



FWCA Workshop

The Central Florida Water Initiative

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Shearer Consulting Inc.

March 30, 2016

Orlando Utilities Commission

Inception to plan approval

▶ ACTION PLAN 2006

- ▶ insufficient groundwater to satisfy long term water needs
- ▶ Need to equitably distribute remaining water
- ▶ Need to transition to AWS

▶ CFCA (1) 2008- Interim Rules

- ▶ Demands beyond 2013 met by alternate water supplies (AWS)
- ▶ December 31, 2012 sunset

▶ CFCA (2) 2009- Final Rules

- ▶ Replace interim rules
- ▶ Unable to meet schedule

▶ CFWI - 2011

- ▶ New process/ new name
- ▶ Collaborate with stakeholders

■ CFWI - 2015

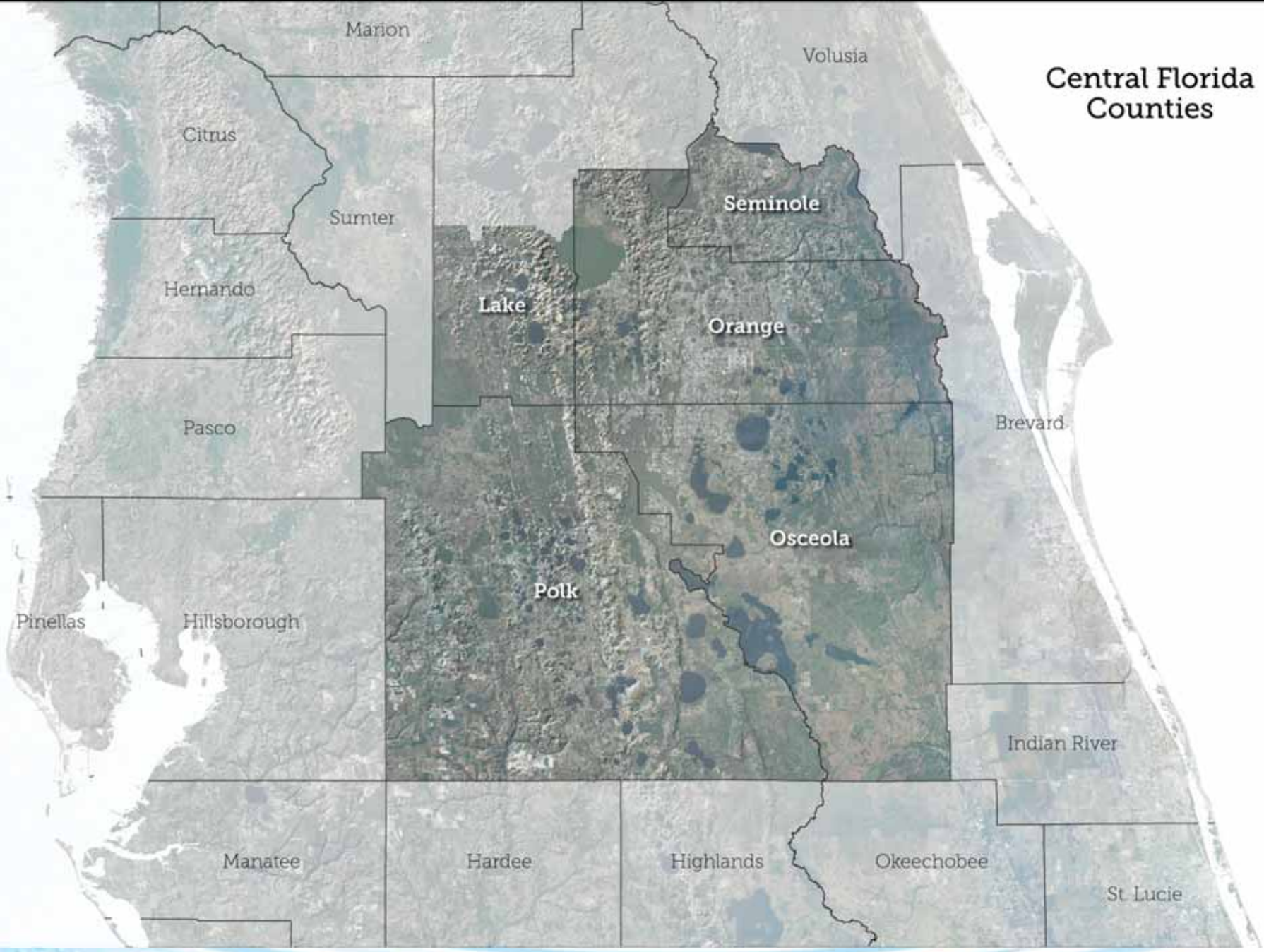
- Framework for regional cooperation
- Single, unified RWSP for Central Florida
- Regional planning level estimate of sustainable ground water
- Regional consensus on the "Next Steps"

■ CFWI (2016 through 2020)

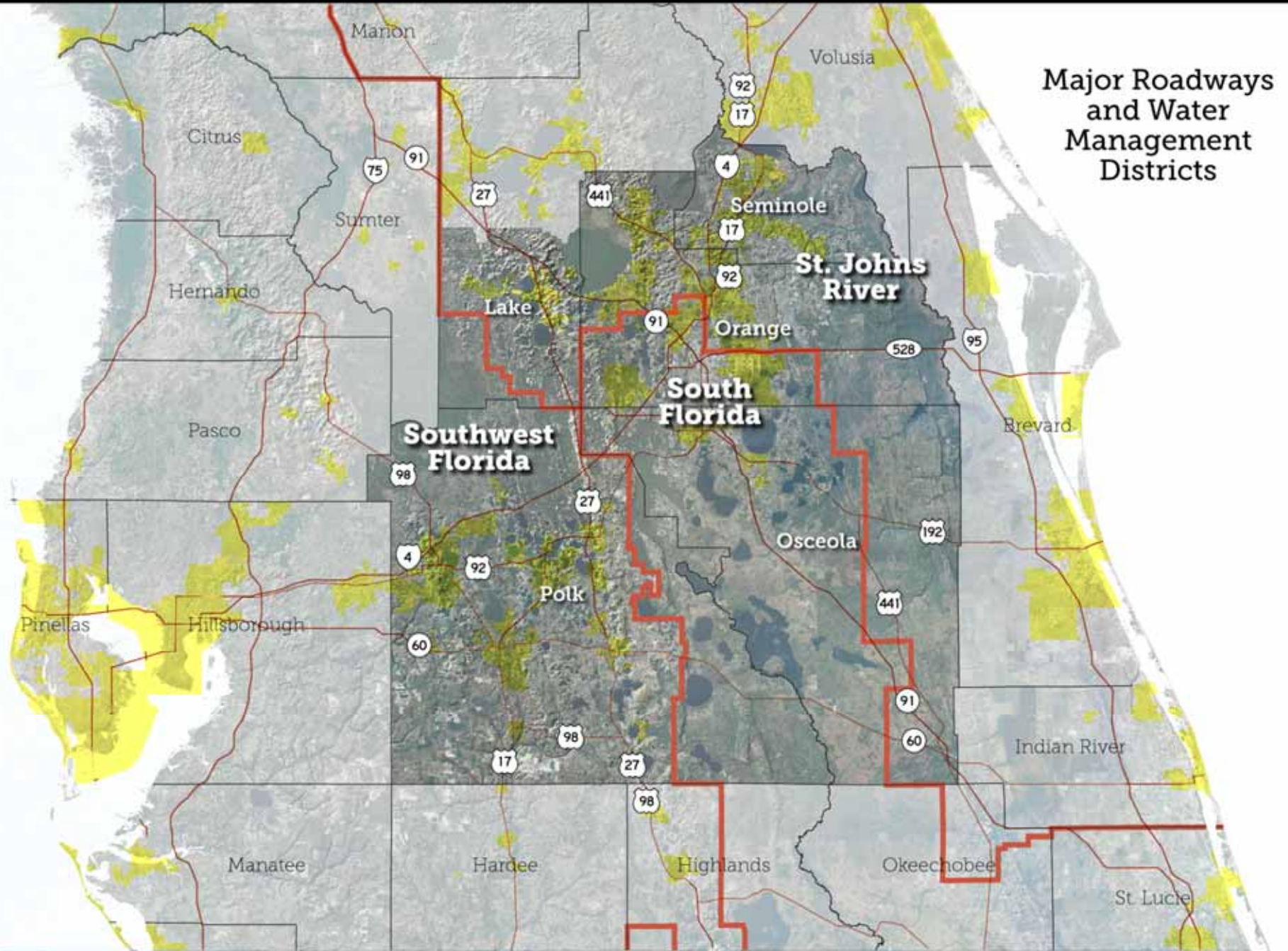
- 2016 Water Bill (HB 552)
- "Next Steps"

