and Lake City have implemented water conservation rate structures. The District will build upon this effort by working with other local utilities within the Lower Santa Fe River Basin to implement water conservation rate structures where practicable.

COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL WATER CONSERVATION PLANS

Based on 2010 water use estimates from the USGS Florida Water Science Center, self-supplied commercial, industrial, and mining uses make up just over three percent of estimated water use in the five county area comprising the Lower Santa Fe River Basin, although several significant industrial uses are present in the north Florida region. In addition to self-supplied withdrawals, commercial, industrial, and institutional users may also contribute significantly to public supply demand through connection to a local utility. To reduce water demand from commercial, industrial, and institutional users, the District has required water conservation plans for all new commercial, industrial, and institutional water use permittees or permit renewals (including mining) since 2010. In addition to this requirement, the District may consider requiring certain existing users to implement water conservation plans. As with other user groups, the District will seek to identify sources of funding or cost-sharing to assist with water conservation programs for commercial, industrial, and institutional users.

In many cases, water use can represent a significant cost to commercial, industrial, and institutional users. As such implementing water conservation measures not only reduces water consumption, but also reduces operating cost. One commercial water conservation program currently administered by the District in Lake City is the Water Conservation Hotel and Motel Program (CHAMP). By enrolling in CHAMP, area hotels agree to implement various water conservation measures in their operations, such as reusing towels and linens for multiple-day stays, and replacing old fixtures with water efficient fixtures when possible. These measures not only reduce water consumption, but also result in cost savings for the hotels, via reduced water, detergent, and energy costs. The District will continue to expand CHAMP to other areas of the District and work with local industries and businesses to identify new and practical water saving measures that can be implemented in business operations.

5.3 WATER SUPPLY DEVELOPMENT COMPONENT (ALTERNATIVE WATER SUPPLIES)

As previously discussed, the primary source for freshwater supplies within the north Florida region is the Upper Floridan aquifer. Due to the high degree of connectivity between the Lower Santa Fe and Ichetucknee Rivers and the Upper Floridan aquifer, regional declines in groundwater levels have led to streamflow declines in these rivers and their associated springs. Finding methods to replace groundwater withdrawals with alternative water supplies can aid in recovery of water levels in the Upper Floridan aquifer and flows in the Lower Santa Fe and Ichetucknee Rivers and their associated springs. To meet this goal, the SRWMD and SJRWMD will assess, promote, and implement (as practicable) various water supply development projects to reduce reliance on groundwater withdrawals.

Reclaimed Water

The District believes that there is potential for additional development of reclaimed wastewater or reuse water within the Lower Santa Fe River Basin and throughout the north Florida region. The rural nature and small size of many wastewater utilities in this region create distinct challenges to the development of wastewater reclamation systems. Namely, the cost of enhanced treatment and conveyance of reclaimed water from rural wastewater treatment plants to potential users (electrical utilities, farms, etc.) can prove cost prohibitive for small local utilities. The District will work with small utilities and potential reclaimed water users to identify practical reuse projects which can be implemented practicably in the Lower Santa Fe River Basin.

Presently, the District is working with the City of High Springs, in northwestern Alachua County, to develop a reuse plan for the City's secondary treated wastewater effluent. The effluent is currently discharged to a sprayfield; the proposed plan will utilize this water source to offset groundwater withdrawals. Groundwater recharge will also occur within the project. The proposed project components consist of constructing a storage facility and installing transmission lines. Although this project was already under consideration prior to the creation of the Recovery Strategy, it would provide benefits to the Lower Santa Fe River by offsetting groundwater withdrawals, and provides an excellent example of the types of alternative water supply projects the District will seek to identify and implement as the Recovery Strategy is developed.

Alternative Groundwater Sources

The intermediate aquifer system is currently utilized as a local source of groundwater, albeit at relatively low yields. Due to the area geology, the highest potential for use of the intermediate aquifer is in the Upper Santa Fe River Basin; however, offsetting demand for Upper Floridan aquifer withdrawals in the upper reaches of the river can have beneficial impacts on spring and streamflows within the Lower Santa Fe River Basin. The District can provide incentives and exercise its regulatory process to encourage new water use permit applicants and existing permit holders to utilize the intermediate aquifer system for low-yield applications where practical, reducing potential demand on the Upper Floridan aquifer.

Limited investigation has been conducted regarding use of the Lower Floridan aquifer as a potential alternative water supply in the SRWMD; furthermore, hydrogeological studies to date have not identified the presence of the Lower Floridan aquifer in the Lower Santa Fe River Basin. As such, the District believes that the current potential for utilizing the Lower Floridan aquifer as an alternative water supply is limited. The District will continue to assess its presence and potential for water supply as opportunities and available funding permit.

Surface Water Sources

Another option which the District will examine is utilizing surface water to replace existing fresh groundwater uses. Due to proposed and future MFLs, it is unlikely that surface water can provide a year-round water supply; however, there is some potential for the diversion, storage, treatment, and distribution of excess surface water during moderate to high flow periods.

Agricultural users are one group that may have some ability to utilize moderate to high streamflows for seasonal irrigation requirements. Where agricultural uses are located near appropriate surface water bodies, agricultural users would be encouraged to draw irrigation water from local rivers and streams during moderate to high flows, and utilize traditional groundwater sources during the remainder of the year, where feasible. Additionally, many area farms maintain private ponds on their property which may provide another potential surface water source. The use of surface water is generally more viable in the Upper Santa Fe River Basin, where the clayey soils of the Hawthorn Group are more conducive to building off-stream storage reservoirs and ponds than in the Lower Santa Fe River Basin, where the Hawthorn Group is absent and recharge rates to the Upper Floridan aquifer are high. Regardless, the replacement of groundwater withdrawals with seasonally available surface water in the Upper Santa Fe River Basin can have beneficial effects on the potentiometric surface of the Upper Floridan aquifer and stream and springflows in the Lower Santa Fe River Basin.

A final list of water supply development projects will be included in the Regional Water Supply Plan proposed to be completed in 2015.

5.4 WATER RESOURCE DEVELOPMENT COMPONENT

Water resource development projects will be another critical component of the MFL Recovery Strategy for the Lower Santa Fe River Basin. The District has identified several potential water resource development programs which can contribute to the re-establishment and maintenance of MFLs. The goal of these programs is to enhance groundwater levels to restore flow to rivers and contributing springs and to augment streamflows within the Lower Santa Fe River Basin to meet MFLs. The District is also working with local businesses and stakeholders to identify potential future water resource development projects which can be implemented as public-private partnerships.

Aquifer Recharge

The District is currently pursuing several strategies for aquifer recharge to the Upper Floridan aquifer. Some of these potential projects are expected to offer benefits to the Lower Santa Fe River Basin by raising the potentiometric surface of the Upper Floridan aquifer. The aquifer recharge strategies currently being studied include:

- Capture and recharge of wet season streamflows
- Capture and recharge of excess stormwater runoff
- Treatment and recharge of reclaimed water

These recharge strategies can be implemented via either direct recharge (wells to the Upper Floridan aquifer), or indirect recharge methods (rapid infiltration basins, floodplain, ponds). Depending on the recharge method, source, and receiving aquifer, differing levels of treatment may be required prior to recharge, which can greatly impact the cost and feasibility of individual projects. In addition to these initiatives, the District will also examine other potential aquifer recharge sources and strategies as opportunities arise.

Off-Stream Storage

As previously stated, excess stormwater and seasonally available streamflows represent a potential source of water within the District. In certain areas of the Lower Santa Fe River Basin, there may be potential for off-stream storage of excess streamflows during flood stages or large rain events. The potential for off-stream storage in the Lower Santa Fe Basin is limited by the relatively pervious soils throughout much of this area; however, storage of excess surface waters can provide a source for augmenting dry season streamflows in the Upper Santa Fe Basin. Increases in flows of contributing streams in the Upper Santa Fe Basin can potentially contribute significant improvements to the Lower Santa Fe Basin streamflows. Off-stream storage of excess surface waters can also aid in the alleviation of localized flooding problems in some areas of the basin, providing a basis for potential cooperation and cost-sharing with other agencies and local governments. As such, the District will examine the feasibility of creating off-stream storage projects for excess surface waters within the Santa Fe River Basin.

Dispersed Water Storage

In some areas of the Santa Fe Basin and north Florida region, the historical loss or modification of natural wetland systems has significantly reduced local surface water storage and consequently reduced the potential for aquifer recharge. Re-establishment of wetland and floodplain storage within a river basin can increase aquifer recharge and the stored water can be used to augment dry season streamflows. The District will assess the potential for programs to create dispersed water storage in the Santa Fe Basin to recover groundwater levels and minimum flows. One area which has already been identified for wetlands storage or restoration projects is Middle Suwannee River and Springs Restoration and Aquifer Recharge project, located in Mallory Swamp, Lafayette and Dixie Counties. The District continues to evaluate District properties for such projects.

DISPERSED STORAGE ON PRIVATE LANDS

Another management strategy the SRWMD will consider is public-private partnerships for dispersed water storage. With the large quantity of agricultural and silvicultural land present in the Lower Santa Fe River Basin, there may be opportunities for dispersed water storage cooperative projects with local landholders. Geologic conditions for potential locations would have to be assessed in order to evaluate the recharge potential of local soils and to determine project viability.

5.5 REGULATORY COMPONENT

Achieving the restoration and maintenance of minimum flows for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs will require careful management of local and regional water consumption patterns. As such, a regulatory component of the Recovery Strategy will be necessary to ensure that local water use is consistent with the recovery and maintenance of MFLs in the Lower Santa Fe and Ichetucknee Rivers and Priority Springs. As previously discussed, recent legislation allows the five WMDs to implement MFLs and Recovery and Prevention Strategies that the Department adopts to ensure that impacts to water resources across WMD boundaries are addressed. The SRWMD has requested that the Department adopt the proposed MFLs for the Lower Santa Fe and Ichetucknee Rivers and Priority Springs, as well as the regulatory portion of the Recovery Strategy. The regulatory component of the Recovery Strategy will be developed and adopted concurrently with the proposed MFL. This section provides a brief summary of the current, proposed, and future regulatory tools which the WMDs will employ to aid in the recovery of the Lower Santa Fe River Basin MFLs, and Section 6.0 of this document provides the additional rule language which the Department will adopt by reference to implement the proposed regulatory recovery measures.

In order to ensure that regulatory strategies are implemented in an expedient manner, while also allowing the Districts the ability to develop regulatory tools in an ongoing and adaptive manner, the regulatory portion of the Recovery Strategy will be developed and adopted in a phased manner. Initially, the Districts will enforce existing rules in light of the adopted MFLs, particularly with regard to water use. The SRWMD and SJRWMD have also created several near-term regulatory strategies which will be adopted by the Department concurrently with the proposed MFL, and will focus on implementing measures which can immediately be taken to protect the resources from additional harm, and provide a basis for establishing long-term recovery programs. Long-term regulatory strategies will be developed in conjunction with SJRWMD in the context of the North Florida Joint Regional Water Supply Plan to address regional impacts and trends that have impacted the Lower Santa Fe Basin.

Current Rules

Presently, the SRWMD and SJRWMD possess a comprehensive system of rules which regulate the consumptive use of water. This section provides a brief overview of existing rules and regulatory authority that are applicable to the implementation of the Recovery Strategy.

PERMIT CRITERIA

Presently, there are a number of criteria that must be met for the issuance of a water use permit within each district. These water use permit criteria are listed in the applicable rules codified in Florida Administrative Code, and expanded upon in the applicable Applicant’s Handbook. Several of the existing general permit requirements will be especially effective in ensuring that water use permits within the Planning Region are consistent with criteria for issuance:

- Reasonable-beneficial water uses must utilize the *lowest quality water sources* environmentally, technologically and economically feasible. Lower quality water sources include reclaimed water, recycled irrigation return flow, storm water, saline water and other alternative water supplies.

- Reasonable-beneficial uses *may not cause harm to the water resources of the area*. According to the definition of an MFL, withdrawals that can be shown to result in decreased flows in rivers or springs in MFL Recovery cause significant harm to that water body. More detailed criteria for harm to wetlands and surface waters are found in the Water Use Permitting Guide.

- Reasonable-beneficial uses must be *in accordance with any minimum flow or level and implementation strategy*.

These requirements, in addition to the other criteria set forth in each Districts water use permitting rules, will provide a foundation for the Districts to assess and issue water use permits in a manner that is compatible with recovery and maintenance of MFLs in the Lower Santa Fe Basin.

SPECIAL PERMIT CONDITIONS

Each of the WMDs has the ability to condition water use permits as necessary to ensure that the permitted consumptive use continues to meet the conditions for issuance and are consistent with the Recovery Strategy. Special conditions will vary among use classes, source classes, and geographic locations, and may be project-specific.

Special conditions which may be utilized for new water use permits or permit renewals in the Planning Region include requirements for water conservation measures or measures to ensure participation in the Recovery Strategy, such as monitoring and reporting requirements. The District intends to incorporate these measures into permittees' water conservation plans on an individual basis, based on the intended water use. The District may also utilize special permit conditions to incorporate the completion of specific projects agreed upon by the permittee into their water use permit, and condition allocations based on the completion of those projects. Special permit conditions provide the District a method to ensure that projects to offset water resource impacts, conservation measures, use of alternative water supplies, and other practices proposed by the user to protect the recovering resource are implemented expeditiously and maintained for the duration of the water use permit.

REVOCATION OF UNUSED WATER USE PERMITS

In order to better quantify and allocate existing water supplies, District staff currently has the ability to request that the Governing Board revoke existing unused water use permits. As stated in subsection 40B-2.341, F.A.C., "The Governing Board may revoke a permit permanently and in whole for non-use of the water for a period of two years or more…" The District also has the ability to revoke unused water use permits at the request of the permittee. Although the revocation of existing permits does not directly reduce water consumption, periodically removing unused permits from the water use allocations allows the District to re-allocate existing unused water supplies, potentially preventing the need for additional water resource development projects that would be identified in the regional water supply planning process. Maintaining an up-to-date and accurate account of allocated water uses greatly aids in planning for future demand.

WATER SHORTAGE ORDERS

Existing rules and Florida statutes (373.175) allow the Districts' Governing Boards to declare a water shortage for the affected source class, if the District determines there is a possibility that "insufficient ground or surface water is available to meet the needs of the users or when conditions are such as to require temporary reduction in total use within the area to protect water resources from serious harm." Extended periods of lower than average precipitation in the District can greatly exacerbate low groundwater levels, as there will typically be an increase in irrigation pumpage to offset the rainfall deficit. Water Shortage Orders, such as the declaration issued by the SRWMD in May of 2012, provide a mechanism to reduce impacts to water resources during periods of water deficit. As nessessitated by local climatic patterns and hydrologic conditions, the District may utilize Water Shortage Orders to implement water conservation and management practices to prevent or reduce impacts to the Lower Santa Fe and Ichetucknee Rivers and priority springs during periods of drought. The Districts, as a part of the joint regional water supply planning effort, may develop hydrologic thresholds for declaration of water shortage orders.

Phase I Regulatory Strategies

In addition to rules currently in place, the Department will adopt additional regulatory measures designed to provide protection to the water resources of the Lower Santa Fe River Basin in the near term, while long-term recovery strategies are developed to address the resource recovery in a regional manner. The rule language to implement these regulatory strategies is contained in Section 6.0 of this document, entitled "Supplemental Regulatory Measures", which will be incorporated by reference by the Department.

Collectively, these Phase I rules provide an important interim mechanism for the prevention of additional harm to the recovering MFL water bodies, while also providing protections to existing legal uses. These rules also define how the existing requirements that proposed water uses not cause harm to water resources will be addressed in the water use permitting review process with regard to the proposed MFLs. The language contained in these rules was crafted to provide the WMDs the opportunity for adaptive management of allocated water uses, and the implementation of long-term recovery measures subsequent to the completion of the North Florida Regional Water Supply Plan. The WMDs and the Department expect that these rules will likely be revised after the North Florida Regional Water Supply Plan and associated recovery strategies are developed.

