SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Lower West Coast Water Supply Plan

Modeling the Floridan Aquifer System

Water Supply Bureau
SFWMD

February 11, 2016

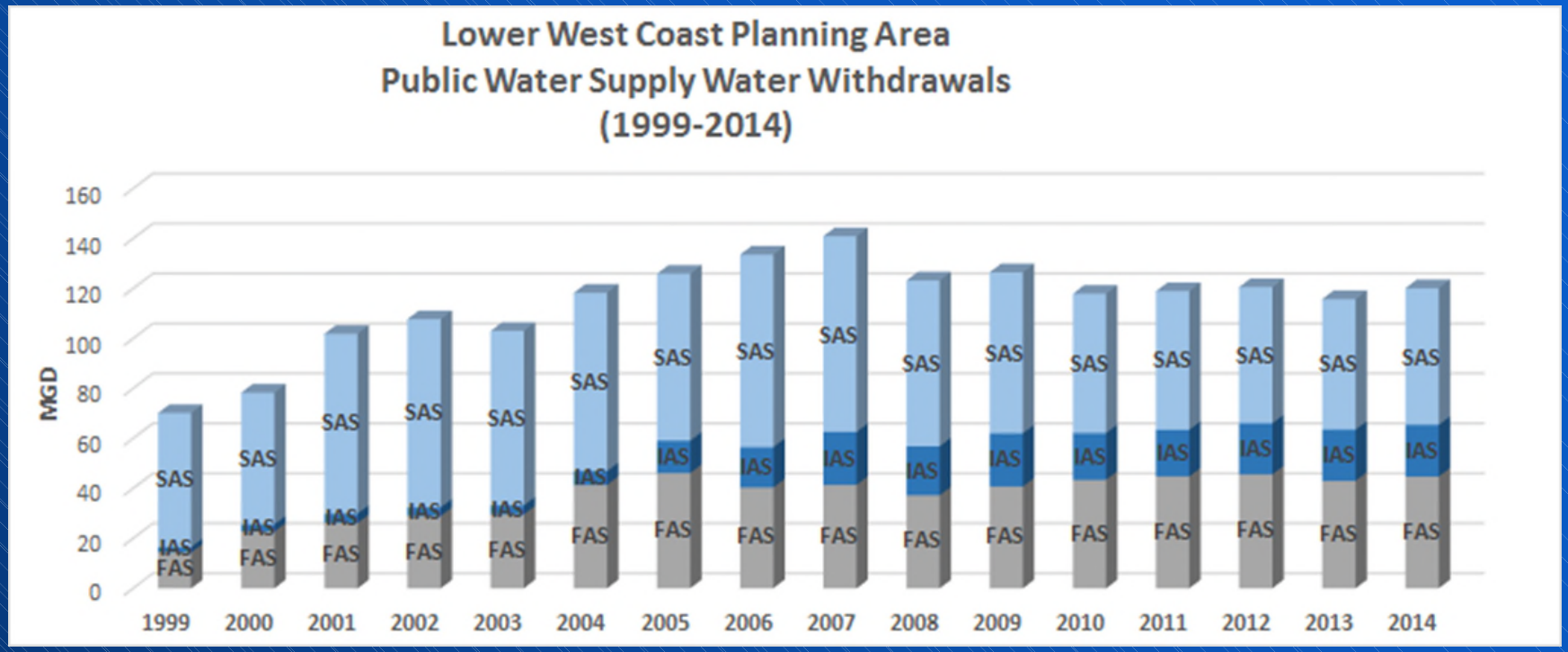
Today's Agenda

• Introduction	Mark Elsner, Section Administrator, Water Supply Development
• Modeling Overview	John Mulliken, FAS Modeling Coordinator
• Next Steps	Bob Verrastro, LWC WSP Project Manager