Central Florida Water Initiative

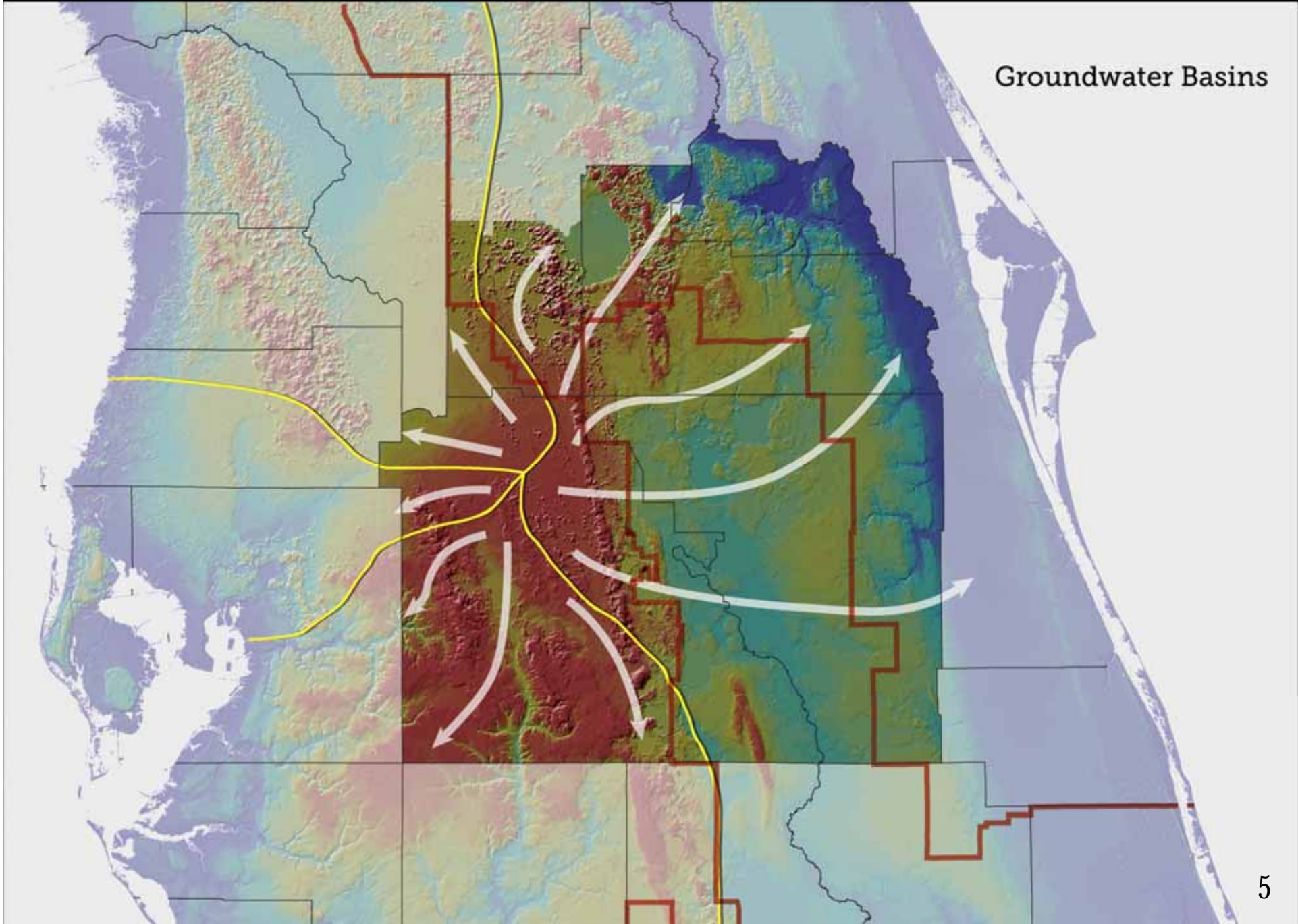
Central Florida
Counties

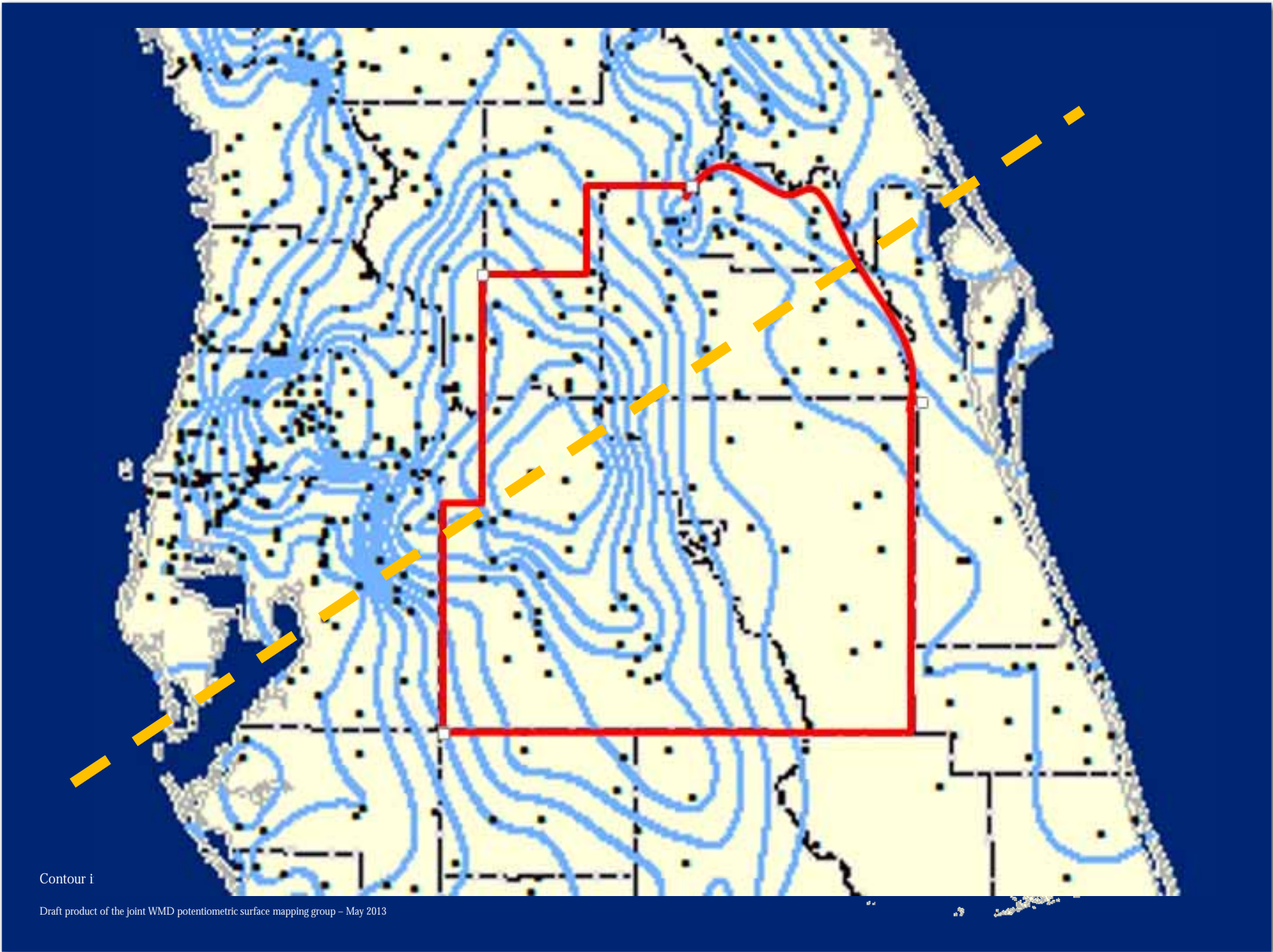


Central Florida Water Initiative



Central Florida Water Initiative

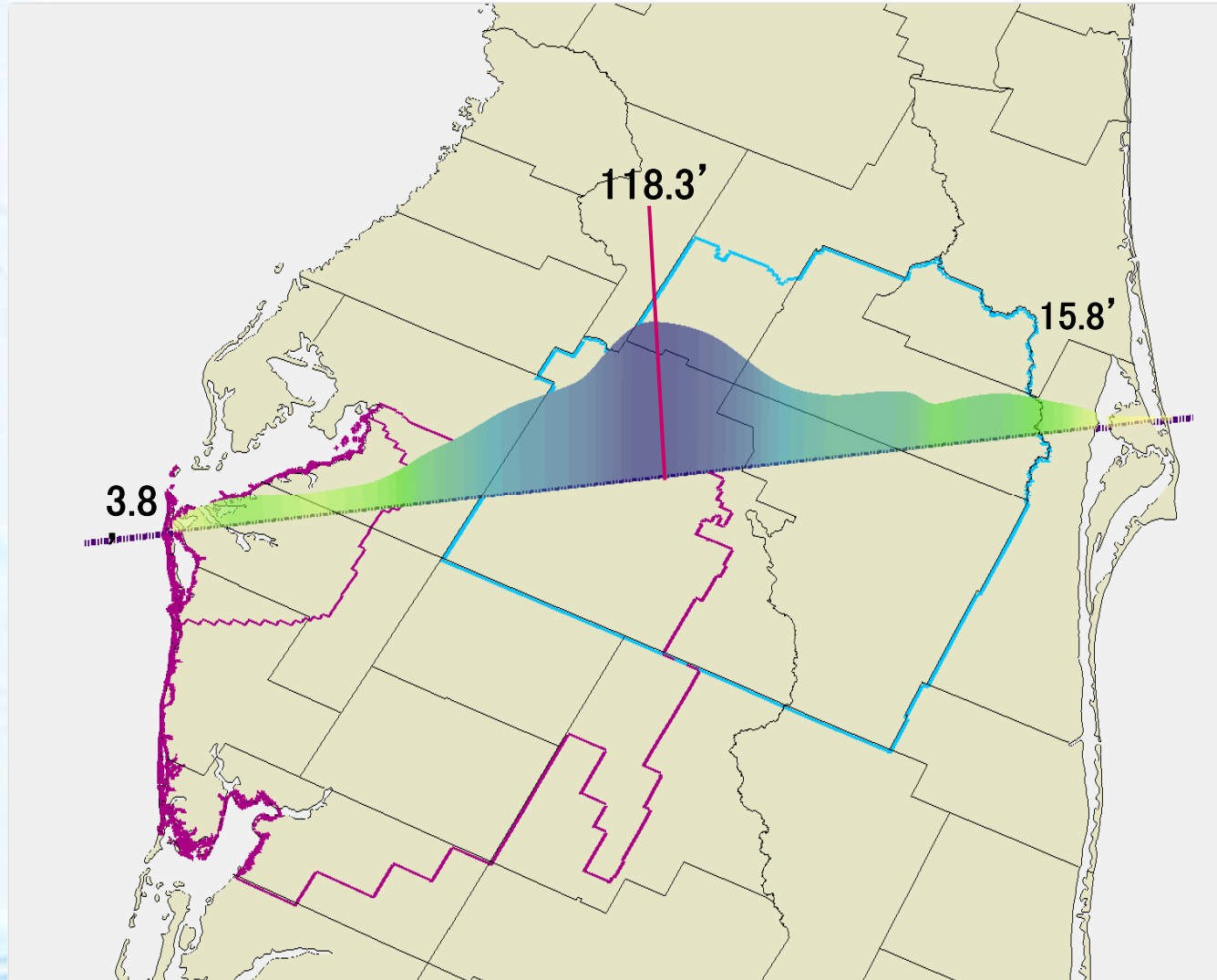




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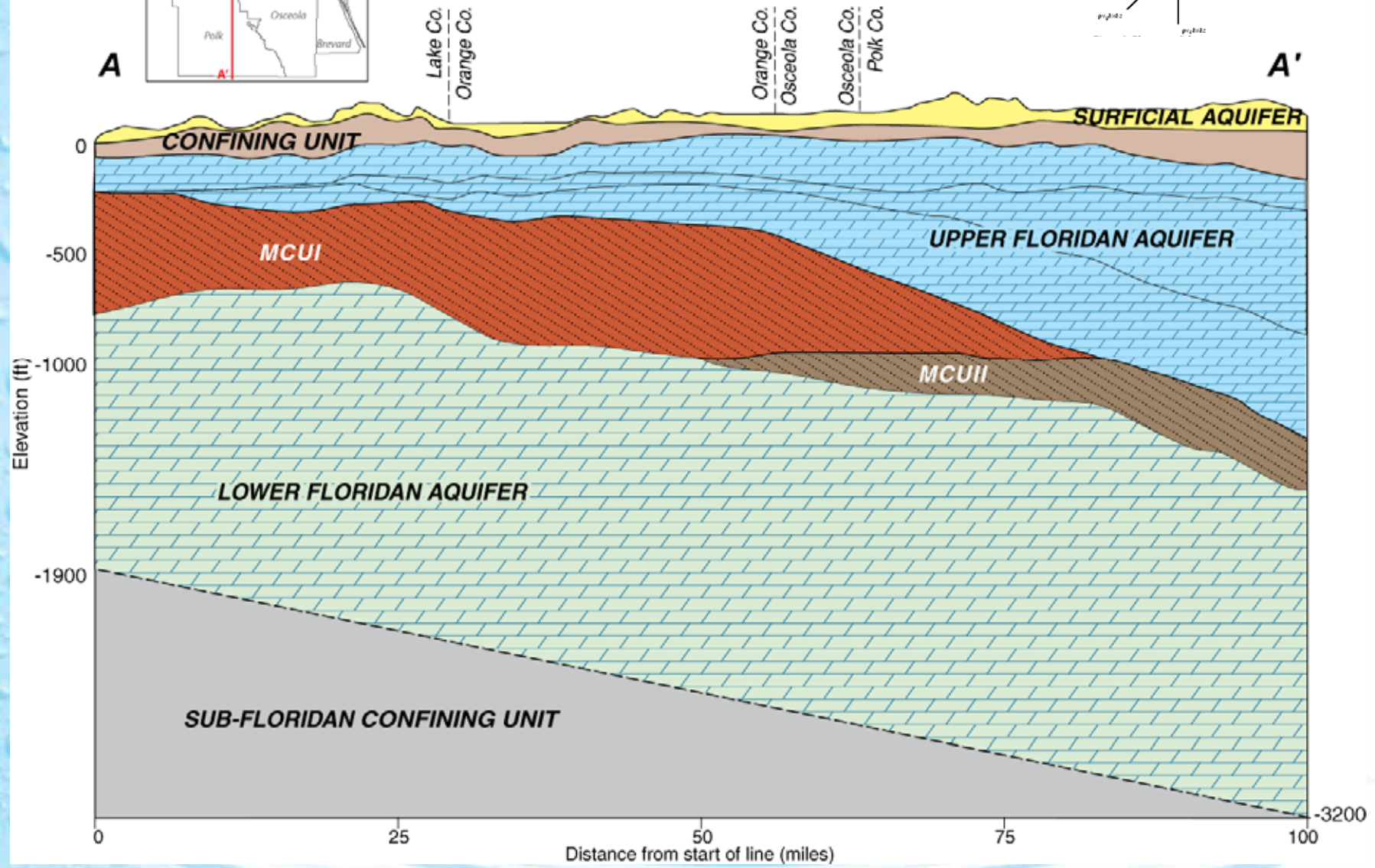
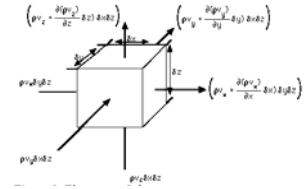
Draft product of the joint WMD potentiometric surface mapping group – May 2013