Phase II Regulatory Strategies

The development of long-term strategies to address the impacts of regional groundwater trends and water use patterns is critical to achieving the recovery of minimum flows in the Lower Santa Fe Basin. As such, the Department, SRWMD, and SJRWMD, will develop long-term recovery measures concurrently with the development of the North Florida Regional Water Supply Plan. This will assist the Districts and the Department in refining the Recovery Strategies and future regulatory measures to address regional groundwater impacts to the Lower Santa Fe and Ichetucknee Rivers.

6.0 SUPPLEMENTAL REGULATORY MEASURES

1. Section 6.0 entitled "Supplemental Regulatory Measures" shall be adopted by the Department of Environmental Protection by rule pursuant to Section 373.042(4), F.S., as a component of the overall recovery strategy for the Lower Santa Fe and Ichetucknee Rivers and Associated Priority Springs MFLs. These rules shall be applicable within the boundaries of the SRWMD and that portion of the North Florida Regional Water Supply Planning Area (see Figure 6-1,) within the SJRWMD.

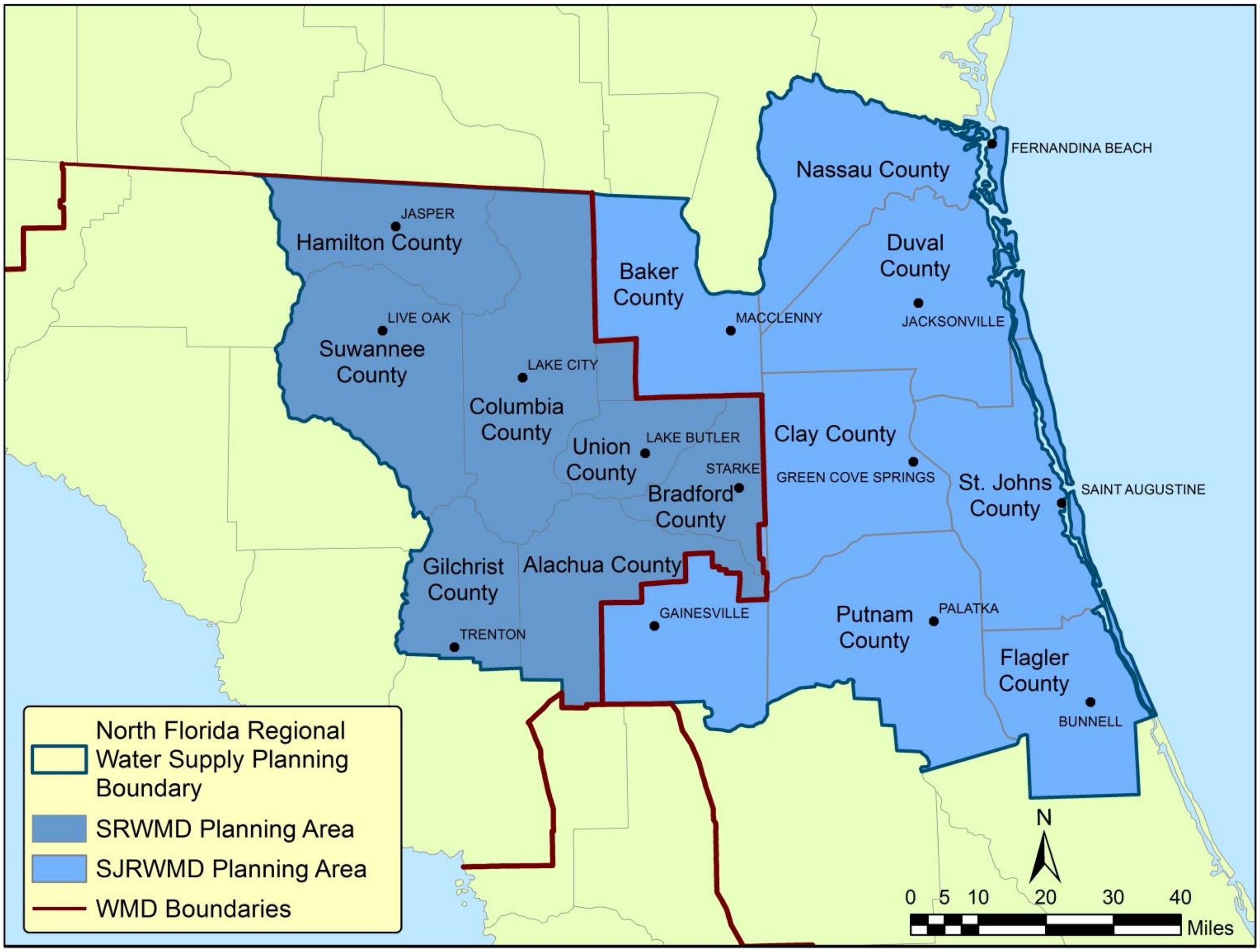


Figure 6-1. North Florida Regional Water Supply Planning Area

2. These rules provide additional criteria for review of consumptive use permit applications prior to the completion of the North Florida Southeast Georgia Regional Groundwater Flow Model and development of long-term recovery measures in the North Florida Regional Water Supply Plan (NFRWSP). Prior to the completion of the North Florida Southeast Georgia Regional Groundwater Flow Model, each District shall apply the best available modeling tools to evaluate permit applications and their potential impact to the MFLs in the Lower Santa Fe River Basin. Upon completion of the North Florida Southeast Georgia Regional Groundwater Flow Model, the

MFLs and these additional regulatory criteria shall be re-evaluated pursuant to Rule 62-42.300(1)(e), F.A.C.

3. In view of the statutory recognition in section 373.709(2)(a)2., F.S., that "…alternative water supply options for agricultural self-suppliers are limited," the Department recognizes that the districts may participate in developing offsets for proposed uses for the purposes of protecting the MFL water bodies consistent with the goals of the Recovery Strategy.

4. "MFL water bodies," when used in this section, shall mean the MFLs established for the Lower Santa Fe and Ichetucknee Rivers and Associated Priority Springs adopted in subparagraph 62-42.300(1)(a)–(c), F.A.C. "MFL water body" shall mean any one of the MFL water bodies described in this definition.

5. Additional Review Criteria for all Individual Permit Applicants:

   a) Evaluation of Potential Impacts: All applications, including applications for renewals, modifications, and new uses, shall be evaluated for their potential impact on the MFL water bodies utilizing best available information. Potential impacts to the MFL water bodies shall be assessed based on potential changes to flow at the Lower Santa Fe River Ft. White Gage and the Ichetucknee River US Highway 27 Gage.

   b) New Permits:
      i. Applications that do not demonstrate a potential impact to the MFL water bodies shall be issued provided the applicant meets the conditions for issuance.
      ii. Applications that demonstrate a potential impact to the MFL water bodies shall provide reasonable assurance of elimination or offset of the potential impact. Such applications shall be considered consistent with the Recovery Strategy, provided the applicant meets all other existing conditions for issuance.

   c) Renewals and Modifications with Increased Allocations:
      i. Applications that do not demonstrate a potential impact to the MFL water bodies based on the total requested allocation shall be issued provided the applicant meets the conditions for issuance.
      ii. Renewal and modification applications that demonstrate a potential impact to the MFL water bodies based on the total requested allocation shall provide reasonable assurance of elimination or offset of that portion of the requested allocation that exceeds the existing allocation and that results in potential impacts to the MFL water bodies. Such applications shall be considered consistent with the Recovery Strategy and shall be issued a permit for a duration of no more than five years provided the applicant meets all other existing conditions for issuance. If the potential impacts of the total requested allocation to the MFL water bodies will be eliminated or offset, the five year permit duration limitation under this subparagraph shall not apply. Permits issued for a duration longer than five years must include the necessary actions to provide for elimination or offset of impacts of the total requested allocation to the MFL water bodies, and a schedule for implementation.

   d) Renewals with No Increase in Allocations:
      i. Applications that do not demonstrate a potential impact to the MFL water bodies based on the total requested allocation shall be issued provided the applicant meets the conditions for issuance.

ii. Renewal applicants that demonstrate a potential impact to the MFL water bodies based on the requested allocation shall be considered consistent with the Recovery Strategy and shall be issued a permit for a duration of no more than five years provided the applicant meets all other existing conditions for issuance. If potential impacts to the MFL water bodies will be eliminated or offset, the five year permit duration limitation under this subparagraph shall not apply. Permits issued for a duration longer than five years must include the necessary actions to provide for elimination or offset of impacts to the MFL water bodies, and a schedule for implementation.

e) Existing permitted uses: Existing permitted uses shall be considered consistent with the Recovery Strategy provided the permittee does not exceed its permitted quantity. Such permits shall not be subject to modification during the term of the permit due to potential impacts to the MFL water bodies unless otherwise provided for in rule revisions pursuant to Rule 62-42.300(1)(e), F.A.C. Nothing in this section shall be construed to alter the District's authority to enforce or modify a permit under circumstances not addressed in this provision.

f) Nothing contained in this Section shall be construed to require a permittee in Florida to be responsible for recovery from impacts to an MFL water body from water users in Georgia, or in any case to be responsible for more than its proportionate share of impacts to an MFL water body that fails to meet the established minimum flow or level.

6. Additional Individual Permit Conditions:

a) Permits within the boundaries of the SRWMD and that portion of the North Florida Regional Water Supply Planning Area within the SJRWMD that are issued for a duration of greater than five years shall be issued with the following permit condition:

> Following the effective date of the re-evaluated Minimum Flows and Levels adopted pursuant to Rule 62-42.300(1)(e), F.A.C., this permit is subject to modification during the term of the permit, upon reasonable notice by the District to the permittee, to achieve compliance with any approved MFL recovery or prevention strategy for the Lower Santa Fe River, Ichetucknee River, and Associated Priority Springs. Nothing herein shall be construed to alter the District's authority to modify a permit under circumstances not addressed in this condition.

b) Permits for agricultural use located within Columbia, Suwannee, Union, and Gilchrist Counties, and the portions of Baker, Bradford, and Alachua Counties within the boundaries of the SRWMD, shall include the following condition:

> The permittee agrees to participate in a Mobile Irrigation Lab (MIL) program and allow access to the Project Site for the purpose of conducting a MIL evaluation at least once every five years.

7.0 MEASURING SUCCESS AND ADAPTIVE MANAGEMENT

Due to the regional nature of the declining groundwater trends in the Upper Floridan aquifer, and their impact on the flows in the Lower Santa Fe and Ichetucknee Rivers and priority springs, implementation of this Recovery Strategy will take place within the context of the existing IAA between the SRWMD, SJRWMD, and the Department. The Districts will coordinate implementation of this Recovery Strategy. By addressing local water resource impacts, in addition to regional groundwater trends, the Districts intend to achieve recovery and maintenance of minimum flows in the Lower Santa Fe and Ichetucknee Rivers and priority springs in an expeditious and effective manner.

7.1 ASSESSMENT OF RECOVERY PROGRESS

One of the most important parts of the Recovery Strategy is measurement of the results. Both the SRWMD and SJRWMD operate monitoring programs in conjunction with the USGS to monitor and analyze hydrologic data, including aquifer levels, streamflows, spring discharges, and lake levels. The WMDs will utilize existing monitoring networks to evaluate trends in the Lower Santa Fe and Ichetucknee Rivers and springs, and in groundwater levels in the region to measure the success of Recovery Strategy programs and projects. To assess the progress of the Recovery Strategy, the SRWMD will develop and use a set of metrics to measure hydrologic trends and the impacts of the Recovery Strategy components in the Lower Santa Fe River Basin.

TRACKING RESOURCE RECOVERY

Analysis of published flow data as a measurement of recovery progress provides a consistent method that can be repeated without the use of models as new flow data are published. However, as the MFLs were developed as flow duration curves based on streamflow data from the baseline period of 1933 to 1990, it can be problematic to compare a single year's streamflow data directly to the MFL flow duration curves which include 57 years of data. To better account for annual climatic variation, the SRWMD has developed a hydrologic screening method to evaluate trends in streamflows in the Lower Santa Fe and Ichetucknee Rivers using annual flow duration curves. This method is presented in **Appendix C**, which develops a MFL screening threshold that can be used on an annual basis to assess if flow trends are moving toward recovery. Utilizing the methodology presented in Appendix C and available hydrologic assessment tools, and the SRWMD will annually evaluate the recovery progress of the Lower Santa Fe and Ichetucknee Rivers and Priority Springs with regard to their MFLs.

MEASUREMENT OF EFFICACY OF INDIVIDUAL RECOVERY PROGRAMS AND PROJECTS

As water resource and water supply development projects are implemented as part of the Recovery Strategy, local hydrologic monitoring stations will be utilized, along with current modeling tools, to examine the hydrologic benefits of projects, particularly with regard to groundwater levels and streamflows. The WMDs will establish metrics to evaluate the efficacy of individual recovery programs and projects prior to implementation. Due to the hydrogeologic characteristics of the Lower Santa Fe River Basin, and year to year weather patterns, the effects of individual recovery programs and projects may not be immediately discernible in hydrologic readings at the streamflow gaging stations on the Lower Santa Fe and Ichetucknee Rivers. Furthermore, the fact that many recovery projects will be focused on improvements in regional or local groundwater levels means that there may be a lag time after implementation before improvements in streamflows can be assessed. As such, project performance metrics will be tailored to individual projects prior to implementation to assess their efficacy over time. This will allow the Districts to periodically gauge the success of individual implemented projects as well as the direction of the overall Recovery Strategy; thereby providing a basis for targeting future funds and programs.

PERIODIC RECOVERY STRATEGY ASSESSMENT

During the implementation of the Recovery Strategy, the Districts will conduct periodic general assessments of the Recovery Strategy and of the water resources within the Planning Region and the Lower Santa Fe River Basin. This periodic assessment will typically be conducted on a five-year timetable, and likely be included as a component of the District's Water Supply Assessments. These periodic assessments will assess the efficacy of the Recovery Strategy components implemented to date, and also examine regional trends in the potentiometric surface of the Upper Floridan aquifer, springflow and streamflow trends, and regional water use trends. The goal of these periodic assessments will be to provide direction and guidance to future recovery projects and programs, by incorporating new hydrologic assessment tools and examining trends in regional hydrologic conditions. For example, by the end of the first five-year Water Supply Assessment cycle (circa 2020), the metering programs for agricultural water users in SRWMD should provide sufficient data to re-examine agricultural use patterns, and may provide additional direction to new agricultural conservation programs. As such, periodic assessment of the Recovery Strategy will also provide an opportunity for the WMDs to examine the Recovery Strategy components with regard to future water use patterns within the Planning Region. Periodic assessment of Recovery Strategy components and resource recovery will enable the Districts to evaluate the efficacy of implemented regulatory approaches and recovery measures, and also provide a basis for adapting future recovery measures, water management decisions, and regulatory approaches to current hydrologic conditions and water use patterns.

7.2 ADDITIONAL INFORMATION GATHERING/FUTURE RESEARCH

In addition to assessing the hydrologic status of the Lower Santa Fe and Ichetucknee River and priority springs, the SRWMD will continue to collect scientific and ecological data relating to these water bodies. The SRWMD recognizes that in some cases during MFL development, insufficient data was available to assess the relationship between streamflows and springflows and some biological characteristics of the river system. As such, the SRWMD will continue to identify potential data needs, and work with other agencies and organizations to develop additional scientific and biological data relating to these systems, to strengthen any future revisions to these MFLs. The SRWMD will continue to assess the latest scientific research to ensure that the adopted MFLs are protective of the Lower Santa Fe and Ichetucknee Rivers and their priority springs.

7.3 PUBLIC AND STAKEHOLDER PARTICIPATION

Throughout the development and implementation of MFL recovery measures, the Department and the WMDs will seek input and participation from the interested stakeholders. As the planning component of this strategy is centered on the North Florida Regional Water Supply Plan, the NFRWSP will provide an excellent forum for stakeholder engagement. The WMDs also intend to engage the public and provide opportunity for comment and participation in the creation of long-term recovery strategies.