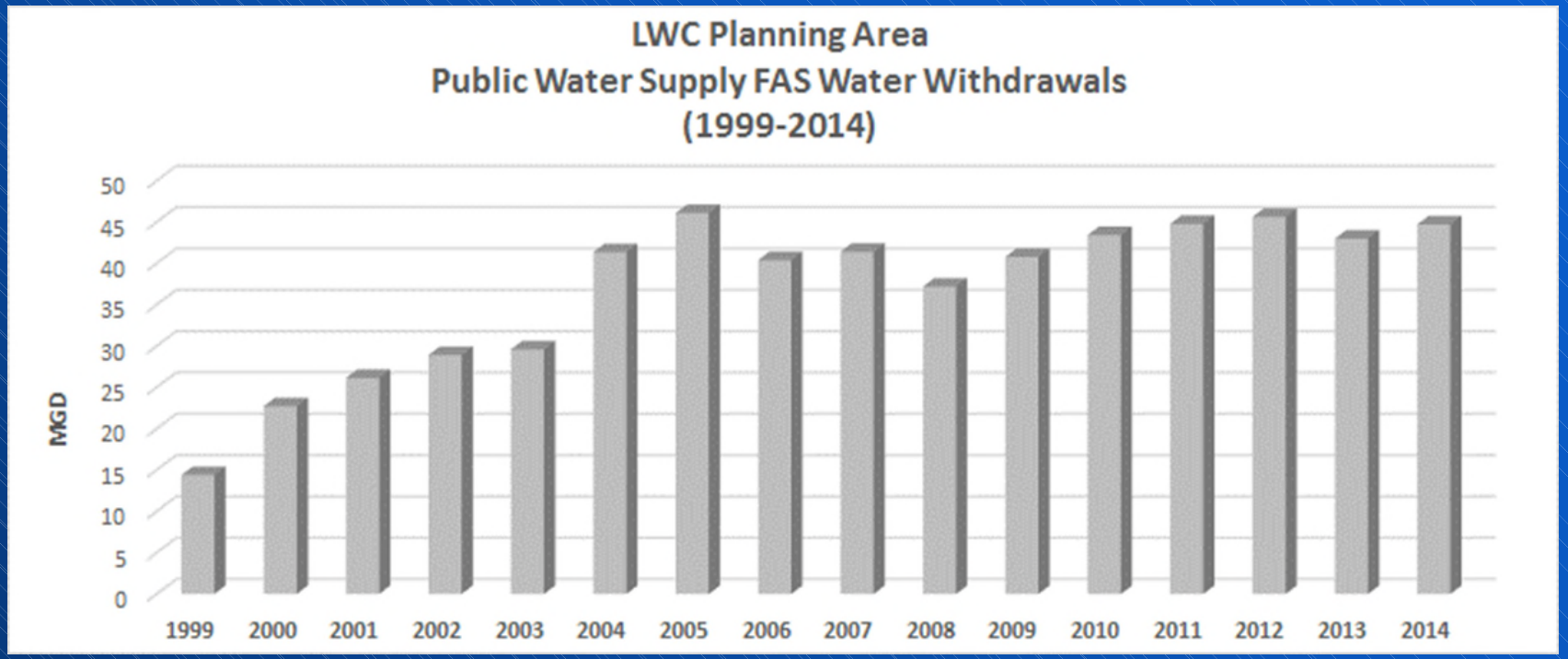
Introduction

Mark Elsner

Historic PWS Water Use by Source



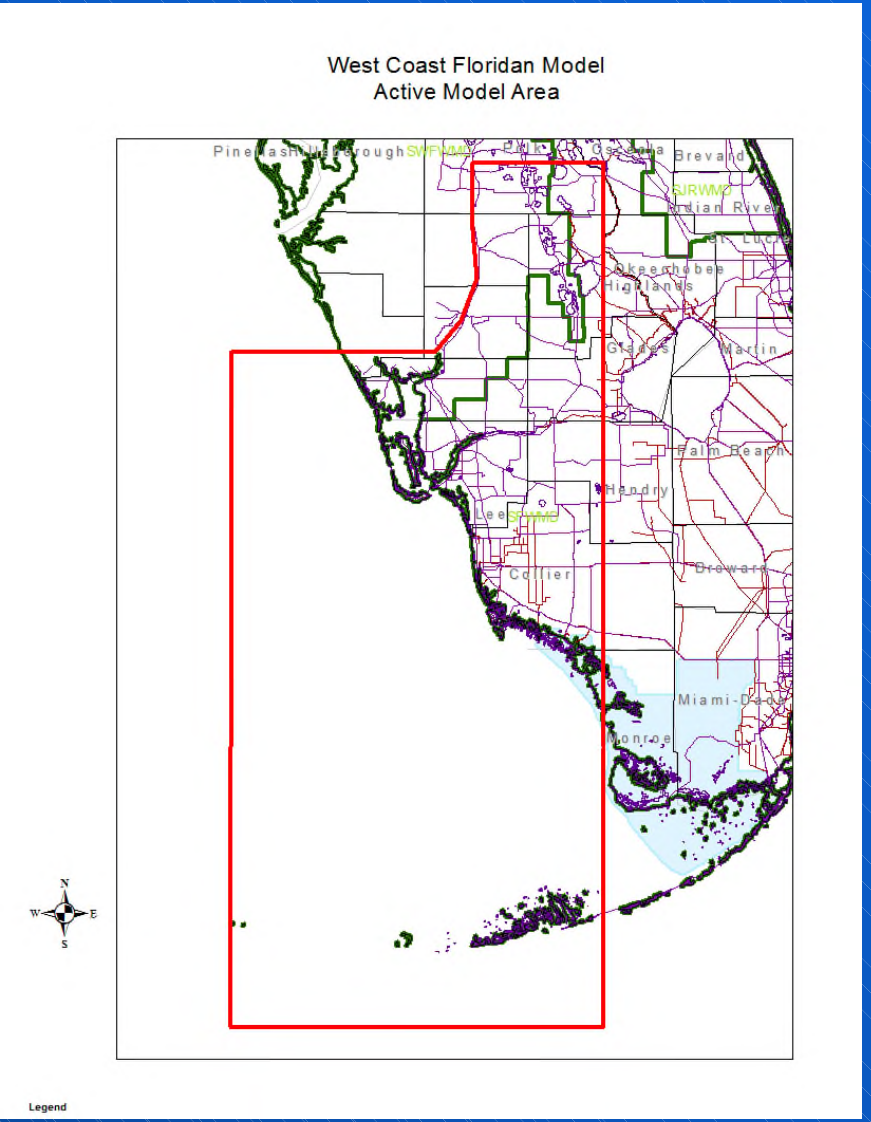
Historic Floridan Use by LWC Utilities



FAS Modeling Overview

John Mulliken

- West Coast Floridan Model (WCFM)
- Model Domain – Active Area
- Model extent
  - North: State Road 60
  - South: Florida Straits
  - West: Dry Tortugas
  - East: Edge of East Coast Floridan Model
- Captures all FAS users in LWC except Clewiston