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Generalized Hydrogeologic Cross Section A-A'

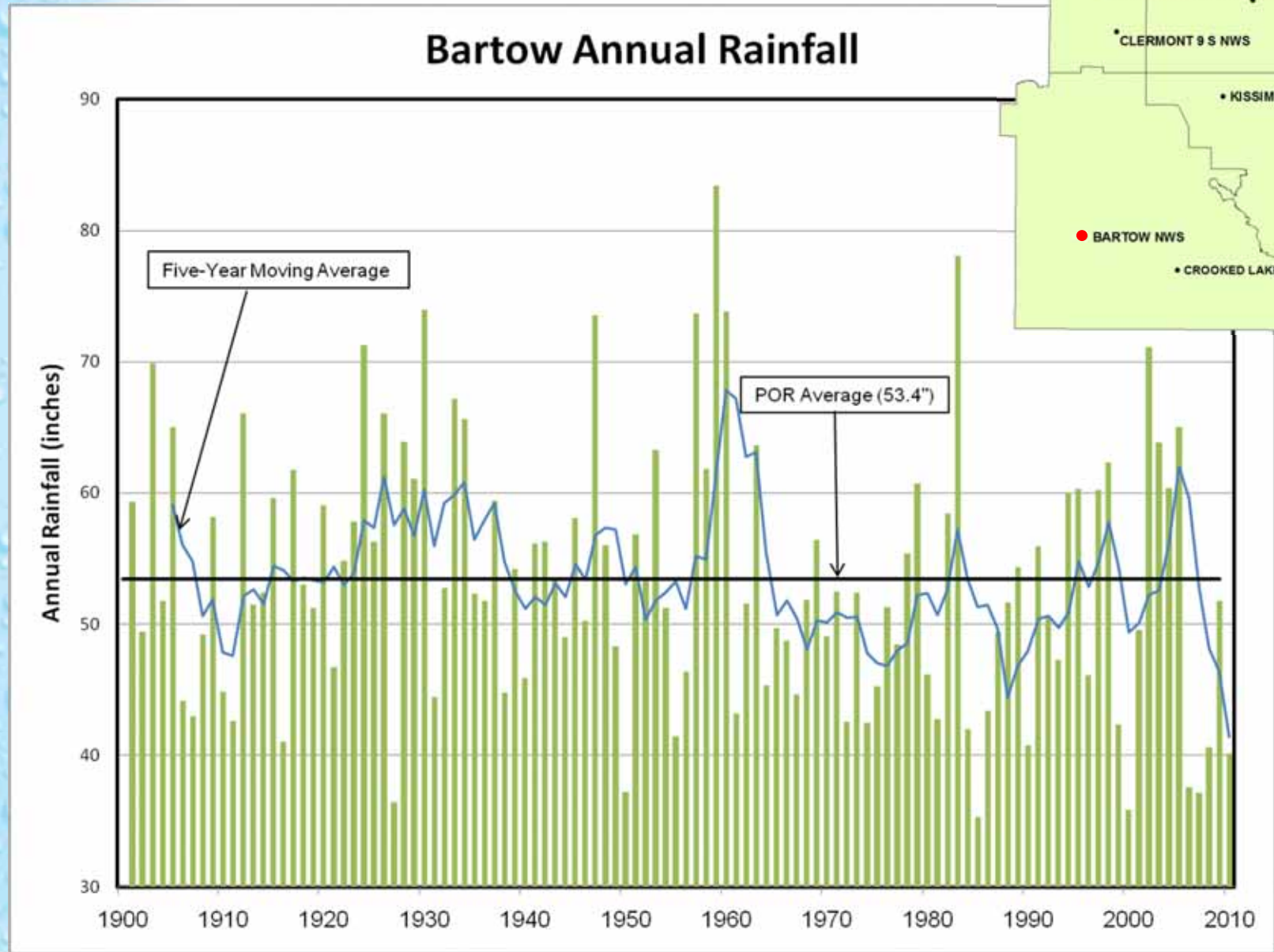


Factors Affecting Surface Water Levels

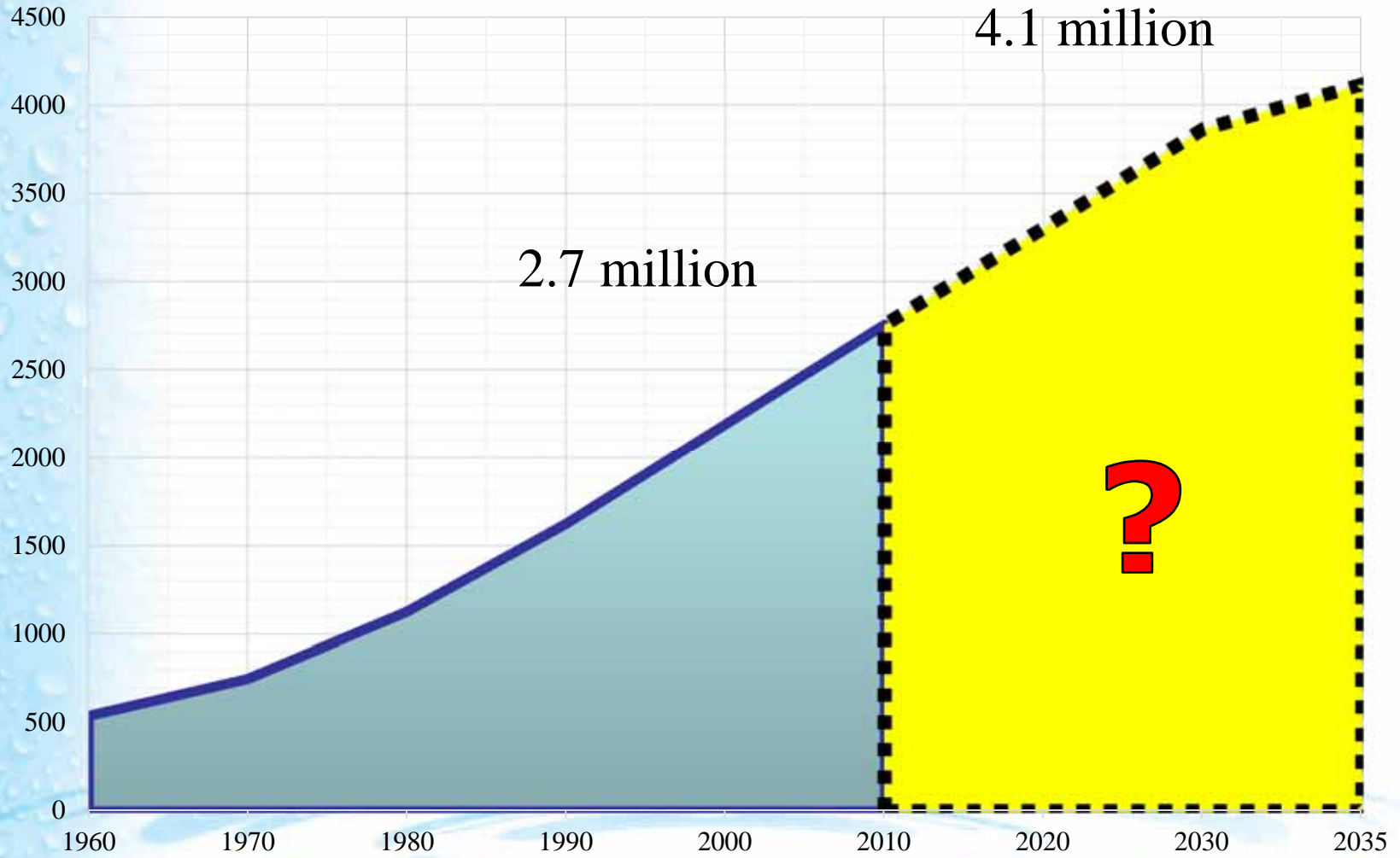
- Rainfall
- Land use and drainage
- Groundwater withdrawals



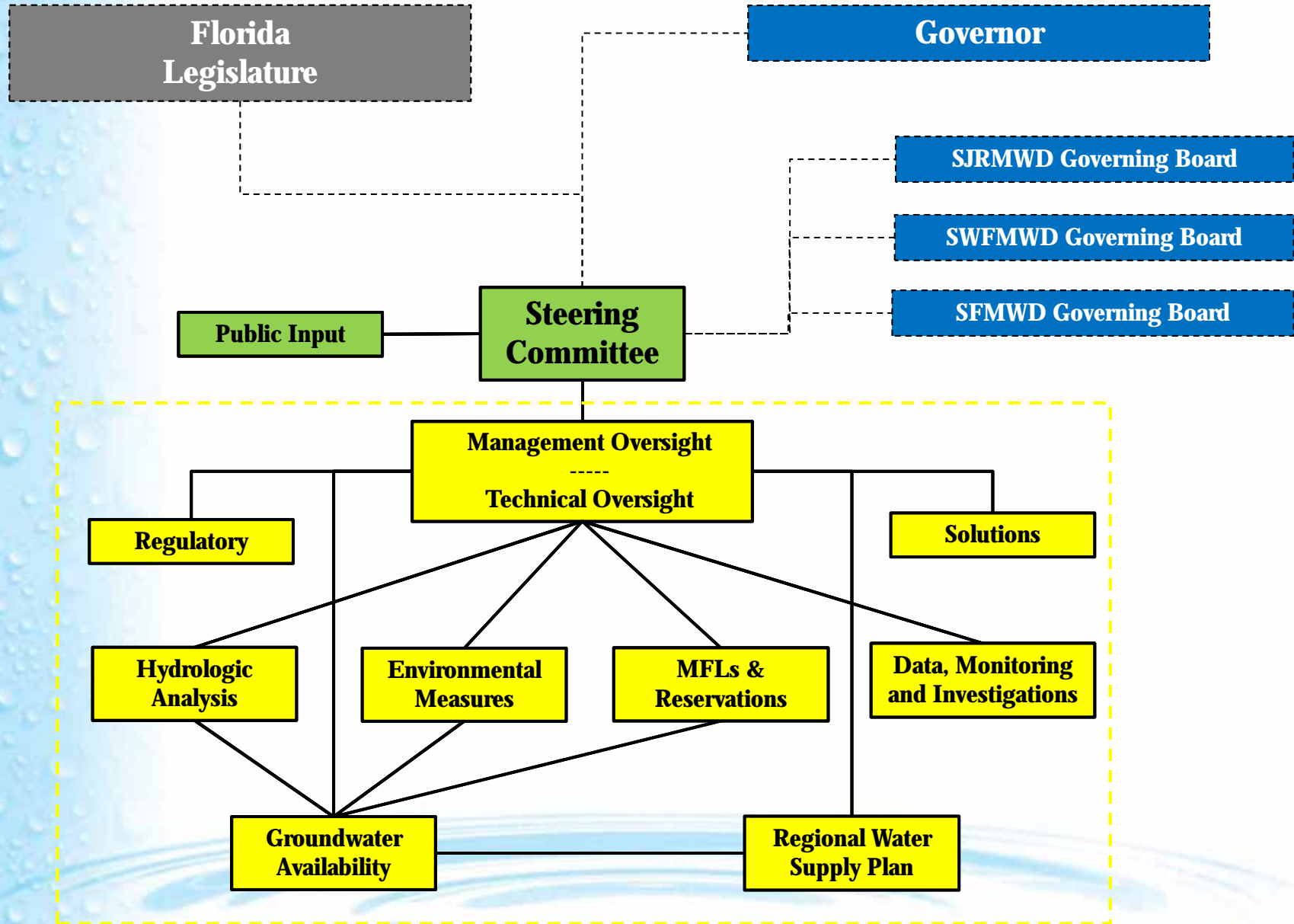
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CFWI Population