7.4 ADAPTIVE MANAGEMENT

This Recovery Strategy is intended to provide general overview of the current initiatives the WMDs intend to implement and establish a path forward to develop long-term measures required to achieve the recovery and maintenance of minimum flows in the Lower Santa Fe and Ichetucknee Rivers and priority springs. Presently, numerous potential approaches that can contribute to resource recovery have been identified, and the Districts understand that flexibility will be an ongoing element of the Recovery Strategy process. New feasibility and pilot studies, updates to groundwater models, changes in funding programs, and the effectiveness of existing projects will guide implementation of the Recovery Strategy over time. Furthermore, the implementation of the North Florida Regional Water Supply Plan with the SJRWMD will provide more detailed strategies that will aid in the full recovery of the MFL water bodies and address the regional water supply issues which have impacted the Lower Santa Fe Basin.

The annual hydrologic evaluations and periodic Recovery Strategy assessments described in Section 7.1 will provide opportunities for the Districts to adapt to changing water resource and water use conditions. These evaluations will provide the opportunity to re-focus the components of the Recovery Strategy, prioritize projects and programs with successful outcomes and established funding sources, and minimize or end less successful efforts. The Districts will also update modeling tools, when feasible, to more accurately predict the anticipated effects and flow recovery for the various executed projects. Moreover, the continued coordination between the SRWMD, SJRWMD and the Department will facilitate the implementation of broader, regional water resource projects in the Planning Region. This recurring process of evaluation, coordination, and planning will allow the Districts to adapt to changes in water use patterns and needs throughout the Recovery Process, thereby meeting the goal of recovering and preserving minimum flows in the Lower Santa Fe and Ichetucknee Rivers and priority springs.

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Appendix A:
Lower Santa Fe and Ichetucknee River Prevention and Recovery Strategy
Summary of Recovery Targets, Existing Projects and Programs, and Concepts with Potential Lower Santa Fe Basin Benefits
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TABLE A1: Estimated Streamflow Recovery Required for LSFR Basin MFLs

Project Name	Location	Est. Project Volume (MGD)	Est. Impact to Santa Fe River Flow (MGD, at Fort White Gage)	Est. Impact to Ichetucknee River Flow (MGD, at Hwy 27 Gage)
Estimated Streamflow Recovery Required to Meet MFLs based on current water use patterns (2010)		NA	11.0	2.0
Projected Public Supply Water Use Increase SJRWMD Region 1 2030	SJRWMD	NA	6.5	0.6
Projected Non-Public Supply Water Use Increase SJRWMD Region 1 2030	SJRWMD	NA	1.3	0.1
City of Alachua Public Supply Demand Increase	Alachua County, FL	0.40	0.3	0.0
Archer Public Supply Demand Increase	Alachua County, FL	0.03	0.02	0.0
High Springs Public Supply Demand Increase	Alachua County, FL	0.11	0.08	0.0
Lake Butler Public Supply Demand Increase	Union County, FL	0.00	0.00	0.0
Lake City Public Supply Demand Increase	Columbia County, FL	0.72	0.14	0.06
Live Oak Public Supply Demand Increase	Suwannee County, FL	0.20	0.01	0.02
Newberry Public Supply Demand Increase	Alachua County, FL	0.19	0.14	0.0
Starke Public Supply Demand Increase	Bradford County, FL	0.09	0.01	0.0
SRWMD AG Increase	SRWMD	~ 0.0	~ 0.0	~ 0.0
SRWMD DSS Increase	SRWMD	~ 5.0	~ 1.0	~ 0.5
SRWMD CII Increase	SRWMD	~ 0.97	~ 0.02	~ 0.0
SRWMD REC Increase	SRWMD	~ 0.40	~ 0.07	~ 0.0
TOTAL Recovery Targets (Est. Current Recovery + Future Demand)		**NA**	**20.6**	**3.3**

Notes:

1. SRWMD Water Use Projections here represent the low range projections from the 2010 SRWMD Water Supply Assessment
2. SJRWMD Water Use Projections here represent the 5-in-10 year water use projections from the SJRWMD's 2013 Draft Water Supply Plan

Appendix A:
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TABLE A2: Conceptual Lower Santa Fe Basin Recovery Projects/Programs**

Project Name	Location	Project Type	Est. Project Volume (MGD)	Est. Benefit to Santa Fe River Flow (MGD, at Fort White Gage)	Est. Benefit to Ichetucknee River Flow (MGD, at Hwy 27 Gage)	Est. Cost	Est. Cost-Benefit ($/1000gal water savings)
Agricultural Water Conservation Potential: Efficiency Improvements ("Farms" - Row crops, irrigated pasture, fruit crops, etc.)	Alachua, Bradford, Columbia, Gilchrist, Union, and Suwannee counties	Water Conservation	2.2 - 4.3	1.2 - 2.3	1.1 - 2.1	$3,910,000	$0.20
Agricultural Water Conservation Potential: Efficiency Improvements (Plant Nurseries)	Alachua, Bradford, Columbia, Gilchrist, Union, and Suwannee counties	Water Conservation	0.6 - 1.1	0.3 - 0.7	0.2 - 0.4	$9,610,000	$1.92
Agricultural Water Conservation Potential: Phase II Irrigation Improvements ("Farms" - Row crops, irrigated pasture, fruit crops, etc.)	Alachua, Bradford, Columbia, Gilchrist, Union, and Suwannee counties	Water Conservation	0.9 - 1.7	0.5 - 0.9	0.4 - 0.9	$15,110,000	$1.92
Agricultural Water Conservation Potential: Phase II Irrigation Improvements (Plant Nurseries)	Alachua, Bradford, Columbia, Gilchrist, Union, and Suwannee counties	Water Conservation	0.6 - 1.3	0.4 - 0.8	0.2 - 0.5	$11,270,000	$1.92
Bradford Timberlands Flood Control and Water Resource Development Project	Bradford County, Florida	Excess Streamflow Capture, Aquifer Recharge, Flood Control, potential Dispersed Water Storage Wetlands	0.5 - 0.9	0.1 - 0.9	0.0 - 0.01	$1,690,000	$0.33
Bradford County Rayonier South Flood Control and Water Resource Development Project	Bradford County, Florida	Stormwater Storage, Aquifer Recharge, Streamflow Augmentation, Dispersed Water Storage Wetlands	1.0 - 2.0	0.1 - 2.0	0.0 - 0.02	$3,500,000	$0.33
Bradford County Dispersed Water Storage and Aquifer Recharge Projects	Bradford County, Florida	Stormwater Storage, Aquifer Recharge, Dispersed Water Storage Wetlands	1.5	0.4	~ 0.0	$750,000	$0.10
Lake Harris Aquifer Recharge Project	Lake City, Columbia County, Florida	Aquifer Recharge, Flood Mitigation	0.3 - 0.6	0.03 - 0.06	0.1	$250,000	$0.08
Conceptual Dispersed Water Storage Public-Private Partnerships	Alachua, Gilchrist, Columbia, Suwannee, Bradford, Union Counties	Surface Water sources, Reclaimed Water	~ 4	~ 1.1	0.4	$1,430,000	$0.07
Optimization of Regional Water Balance through Modified Silviculture Practices (Pilot Scale)	Alachua, Gilchrist, Columbia, Suwannee, Bradford, Union Counties	Land Management Practices	~ 6	~ 1.8	0.3	$2,440,000	$0.07
City of Alachua Reclaimed Water Aquifer Recharge Project	City of Alachua, Alachua County, Florida	Reclaimed Water, Aquifer Recharge	0.5	- 0.02	0.001	$800,000	$0.31
Alachua County Conceptual Reclaimed Water Recharge Projects	Alachua County	Reclaimed Water, Aquifer Recharge	7.7	1.6	0.1	$3,800,000	$0.09
Future Water Resource Development Concepts	SRWMD	Water Resource Development	~ 4.0	~ 1.2	~ 0.2	$36,390,000	$2.00
Subtotal			**35.1**	**13.7**	**4.97**	**$90,940,000**	**$0.49**

** Users seeking to develop offsets for proposed uses may elect to participate in the above listed recovery conceptual projects and programs.

Appendix A:
Lower Santa Fe and Ichetucknee River Prevention and Recovery Strategy
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TABLE A3: Future Potential Water Conservation: 2030***

Project Name	Location	Project Type	Est. Project Volume (MGD)	Est. Benefit to Santa Fe River Flow (MGD, at Fort White Gage)	Est. Benefit to Ichetucknee River Flow (MGD, at Hwy 27 Gage)	Est. Cost	Est. Cost-Benefit ($/1000gal water savings)
City of Alachua Public Supply Conservation	Alachua County, FL	Water Conservation	0.11 - 0.33	0.2	0.0	$1,870,000	$1.87
Archer Public Supply Conservation	Alachua County, FL	Water Conservation	0.03 - 0.03	0.02	0.0	$20,000	$0.27
High Springs Public Supply Conservation	Alachua County, FL	Water Conservation	0.04 - 0.11	0.08	0.0	$590,000	$1.96
Lake Butler Public Supply Conservation	Union County, FL	Water Conservation	0.03 - 0.04	0.01	0.0	$40,000	$1.77
Lake City Public Supply Conservation	Columbia County, FL	Water Conservation	0.32 - 0.66	0.13	0.05	$3,930,000	$2.67
Live Oak Public Supply Conservation	Suwannee County, FL	Water Conservation	0.10 - 0.20	0.01	0.02	$50,000	$0.10
Newberry Public Supply Conservation	Alachua County, FL	Water Conservation	0.05 - 0.15	0.11	0.0	$610,000	$1.39
Starke Public Supply Conservation	Bradford County, FL	Water Conservation	0.08 - 0.09	0.02	0.0	$0	$0.08
SRWMD CII Conservation Potential	SRWMD	Water Conservation	TBD	TBD	TBD	TBD	TBD
Agricultural BMPs - SJRWMD	SJRWMD portion of Alachua County	Water Conservation	0.3	0.14	0.0	$1,500,000	$0.96
Water-wise Florida Landscape - Inground: Alachua County	Alachua County, FL	Water Conservation	1.9	1.3	0.1	$10,030,000	$1.44
Targeted Residential Water Conservation BMPs: LDR Modifications - Alachua County	Alachua County, FL	Water Conservation	1.8	1.1	0.1	$32,000	$0.00
SJRWMD Region 1 Public Supply Conservation Potential	SJRWMD	Water Conservation	~ 20.0	1.4	0.0	$36,690,000	$1.28
SJRWMD Region 1 DSS and Small Public Supply Conservation Potential	SJRWMD	Water Conservation	3.0	0.21	0.0	TBD	TBD
SJRWMD Region 1 AG Conservation Potential	SJRWMD	Water Conservation	8.2	0.4	0.1	$71,610,000	$1.92
SJRWMD Region 1 CII Conservation Potential	SJRWMD	Water Conservation	1.6	0.11	0.0	TBD	TBD
Subtotal			**38.4**	**5.3**	**0.3**	**$120,980,000**	**NA**

*** These and other water supply/restoration projects under development or consideration are a part of the water supply planning process or other MFL constraints, and may reduce groundwater withdrawals or provide ancillary benefits to the Upper Floridan Aquifer in the North Florida region and the Lower Santa Fe Basin. These and other concepts under development are not a component of the Recovery Strategy for the Lower Santa Fe Basin, but are provided here to demonstrate their potential ancillary benefits to the Lower Santa Fe MFL recovery efforts.

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TABLE A4: Current Projects and Concepts with Benefits to Lower Santa Fe Basin: SRWMD***

Project Name	Location	Project Type	Est. Project Volume (MGD)	Est. Benefit to Santa Fe River Flow (MGD, at Fort White Gage)	Est. Benefit to Ichetucknee River Flow (MGD, at Hwy 27 Gage)	Est. Cost	Est. Cost-Benefit ($/1000gal water savings)
City of Waldo Water Meter Replacement	Alachua County, FL	Infrastructure Improvements	0.01	0.002	0.0	$150,000	$2.18
City of Alachua Water Conservation RIVER cost-share Project	Alachua County, FL	Water Conservation	0.05	0.038	0.0	$60,000	$0.22
City of High Springs Water Conservation RIVER cost-share project	Alachua County, FL	Water Conservation	0.02	0.012	0.0	$60,000	$0.68
Live Oak Golf Course Reuse Connection RIVER cost-share project	Suwannee County, FL	Reclaimed Water	0.1	0.004	0.008	$20,000	$0.04
City of Archer Wastewater Collection, Treatment & Reuse RIVER cost share project	Alachua County, FL	Reclaimed Water	0.14	0.09	0.004	$14,400,000	$19.66
Lake City Sprayfield Treatment Wetlands Project	Lake City, Columbia County, Florida	Reclaimed Water, Aquifer Recharge	3.0	~ 0.04	~ 0.06	$4,600,000	$0.30
Middle Suwannee Springs Restoration Project: Mallory Swamp Improvements - Phase II	Lafayette County, Florida	Aquifer Recharge, Dispersed Water Storage	~ 5.0	~ 0.25	~ 0.5	$1,900,000	$0.07
Lake City Municipal Airport Modification	Columbia County, FL	Stormwater Improvements, Increased soil percolation	~ 1.9	~ 0.4	~ 0.4	No Additional Cost - Existing Project	NA
Starke By-pass	Bradford County, Florida	Stormwater Improvements, Indirect Aquifer Recharge	TBD	TBD	TBD	No Additional Cost - Existing Project	NA
Subtotal			**10.2**	**0.8**	**1.0**	**$21,190,000**	**$0.40**

*** These and other water supply/restoration projects under development or consideration are a part of the water supply planning process or other MFL constraints, and may reduce groundwater withdrawals or provide ancillary benefits to the Upper Floridan Aquifer in the North Florida region and the Lower Santa Fe Basin. These and other concepts under development are not a component of the Recovery Strategy for the Lower Santa Fe Basin, but are provided here to demonstrate their potential ancillary benefits to the Lower Santa Fe MFL recovery efforts.

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TABLE A5: Current Projects Concepts with Benefits to Lower Santa Fe Basin: SJRWMD***

Project Name	Location	Project Type	Est. Project Volume (MGD)	Est. Benefit to Santa Fe River Flow (MGD, at Fort White Gage)	Est. Benefit to Ichetucknee River Flow (MGD, at Hwy 27 Gage)	Est. Cost	Est. Cost-Benefit ($/1000gal water savings)
Clay County Utilities: Postmaster Wellfield - Lower Floridan Aquifer Water Supply Wells* **	Clay County, Florida	Alternative Groundwater Supply	0.7	0.01	0.0	$1,000,000	$0.63
Grandin Sand Mine - LFAS* **	Putnam County, Florida	Alternative Groundwater Supply	3	0.1	0.0	$1,500,000	$0.11
Mid-Clay Reservoir project* **	Clay County, Florida	Reclaimed Water	NA	NA	0.0	$5,500,000	NA
Keystone Area Rapid Infiltration Basin System* **	Clay County, Florida	Aquifer Recharge, Reclaimed Water, Alternative Water Supplies	3 - 5	0.5	0.1	$113,000,000	$4.32
GRU Smart Meter Program	Alachua County	Water Conservation	0.1	0.07	0.0	$100,000	$0.19
GRU – Innovation District	Alachua County	Reclaimed Water	0.1	0.07	0.0	$400,000	$0.76
GRU – Finely Woods	Alachua County	Reclaimed Water	0.1	0.03	0.0	$250,000	$0.96
GRU – Celebration Pointe	Alachua County	Reclaimed Water	0.1	0.07	0.0	$700,000	$1.34
Subtotal			**8.6**	**0.8**	**0.1**	**$123,650,000**	**$2.74**

TOTAL Benefits (Tables A2-A5)	**92.3**	**20.6**	**6.4**	

*** These and other water supply/restoration projects under development or consideration are a part of the water supply planning process or other MFL constraints, and may reduce groundwater withdrawals or provide ancillary benefits to the Upper Floridan Aquifer in the North Florida region and the Lower Santa Fe Basin. These and other concepts under development are not a component of the Recovery Strategy for the Lower Santa Fe Basin, but are provided here to demonstrate their potential ancillary benefits to the Lower Santa Fe MFL recovery efforts.

Notes:
1. Costs presented represent estimated project costs at time of publication.
2. Costs presented were obtained from current project proposals or estimated based on unit rates of similar district projects.