- Analysis is focused on LWC Planning Area
- Results will be displayed as subset of model domain
- WCFM has Lower Hawthorn Aquifer as top layer
  - SAS and IAS not represented in WCFM
  - Lower West Coast Surficial and Intermediate Model (LWCSIM) in development

Draft FAS Modeling Objective for Lower West Coast

- Conduct a regional-scale, planning-level evaluation of the FAS as a water supply source
- Evaluate the potential of existing and proposed facilities to meet 2040 water demands
- Focus analysis on potential changes to water quality (TDS) and water levels
- Consider the modeling results in LWC Plan Update process when determining if proposed FAS projects:
  - Are generally feasible
  - Have potential to meet projected demands

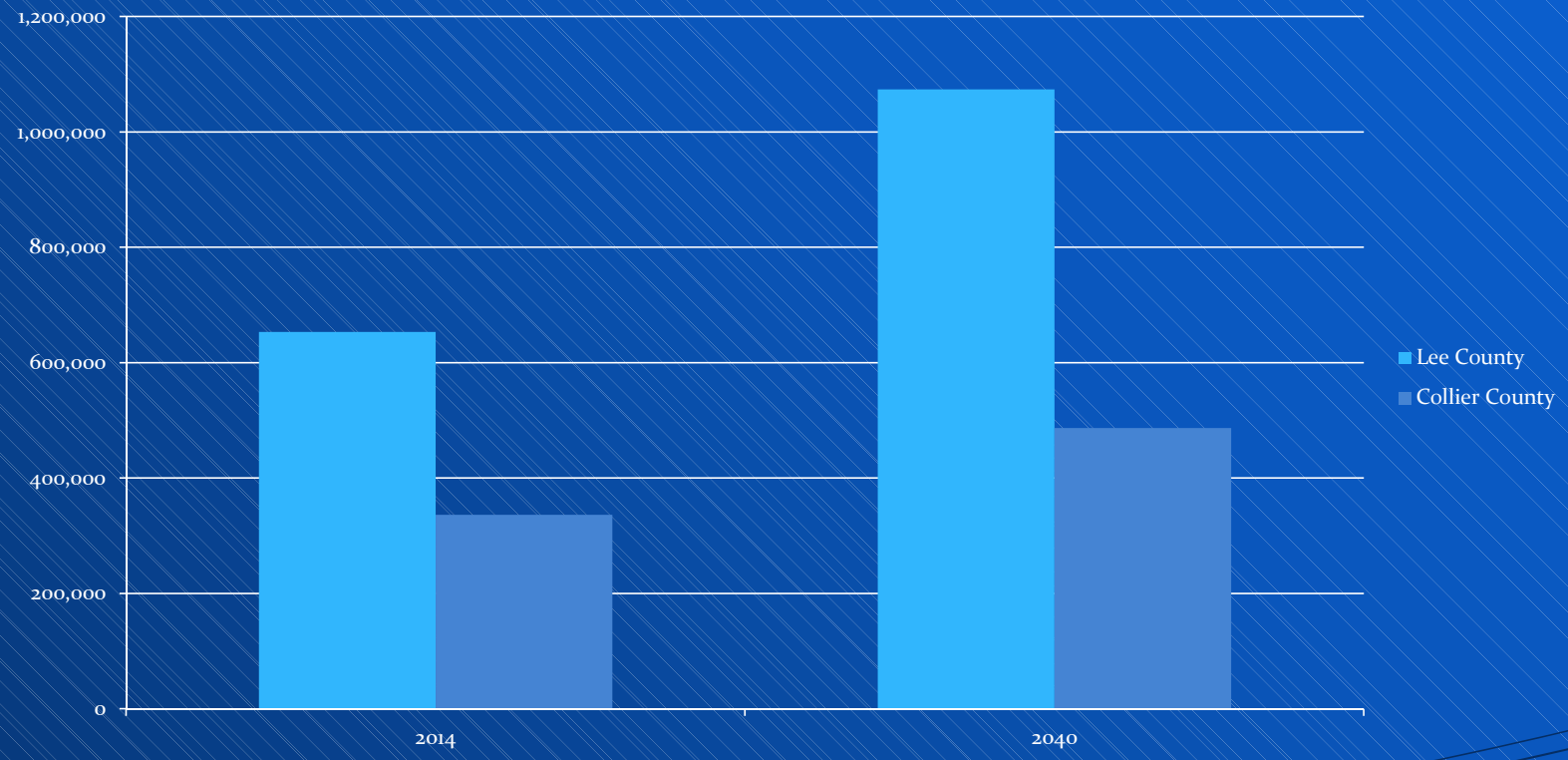
Preparing for Modeling

- Calibration Period: 1989 to 2014
- Establish baselines
  - Current conditions (2014)
  - Future conditions (2040)
- Develop demand projections – all use categories
  - Population growth, changes in agricultural and other irrigation acreage
  - Determine portion of demand to be met from the FAS

Modeling Assumptions

- Public Water Supply
  - Distribution of population growth
  - Future Floridan use – new or expanded wellfields
  - Pumping protocols
  - Seasonal variations in water use
- Agriculture
  - AGR Floridan use: Mostly north and east of LWC
  - Projected acreage by crop type
- Other FAS Use
  - Golf course and landscape irrigation