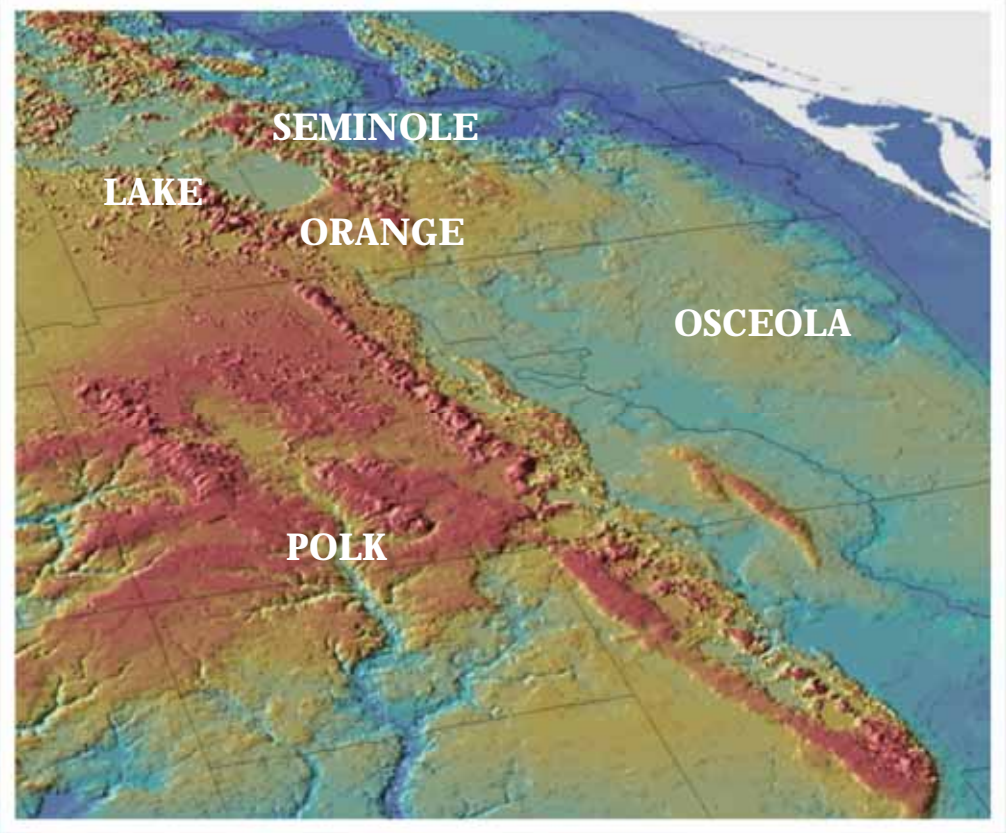


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CFWI 2015 Accomplishments

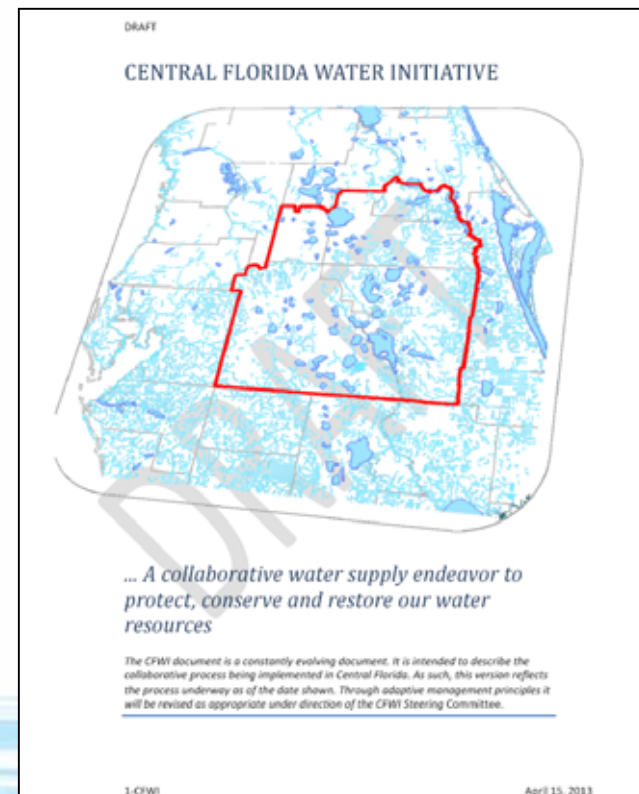
1. Framework for regional cooperation
2. Regional planning level estimate of sustainable groundwater
3. Single, unified RWSP
4. Regional consensus on the "Next Steps"



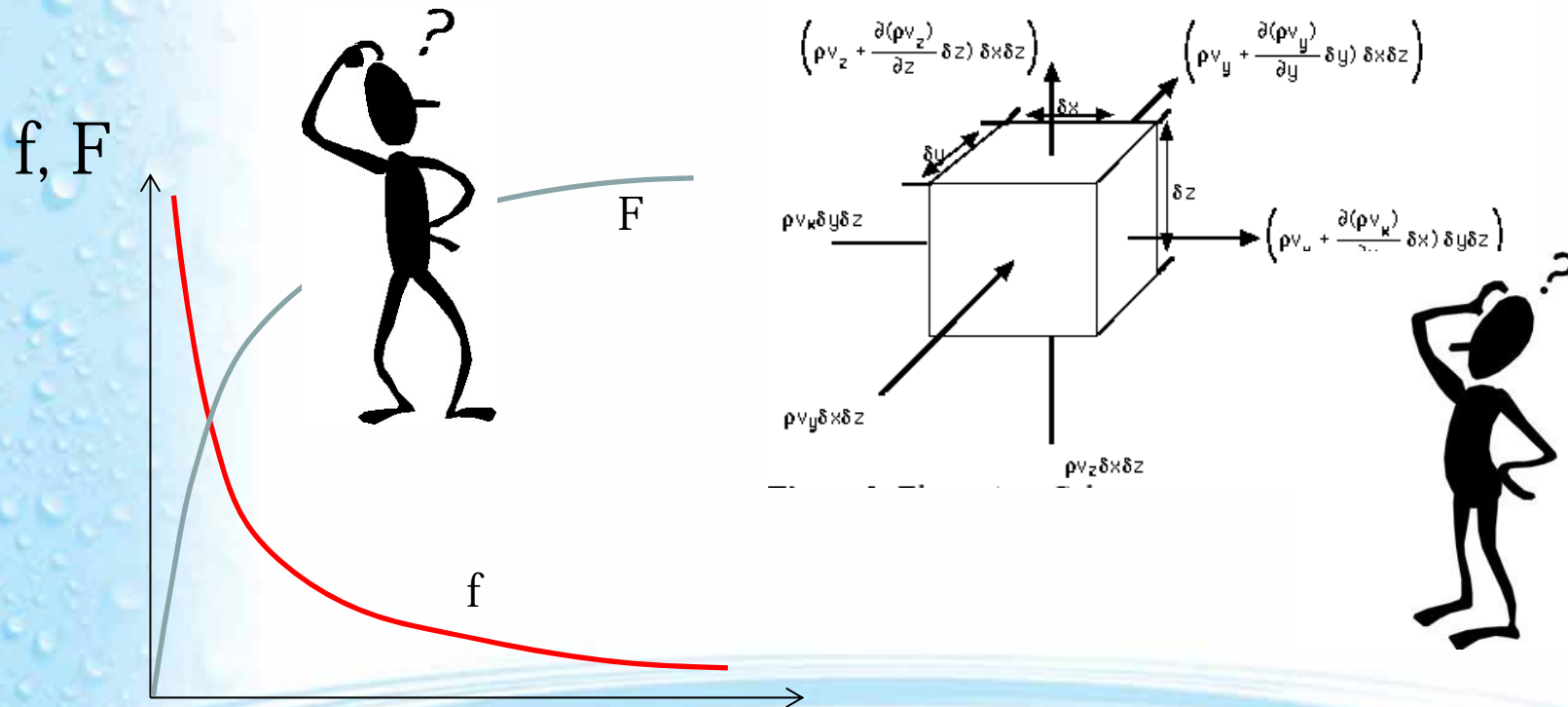
1. Framework for regional cooperation

✓ CFWI 2015

😊 CFWI 2020

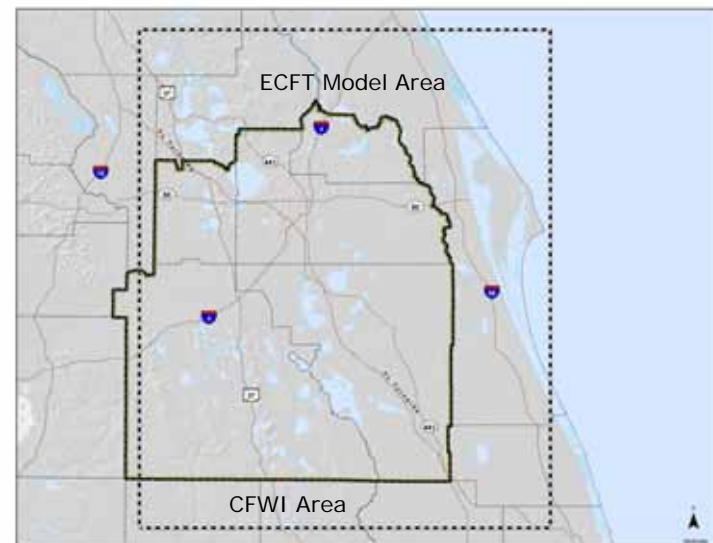


2. Regional planning level estimate of sustainable ground water



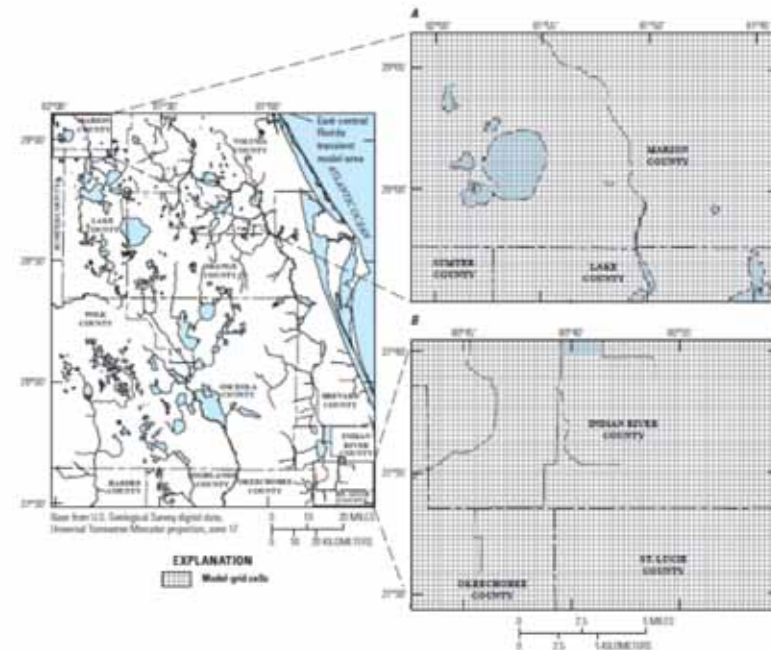
East-Central Florida Transient (ECFT) Groundwater Flow Model

- Based on USGS MODFLOW code
- Expansion by the USGS of previous models
- Fully three-dimensional
- 10,000 square miles
 - 112 miles north/south
 - 92 miles east/west
- 7 layers from land surface to the base of the Floridan aquifer



East-Central Florida Transient Groundwater Flow Model

- **Grid spacing 1250 ft X 1,250 ft (35.9 acres per cell)**
- **472 rows/ 388 columns**
 - 7 layers
 - 183,000 cells per layer
 - 1,281,952 MODEL CELLS
 - Parameter assignments made to each model cell
- **Calibration period: 1995 to 2006**
 - 144 monthly stress periods
 - Recharge and withdrawal assignments applied for each stress period