Appendix B

Timeline for Recovery Strategy Implementation

	Phase I			Phase II
Planning	2010 Water Supply Assessment	Formation of NFRWSP	**Create North Florida Regional Water Supply Plan.** Concurrently develop long-term recovery strategies to address regional impacts.	Continue Developing Long Term Recovery Strategies and Projects based on Current Hydrologic Conditions and Water Supply Needs
Projects			Project Identification and Feasibility Analysis	Implement Alternative Water Supply and Water Resource Development Projects
Conservation			Implement Preliminary Conservation Measures and Programs	Continue Implementing Programs to Achieve Long Term Conservation Goals
Regulatory			Implement Preliminary Regulatory Measures	Implement Long Term Regulatory Measures
Funding/Cost Share Programs			Implment Cost-Share Programs in Lower Santa Fe Basin. Seek Funding Sources and Cost-Share Partnerships	Seek Funding Sources and Cost-Share Partnerships. Utilize Cost Share Programs to Achieve Conservation Goals
Water Resource Monitoring	Use Monitoring Data from Lower Santa Fe Basin Water Resources to Direct Recovery Measures			Maintain and Expand Monitoring Program as Needed in Lower Santa Fe Basin to Direct Recovery Measures
	2010	2011		2015

	Phase II, continued			
Planning	**5 Year Water Supply Assessment & Strategy Evaluation**	Continue Developing Long Term Recovery Strategies and Projects based on Current Hydrologic Conditions and Water Supply Needs	**5 Year Water Supply Assessment & Strategy Evaluation**	Continue Developing Long Term Recovery Strategies and Projects based on Current Hydrologic Conditions and Water Supply Needs
Projects	Implement Alternative Water Supply and Water Resource Development Projects		Implement Alternative Water Supply and Water Resource Development Projects	
Conservation	Continue Implementing Programs to Achieve Long Term Conservation Goals		Continue Implementing Programs to Achieve Long Term Conservation Goals	
Regulatory	Implement Long Term Regulatory Measures		Implement Long Term Regulatory Measures	
Funding/Cost Share Programs	Seek Funding Sources and Cost-Share Partnerships. Utilize Cost Share Programs to Achieve Conservation Goals		Seek Funding Sources and Cost-Share Partnerships. Utilize Cost Share Programs to Achieve Conservation Goals	
Water Resource Monitoring	Maintain and Expand Monitoring Program as Needed in Lower Santa Fe Basin to Direct Recovery Measures		Maintain and Expand Monitoring Program as Needed in Lower Santa Fe Basin to Direct Recovery Measures	
	2020		2025	

	Phase II, continued			
Planning	**5 Year Water Supply Assessment & Strategy Evaluation**	Continue Developing Long Term Recovery Strategies and Projects based on Current Hydrologic Conditions and Water Supply Needs	**5 Year Water Supply Assessment & Strategy Evaluation**	Continue Developing Long Term Strategies and Projects to Maintain Water Resources based on Current Hydrologic Conditions and Water Supply Needs
Projects	Development Projects		Supply Needs and MFL Requirements	
Conservation	Conservation Goals		Conservation Goals	
Regulatory	Implement Long Term Regulatory Measures		Implement Long Term Regulatory Measures	
Funding/Cost Share Programs	Seek Funding Sources and Cost-Share Partnerships. Utilize Cost Share Programs to Achieve Conservation Goals		Maintain Funding and Partnerships for ongoing Conservation Efforts	
Water Resource Monitoring	Maintain and Expand Monitoring Program as Needed in Lower Santa Fe Basin to Direct Recovery Measures		Maintain and Expand Monitoring Program as Needed in Lower Santa Fe Basin to Direct Recovery Measures	
	2030		2035	

APPENDIX C
Annualized Flow Duration Curves: Methods for Assessing MFL Recovery

Introduction

In order to assess if flow trends are moving towards recovery, there is a need for a tool that allows comparison of different flow regimes during different periods of record, yet retains measures of the intra-annual variability in the systems. Flow Duration Curves, as described below, are one such tool. The SRWMD will utilize Flow Duration Curves (FDCs), based on the method described in this appendix, for tracking recovery of the Lower Santa Fe and Ichetucknee rivers and as a statistical tool in assessing if flow trends are moving toward recovery of MFLs. This appendix describes the background and development of this assessment tool for these two rivers.

Traditional Flow Duration Curves

Traditional FDCs are a convenient tool for visualization, simplification, and comparison of streamflow data. Searcy (1959) notes that the curves are cumulative frequency curves "combining in one curve the flow characteristics of a stream throughout the range of discharge." FDCs have had "wide-spread application" and a "long history" in a variety of hydrologic studies including in-stream flow assessments (Vogel & Fennessey, 1995).

The vertical axis of a FDC is the streamflow rate in cubic feet per second (cfs) and the horizontal axis is the proportion of time flow is equaled or exceeded, sometimes termed the exceedance. The calculation of exceedance commonly used (and used here) is the Weibull plotting position (Jacobs & Ripo, 2002) expressed as a decimal. As can be observed in Figures 1 and 2, FDCs are constructed by sorting all of the daily data, from highest to lowest and assigning the exceedance. The highest flow in the record corresponds to the lowest exceedance probability flow; the lowest flow in the record corresponds to the highest exceedance probability flow.

FDCs show the proportion of time specified discharges were equaled or exceeded for a continuous record in a given period. For example, **Figure 1** provides the hydrograph and FDC of the daily mean flow of the Santa Fe River near Fort White during the period 1932 to 2012. From that FDC, it can be shown that the daily mean flow at that point on the river was at least 885 cfs, 90 percent of the time during the period of record. (**Figure 2** similarly provides the hydrograph and FDC for the Ichetucknee River at the Highway 27 gage). However, flow duration curves are influenced by the period of record used in their creation, exhibiting sensitivity to the period of record in the "tails," but they are useful for comparison purposes between different scenarios over the same time period.

Flows and/or exceedances of interest can be plotted on the FDC. For example, the magnitude of a spring is of common interest to the public and is used in MFL priority list development. An exceedance probability of 0.5 (the median) is used to determine spring magnitude (Florida Geological Survey, 2005).

Given the characteristics of the rivers and the available flow data, MFLs have been developed at two USGS gages and plotted as FDCs (see MFL Technical Report). These gages are the Santa Fe River near Fort White (Fort White) and the Ichetucknee River at Highway 27 near Hildreth (HWY27).

Period of Record Flow Duration Curve vs. Annual Flow Duration Curve

Note: The following section is adapted from Jacobs and Ripo (2002).

Traditionally, FDCs have been constructed by simply ranking all streamflows q_i over the period-of-record (Searcy 1959) from largest to smallest, q_1, q_2, ..., q_S where S is the total number of streamflows and $q_i > q_{i+1}$. Each streamflow quantity has a corresponding exceedance $p_i = i/(S+1)$ using the Weibull plotting position. If an FDC is constructed using period-of-record streamflows (termed here a PFDC), then one interprets the exceedance as the reliability of streamflow exceeding some level over the period of record.

Alternatively, one can construct an annual-based FDC (AFDC) that represents the exceedance probability or reliability of streamflow exceeding some minimum level in a design year (see Vogel and Fennessey, 1994). The AFDC provides a different graphical tool to illustrate the quantity and frequency of streamflow available in a river basin. The AFDC, as compared to the traditional period-of-record (POR) flow duration curve, has a robust statistical interpretation of streamflow that allows for the determination of high and low flow AFDCs and their annual yield with a specified recurrence interval T (T-year return period). The AFDC is constructed by developing a FDC for each of the N-years of data by rank ordering each year's 365 discharge values. The AFDC is constructed from the N-year series of annual FDCs using a specified probability (e.g., the mean or the median) for each of the 365 sets of values.

Figures 1 and 2 show the PFDCs and the median AFDCs for Fort White and HWY27, respectively. **Figures 3 and 4** show the 2-year (median) and 10-year flood and drought AFDC curves for Fort White and HWY27, respectively. The 10-year flood curve corresponds to the $p = 0.10$ probability. The 10-year drought curve corresponds to the $p = 0.90$ probability.

Use of Annual Flow Duration Curves to Assess Flow Trends

The SRWMD selected a 20-year moving AFDC statistic for use in MFL trend assessment. Using a 20-year moving AFDC statistic provides a methodology for District staff to compare annual streamflow data to the MFL, and evaluate the trends in streamflow recovery on an annual basis, while minimizing year to year climate variations. Based on assessment of multiple "windows" in time, including 5- and 10-year estimates, SRWMD staff determined that a 20-year period is long enough to provide a stable estimate without significant potential for "false positives" the shorter periods produced, due to short term climate fluctuations.

The assessment tool is constructed by first obtaining the 20-year moving median AFDCs of the Baseline period (Water Years 1933-1990) from the MFL time series. Figures 5 and 6 show these AFDCs for the Fort White and HWY27 respectively (gray lines). Then, the T-year AFDCs (from the complete baseline individual year data, not the 20-year medians) were found that completely bound the set of 20-year median AFDCs (the median AFDC for the Baseline period is also shown for completeness). These T-year AFDCs which are the lower bound for Baseline MFL data represent the lower limit beyond which the AFDC for any subsequent 20-year period in the flow record should not fall if the river is meeting the MFL (assuming similar climatological conditions). These lower bound AFDCs for the MFL data, represent a hydrologic threshold, hereafter referred to as the lower MFL screening threshold, for annual comparison of streamflow data to the MFL.

SRWMD staff utilized this method to develop the lower MFL screening threshold for the Lower Santa Fe and Ichetucknee Rivers, as shown in **Figures 5 and 6**. In this case, the return period for the lower MFL screening threshold AFDC was the 2.7-year AFDC for the Lower Santa Fe River, and the 3.8-year AFDC for the Ichetucknee River. These lower MFL screening thresholds are illustrated by the red line in Figures 5 and 6, which demonstrate how the lower MFL screening threshold AFDC for each river provides a lower bound for the 20 year AFDCs for the MFL Baseline data. As previously stated, in subsequent years after the baseline period, it would be expected that the 20-year AFDC of observed streamflows for each year after the Baseline period would be above the lower MFL screening threshold if the river is meeting the MFL, assuming similar long term climate conditions. Similarly if several years of new 20-year AFDCs fall below the lower MFL screening threshold, and exhibit a declining trend, then there is potential that the river is not meeting the MFL, and further assessment of streamflows and climate conditions would be required to determine the river's status.

To illustrate how the SRWMD will use the lower MFL screening threshold, Figures 7 and 8 show the lower MFL screening threshold for the Lower Santa Fe and Ichetucknee Rivers, respectively, along with one 20-year AFDC from the post-Baseline period (in this case 1991 to 2010). Each of these 20-year AFCDs is below the lower MFL screening threshold, indicating that there is potential that the rivers are not meeting their MFLs. This matches the conclusion of the assessment of the status of these rivers in the establishment of the MFLs. When evaluating these rivers with regard to their MFLs, the District will examine multiple, sequential 20-year AFDCs, to gage the overall trends in streamflows with regard to the MFLs. When the 20-year condition increases to the MFL metric AFDC, the system is trending toward recovery. Similarly, when recovery is achieved in the future, it is expected that each 20-year AFDC will be above this screening threshold.

In addition to examining the overall ADFC, the District will also examine various exceedances along the ADFCs to assess trends in low flows, median flows, and high flows over time. As an example, **Figures 7 and 8** illustrate the 0.5 (median) and 0.9 (a low flow) exceedance conditions over several consecutive 20-year AFDCs. The horizontal lines are 0.5 and 0.9 exceedance flows taken from the lower MFL screening threshold, and the plotted points illustrate the overall trend in the 0.5 and 0.9 excedance flows for several 20-year AFDCs ending in recent years. These points exhibit a slight declining trend for both rivers, as would be expected considering that the rivers are not meeting their MFLs. As recovery projects are implemented and hydrologic conditions in the Lower Santa Fe basin improve, it would be expected that these points would gradually begin to trend upward toward the flow metric taken from the lower MFL screening threshold.

Utilizing AFDCs to create the lower MFL screening thresholds provides an important tool for the SRWMD to assess the status of the Lower Santa Fe and Ichetucknee River on a recurring annual basis. The method is based on actual data as opposed to modeling, and provides a simple metric to compare the trends in streamflows to the MFL. It should be noted that one limitation of this method is that it assumes that future climate conditions will be similar to the baseline period of 1933-1990. As discussed in the MFL Technical Document, this baseline data represents the best available information, and the duration of hydrologic data records is a limitation of nearly all hydrologic analysis. The SRWMD intends to utilize this AFDC tool as a hydrologic screening threshold and a method to evaluate trends in future streamflows with regard to the MFL. The SRWMD will also continue to utilize the best available tools, streamflow data, and climate records to evaluate the status of the Lower Santa Fe and Ichetucknee Rivers and associated priority springs with regard to their MFLs.

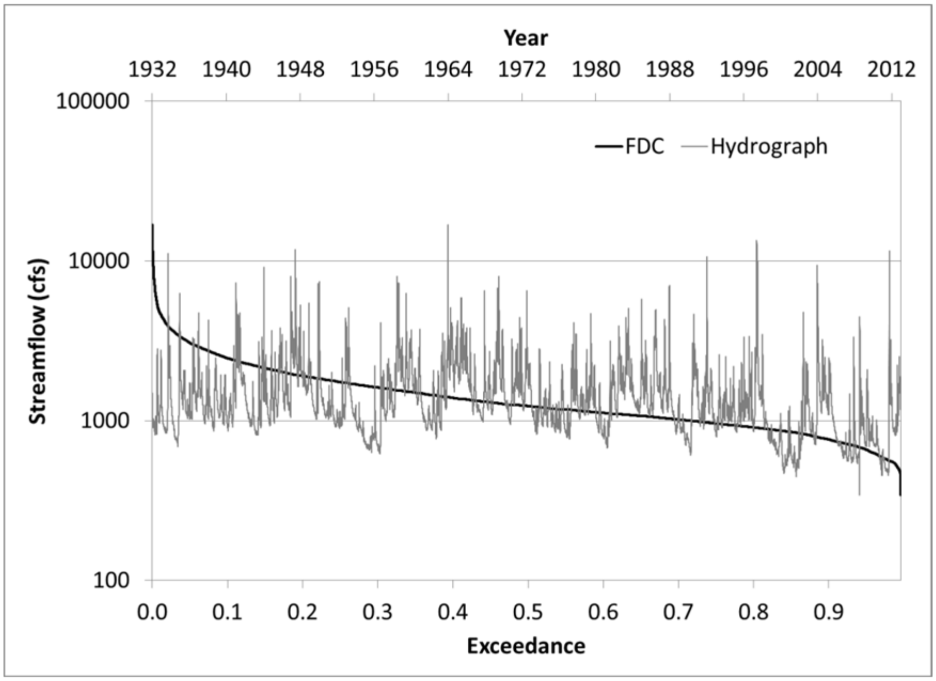

Figure 1. Comparison of the period-of-record hydrograph of the Lower Santa Fe River near Fort White with its period-of-record flow duration curve.

