**Technical Memorandum**

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| **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modeling staff, it was determined that the dataset (non-agriculture) should be updated to reflect the actual water withdrawn respective to its consumptive use permit (CUP).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. The Jones Edmunds & Associates report, including detailed information regarding the methodlogy 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:

CUSTOMERS_WATERUSE_XXXX_Indoor - (1992-2012, 2015, 2020, 2025, 2030, 2035) 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.

CUSTOMERS_WATERUSE_XXXX_Outdoor - (1992-2012, 2015, 2020, 2025, 2030, 2035) 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
- 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

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
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      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_Irriga
            tion_Septic.gdb
      INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

PROCESS
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      \FL_Historic_Water_Use_Irrigation_Septic.gdb
      INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

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      _20160129.gdb
      INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

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      DATE 2016-05-17 18:32:45
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      Tools.tbx\CompressFileGeodatabaseData
      COMMAND ISSUED

CompressFileGeodatabaseData
C:\Users\jwalters\Desktop\NFSEG\FL_Historic_Water_Use_Irrigation_Septic
_20160129.gdbtrue
INCLUDE IN LINEAGE WHEN EXPORTING METADATA No

*Hide Geoprocessing history* ▲

**Metadata Details**
METADATA CHARACTER SET utf8 - 8 bit UCS Transfer Format
SCOPE OF THE DATA DESCRIBED BY THE METADATA dataset
ARCGIS METADATA PROPERTIES
     METADATA FORMAT ArcGIS 1.0
     METADATA STYLE FGDC CSDGM Metadata
     STANDARD OR PROFILE USED TO EDIT METADATA FGDC
     CREATED IN ARCGIS FOR THE ITEM 2015-12-11 18:08:34
     LAST MODIFIED IN ARCGIS FOR THE ITEM 2016-05-23 80:33:20
     AUTOMATIC UPDATES
        HAVE BEEN PERFORMED No
*Hide Metadata Details* ▲

**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:*
GOLF_WATERUSE_XXXX - (1992-2012) Golf course water use by year in gallons.
  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
- M04_YEAR - April water use for year XXXX in gallons
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- M09_YEAR - September water use for year XXXX in gallons
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- 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