Today’s Agenda

- Progress Since the June 2016 Stakeholder Meeting
- LWC Agricultural Industry Overview
- Agricultural Demand Estimates and Projections
- LWC Water Resource Protection Measures
- Everglades Restoration Projects Update
- 2017 LWC Water Supply Plan Update Issues Discussion
- Next Steps
Progress Since the June 2016 Stakeholder Meeting

Bob Verrastro, P.G.
Plan Manager
2017 LWC Water Supply Plan Update Schedule

Lower West Coast Water Supply Plan Update Process

- **2015**: Start Update Process
- **June 2016**: Stakeholder Meetings
- **March 2017**: Updates to Water Resources Advisory Commission and Governing Board
- **Early 2017**: FAS Model Results
- **Mid-2017**: Conclusions and Comprehensive Review
- **Late 2017**: Governing Board Approval
Major Ongoing Efforts

- Finalize agricultural demand estimates
- Groundwater modeling (FAS and SAS/IAS)
- Annual utility water supply reporting
- LWC water resource protection measures
- Everglades restoration projects
- Draft 2017 LWC Water Supply Plan Update report preparation
Floridan Aquifer Model

- Preliminary calibration complete
  - Better performance than the previous model
- Met with utilities to discuss water quality trends at some of the larger wellfields
- Model simulations by June 2017
  - Baseline and 2040 scenarios
  - Will meet with PWS utilities to share results
  - Modeling workshop by late summer
- Model results will be incorporated into the Plan Update
Surficial/Intermediate Aquifer Model

- Will not be incorporated into this Plan Update
- Conceptual and steady-state models complete
- Report is undergoing peer review
- Transient data sets that are completed:
  - Recharge
  - Evapotranspiration
  - Pumping wells
  - General head boundary
  - Rivers
  - Wetlands
- Transient model runs are underway
  - Peer review panel will comment on the results
Florida Statutes require public water supply utilities to provide an annual report by November 15 on the status of current and proposed water supply projects

- Current status reports submitted November 2016

Data are used to:

- Fulfill requests from FDEP and Legislature regarding water supply development projects planned by utilities
- Track proposed water treatment capacity expansions
- List and describe projects in the Plan Update
Overview of the Agricultural Industry in the Lower West Coast

Jamie Williams
Director of Florida Farms, Lipman Produce

Bob Newsome
Agribusiness Manager, Barron Collier
Agricultural Water Demand Estimates and Projections

Nathan Kennedy, Ph.D.
Lead Economist
Water Demand Categories

- Public Water Supply
- Domestic Self-Supply
- Industrial/Commercial/Institutional Self-Supply
- Recreational/Landscape Self-Supply
- Power Generation Self-Supply
- Agricultural Self-Supply
Water Demand Categories

- Public Water Supply
- Domestic Self-Supply
- Industrial/Commercial/Institutional Self-Supply
- Recreational/Landscape Self-Supply
- Power Generation Self-Supply
- Agricultural Self-Supply
Agricultural Self-Supply Crop Categories

- Fresh Market Vegetables
- Citrus
- Field Crops
- Sugarcane
- Fruits (Non-Citrus)
- Greenhouse or Nursery
- Sod
- Potatoes
- Hay
Complexities in Projecting Agricultural Demands

- Highest population growth rates in the U.S.
- Robust economic growth
- New development patterns
- Citrus industry in flux
Florida Citrus Acreage 1970-2015

Source: USDA NASS
Glades and Hendry Counties Sugarcane Acreage 1975-2014

Source: USDA NASS
Complexities in Projecting Agricultural Demands

- Highest population growth rates in the U.S.
- Robust economic growth
- New development patterns
- Citrus industry in flux
- National and global market dynamics
- Grower strategies and plans are proprietary
Sources of Agricultural Acreage Data

- 2012 Census of Agriculture
- Florida Citrus
- Bureau of Economic Analysis
- Economic Research Service
- United States Department of Agriculture
- U.S. Bureau of Labor Statistics
- World Bank
- University of Florida
- IFAS
- United States Department of Agriculture
- Florida Department of Agriculture and Consumer Services
- Florida Agriculture Counts
- Southeast Florida Water Management District
- U.S. Department of Commerce
- University of the Everglades
Statutory Basis for Projections