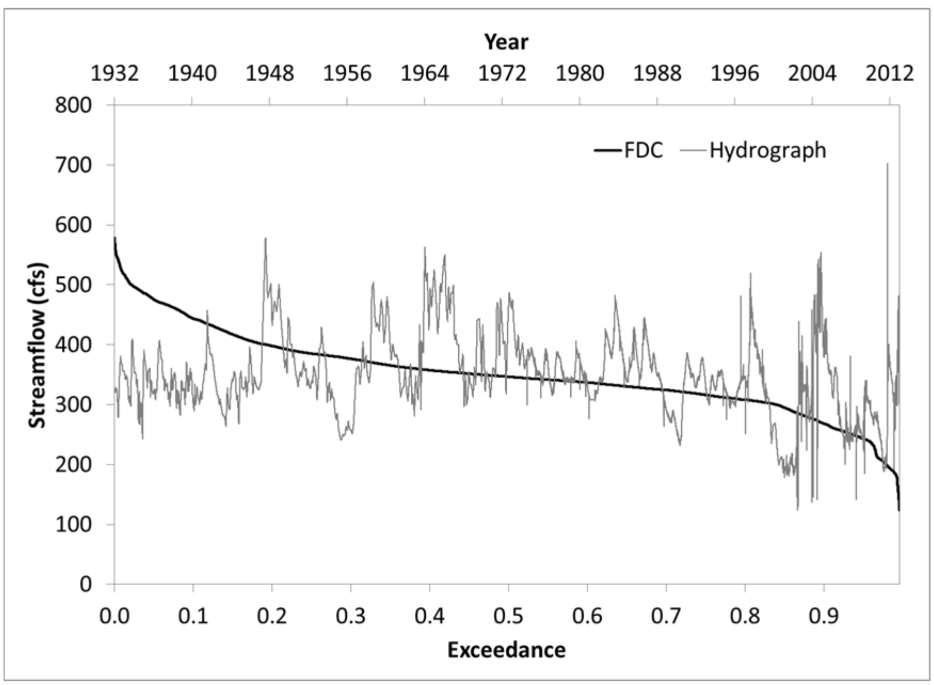

Figure 2. Comparison of the period-of-record hydrograph of the Ichetucknee River at Highway 27 Hildreth with its period-of-record flow duration curve.

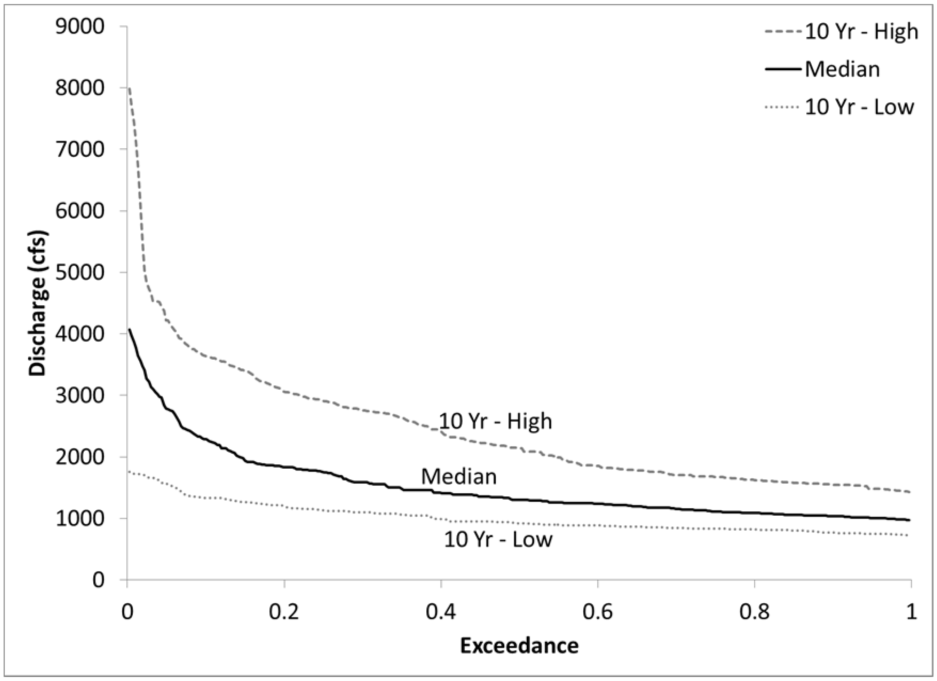

Figure 3. Annual Flow Duration Curves for the Lower Santa Fe River near Fort White.

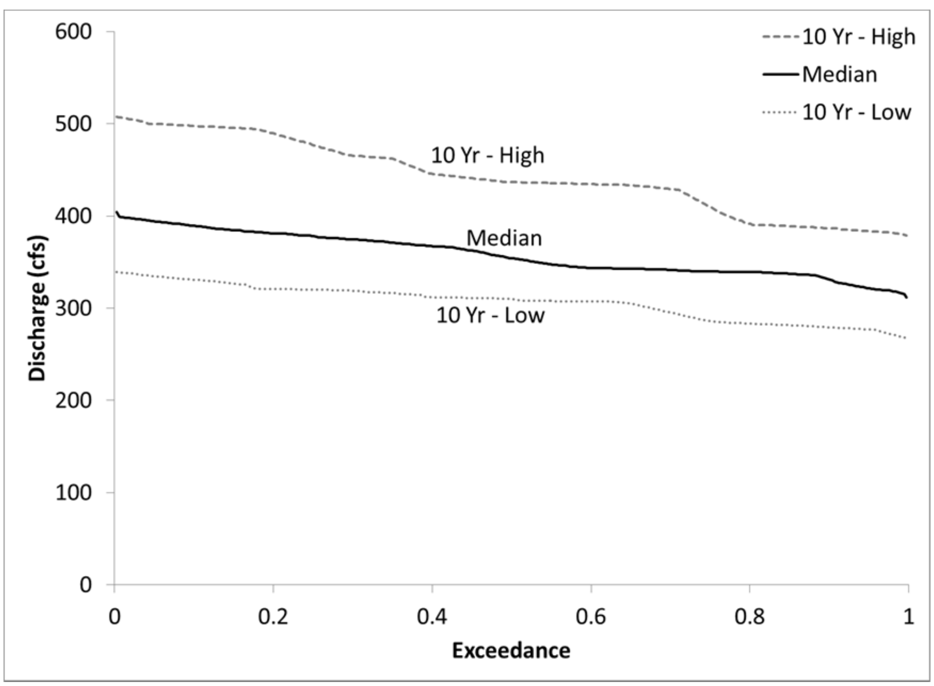

Figure 4. Annual Flow Duration Curves for the Ichetucknee River at Highway 27.

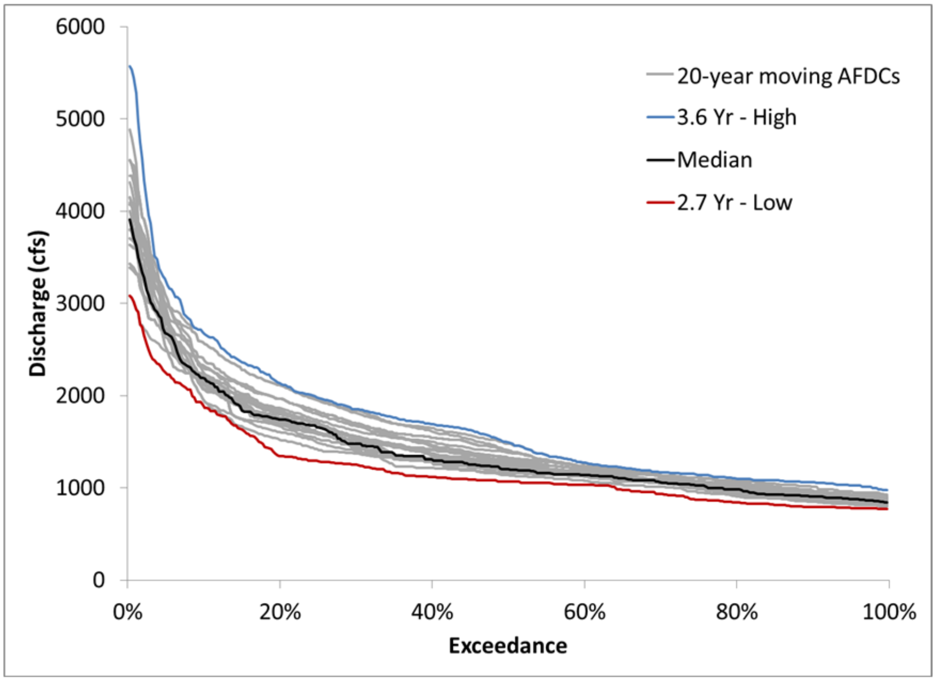

Figure 5. Median and Bounding T-year Annual Flow Duration Curves superimposed on the Individual 20-Year moving Annual Flow Duration Curves for the Lower Santa Fe River near Fort White.

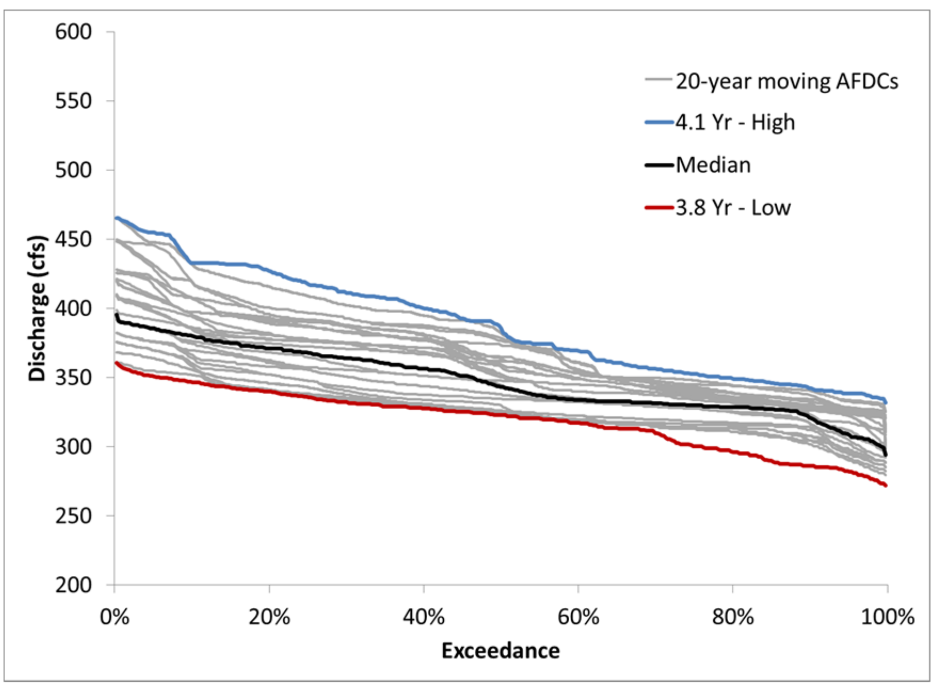

Figure 6. Median and Bounding T-year Annual Flow Duration Curves superimposed on the Individual Annual Flow Duration Curves for the Ichetucknee River at Highway 27.

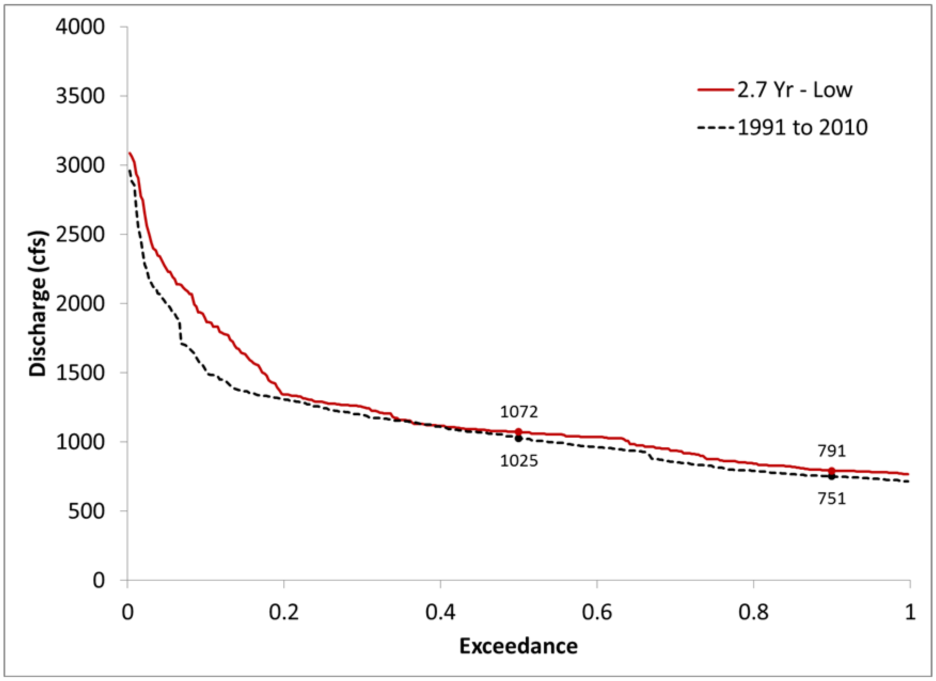

Figure 7. Lower MFL Screening Threshold and 20-Year moving Annual Flow Duration Curve for the Lower Santa Fe River near Fort White.

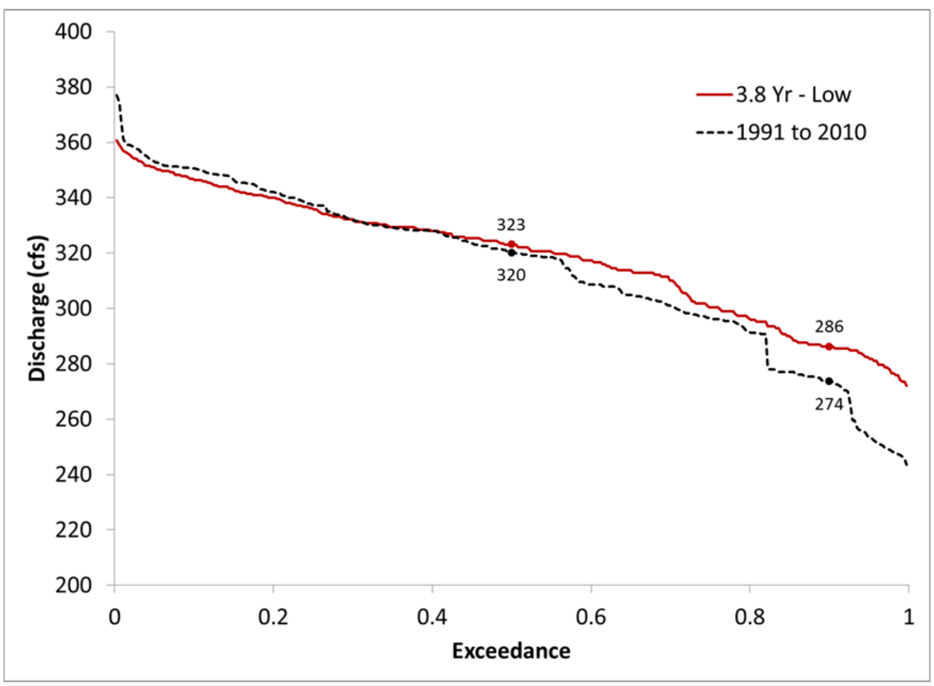

Figure 8. Lower MFL Screening Threshold and 20-Year moving Annual Flow Duration Curve for the Ichetucknee River at Highway 27.

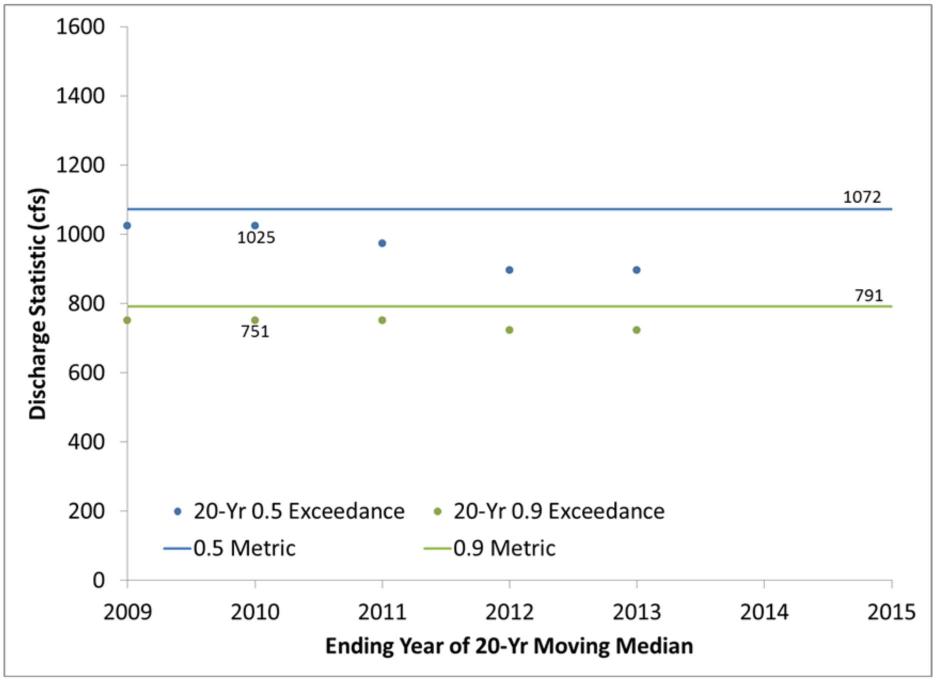

Figure 9. Assessment Tool for the Lower Santa Fe River near Fort White.

