Technical Memorandum

To: Fatih Gordu, Senior Professional Engineer, Bureau of Resource Evaluation and Modeling
From: James Walters, GIS Analyst, Office of Information Technology
Through: Tammy Bader, Technical Program Manager, Bureau of Water Supply Planning
Subject: Florida Historic Water Use for Irrigation and Septic
Date: December 17, 2015

Introduction

To address potential recharge within the North Florida Southeast Georgia groundwater flow model boundary, St. Johns River Water Management District (SJRWMD) modeling staff requested that the Bureau of Water Supply Planning distribute projected water demand at the parcel level (both indoor and outdoor estimates).

SJRWMD previously contracted with Jones Edmunds & Associates, Inc. to develop a historic dataset (2000-2012) that estimated indoor and outdoor water use at the parcel level. This dataset was based upon an average of water consumption billing data from 26 utilities. Upon review and refined needs of SJRWMD modeling staff, it was determined that the dataset (non-agriculture) should be updated to reflect the actual water withdrawn respective to its consumptive use permit (CUP). This technical memorandum details the changes to the original Jones Edmunds & Associates, Inc. report, including detailed information regarding the methodology employed, can be found here: http://www.sjrwmd.com/technicalreports/pdfs/SP/SJ2014-SP1.pdf.

Data Sources

As noted above, the original dataset developed needed to be tensioned to actual permit level data and future water demand projections needed to be distributed at the parcel level for recharge purposes. The following are datasets that were used in this process.

1.) Historic Water Use:
   a. Non-agriculture and non-domestic self-supply
   b. GROBINSO.WUP_StationsWU in SDE (Download date: January 13, 2016)
   c. Future Water Use
2.) Future Water Use:
   a. Non-agriculture and non-domestic self-supply
   b. GROBINSO.WUP_StationsWU in SDE (May 10, 2016)
3.) Domestic Self-supply:
   a. Mega Model_NFSEG_DSS_100815.xlsx
Original Tasks Completed

1) Backcast historic water use to include 1992-1999
   a. 1992-1999 was backcast by Water Supply Planning (WSP) using growth rates from the 2000-2004 data in the original JEA dataset.
2) Tension domestic self-supply
   a. Domestic self-supply indoor and outdoor water use was tensioned to WSP’s "Mega Model_NFSEG_DSS_100815.xlsx" by year, by county.
3) Tension public supply
   a. Public supply indoor and outdoor water use was tensioned using the CUP geodatabase (CUP-level Annual Usage) - ROBINSO.WUP_StationsWU in SDE.
   b. All utilities within SJRWMD tensioned to WUP utility by utility.
   c. Other major utilities (as identified by Balmoral in their Sept. 2015 report) as major users were also tensioned individually to WUP.
   d. If utility was not within SJRWMD and not identified as a major user, utility was tensioned to Balmoral’s "county level" coefficient as provided in their Sept. 2015 report.

Analytical Tools (Geoprocessing) Used / Metadata

Parcel Polygons:

Parcel_Statewide_2012_MODIFIED - Modified version of the original Parcel_Statewide_2012 parcel polygons provided in the original JEA geodatabase. This modified version has unnecessary columns and any null rows removed.

Tables:

Indoor water use for both self-supplied and public supply. Includes single-family, multi-family, and CII (hospitals, hotels, restaurants, businesses, etc), but not major industrial.

Outdoor water use for both self-supplied and public supply (single-family residential only, no outdoor use assigned to any other sectors).

Fields:

OBJECTID - ArcGIS unique ID

AUTOID - JEA ID number (Join ID used to join with Indoor/Outdoor Water Use Tables):

- County - County name
- SupplyCode - Type of supply; Domestic self-supply = S, public supply = P
- WTP - Utility Name (DSS = 'SELF SUPPLIED')
- WWTP - Utility Name (if on central sewer) or 'SEPTIC' (if on septic)
- SF_MF_CII - Sectors (Single-Family; Multi-Family; Commercial, Industrial, Institutional (Non-Major CII Hospitals, Hotels, Businesses, Retail)
- M01_YEAR - January water use for year XXXX in gallons
- M02_YEAR - February water use for year XXXX in gallons
- M03_YEAR - March water use for year XXXX in gallons
- M04_YEAR - April water use for year XXXX in gallons
- M05_YEAR - May water use for year XXXX in gallons
- M06_YEAR - June water use for year XXXX in gallons
- M07_YEAR - July water use for year XXXX in gallons
- M08_YEAR - August water use for year XXXX in gallons
- M09_YEAR - September water use for year XXXX in gallons
- M10_YEAR - October water use for year XXXX in gallons
- M11_YEAR - November water use for year XXXX in gallons
- M12_YEAR - December water use for year XXXX in gallons

Note - Indoor contains both septic and central waste water users. For septic only indoor water use a query on "WWTP" = 'SEPTIC' must be made in order to exclude accounts on central sewer.