- Section 570.93, F.S., approved in 2013
- Requires FDACS to develop statewide agricultural demand projections
  - Acreages – past, current, and 20-year projection by crop
  - Demands for average and 1-in-10 year drought by crop
  - Metered data factored into estimates of past and current demands
  - Consult with stakeholders
- FDACS publishes the annual FSAID report
  - First FSAID report in 2014
  - 2016 FSAID report contains data from 2015-2040
Statutory Basis for Projections

- Section 373.709, F.S., approved in 2013
- Agricultural demand projections in regional water supply plans must be based on best available data
  - Must consider data of future demands provided by FDACS
  - Any deviation from FDACS data must be described
  - FDACS data are presented with adjusted data
Key Components for Demand Projections

Irrigated Acreages

- FSAID irrigated lands geodatabase
- SFWMD land use map and acreage projections

Water Demand Models

- FSAID water use model
- Agricultural Field Scale Irrigation Requirements Simulation (AFSIRIS) model
Key Components for Demand Projections

Irrigated Acreages
- FSAID irrigated lands geodatabase
- SFWMD land use map and acreage projections

Water Demand Models
- FSAID water use model
- Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) model
FSAID Irrigated Acreage in the LWC
Key Components for Demand Projections

Irrigated Acreages
- FSAID irrigated lands geodatabase
- SFWMD land use map and acreage projections

Water Demand Models
- FSAID water use model
- Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) model
Key Components for Demand Projections

### Irrigated Acreages
- FSAID irrigated lands geodatabase
- SFWMD land use map and acreage projections

### Water Demand Models
- FSAID water use model
- Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) model
## Water Demand Model Comparison

<table>
<thead>
<tr>
<th>AFSIRS</th>
<th>FSAID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built with data from UF field experiments</td>
<td>Built with available reported water used from all water management districts</td>
</tr>
<tr>
<td>Uses a wide range of location-specific environmental variables</td>
<td>A limited set of environmental variables are used directly in the model</td>
</tr>
<tr>
<td>Does not consider changing irrigation intensities in response to crop profitability</td>
<td>Irrigation intensities vary in response to crop profitability</td>
</tr>
</tbody>
</table>
FSAID and AFSIRS Water Demands in LWC

<table>
<thead>
<tr>
<th></th>
<th>2015 FSAID</th>
<th>2015 AFSIRS</th>
<th>2040 FSAID</th>
<th>2040 AFSIRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Demand (mgd)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugarcane</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citrus</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FSAID and AFSIRS
Additional Projected Demands

Water Demands (mgd)

2015 2020 2025 2030 2035 2040

FSAID
AFSIRS
Use of AFSIRS in 2017 LWC Plan Update

- AFSIRS irrigation rates are closer to those used with water use permits in the region
- AFSIRS estimates are consistent with previous planning efforts in the LWC
- Unique aspects of agricultural production in the LWC likely are under-represented with the FSAID model
- AFSIRS is used to calculate recreational and landscape irrigation demands
### LWC Agricultural Water Demands

AFSIRS gross water demands (mgd) estimated using FSAID acreages

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>2015</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citrus</td>
<td>195.91</td>
<td>195.06</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>209.13</td>
<td>213.20</td>
</tr>
<tr>
<td>Fresh Market Vegetables</td>
<td>126.35</td>
<td>170.77</td>
</tr>
<tr>
<td>Pasture/Hay</td>
<td>45.93</td>
<td>55.68</td>
</tr>
<tr>
<td>Sod</td>
<td>15.47</td>
<td>15.80</td>
</tr>
<tr>
<td>Fruits (Non-Citrus)</td>
<td>0.52</td>
<td>0.62</td>
</tr>
<tr>
<td>Greenhouse/Nursery</td>
<td>9.58</td>
<td>10.39</td>
</tr>
<tr>
<td>Other Crops</td>
<td>3.55</td>
<td>3.55</td>
</tr>
<tr>
<td>Field Crops</td>
<td>3.92</td>
<td>8.84</td>
</tr>
<tr>
<td>Potatoes</td>
<td>2.56</td>
<td>1.97</td>
</tr>
</tbody>
</table>

**Total**                        | 612.92 | 675.88 |
LWC Livestock Water Demands

- FSAID Estimates (2015)
  - 107,000 head of cattle
  - 10% of state herd population
  - Water demands estimated at 1.21 mgd
  - No change projected in livestock population or water demands
Summary of LWC Water Demands