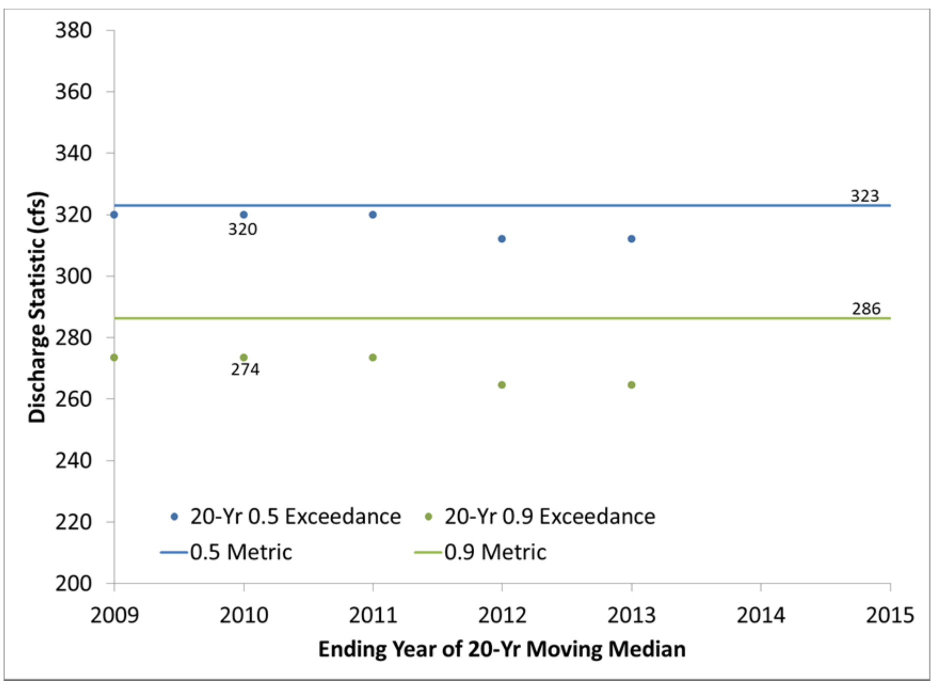

Figure 10. Assessment Tool for the Ichetucknee River at Highway 27.

Recovery Strategy for the Implementation of Lakes Brooklyn and Geneva Minimum Levels

July 13, 2021

St. Johns River Water Management District
Division of Water Supply Planning and Assessment
Bureau of Water Supply Planning

Introduction

As a part of fulfilling its mission and statutory responsibilities, the St. Johns River Water Management District (District) establishes minimum flows and levels (MFLs) for priority water bodies within its boundaries. MFLs establish a minimum hydrologic regime and define the limits at which further consumptive use withdrawals would be significantly harmful to the water resources or ecology of an area. MFLs are one of many effective tools used by the District to assist in making sound water management decisions and preventing significant adverse impacts due to water withdrawals.

Lakes Brooklyn and Geneva are sandhill lakes located in Clay and Bradford counties, Florida (see Figure 1) and adjacent to the city of Keystone Heights, Florida. Lakes Brooklyn and Geneva are part of a chain of lakes and wet prairies in the Upper Etonia Creek Basin. Minimum levels for Lakes Brooklyn and Geneva were originally adopted in January 1996. The District completed a reevaluation of minimum levels for Lakes Brooklyn and Geneva in 2020. The reevaluated minimum levels recommended for Lakes Brooklyn and Geneva are based on implementation of updated methods and more appropriate environmental criteria. The updated methods include results from a new regional steady state groundwater model and a local scale transient model used to quantify the effects of local and regional groundwater withdrawals, and the analysis of an additional 20 years of hydrologic data. The status assessment for Lakes Brooklyn and Geneva indicate that they are currently not meeting their proposed MFLs based upon current (average of 2014–2018) groundwater withdrawals with a P50 lake deficit of 1.6 feet for Lake Brooklyn and 0.3 feet for Lake Geneva. Therefore, Lakes Brooklyn and Geneva are in recovery, and a recovery strategy is required (subsection 373.0421(2), *Florida Statutes* (F.S.)). Additionally, the estimated pumping conditions at 2045 were assessed and when added to the current deficit resulted in an estimated total deficit for Lakes Brooklyn and Geneva at the P50 of 3.9 feet and 1.5 feet, respectively.

Consistent with the provisions for establishing and implementing MFLs provided for in section 373.0421, F.S., the Recovery Strategy (Strategy) for the Implementation of Lakes Brooklyn and Geneva MFLs identifies a suite of projects and measures that, when implemented, recovers the MFLs for Lakes Brooklyn and Geneva and prevents the MFLs from being violated in the future due to consumptive uses of water, while also providing sufficient water supplies for all existing and projected reasonable beneficial uses.

To meet the requirements for the Strategy according to subsection 373.0421(2), F.S., this Strategy contains the following information:

- A listing of specific projects and measures identified for implementation of the plan
- A regulatory component to achieve the MFLs
- A timetable for implementation

On January 17, 2017, the St. Johns River Water Management District and the Suwannee River Water Management District Governing Boards approved the 2015–2035 North Florida Regional Water Supply Plan [NFRWSP] (SJRWMD and SRWMD, 2017) which identified that groundwater withdrawals beyond 2010 were not sustainable without creating adverse environmental impacts.

The MFLs for Lakes Brooklyn and Geneva support the conclusions of the NFRWSP. Like the NFRWSP, this Strategy focuses on water conservation, water supply development and water resource development (WRD) projects. A regulatory component is also included that utilizes existing rules to provide a structure for consumptive use permittees to address individual and cumulative impacts to Lakes Brooklyn and Geneva. The combination of projects and regulatory measures provide assurance that the MFLs for Lakes Brooklyn and Geneva will be achieved while meeting future demands.

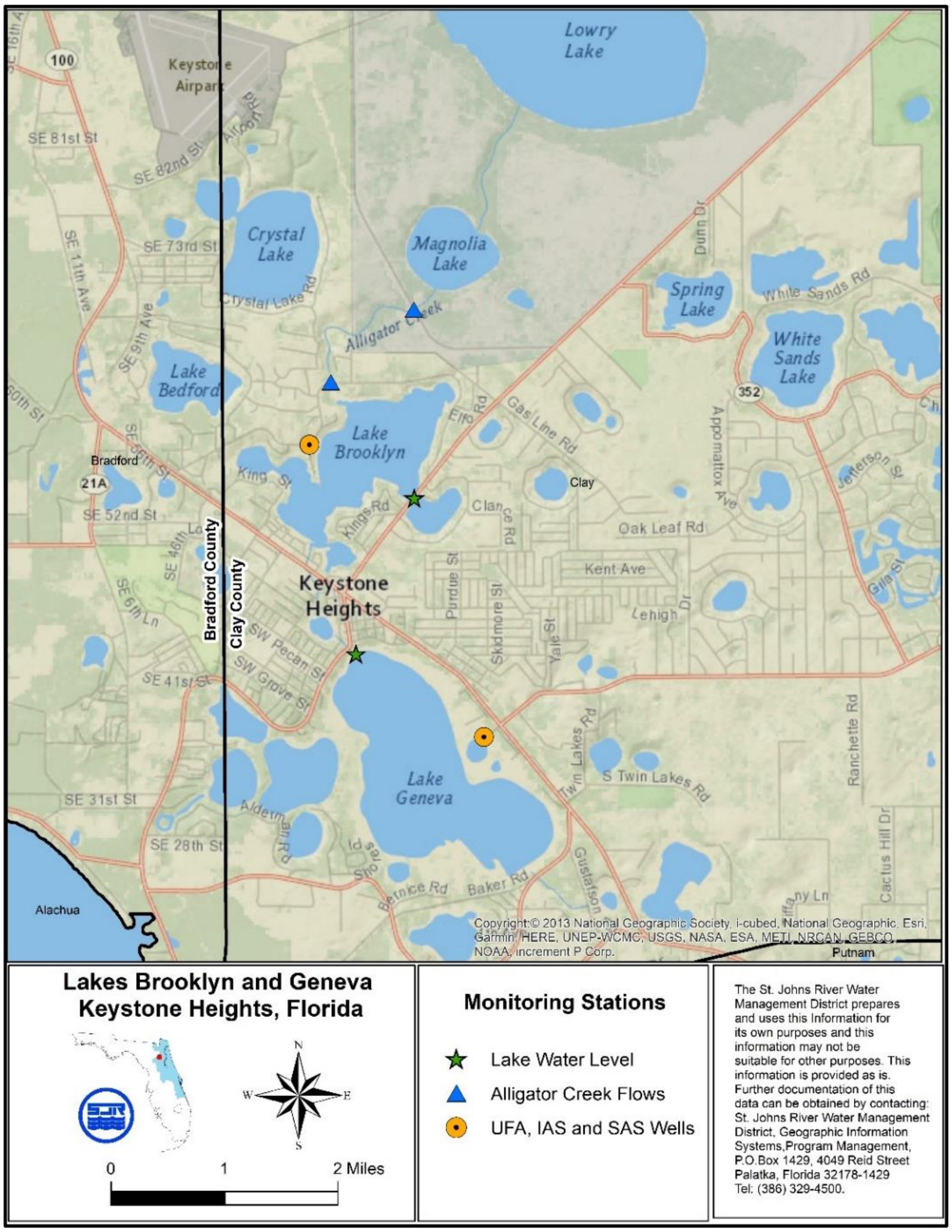

Figure 1. Location of Lakes Brooklyn and Geneva and associated monitoring stations

Stakeholder outreach

The District has been coordinating with stakeholders within the region since 2012 regarding potential projects to benefit Lakes Brooklyn and Geneva. Stakeholder outreach activities specifically related to the updated MFLs and the Strategy began in April 2018 with briefings to members of the Save Our Lakes Organization (SOLO), the North Florida Utility Coordination Group (NFUCG), and the Florida Pulp and Paper Association. On October 26, 2020, all District consumptive use permittees within the NFRWSP area (see Figure 2) were advised by letter of the draft MFLs for Lakes Brooklyn and Geneva and encouraged to participate in the development of the Recovery Strategy. A draft Recovery Strategy for the Implementation of Lakes Brooklyn and Geneva Minimum Levels was posted for public viewing on the District website on December 3, 2020, and a public workshop was held on December 10, 2020, in Palatka, Florida.

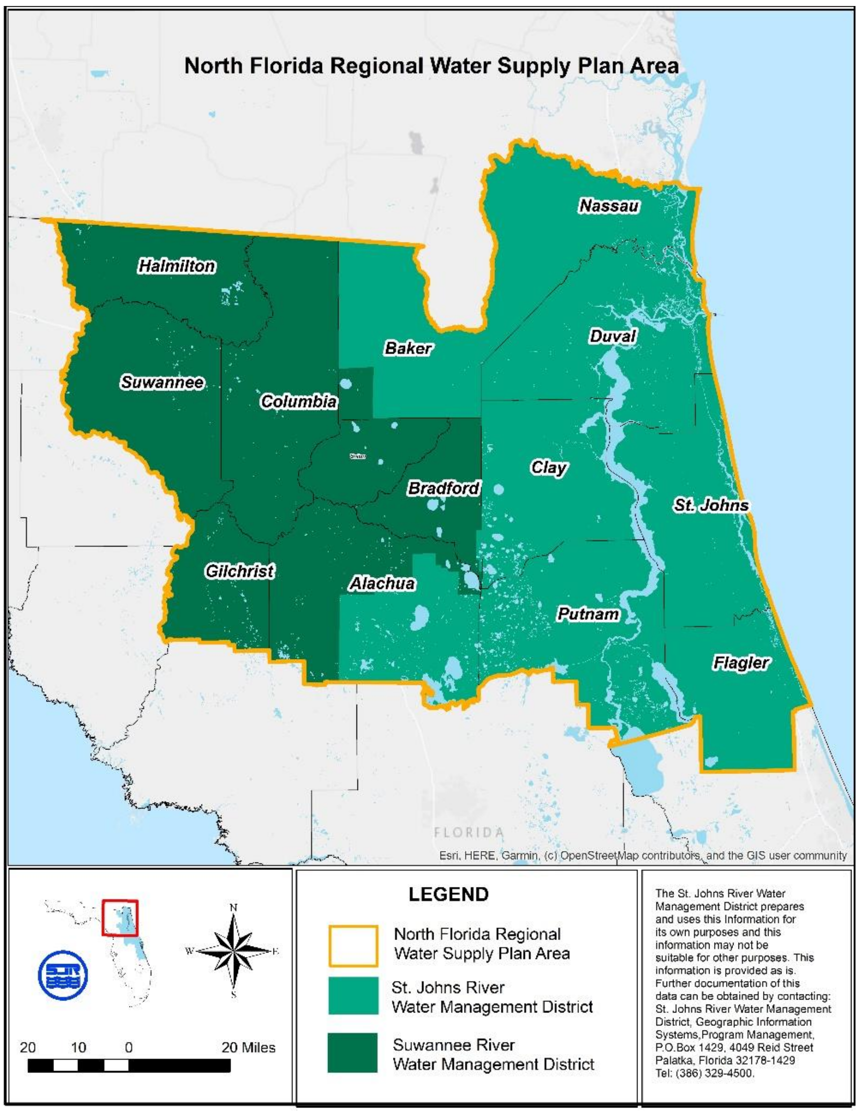

Figure 2. Map of the North Florida Regional Water Supply Plan area.

Lakes Brooklyn and Geneva MFLs and Status Assessment

The District completed a reevaluation of the minimum levels for Lakes Brooklyn and Geneva in 2020. After peer review and staff evaluation of relevant criteria, 10 environmental metrics were chosen for evaluation and assessment at Lakes Brooklyn and Geneva. Of these 10 metrics, the open-water area criterion was determined to be the most sensitive for both Lakes Brooklyn and Geneva. (Sutherland, et. al., 2020).

Three minimum levels (see Table 1) were recommended for Lakes Brooklyn and Geneva. These three levels were calculated from the MFLs condition exceedance curve for each lake. Adopting these three minimum levels will ensure the protection of the minimum hydrologic regime at low, average and high levels for Lakes Brooklyn and Geneva.

Table 1. Recommended minimum levels for Lakes Brooklyn and Geneva, Clay and Bradford counties, Florida (from Sutherland et al, 2020).

System	Percentile	Recommended minimum lake level (ft; NAVD88)
Lake Brooklyn	25	111.5
	50	106.2
	75	98.6
Lake Geneva	25	101.7
	50	98.3
	75	89.3

The recommended minimum levels for Lakes Brooklyn and Geneva will protect relevant water resource values from significant harm due to water withdrawals. The recommended MFLs are preliminary and will not become effective until after adoption.

As part of the reevaluation, an assessment was conducted to compare the proposed minimum levels (minimum MFLs hydrologic regime) to existing and projected hydrologic regimes to determine the current and future status of the MFLs. The status assessment utilized the North Florida Southeast-Georgia Regional Groundwater Flow Model version 1.1 (NFSEG) and the Keystone Heights Transient Groundwater Flow Model v2.0 (KHTM) to determine the current status associated with the MFLs for these two lakes.

Proposed MFLs and current-pumping conditions were compared to determine lake freeboards/deficits for the final suite of environmental criteria. The current-pumping condition represents the average 2014–2018 pumping condition and is based on the best available data as of July 2020. The status assessment for Lakes Brooklyn and Geneva indicate that they are currently not meeting their proposed MFLs. A comparison of the MFLs and current-pumping conditions for Lakes Brooklyn and Geneva yields a lake level deficit of 1.6 feet and 0.3 feet, respectively.