USGS Model was Recalibrated by HAT to Improve Performance

- Lateral boundary heads
- Leakance-vertical hydraulic conductivities
- Storage values
- Spring discharge/ pool elevations
- Irrigation water use data improvement

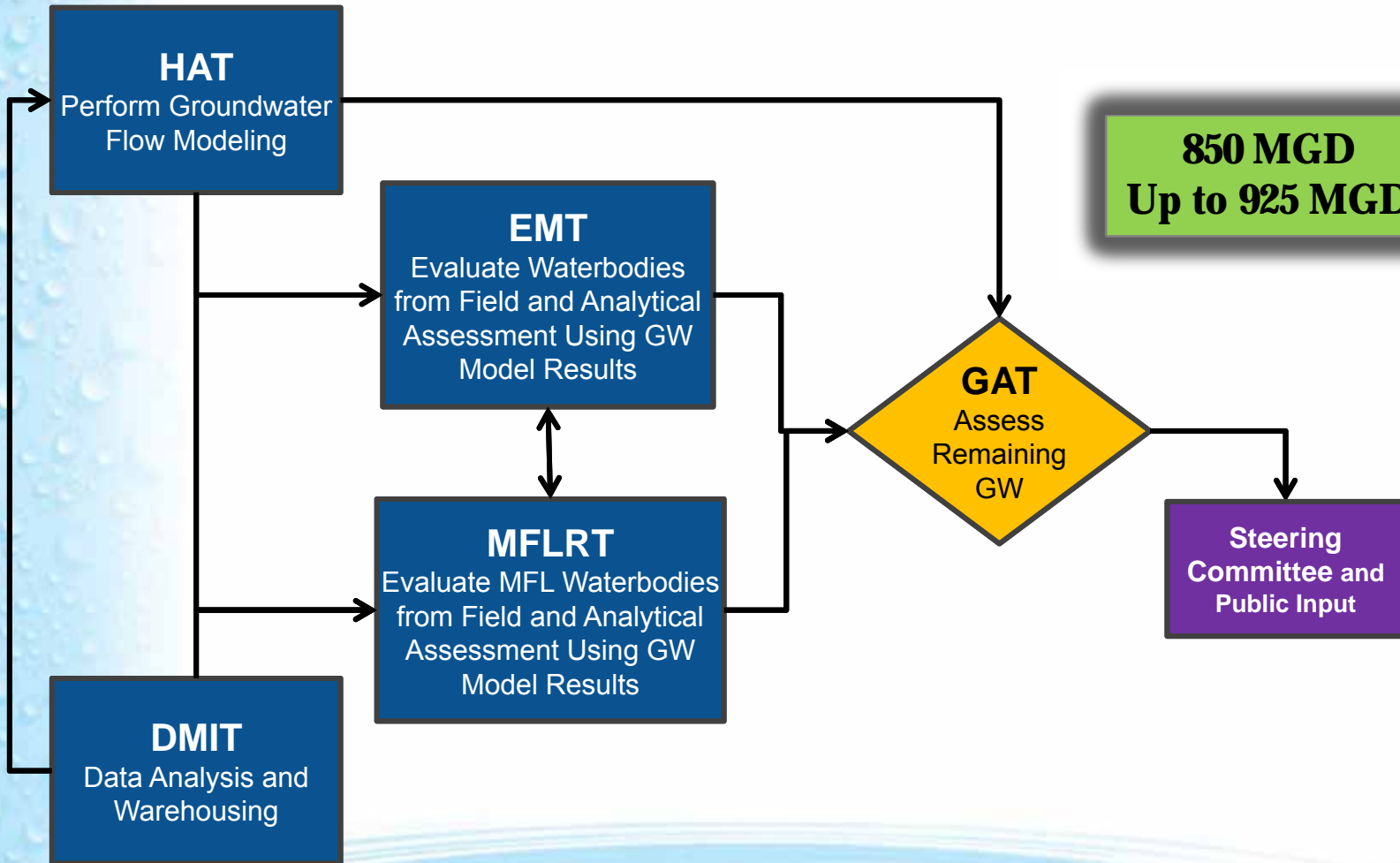


Central Florida Water Initiative

| | Scenario | | | |
|---|--|---|--|---|
| | Calibration | Reference Condition | End-of-Permit | 2035 |
| Period | 1995 to 2006 | 2005 | 2012 to 2041 | 2035 |
| Land Use | 1995, 2000 and 2004 | 2004 | 2004 | 2004 |
| Rainfall | Measured 1995-2006 | Measured 1995-2006 | Measured 1995-2006 | Measured 1995-2006 |
| Withdrawals | 1995-2006 <ul style="list-style-type: none"> • PWS as measured • Ag. as measured or estimated | 2005 <ul style="list-style-type: none"> • Repeated for 12 years • Adjusted by historic monthly peaking factors • Ag. as measured or estimated | EOP Allocations <ul style="list-style-type: none"> • Repeated for 12 years • Adjusted by historic monthly peaking factors • Ag. (under discussion) | 2035 Projected <ul style="list-style-type: none"> • Repeated for 12 years • Adjusted by historic monthly peaking factors • Ag. (under discussion) |
| Runoff and Infiltration Partitioning | Calculated using Green-Ampt | Calculated using Green-Ampt | Calculated using Green-Ampt | Calculated using Green-Ampt |
| Irrigation and RIB Recharge | Measured and Estimated | <ul style="list-style-type: none"> • 2005 Measured and Estimated • Adjusted by irrigation deficit from rainfall | Estimated irrigation deficit then remaining reclaimed water to RIBs or other wet weather disposal | Estimated irrigation deficit then remaining reclaimed water to RIBs or other wet weather disposal |

Open technical process with model assumptions clearly stated and identified

Workflow Of The Technical Teams Accommodates CFWI Guiding Principals And Collaborative Goals

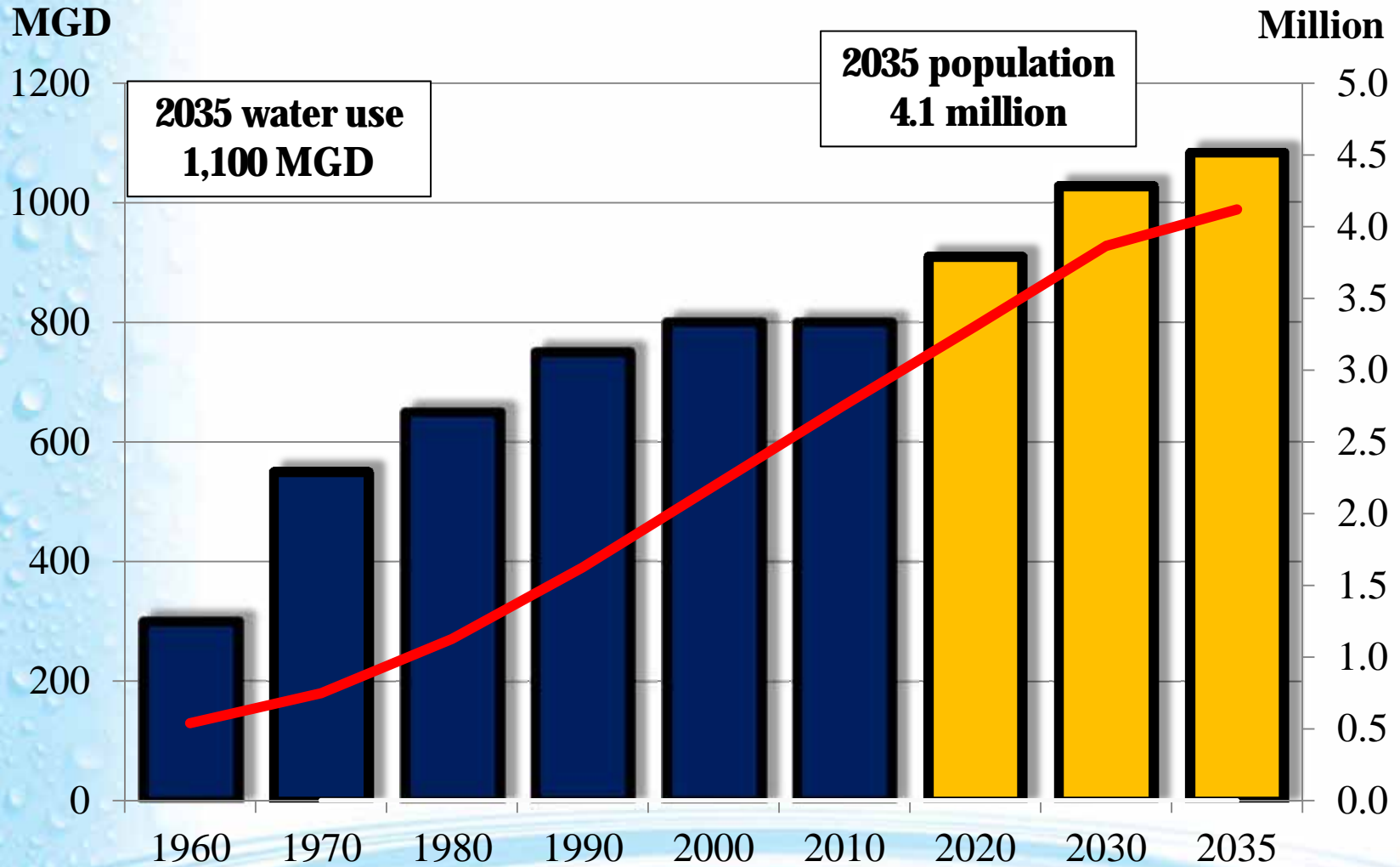


Coordinated Integration of the Teams Leads to Comprehensive Results

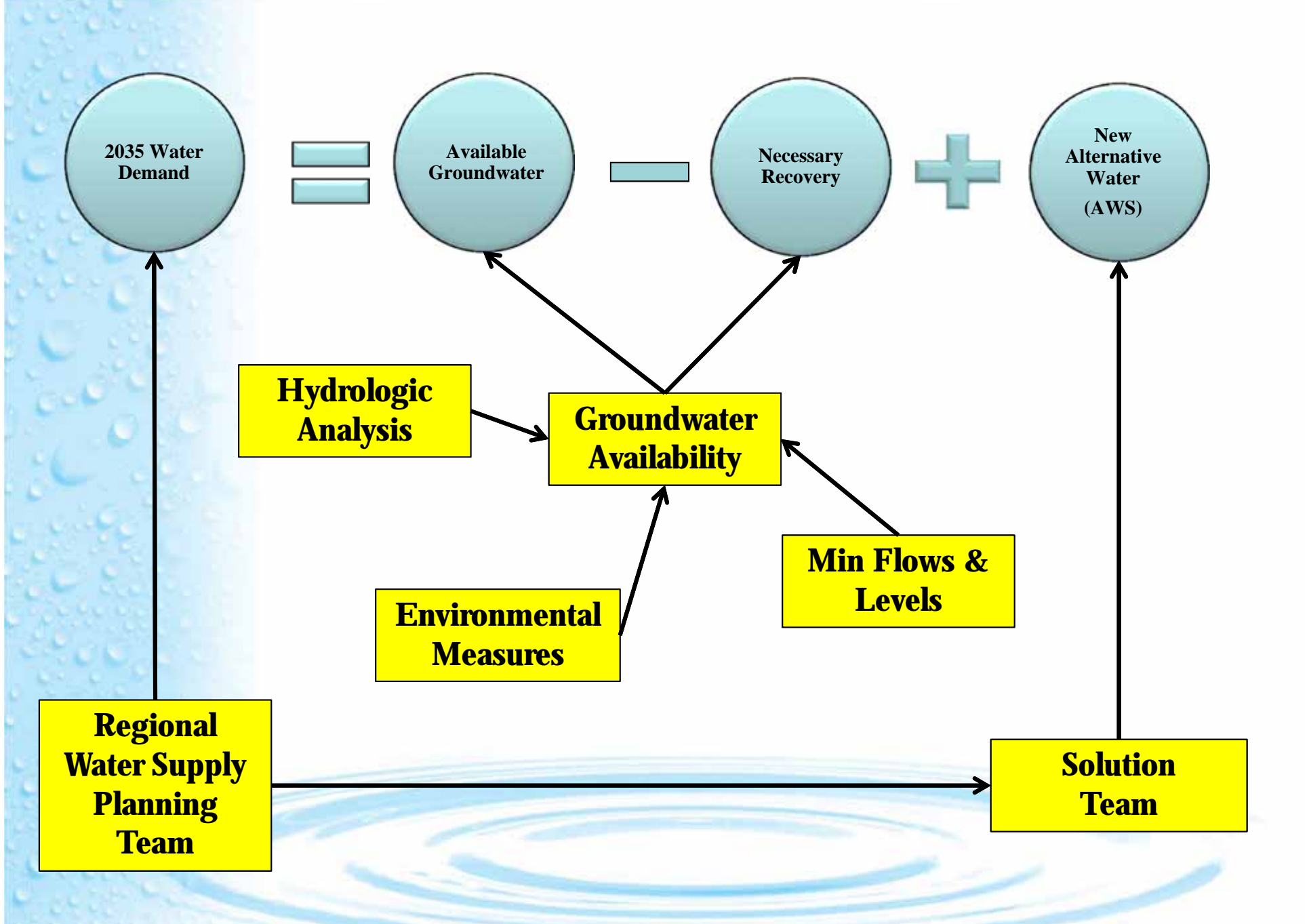
3. SINGLE, UNIFIED REGIONAL WATER SUPPLY PLAN