LWC Population Projections (2014-2040)

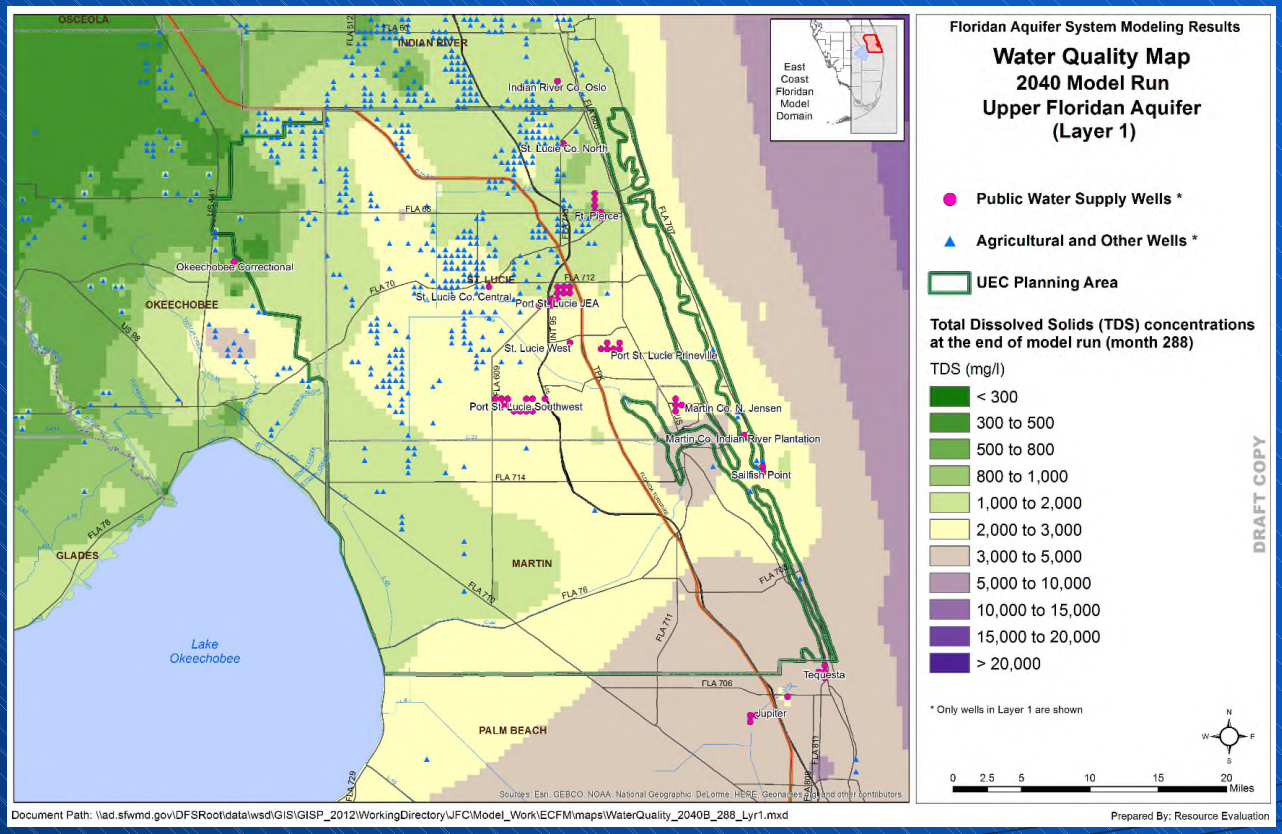


Source: University of Florida, Bureau of Business and Economic Research, 2015

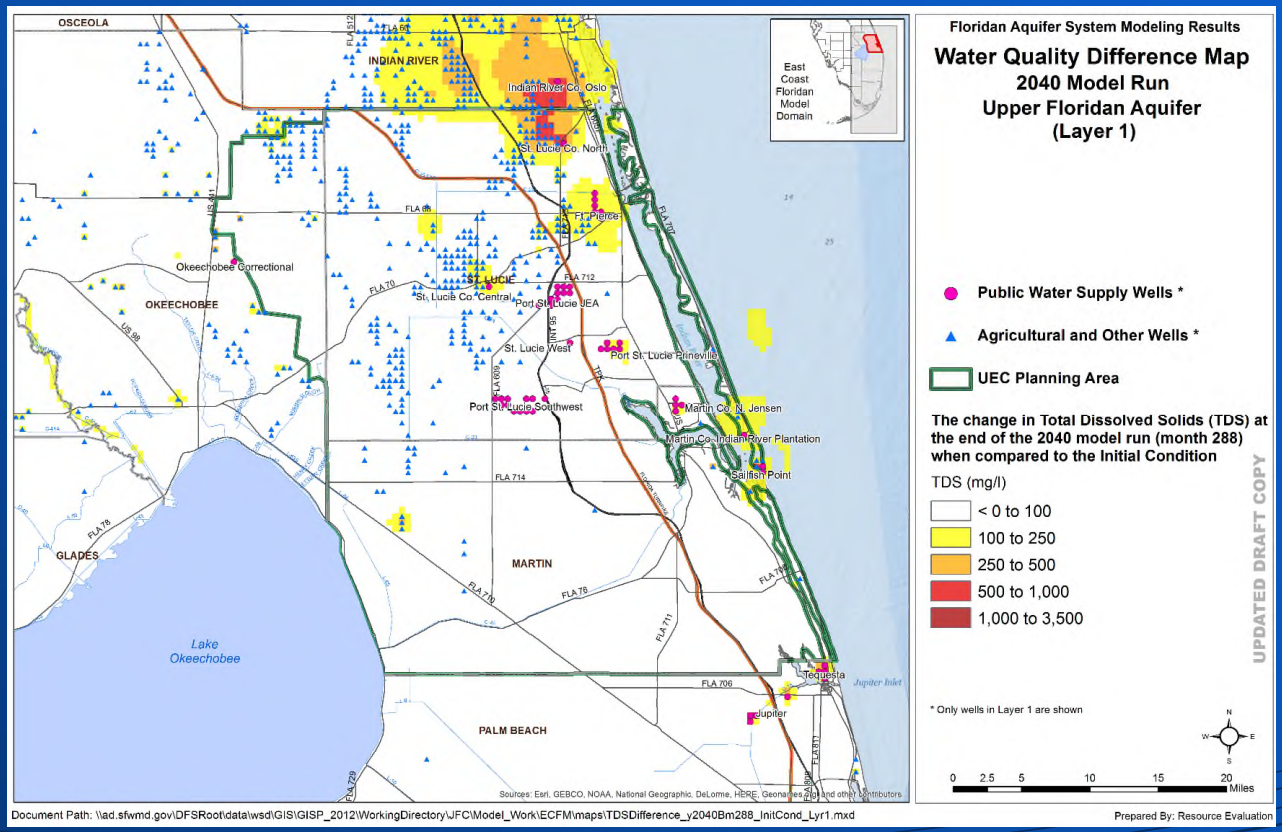
Interpreting Results

- Relative comparisons between model runs
  - 2014 Base Case
  - 2040 Base Case
- Points of comparisons
  - End of model run (Month 300)
  - 1 in 10 year rainfall deficit
  - Change from initial condition to end of model run
- Graphic representation of performance
  - Show changes in water levels (NGVD29)
  - Display differences in water quality (Total Dissolved Solids)
  - Illustrate variations in flow (horizontal and vertical)