Gross Water Demand (mgd)

- Power Generation
- Domestic Self-Supply
- Industrial/Commercial/Institutional
- Recreational/Landscape
- Public Water Supply
- Agriculture and Livestock

2015 vs 2040 demands comparison.
## Projection Comparisons: 2012 Plan to 2017 Plan Average Demands (mgd)

<table>
<thead>
<tr>
<th>Water Use Category</th>
<th>2012 LWC Plan 2030 Projection</th>
<th>2017 LWC Plan 2040 Projection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Water Supply</td>
<td>232.1</td>
<td>199.7</td>
</tr>
<tr>
<td>Domestic Self-Supply</td>
<td>24.0</td>
<td>33.2</td>
</tr>
<tr>
<td>Agricultural Self-Supply*</td>
<td>695.9 – 740.9</td>
<td>675.8</td>
</tr>
<tr>
<td>Industrial/Commercial/Institutional Self-Supply</td>
<td>35.3</td>
<td>29.1</td>
</tr>
<tr>
<td>Recreational/Landscape Self-Supply</td>
<td>188.5</td>
<td>254.3</td>
</tr>
<tr>
<td>Power Generation Self-Supply</td>
<td>42.1</td>
<td>15.4</td>
</tr>
<tr>
<td><strong>Total for LWC Planning Area</strong></td>
<td><strong>1,217.9 – 1,262.9</strong></td>
<td><strong>1,207.5</strong></td>
</tr>
</tbody>
</table>

* Range in water demand projection is due to 29,000 acres of transitional land.
Questions?
2017 Lower West Coast Plan Update

Issues
Limited opportunity to increase surficial and intermediate aquifer use

Surface water availability (storage) is limited
  - Lake Okeechobee Regulation Schedule (LORS 2008)
  - LOSA Restricted Allocation Rule

Fresh water discharges are affecting the health of coastal resources

Fresh water sources alone are not adequate to meet water needs
Next Steps

Bob Verrastro, P.G.
Plan Manager
Next Steps

- Ongoing Meetings with stakeholders
- June 2016 WRAC & GB Presentation
- June 2016 LWC Plan Update Kick-off Public Meeting
- March 2017 Stakeholder Meeting #2
- June/July West Coast Floridan Modeling Workshop
- August Post Draft Plan Documents
- Aug/Sept Stakeholder Meeting #3
- September Draft Plan to Governing Board & WRAC
- October Optional Stakeholder Meeting #4
- Nov 2017 Final Plan to Governing Board for approval
2017 Draft LWC Water Supply Plan Update

Planning

Appendices

Support
Executive Summary

Chapter 1: Introduction
   - Plan goal and objectives, overview of planning area and update process and water supply planning through 2040

Chapter 2: Demand Estimates and Projections
   - Population and demands by water use category

Chapter 3: Conservation
   - Demand management and estimated savings

Chapter 4: Water Resource Protections
   - Minimum flows and minimum water levels, water reservations, permitting, and water shortage rules
Draft Planning Document Outline (cont.)

- **Chapter 5: Evaluation of Water Source Options**
  - Surface water, groundwater, reclaimed water, storage, conservation, and seawater

- **Chapter 6: Water Resource Analyses – Current and Future Conditions**
  - Water resources, water supply issues, evaluation and analysis, and FAS modeling

- **Chapter 7: Water Resource Development Projects**
  - Projects such as CERP, monitoring, dispersed water management, and modeling

- **Chapter 8: Water Supply Development Projects**
  - PWS projects to meet demands through 2040
  - Utility summaries

- **Chapter 9: Future Direction**
  - Water sources, coordination, and climate change
Need Water Supply Plan Information?

- Plan information can be found at [www.sfwmd.gov](http://www.sfwmd.gov)
  - Our Work → Water Supply Planning → Lower West Coast Plan
- Workshop announcements sent by email
Contact Information

Bob Verrastro, P.G.
Plan Manager
(561) 682-6136
bverras@sfwmd.gov

Mark Elsner, P.E.
Bureau Chief
(561) 682-6156
melsner@sfwmd.gov

Tom Colios
Section Leader
(561) 682-6944
tcolios@sfwmd.gov
Questions?