Water Use/ Population



Central Florida Water Initiative



Metrics

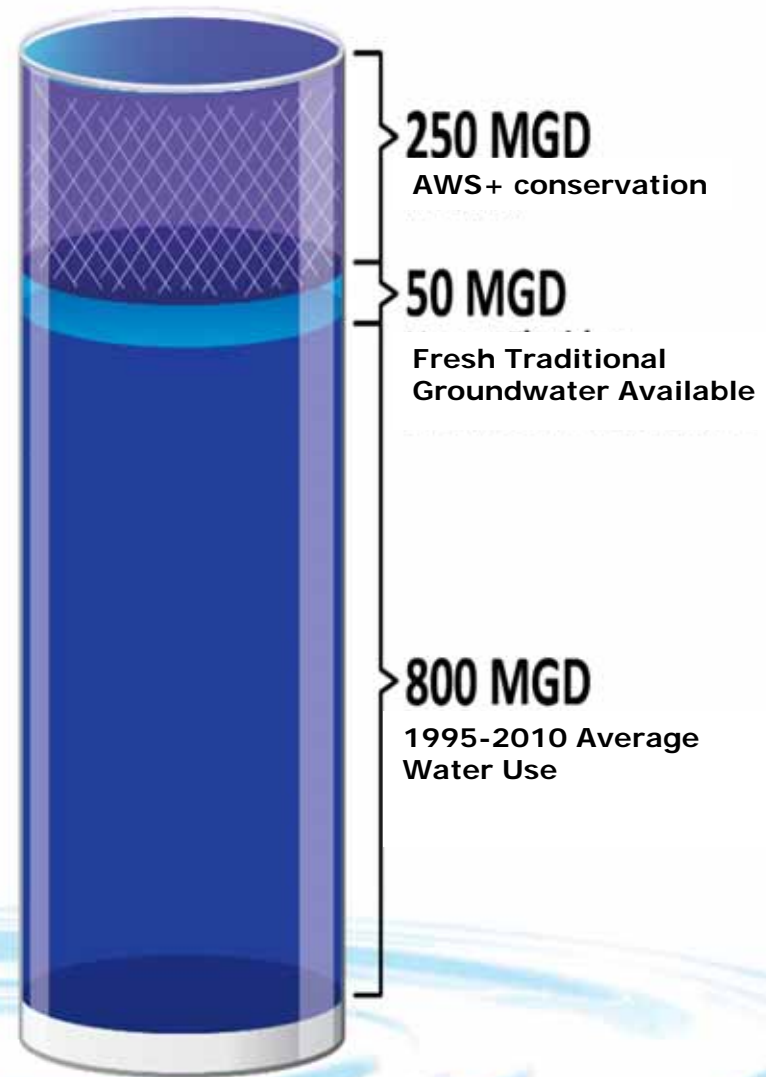
Population

- 2015- 2.9 million
- 2035- 4.1 million

2015 RWSP

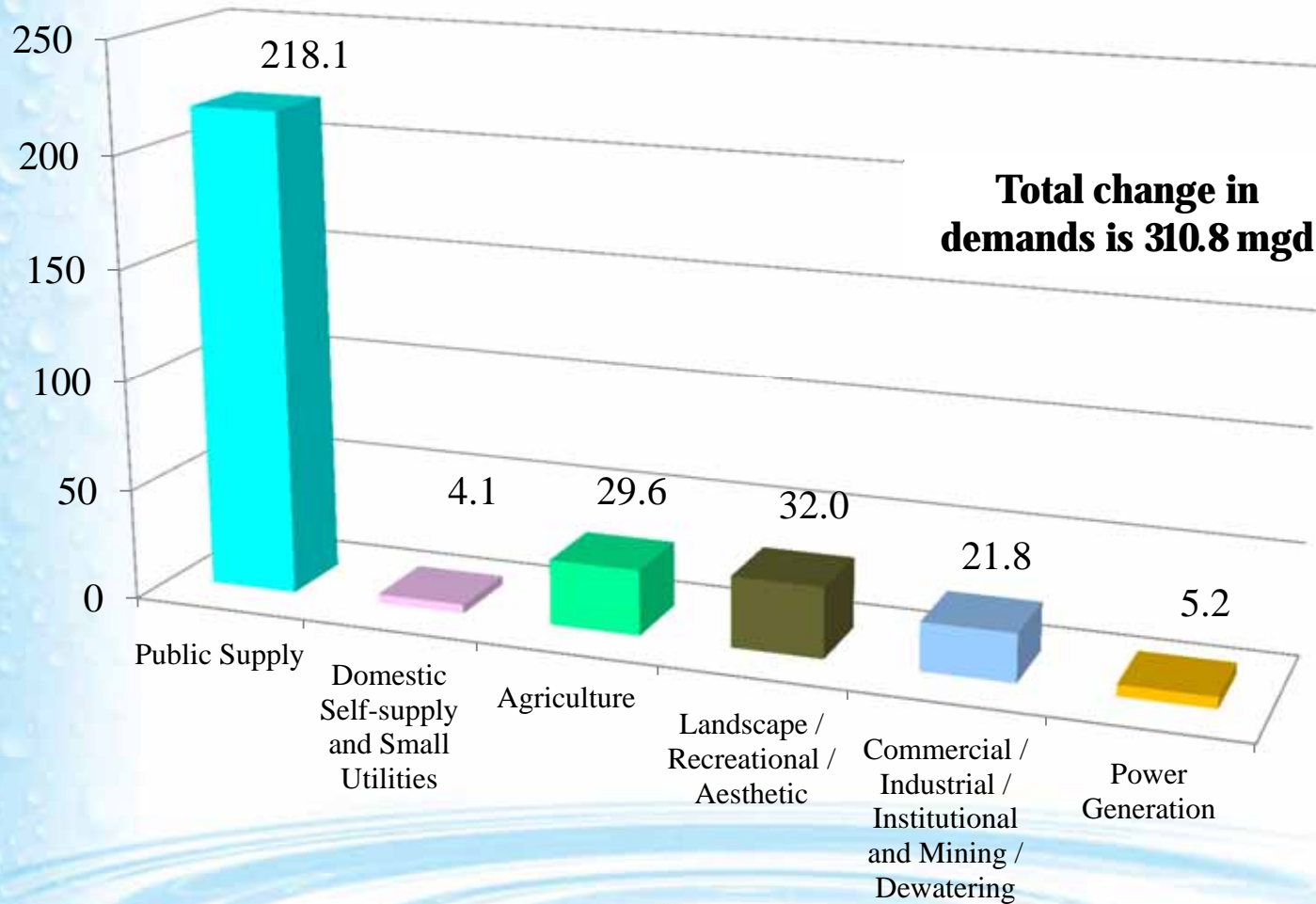
- 415 MGD potential

1,100 MGD
Total Water Needed (2035)