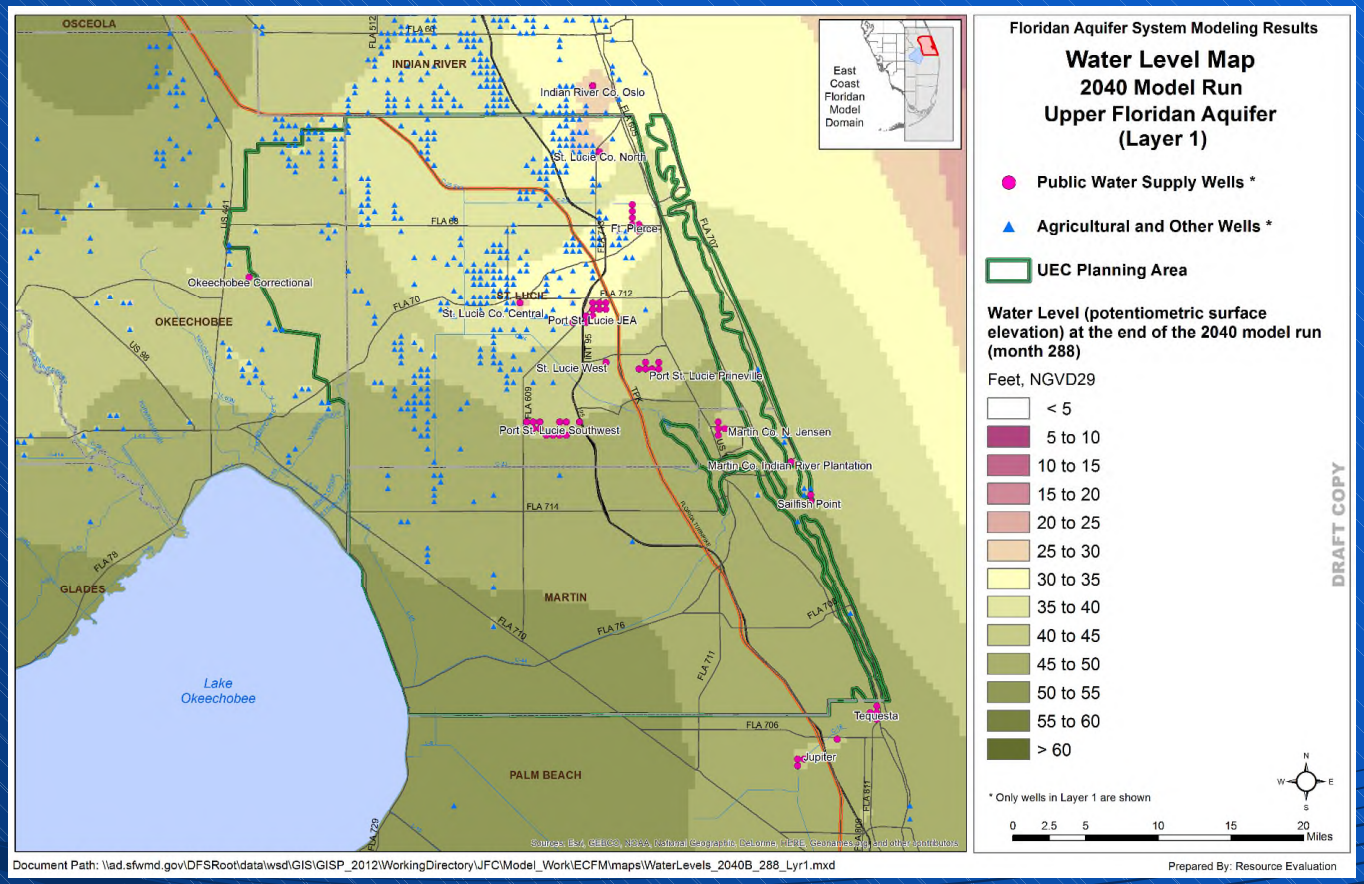
Example Graphic: Water Quality Results