Credits
There are no credits for this item.

Use limitations
There are no access and use limitations for this item.

Extent
There is no extent for this item.

Scale Range
Maximum (zoomed in) 1:5,000
Minimum (zoomed out) 1:150,000,000

ArcGIS Metadata

Citation
TITLE Florida Historic Water Use for Irrigation and Septic
PUBLICATION DATE 2016-01-29 00:00:00
REVISION DATE 2016-05-20 00:00:00
Hide Citation ▲

Resource Details
DATASET CHARACTER SET utf8 - 8 bit UCS Transfer Format
Hide Resource Details ▲
Geoprocessing history

Process
PROCESS NAME
DATE 2015-12-11 18:08:34
TOOL LOCATION c:\program files
(x86)\arcgis\desktop10.3\ArcToolbox\Toolboxes\Data Management Tools.tbx\Compact
COMMAND ISSUED
Compact
C:\Users\jwalters\Desktop\NFRWSP Recharge\FL_Water_Use_Irrigation_Septic.gdb
INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

Process
PROCESS NAME
DATE 2016-01-29 17:16:42
TOOL LOCATION c:\program files
(x86)\arcgis\desktop10.3\ArcToolbox\Toolboxes\Data Management Tools.tbx\Compact
COMMAND ISSUED
Compact
C:\Users\jwalters\Desktop\FL_Historic_Water_Use_Irrigation_Septic_20151214\FL_Historic_Water_Use_Irrigation_Septic.gdb
INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

Process
PROCESS NAME
DATE 2016-05-17 16:13:18
TOOL LOCATION c:\program files
(x86)\arcgis\desktop10.3\ArcToolbox\Toolboxes\Data Management Tools.tbx\Compact
COMMAND ISSUED
Compact
C:\Users\jwalters\Desktop\NFSEG\FL_Historic_Water_Use_Irrigation_Septic_20160129.gdb
INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

Process
PROCESS NAME
DATE 2016-05-17 18:32:45
TOOL LOCATION c:\program files
(x86)\arcgis\desktop10.3\ArcToolbox\Toolboxes\Data Management Tools.tbx\CompressFileGeodatabaseData
COMMAND ISSUED
Additional Tasks Completed

During quality assurance checks it was determined that there were missing golf courses in the datasets developed and water use for the golf course category was not tied to reported data. Below are the steps (1-3) taken to update the golf course data set, including locations and water use. Also included below is a summary of the GIS functions.

1.) A comparison between the Jones Edmunds & Associates, Inc. golf course point locations as delivered in SJ2014-SP1 was made against the Balmoral polygon golf locations. 353 golf courses were identified in the Jones Edmunds & Associates, Inc. dataset that were not found in the Balmoral dataset. These 353 courses were added to the Balmoral polygon dataset using property appraiser parcel boundaries, the same methodology used by Balmoral. These are often very general locations, not exact delineations of the golf course itself. Of note, refinements need to be made to this layer in the future to refine delineations of the actual golf course against imagery.

2.) Instead of using the application rate established by Balmoral, usage was applied to the polygons based on county level usage from the SJRWMD Annual Water Use Survey (AWUS) where available and USGS where not available.
   a. Counties using AWUS: Baker, Brevard, Clay, Duval, Flagler, Indian River, Lake, Nassau, Putnam, Seminole, St. Johns, Volusia. All other counties used USGS. Since USGS data is provided at five year intervals, the gap years filled with a linear interpolation.

3.) Usage was distributed by year, by county to the polygons based on area of polygon so that usage was proportional to the size of the golf course.
GIS Functions:

**Golf Polygons:**
FL_Golf_Courses - Modified version of the golf course polygon data supplied by Balmoral with the addition 353 polygons identified from the JEA dataset.
- **Fields:**
  - OBJECTID - ArcGIS unique ID
  - CNTYNAME - County name
  - ACTYRBLT - Actual year built
  - WMD - Water management district
  - AUTOID - ID number (**Join ID used to join with Golf Water Use Tables**)
  - AREA_SQFT - Square footage of polygon
  - ACRES - Acreage of polygon

**Tables:**
- **Fields:**
  - AUTOID - ID number (**Join ID used to join with Golf Water Use Tables**)
  - M01_YEAR - January water use for year XXXX in gallons
  - M02_YEAR - February water use for year XXXX in gallons
  - M03_YEAR - March water use for year XXXX in gallons
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  - M09_YEAR - September water use for year XXXX in gallons
  - M010_YEAR - October water use for year XXXX in gallons
  - M011_YEAR - November water use for year XXXX in gallons
  - M012_YEAR - December water use for year XXXX in gallons

**Deliverables**

1) FL_Historic_Golf_Water_Use_20151214
2) FL_Historic_Water_Use_Irrigation_Septic_20160520

These files are found in: H:\Engineering_and_Hydro_Science\Staff\tcera\From_WUPR\Non_Agricultural\Reshaped_FL