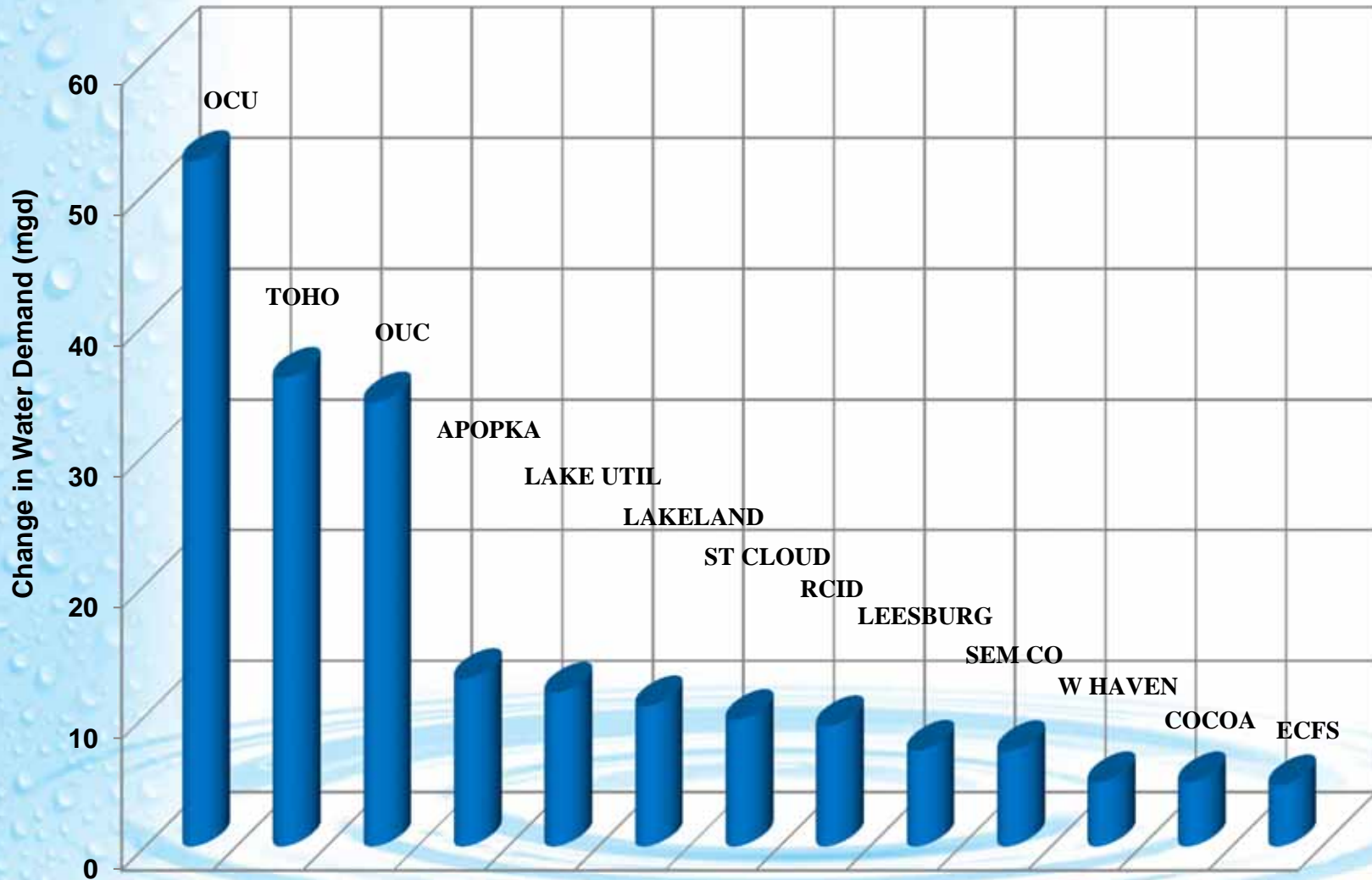
Change in Demand

2010 to 2035



Public Supply

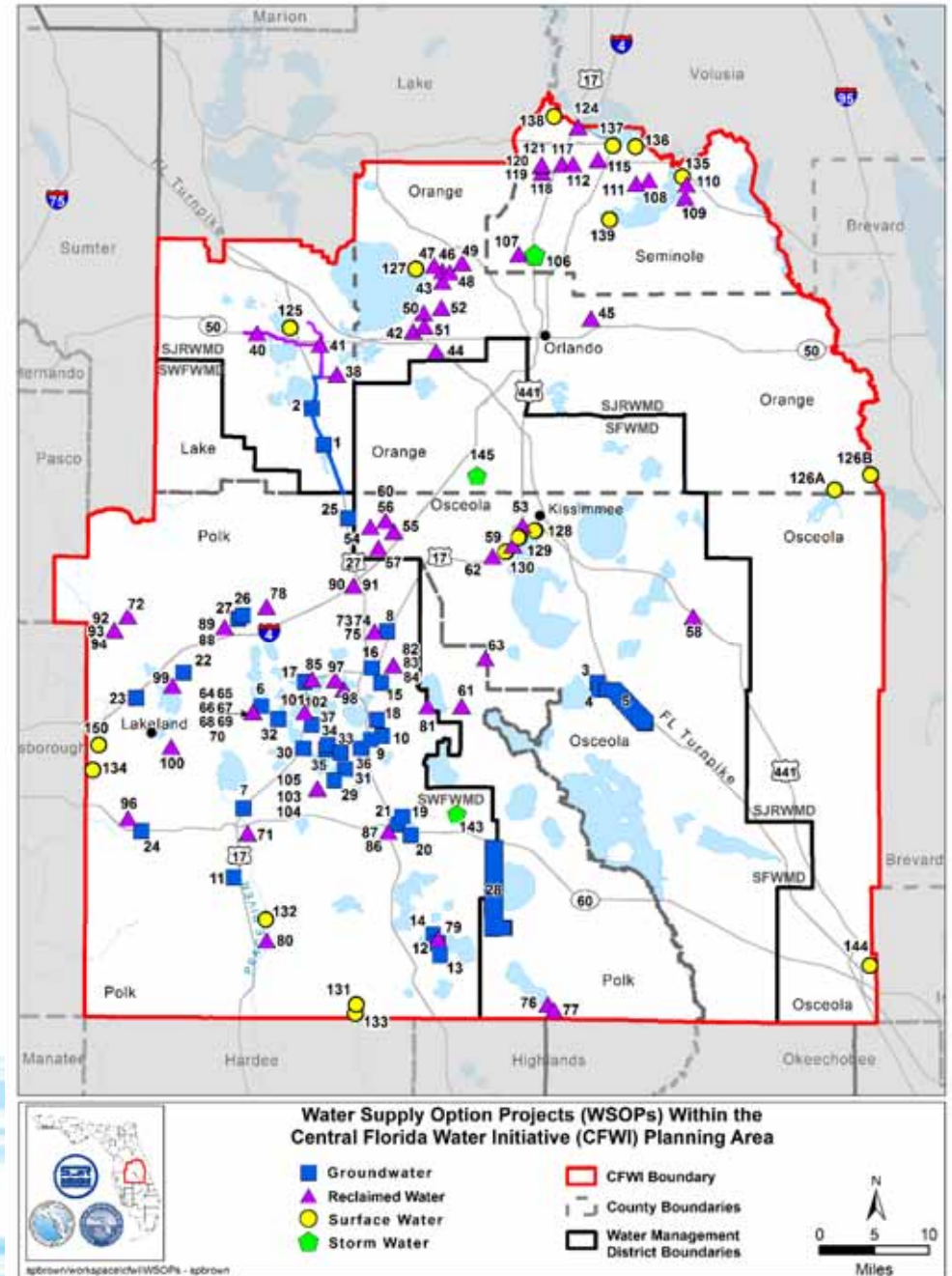
Increases > 4 mgd 2010 to 2035



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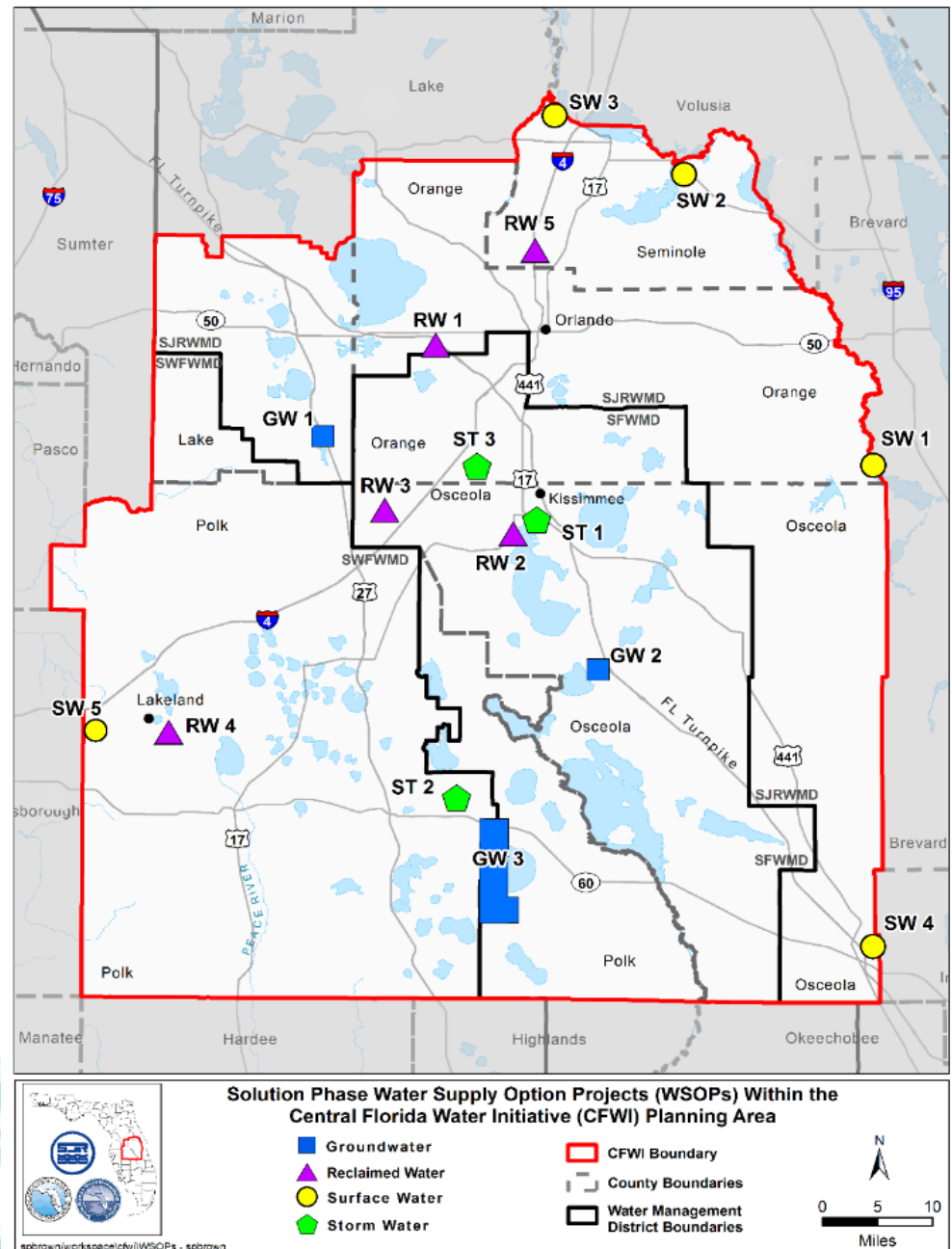
RWSP Projects

- 142 RWSP Projects
- 10 “new” Projects
- 415 mgd
- \$3.7B



Solutions Team Projects

- 152 RWSP Projects
- Reduced to 20 projects/ programs
- 224 MGD
- \$2.8B



Central Florida Water Initiative

CFWI 2015 Regional Priority Projects

| Projects | Quantity (MGD) | Year 1 (MIL \$) | Year 2 (MIL \$) | Years 3-5 (MIL \$) | Total Cost (Mil \$) |
|--|----------------|-----------------|-----------------|--------------------|---------------------|
| 1 Conservation (All) | 37 | 3.8 | 6.1 | 24.5 | 170 |
| 2 Recovery Projects | | 2 | 1.5 | 10 | 50 |
| 3 Data Monitoring & Investigation | | 3 | 7.5 | 23.1 | 34.1 |
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| Surface Water Projects | | | | | |
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| 20 Reedy Creek Watershed | 4 | | | | 1.6 |
| Total Financial Plan (Regional Priority Projects) | 224 MGD | \$32 M | \$74 M | \$496 M | \$2,776 M |
| Total Solutions Projects | 415 MGD | | | | \$3,731 M |

A vertical column of water droplets on the left side of the slide, and a series of concentric blue ripples at the bottom, suggesting water being poured or a drop hitting a surface.

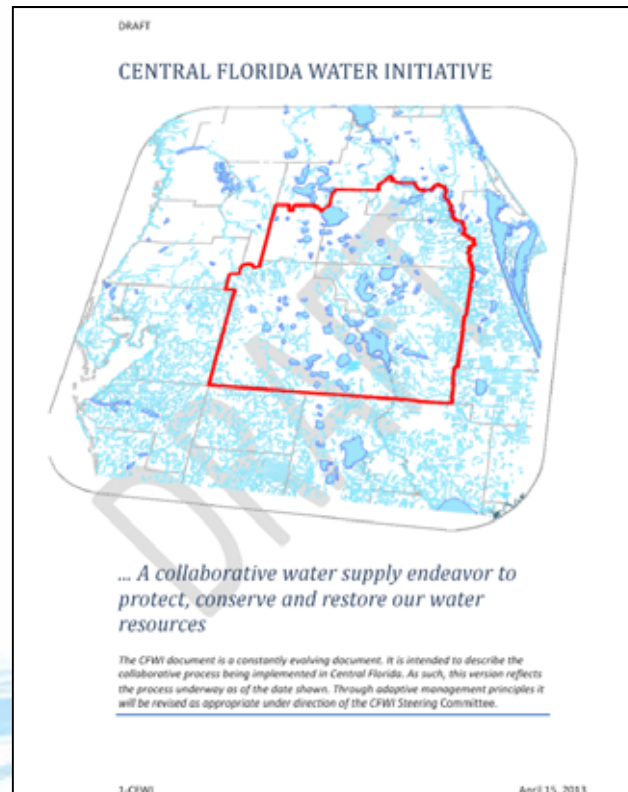
4. Regional consensus on the “Next Steps”

Next Steps

1. Water Conservation
2. Prevention and Recovery Projects
3. Implement Regional Project Solutions
4. Support Additional AWS Projects
5. Assessment Tools and Supporting Data
6. Consistent Rules and Regulations
7. Communication and Outreach
8. Future Framework to Support Implementation