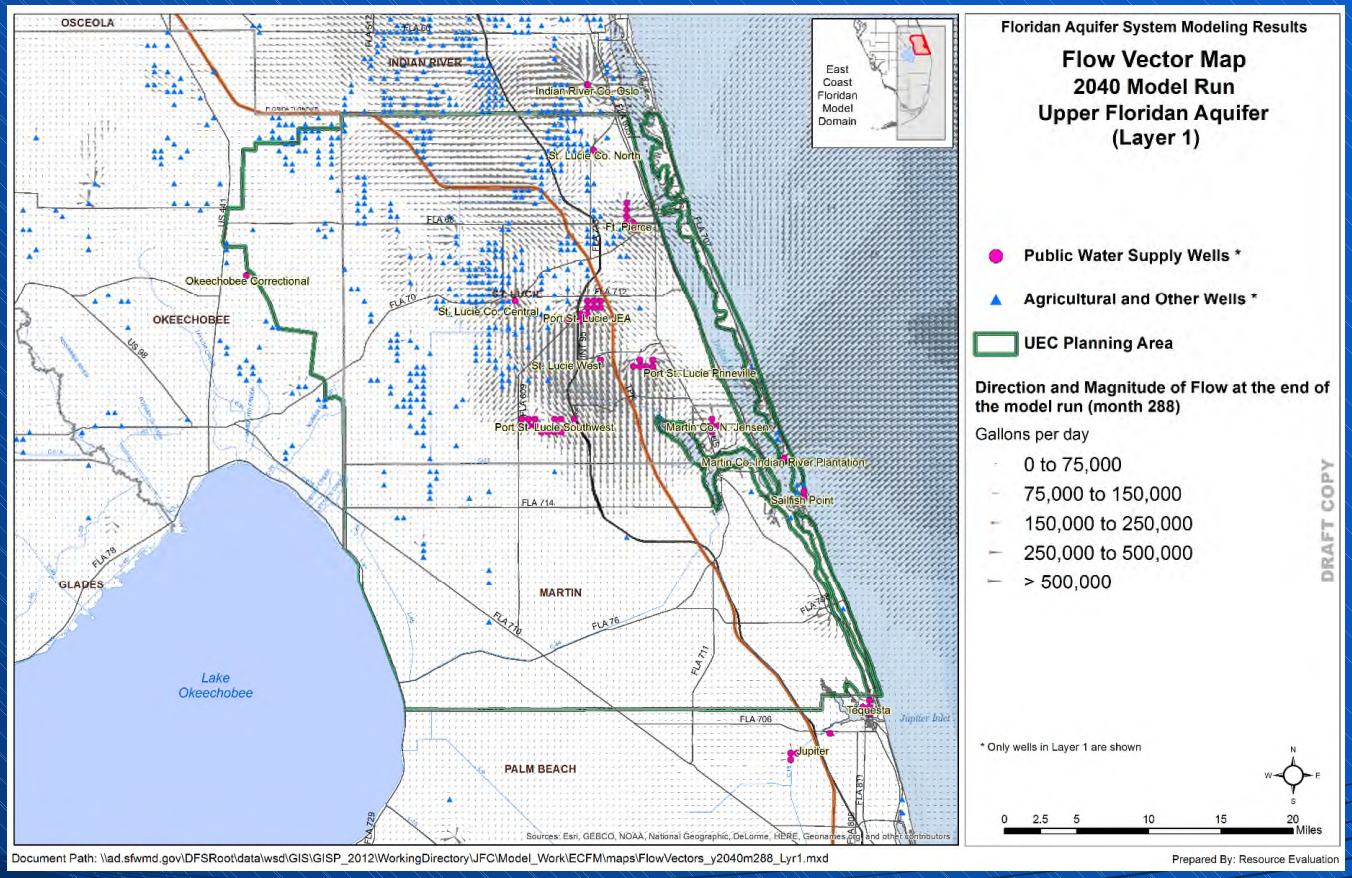
Example Graphic: Water Quality Difference Results