Therefore, Lakes Brooklyn and Geneva are in recovery, and a recovery strategy is required. The 2035 water use estimations were extrapolated out to 2045 resulting in an 8% increase over expected 2035 withdrawals. This 8% increase was applied to the results of the 2035 status assessment for Lakes Brooklyn and Geneva levels producing an estimated 2045 deficit for Lakes Brooklyn and Geneva of 3.9 feet and 1.5 feet, respectively.

Consistent with the provisions for establishing and implementing MFLs provided for in section 373.0421, F.S., the recovery strategy for Lakes Brooklyn and Geneva MFLs identifies a suite of projects and measures that, when implemented, will recover these lakes from impacts due to withdrawals. Since the MFLs status of Lakes Brooklyn and Geneva are in recovery, a portion of the current groundwater pumping and all future groundwater demands that have a potential impact will need to be met through increased water conservation, alternative water supplies, or impact offsets (e.g., recharge).

Influence by use type

Identifying the water uses that have the largest potential impact on the water resource of concern is an important first step in the development of a recovery strategy. This assessment guides the development of strategies, including projects, that result in the greatest benefit to the constrained water resource. The NFSEG model was used to determine the impact by use type for Lake Brooklyn, because it has the greater recovery deficit. Public supply water use represents 44.3% of the change in the potentiometric surface of the Upper Floridan aquifer (UFA) at Lake Brooklyn from current pumping within the District (see Figure 3). The second largest user group is domestic self-supply at 27.0%.

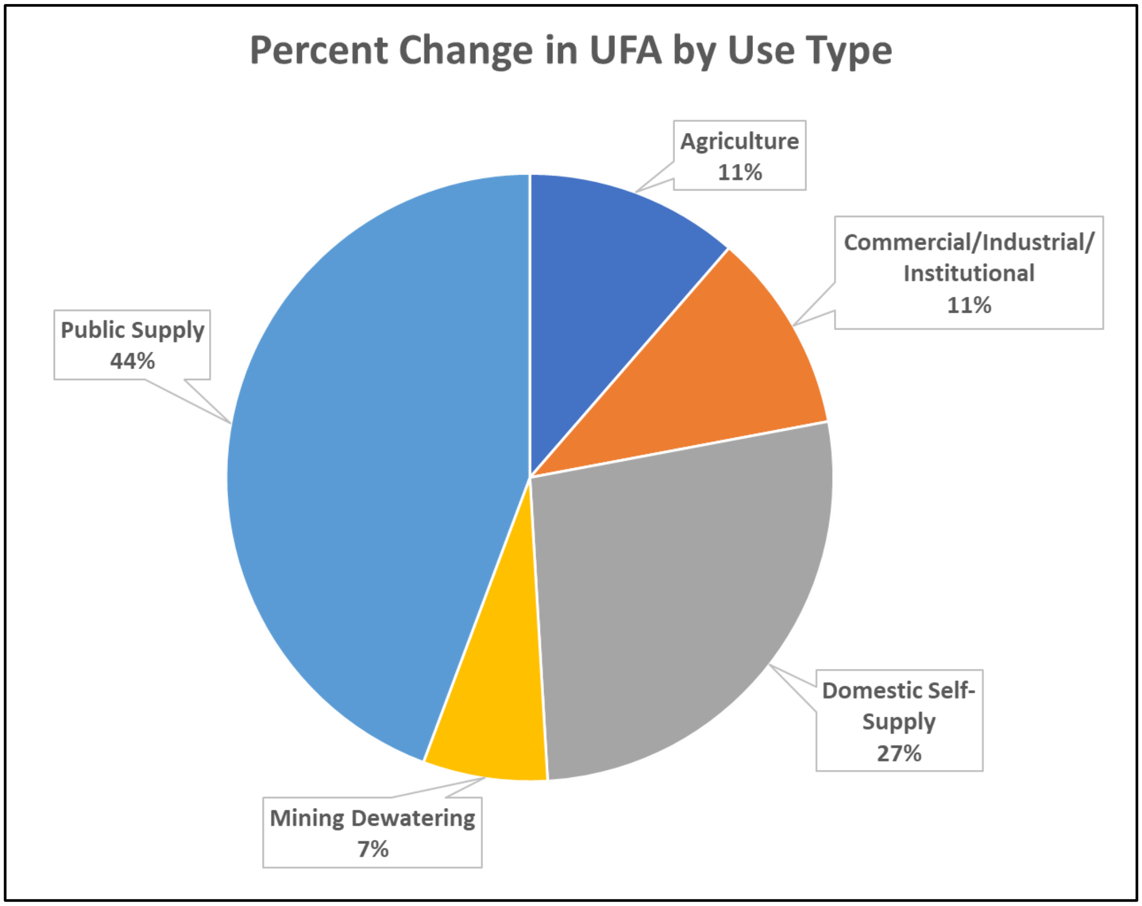

Figure 3[1]. Percent change in Upper Floridan Aquifer levels at Lake Brooklyn by category from withdrawals in the District.

Domestic Self-Supply near Keystone Heights

Impacts from domestic self-supply withdrawals within 10 miles of Lake Brooklyn in the District were investigated. The results of this investigation indicate that current pumping from domestic self-supply withdrawals near Keystone Heights represent nearly 50% of the total DSS change in the

[1] The combined change to UFA at Lake Brooklyn from current pumping for the landscape/recreation/aesthetic, power generation, and other small categories make up less than 1.0% of the remaining change and thus are not shown in Figure 2, but are considered in this Strategy.

UFA levels at Lake Brooklyn from withdrawals in the District. This investigation highlights how, cumulatively, nearby small withdrawals can significantly influence the UFA levels at Lake Brooklyn.

The impact from domestic self-supply withdrawals could be mitigated by development of a source of supply other than the UFA or by relocating the UFA withdrawals farther from the lakes. For example, the development of a public water supply system would allow for the centralization of the UFA withdrawal to a location farther away from the lakes and thus provide a benefit to the UFA at Lake Brooklyn. Optimization of the UFA withdrawal location and the individuals served could be further explored to address the impact from domestic self-supply withdrawals near Lake Brooklyn.

Projects and Measures that Achieve the Strategy Objective

Achieving and ensuring the maintenance of the MFLs for Lakes Brooklyn and Geneva will require the implementation of projects and measures in addition to the careful management of local and regional groundwater withdrawals. Projects and measures include enhanced conservation, aquifer recharge, development of alternative water supplies, and expansion of reclaimed water systems. The benefits predicted from the suite of proposed projects and measures, together with the regulatory component, provide assurance that the MFLs for Lakes Brooklyn and Geneva will be achieved through 2045.

Numerous projects and measures within the District from the NFRWSP were completed between 2014 and 2020. Examples of these projects include water conservation measures utilizing technological improvements such as soil moisture monitoring and advanced metering, implementation of best management practices, and reuse system expansion through increased treatment, distribution and storage systems. Appendix A provides further information on projects from the NFRWSP that have been completed. The primary benefit from these completed projects is reducing future demand from the Floridan aquifer.

Additional water conservation measures, water resource development projects, and water supply projects will be necessary to meet future water use demands while ensuring that the MFLs for Lakes Brooklyn and Geneva will be met. Potential stakeholder projects and measures from the NFRWSP along with their estimated benefits are listed in Appendix B.

Actual projects and measures implemented to achieve the goals of the Strategy objective may differ from those described in this document. Moreover, projects and measures identified in the Strategy do not become permit conditions by virtue of their inclusion in an approved Strategy. The projects described in this Strategy or alternative projects that the District concurs will provide an equivalent benefit, may be developed and incorporated as consumptive use permit (CUP) conditions through standard permitting procedures and future Strategy revisions, as appropriate.

Water conservation

Water conservation is an important component of any prevention or recovery strategy as it directly affects projected water demand and, therefore, the magnitude of resource impacts. Best management practices such as improved irrigation scheduling, conversion to more efficient irrigation systems, and moisture sensor-controlled automation can reduce the amount of water applied to crops and landscape. A large portion of these savings occurs through passive water conservation. Passive water conservation occurs when showerheads, appliances, urinals, and faucet aerators are replaced with more efficient fixtures or systems in homes, commercial establishments, institutions, or any facility with household type use.

Potential water conservation quantities were estimated based on the methodologies employed for the NFRWSP. The conservation savings potential within the District was estimated to be 23 million gallons per day (mgd) through both passive water conservation strategies and active water conservation programs funded by local governments or public water supply utilities.

Reclaimed water potential

The reclaimed water projects summarized in Appendixes A and B provide details on the actual projects completed or planned to be constructed to expand the use of reclaimed water as identified in the NFRWSP. Implementation of reclaimed water provides an offset to withdrawals from traditional water sources and reduces potential impacts. Much of this reclaimed water will provide a source of irrigation water for recreational, residential, and commercial users.

Black Creek WRD project

The 10 mgd Black Creek WRD project, identified in the NFRWSP, is currently in the design and permitting phase. The Black Creek WRD development project will provide regional recharge to the Floridan aquifer. In addition to these regional benefits, when fully implemented, this project has the potential to increase median lake levels in Lakes Brooklyn and Geneva by up to 9.9 ft and 4.9 ft, respectively. The estimated construction and 20-year operation and maintenance cost for the project is $81.4 million. The St. Johns River and Keystone Heights Lake Region Projects legislative appropriations provided nearly $43.4 million to the Black Creek WRD Project, and the District is also contributing $5 million toward the project. Once the necessary permits have been issued and sufficient funding has been secured, construction could be completed within 3 years.

The project will provide sufficient benefits to Lakes Brooklyn and Geneva to offset the impacts from current and future water uses that are not subject to individual permitting requirements such as domestic self-supply and other water uses that are below consumptive use permitting thresholds. It is anticipated that additional benefits could be available to offset a portion of existing impacts from individual consumptive use permittees. Permittees would also have the opportunity to partner with the District on the project to ensure the project could be constructed and operated in a manner such that sufficient benefits would be available to fully offset their current and future impacts to Lakes Brooklyn and Geneva. Entities who have executed agreements to participate in the Black Creek WRD project have addressed their proportional share of impacts to the MFLs and are in compliance with the Recovery Strategy up to the amount of lift purchased by that entity.

Regulatory Component

A regulatory component to the recovery strategy is necessary to not only ensure that existing and future groundwater use is consistent with the recovery and maintenance of the MFLs for Lakes Brooklyn and Geneva, but also to outline the necessary actions by permittees to address their proportional share of the required recovery of the minimum levels for Lakes Brooklyn and Geneva.

Current permitting rules

Presently, the District possesses a comprehensive system of rules, which regulate consumptive uses of water. These permit criteria are listed in Chapter 40C-2, Florida Administrative Code (F.A.C.), and are expanded upon in the District's *Applicant's Handbook: Consumptive Uses of Water* (A.H). Several existing permit requirements will continue to provide assurance that existing and new permitted consumptive uses are consistent with the Strategy objective:

- Permitting criterion requiring that reasonable-beneficial uses *must not cause harm to the water resources of the area*. See Rule 40C-2.301(2)(g), F.A.C. According to the definition of an MFL, withdrawals that result in MFLs not being achieved are considered significantly harmful to that water body.
- Permitting criterion requiring that reasonable-beneficial uses *must be in accordance with any minimum flow or minimum level and implementation strategy*. See Rule 40C-2.301(2)(h), F.A.C.
- Permitting criterion requiring that reasonable-beneficial uses *must be in such quantity as is necessary for economic and efficient use*. See Rule 40C-2.301(2)(a), F.A.C. To meet the requirements of this criterion, water use must be consistent with the demonstrated water demand for a particular water use.
- A standard limiting condition is placed on consumptive use permits requiring that the permittee's consumptive use of water as authorized by the permit shall not reduce a flow or level below any minimum flow or level established by the District or the Department of Environmental Protection pursuant to sections 373.042 and 373.0421, F.S. The condition further requires that if the permittee's use of water causes or contributes to such a reduction, then the District shall revoke the permit, in whole or in part, unless the permittee implements all provisions applicable to the permittee's use in a District-approved recovery or prevention strategy. See Rule 40C-2.381(2)(a)10., F.A.C.
- Another standard limiting condition requires that the permittee's consumptive use of water as authorized by this permit shall not significantly and adversely impact wetlands, lakes, rivers, or springs. If significant adverse impacts occur, the District shall revoke the permit, in whole or in part, to curtail or abate the adverse impacts, unless the impacts associated with the permittee's consumptive use of water are mitigated by the permittee pursuant to a District-approved plan. See Rule 40C-2.381(2)(a)9., F.A.C.

Existing Permitted Uses

Nothing in this strategy shall be construed to automatically modify any consumptive use permits to reduce previously authorized allocations. Upon determination that groundwater withdrawals authorized by individual consumptive use permits held by a permittee will cause or contribute, individually or cumulatively, to a violation of the MFLs for Lakes Brooklyn or Geneva, the District will notify them pursuant to the standard limiting conditions above of their responsibility to address their proportional share of the required recovery of the MFLs. Any modifications to existing consumptive use permits would be in accordance with chapter 373, Florida Statutes, and District rules.

Applications for New Quantities and Renewals

Requests for withdrawals of new quantities of water or renewals of existing allocations that are projected to impact the MFLs for Lakes Brooklyn or Geneva would need to meet the conditions for issuance described above, including a demonstration that the proposed use will not cause or contribute, individually or cumulatively, to violations of the Minimum Levels for Lakes Brooklyn or Geneva.

Timeline

The following timeline highlights the milestones toward achieving the recovery of the MFLs within 20 years.

- **Ongoing efforts**
    - Continue implementation of projects from the NFRWSP (Appendix B).
    - Incentivize water conservation and water supply projects through the District's cost-share programs.
    - Utilize existing Consumptive Use Permitting rules to require applicants to demonstrate their proposed use of water will not cause or contribute, individually or cumulatively to harm to the water resources of the area or to a violation of the Minimum Levels for Lakes Brooklyn and Geneva.
- **2021-2025**
    - Approval of MFL for Lakes Brooklyn and Geneva and associated Recovery Strategy by the District Governing Board.
    - Initiation of construction of Black Creek WRD project.
    - District's Consumptive use permittees whose groundwater withdrawals cause or contribute, individually or cumulatively, to the reduction of the water levels in Lakes Brooklyn or Geneva below their minimum levels will be notified that they must address their proportional share of required recovery of the minimum levels for Lakes Brooklyn and Geneva in accordance with this strategy.
    - Complete construction and begin operation of the Black Creek WRD project.
- **2025-2040**
    - Continue to work with the District's consumptive use permittees to implement their selected methods for addressing their proportional share of the required recovery of the minimum levels for Lakes Brooklyn and Geneva.
    - Continued operation of the Black Creek WRD project.

Funding

Black Creek WRD Project

The St. Johns River and Keystone Heights Lake Region Projects legislative appropriations provided nearly $43.4 million to the Black Creek WRD Project. The District is also contributing $5 million toward the project. The Black Creek WRD Project is an example of a regional project whereby entities could partner with the District by contributing to construction and operation and maintenance costs to offset their impacts.

Districtwide/REDI Cost-Share programs

The District primarily provides funding assistance through the Districtwide Cost-Share program, which is administered annually and supports projects that benefit one or more of the District's four core missions: water supply (alternative water supply, non-traditional sources, and water conservation), water quality, natural systems restoration (including projects that provide a significant percent recovery for an MFL waterbody whose status is in prevention or recovery), and flood protection.

This funding assistance is exclusively available for construction-related costs with the District's percent match typically at 33% or up to 50% for conservation projects. The District's scoring criteria is geared such that projects that benefit an MFL water body that is determined to be in prevention or recovery receive the highest score in the core mission benefit ranking criterion, thereby giving weight to projects with demonstrated benefits that are listed within a prevention or recovery strategy. For the current fiscal year (FY), there is approximately $20 million in the district-wide/REDI cost-share programs.

Agricultural Cost-Share program

The District's Agricultural Cost-share Program provides funding assistance districtwide to agricultural operations for the implementation of projects that conserve water and/or result in nutrient loading reductions. This cost-share program provides up to 75%, not to exceed $250,000 per project, for engineering, design, and construction costs of an approved project. The grower is expected to cover operation and maintenance costs; however, future requests for long-term maintenance items (such as drip tape) may be considered for funding. For FY 2019/20, the District funded about $1.9 million and for the current fiscal year is expecting to fund $1.1 million.