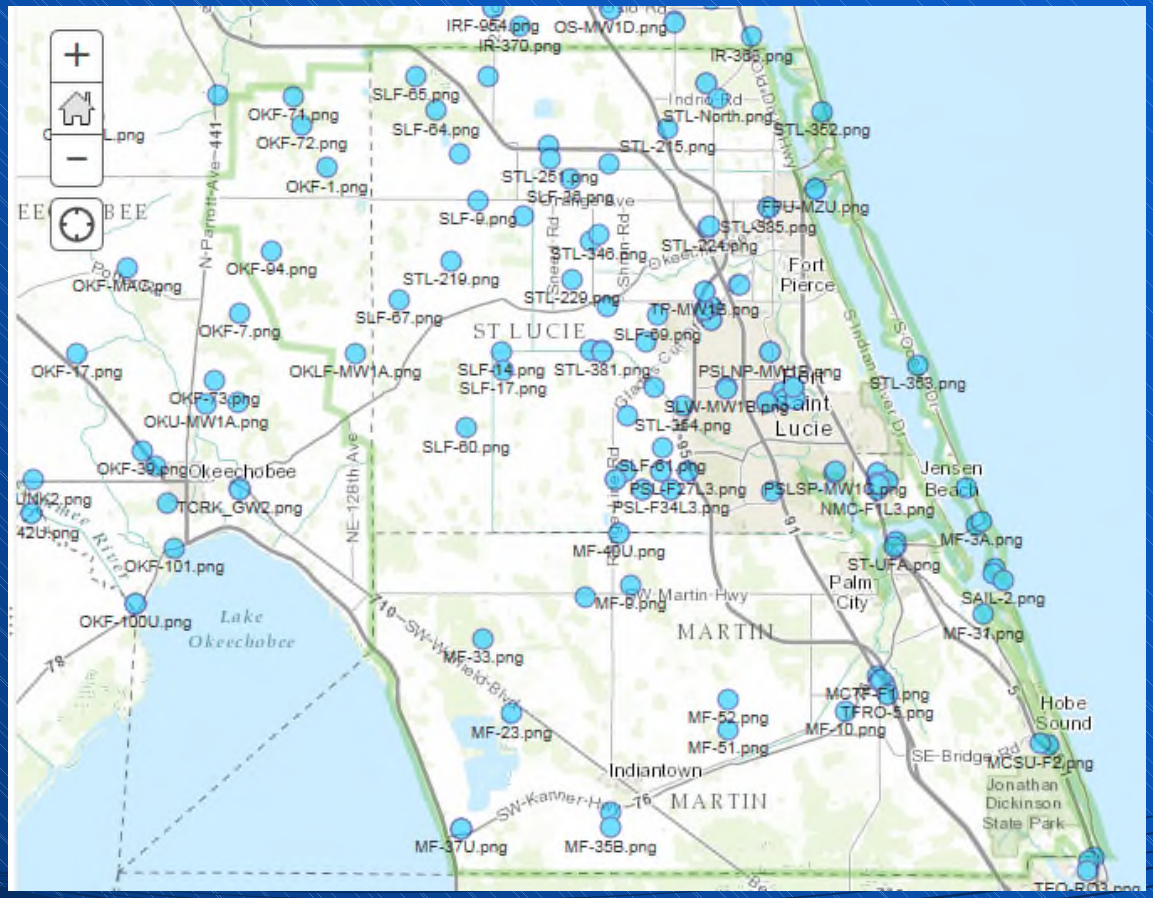
Example Graphic: Water Level Results



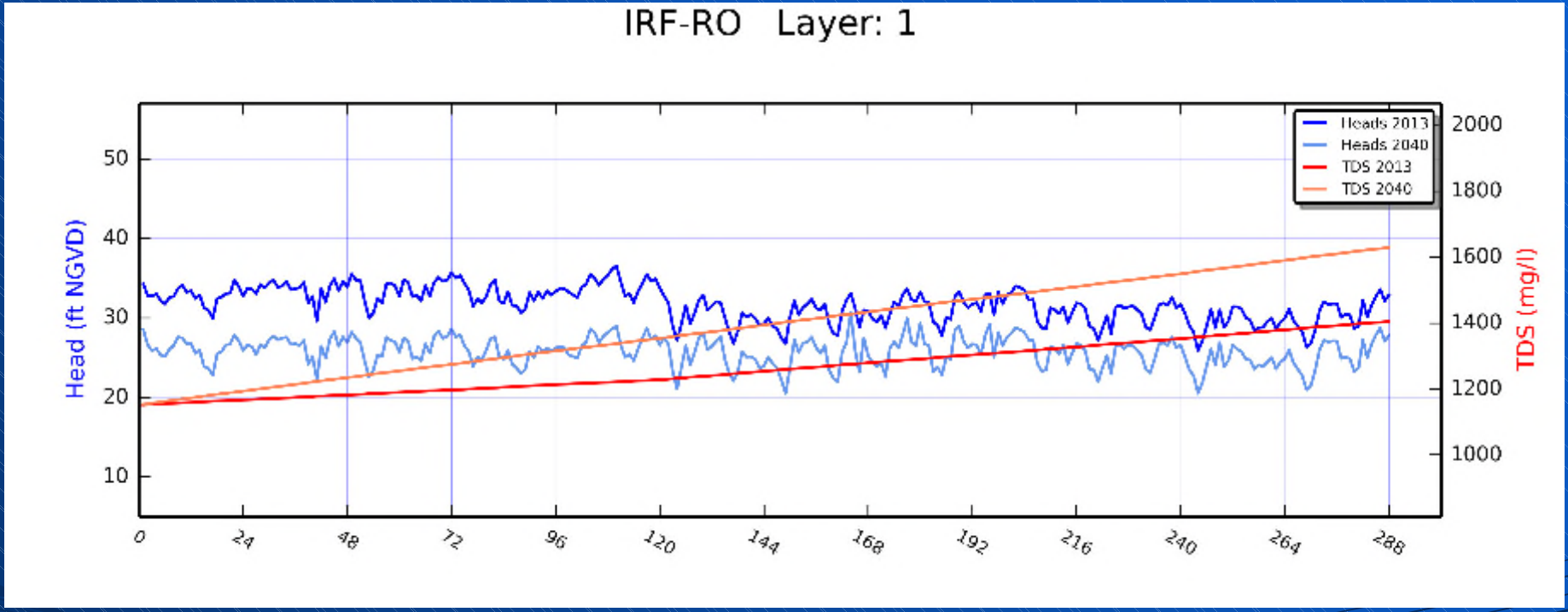
Example Graphic: Horizontal Flow Results



Hydrograph Example: Interactive Results



Hydrograph Example:
Water Level and Quality for Period of Record

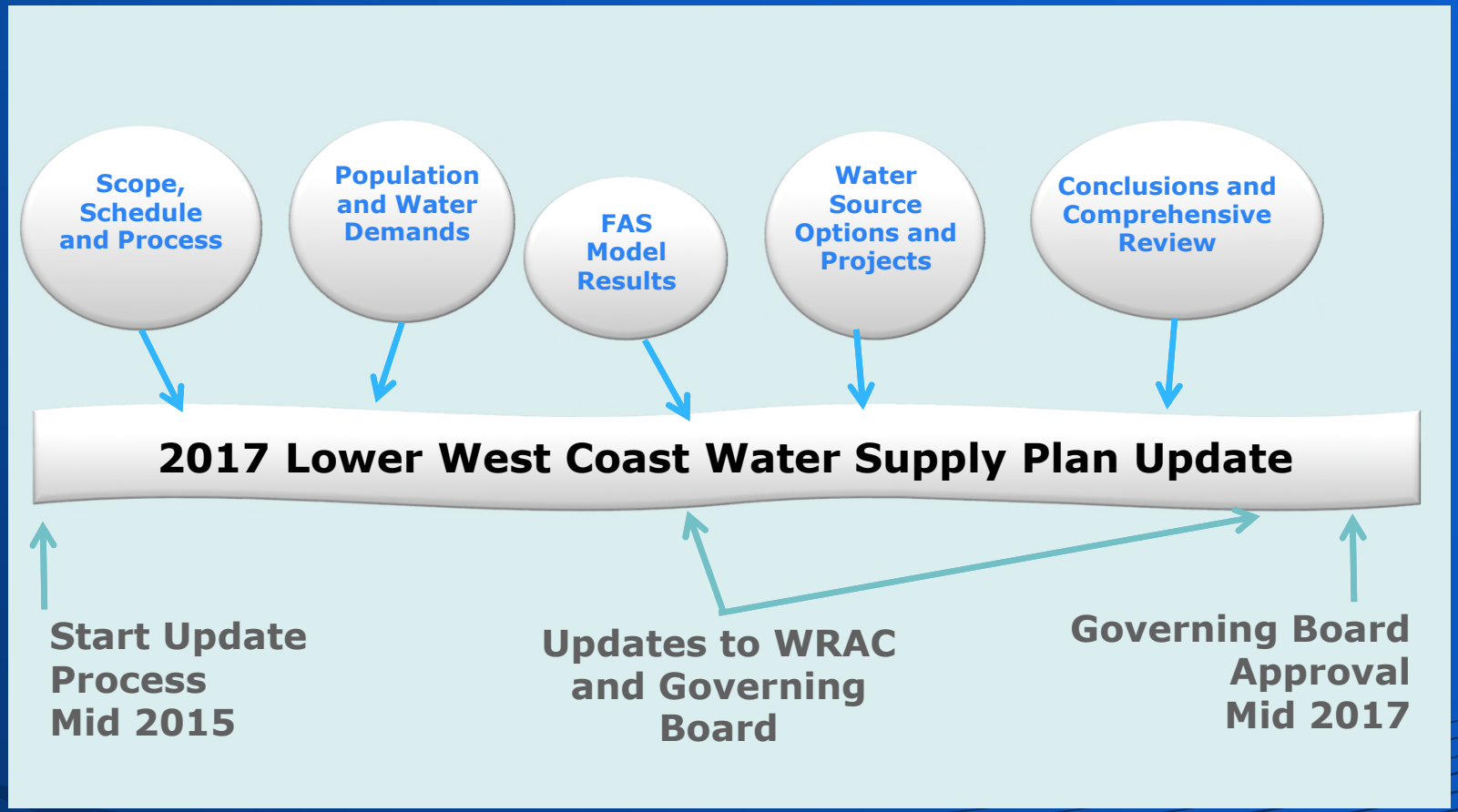


Discussion

Next Steps

Bob Verrastro

2017 Lower West Coast Water Supply Plan Schedule



2016 FAS Modeling Schedule

• Model development and calibration	Winter
• Stakeholder discussions	Winter
• Public workshop	Mid Spring
• Simulations	Late Spring
• Post results	Early Summer
• Public workshop	Mid Summer
• Model documentation	Late Summer

Key Activities

- Continue to incorporate latest data into model
- Complete calibration
- Finalize future demand projections for all use categories by aquifer

Please send questions or comments concerning FAS modeling to:

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The End

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