Tri-County Agricultural Area (TCAA) Water Management Partnership

Multiple agencies are contributing funding, education, and technical assistance for growers in the TCAA of Flagler, Putnam, and St. Johns counties to implement projects that contribute to improving the health of the St. Johns River and implementation of effective water conservation measures. These projects are anticipated to contribute to the improved health of the river through on-farm and regional water management projects and practices that reduce the movement of nutrients to the river, improve irrigation efficiencies, which will result in more efficient farm management practices, while maintaining the long-term viability of agriculture in the TCAA. Funds allocated to this program vary year-to-year based upon funding availability from the Florida

Department of Agriculture and Consumer Services, Florida Department of Environmental Protection, and the District. For the FY 2019/20, there was about $1.9 million funded for the TCAA Water management Partnership. Funding in the current fiscal year is expected be similar.

Other funding sources

There are several grant programs being administered by the Florida Department of Environmental Protection at: *https://protectingfloridatogether.gov/state-action/grants-submissions*, which would provide funding for projects to assist in the recovery of these lakes. Specifically, in FY 2020, the Rivers and Springs Grants had $25 million available for projects and the Alternative Water Supply Grants had $40 million available.

References

SJRWMD and SRWMD. 2017. *North Florida Regional Water Supply Plan (2015–2035).* St. Johns River Water Management District and Suwannee River Water Management District. Palatka, FL.

Sutherland, A.B., F. Gordu, and S. Jennewein. 2020. *Minimum Levels Revaluation for Lakes Brooklyn and Geneva; Clay and Bradford Counties, Florida (Draft)*. St. Johns River Water Management District. Palatka, FL.

Appendices

Appendix A

NFRWSP projects completed from 2014–2020 (updated October 2020)

Completion Date	County	Project Name	Implementing Entity	Project Type	Water Source	Project Capacity (mgd)	Total Capital ($M)
2014	Duval	Queens Harbor Reclaimed Water Main Expansion	JEA and Queens Harbor Golf and Country Club	Reuse - Pipeline	Reclaimed Water	0.30	0.5
2015	Clay	AMI	CCUA	Conservation	Floridan	0.08	0.0
2015	Duval	Atlantic Beach Selva Marina Reclaimed Water System Expansion	City of Atlantic Beach	Reuse - Supply	Reclaimed Water	0.50	1.1
2015	Duval	Gate Pkwy - Shiloh Mill Blvd to Town Ctr Pkwy - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.01	0.3
2015	Flagler	Palm Coast Royal Palms Parkway Reclaimed Water Line	City of Palm Coast	Reuse - Pipeline	Reclaimed Water	0.05	0.3
2015	Flagler	Palm Coast Utilization of Concentrate as Raw Water Supply	City of Palm Coast	AWS	Concentrate	0.75	1.2
2015	St. Johns	Nocatee Coastal Oaks Phase 4	JEA	Reuse - Supply	Reclaimed Water	2.00	1.1
2015	St. Johns	AMR - Ponte Vedra System	SJCUD	Conservation	N/A	0.39	4.3
2015	St. Johns	Outdoor BMP Retrofit	SJCUD	Conservation	N/A	0.00	0.1
2015	St. Johns	Soil Moisture Sensor Pilot Project	SJCUD	Conservation	N/A	0.04	0.3
2016	Clay	Reclaimed Water SCADA System	CCUA	Reuse	Reclaimed Water	4.51	0.7
2016	Duval	Arlington East Water Reclamation Facility - Onsite Reuse Pump Upgrade	JEA	Reuse - Pipeline and Pumping	Reclaimed Water	0.60	0.6
2016	Duval	District II - Broward River Crossing Replacement	JEA	Reuse - Pipeline	Reclaimed Water	0.08	4.8
2016	Duval	Intermediate Well Conversion	San Jose Country Club	AWS	Intermediate aquifer	0.27	0.0

Completion Date	County	Project Name	Implementing Entity	Project Type	Water Source	Project Capacity (mgd)	Total Capital ($M)
2016	Flagler	State Street Irrigation System Expansion	City of Bunnell	Reuse - Pipeline	Reclaimed Water	0.10	0.1
2016	Flagler	Palm Coast Matanzas Woods Reclaimed Pipeline	City of Palm Coast	Reuse - Pipeline	Reclaimed Water	2.00	2.5
2016	St. Johns	Nocatee Area - Artisan Lakes - N10 - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.02	0.2
2016	St. Johns	Nocatee Area - Riverwood POD 17 - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.02	0.2
2016	St. Johns	Nocatee Area - Twenty Mile Village - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.02	0.3
2016	St. Johns	Nocatee Storage and Repump Facility Tank Expansion	JEA	Reuse - Storage	Reclaimed Water	0.00	0.3
2016	St. Johns	AI WWTP Reuse Storage Tank and Booster Pump Station	SJCUD	Reuse - Storage and Pumping	Reclaimed Water	2.00	1.5
2016	St. Johns	International Golf Parkway - Reclaimed Water System Expansion	SJCUD	Reuse - Pipeline	Reclaimed Water	0.42	2.4
2016	St. Johns	NW WWTF Reclaimed Water System Expansions/Improvements	SJCUD	Reuse - Pipeline, Storage, Pumping	Reclaimed Water	3.00	2.6
2016	St. Johns	SR 16 Corridor Reclaimed Water System Expansions/Improvements	SJCUD	Reuse - Pipeline, Storage, Pumping	Reclaimed Water	1.00	3.1

Completion Date	County	Project Name	Implementing Entity	Project Type	Water Source	Project Capacity (mgd)	Total Capital ($M)
2016	St. Johns	AI WWTP Reuse Storage Tank and Booster Pump Station	SJCUD/ SJRWMD	Reuse - Storage and Pumping	Reclaimed Water	2.00	1.5
2016	St. Johns	International Golf Parkway - Reclaimed Water System Expansion	SJCUD/ SJRWMD	Reuse - Pipeline	Reclaimed Water	0.42	2.4
2017	Duval	Bartram Park WTP - RW - Storage Expansion	JEA	Reuse - Storage	Reclaimed Water	0.05	2.2
2017	Flagler	Palm Coast Grand Landing Reclaimed Water Transmission Main	City of Palm Coast	Reuse - Pipeline	Reclaimed Water	0.56	0.7
2017	Flagler	Palm Coast RCW Irrigation Along US-1 & Palm Coast Park	City of Palm Coast	Reuse - Pipeline	Reclaimed Water	1.00	1.5
2017	St. Johns	Bartram Park Reclaimed Water Storage Tank Expansion	JEA	Reuse - Storage	Reclaimed Water	0.53	2.1
2017	St. Johns	Nocatee Area - Crosswater Pkwy - Coastal Oaks to South Village - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.04	0.4
2017	St. Johns	Nocatee Area - Twenty Mile Village Ph 4A - 4B - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.02	0.3
2017	St. Johns	Nocatee Booster Station	JEA	Reuse - Pumping	Reclaimed Water	1.20	1.4
2017	St. Johns	Nocatee North Storage and Repump Facility - New 3.5 MG Reclaimed Water Storage Tank	JEA	Reuse - Storage	Reclaimed Water	0.07	2.5
2017	St. Johns	City of St. Augustine Beach Reclaimed Water System Expansion	SJCUD	Reuse - Pipeline	Reclaimed Water	0.02	0.6

Completion Date	County	Project Name	Implementing Entity	Project Type	Water Source	Project Capacity (mgd)	Total Capital ($M)
2017	St. Johns	NW Automated Metering Infrastructure System Expansion	SJCUD	Conservation	N/A	0.14	0.1
2017	St. Johns	Web Based Customer Portal	SJCUD	Conservation	N/A	0.37	0.0
2018	Clay	Old Jenning Road Reclaimed Storage Tank	CCUA	Reuse - Storage	Reclaimed Water	1.70	1.3
2018	Clay	Tynes Blvd. Reclaimed Water Main Extension	CCUA	Reuse - Pipeline	Reclaimed Water	1.92	0.3
2018	Duval	Jacksonville Beach Water & Sewer Mains Extension	City of Jacksonville Beach	Reuse - Supply	Reclaimed Water	0.00	0.4
2018	Duval	9B Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	13.00	0.5
2018	Duval	Monument Rd - Cancun Dr to Hidden Hills Ln - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.36	0.6
2018	Duval	RG Skinner Area - 9B to Parcels 10A - 11 - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.12	1.1
2018	Duval	RG Skinner Area - 9B to T-Line - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.12	1.2
2018	St. Johns	Rivertown - Parcel 13 - Southern POD - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.02	0.1
2018	St. Johns	St Johns Pkwy - Racetrack Rd to Espada Ln - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.01	0.6

Completion Date	County	Project Name	Implementing Entity	Project Type	Water Source	Project Capacity (mgd)	Total Capital ($M)
2019	Duval	Baymeadows Rd - Point Meadows Rd to Old Still PUD - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.01	1.0
2019	Duval	JP - FDOT - SR 9A (I-295) - Managed Lanes - JTB - 9B Extension - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.06	0.3
2019	Duval	Mandarin Water Reclamation Facility - Equalization Storage Tank and Transfer Pump Station	JEA	Reuse - Storage and Pumping	Reclaimed Water	0.03	2.6
2019	Duval	Mandarin Water Reclamation Facility - High Level UV Upgrade	JEA	Reuse - Supply	Reclaimed Water	3.05	4.2
2019	Duval	RG Skinner - North Rd - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.47	3.0
2019	Nassau	Nassau RW Main - Radio Av to Harts Rd - Trans - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.04	2.3
2019	Nassau	William Burgess Rd - SR200 to Harts Rd - Trans - New - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.46	2.5
2019	St. Johns	Bannon Lakes 2 MG Reclaimed Water Storage and Booster Pump Station	SJCUD	Reuse - Storage and Pumping	Reclaimed Water	0.42	3.2
2020	Clay	Stormwater Harvest Pilot Project	CCUA	Reuse - Pipeline	Stormwater	0.40	1.2

Completion Date	County	Project Name	Implementing Entity	Project Type	Water Source	Project Capacity (mgd)	Total Capital ($M)
2020	Clay	Tynes Reclaimed Storage Tank and Pumping Facility	CCUA	Reuse - Storage	Reclaimed Water	1.10	4.0
2020	Duval	WTP SCADA System Upgrade	City of Atlantic Beach	Conservation	N/A	0.48	0.2
2020	Duval	Gate Pkwy - Glen Kernan to T-Line - Trans - New - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.18	8.5
2020	Duval	Tredinick Pkwy - Millcoe Rd to Mill Creek Rd - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.04	1.6
2020	St. Johns	CR210 - Old Dixie Hwy to Twin Creeks - Trans - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.06	2.3
2020	St. Johns	Oak Bridge Golf Course Reuse Modification	SJCUD	Reuse - Storage and Pumping, and Pipeline	Reclaimed Water	0.50	1.9

Appendix B

NFRWSP projects planned to be completed by 2030 (updated October 2020)

Timeframe for Completion	County	Project Name	Implementing Entity	Project Type	Water Source	Project Capacity (mgd)	Total Capital ($M)
2021	St. Johns	Twin Creeks Reclaimed Water Storage Tank and Booster Pump Station	JEA	Reuse - Storage and Pumping	Reclaimed Water	2.00	3.5
2022	Alachua	Low-Income Water Efficient Toilet Exchange Program	GRU	Conservation	N/A	0.00	0.1
2022	Clay	Potable Reuse Pilot Project	CCUA	Supply/Storage	Reclaimed Water	0.03	4.0
2022	Clay	Ridaught Reclaimed Water Ground Storage Tank	CCUA	Reuse - Storage	Reclaimed Water	1.10	1.3
2022	Clay	Saratoga Springs Reclaimed Water Storage and Pumping Facility	CCUA	Reuse - Storage	Reclaimed Water	1.10	4.3
2022	Clay	Saratoga Springs Reclaimed Water Transmission/Distribution Main Extensions	CCUA	Reuse - Pipeline	Reclaimed Water	1.91	1.2
2022	Duval/St. Johns	US 1 - Greenland WRF to CR 210 - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.06	7.8
2022	Nassau	Nassau Area - Radio Av - Reclaimed Water Storage Tank and Booster Pump Station	JEA	Reuse - Storage and Pumping	Reclaimed Water	1.44	3.3
2022	St. Johns	CR210 - South Hampton to Ashford Mills - Trans - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.02	0.6
2023	St. Johns	CR210 - Longleaf Pine Pkwy to Ashford Mills Rd - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.16	5.0

Timeframe for Completion	County	Project Name	Implementing Entity	Project Type	Water Source	Project Capacity (mgd)	Total Capital ($M)
2024	Clay	Peter's Creek AWT Plant Expansion and Reclaimed Water Facility (f.k.a. Green Cove Regional Reclaimed WTP)	CCUA	Reuse - Supply	Reclaimed Water	1.50	22.0
2024	St. Johns	Nocatee South Reclaimed Water Storage Tank and Booster Pump Station	JEA	Reuse - Storage and Pumping	Reclaimed Water	2.00	3.5
2024	St. Johns	SR 16 Corridor Reuse Transmission Main Expansion	SJCUD	Reuse - Storage and Pumping, and Pipeline	Reclaimed Water	1.00	3.7
2025	Duval	Davis - Gate Pkwy to RG Skinner - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.12	5.0
2025	Duval	Greenland Reclaimed Water Repump Facility - Storage Tank and Booster Pump Station	JEA	Reuse - Storage and Pumping	Reclaimed Water	4.00	5.0
2025	Duval	T-Line - Greenland Substation to GEC - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.12	3.1
2025	Nassau	Nassau Regional WWTF Reclaimed Water Storage Tank, UV Disinfection and Pumps	JEA	Reuse - Storage, Pumping and Supply	Reclaimed Water	2.16	6.1
2025	St. Johns	NW Wellfield VFD addition	SJCUD	Conservation	Floridan	1.55	1.0
2025	St. Johns	NW WRF Expansion (3 MGD to 6 MGD)	SJCUD	Reuse - treatment, Storage, and Pumping	Reclaimed Water	3.00	40.0
2025	St. Johns	Promote Cost-Effective Conservation Programs	SJCUD	Conservation	N/A	1.14	3.8

Timeframe for Completion	County	Project Name	Implementing Entity	Project Type	Water Source	Project Capacity (mgd)	Total Capital ($M)
2026	Duval	Arlington East WRF - Reclaimed Water Filtration Expansion - Increase Capacity from 8.0 to 10.0 MGD	JEA	Reuse - Supply	Reclaimed Water	2.00	2.8
2026	Duval	Monument Rd - Arlington East WRF to St Johns Bluff Rd - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.06	3.3
2026	Duval	Ridenour WTP - Reclaimed Water Storage and Repump	JEA	Reuse - Storage and Pumping	Reclaimed Water	3.00	3.7
2026	St. Johns	CR210 - Twin Creeks to Russell Sampson Rd - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.06	3.0
2027	St. Johns	RiverTown WTP - Reclaimed Water - New Storage and Pumping System	JEA	Reuse - Storage and Pumping	Reclaimed Water	2.00	4.0
2027	St. Johns	Veterans Pkwy - Longleaf Pine Pkwy to CR210 - Reclaimed Water System Expansion	JEA	Reuse - Pipeline	Reclaimed Water	0.06	8.8
2027	St. Johns	Develop supplemental reclaimed water source from stormwater harvesting (Potential I-95 Corridor)	SJCUD	Reuse - Supply	Stormwater	2.00	14.5
2027	St. Johns	SR 207 WRF Expansion	SJCUD	Reuse - Storage and Pumping, and Pipeline	Reclaimed Water	2.25	40.0
2030	Alachua	Brytan subdivision Reclaimed Water system expansion	GRU	Reuse - Pipeline	Reclaimed Water	0.07	1.1
2030	Clay	FCOB Stormwater Ponds	CCUA	Reuse - Pipeline	Stormwater	2.50	27.0