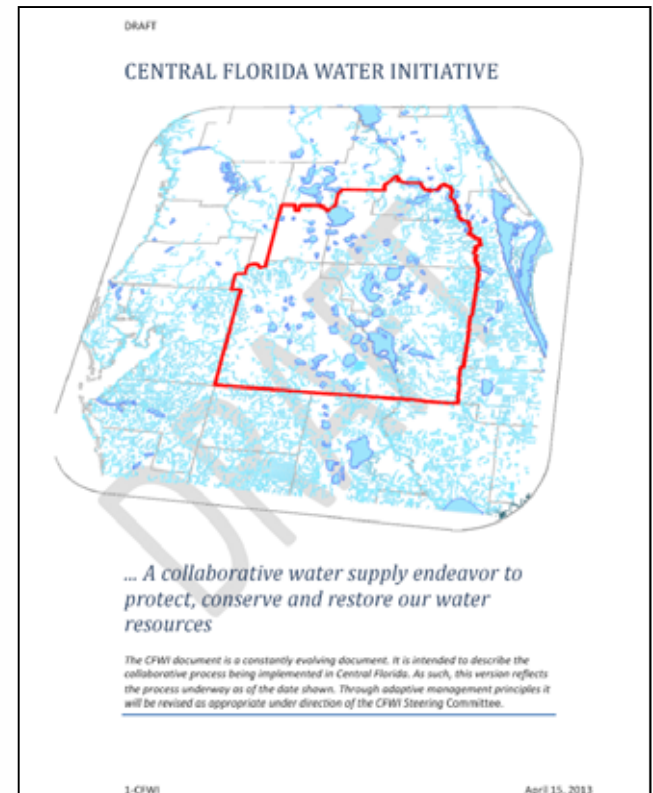
The next 5 years

CFWI 2020



2020 Guiding Principles

1. Update sustainable quantities of groundwater sources
2. Monitor strategies to meet water demands
3. Establish consistent rules
4. Encourage funding

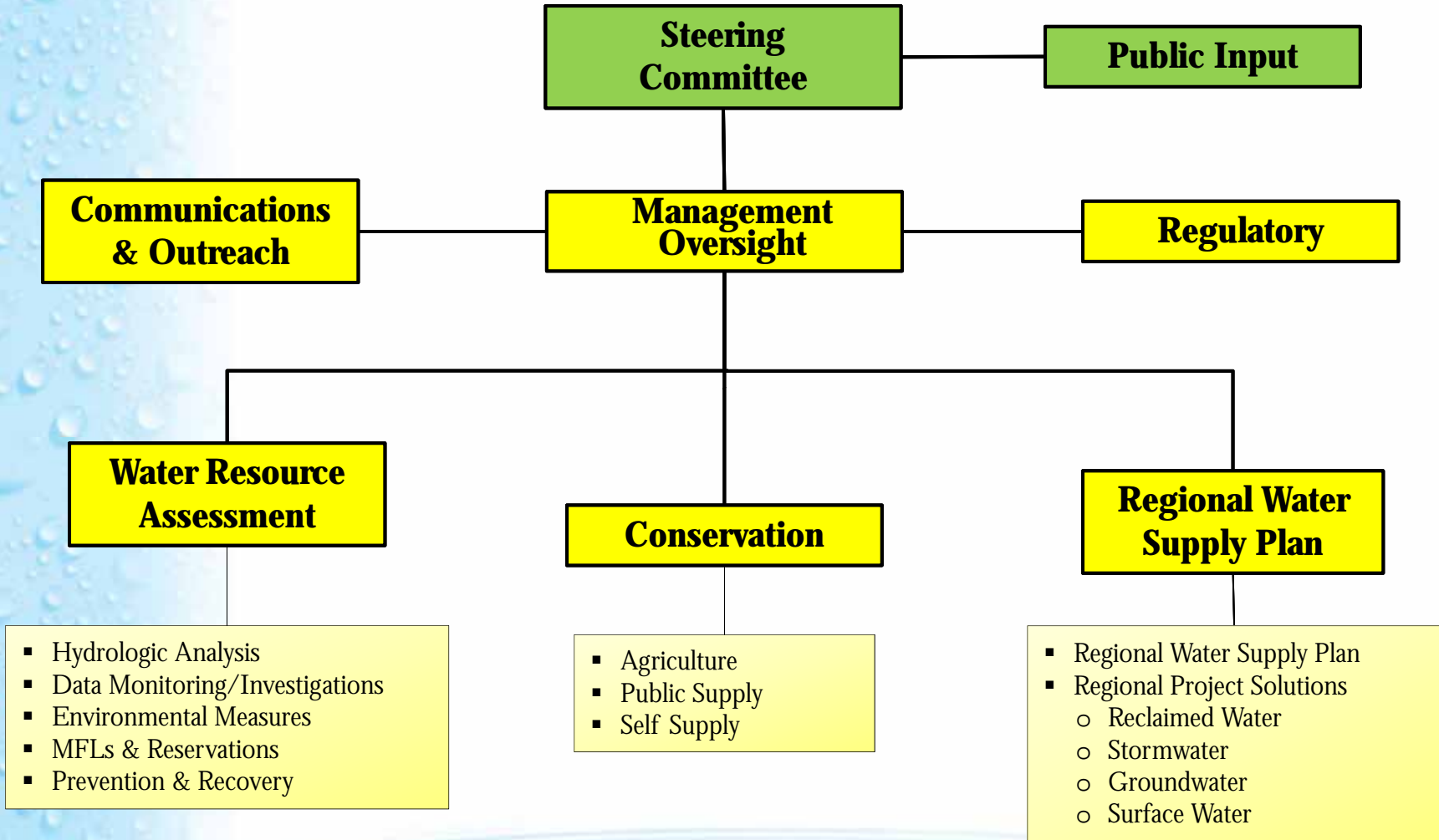


Guidance Document available at cfwiwater.com

Collaborative Process Goals

- a) Update the single hydrologic planning model used to assess the availability of groundwater
- b) A single, uniform definition of “harmful to the water resources” consistent with its usage in section 373.219, Florida Statutes.
- c) *One reference condition as used in the ECFT planning model. Other reference conditions for addressing harm, MFLs and other needs of the region may be identified in the future as part of this process.*
- d) A single process for permit reviews
- e) A single, consistent process, as appropriate, to set MFLs and water reservations
- f) An updated single multidistrict regional water supply plan, including any needed recovery or prevention strategies and a list of water resource or supply development projects
- g) Address other directives enacted by the Florida Legislature

CFWI 2020

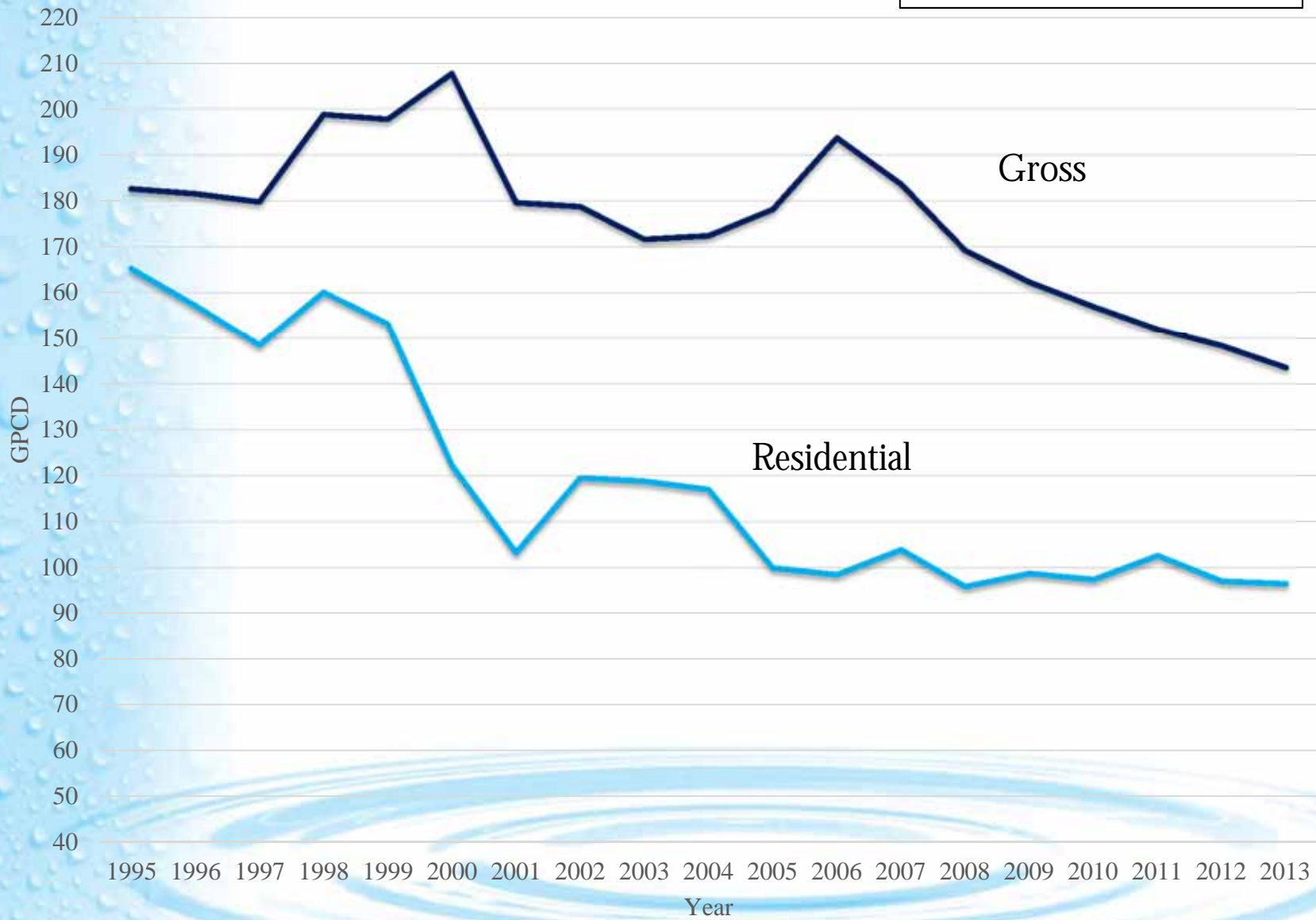


Conservation Team

- Continue the effort to advance conservation beyond the estimates established in the RWSP.

Central Florida Water Initiative

Per capita water use
1995 - 2013



Water Conservation

- 5-year Plan
 - Clearinghouse/Conservation Planning Tools/Research
 - Public Supply & Other Self Supply
 - 10 BMPs
 - Adopt High-Efficiency Standards
 - Landscape and Irrigation Systems
 - Plumbing Fixtures and Appliances
 - Public Education
 - Agriculture (Programmatic Approach)
 - 7 BMP categories
 - Includes training workshops, on-site demonstrations, mobile labs and support for Extension Services

Conservation Technical Team

- Team Leader: Janet Llewellyn (FDEP)
- Scope of Work (see Guidance Document)
- Schedule
 - **Task A:** Complete draft options for implementation strategies to achieve the 37 MGD of water savings identified in the 2015 CFWI RWSP for MOC consideration – **June, 2017**.
 - **Task B:** Complete draft options for actions/programs to increase water savings beyond the 37 MGD identified in 2015 CFWI RWSP – **TBD**.
 - **Task C:** Coordinate with the Regulatory Team, **On-going**.
 - **Task D:** Coordinate with the Communication & Outreach Team. **On-going**.
 - **Task E:** Provide Quarterly updates to MOC on progress **On-going**.
 - **Task F:** Provide draft Water Conservation Chapter to the 2020 RWSP Team - **December, 2018** , or consistent with the schedule established by the 2020 RWSP Team.

Communication & Outreach Team

- Develop programs to address the “next step” recommendations from the Phase 2 Community Outreach and Consensus Report.

Communication & Outreach Technical Team

- Team Leader: Barbara Ross (SFWMD)
- Scope of Work (see Guidance Document)
- Schedule
 - Ongoing throughout the year. Key features will include:
 - Project-specific tours/site visits (2-4 per year)
 - Annual enhancements to the Water Conservation Education and Outreach program.
- Continue to update and maintain *cfwiwater.com* website

Regional Water Supply Plan Team

- Update the **water supply projections** by December 2017.
- Update and implement the **single multidistrict regional water supply plan**, including any needed recovery or prevention strategies including identification of sustainable water supply programs and projects.
- Monitor and **report progress** on the CFWI Programs and projects and identified in the CFWI 2015 Plan.

Water Use

MGD

1200

1000

800

600

400

200

0

1960

1970

1980

1990

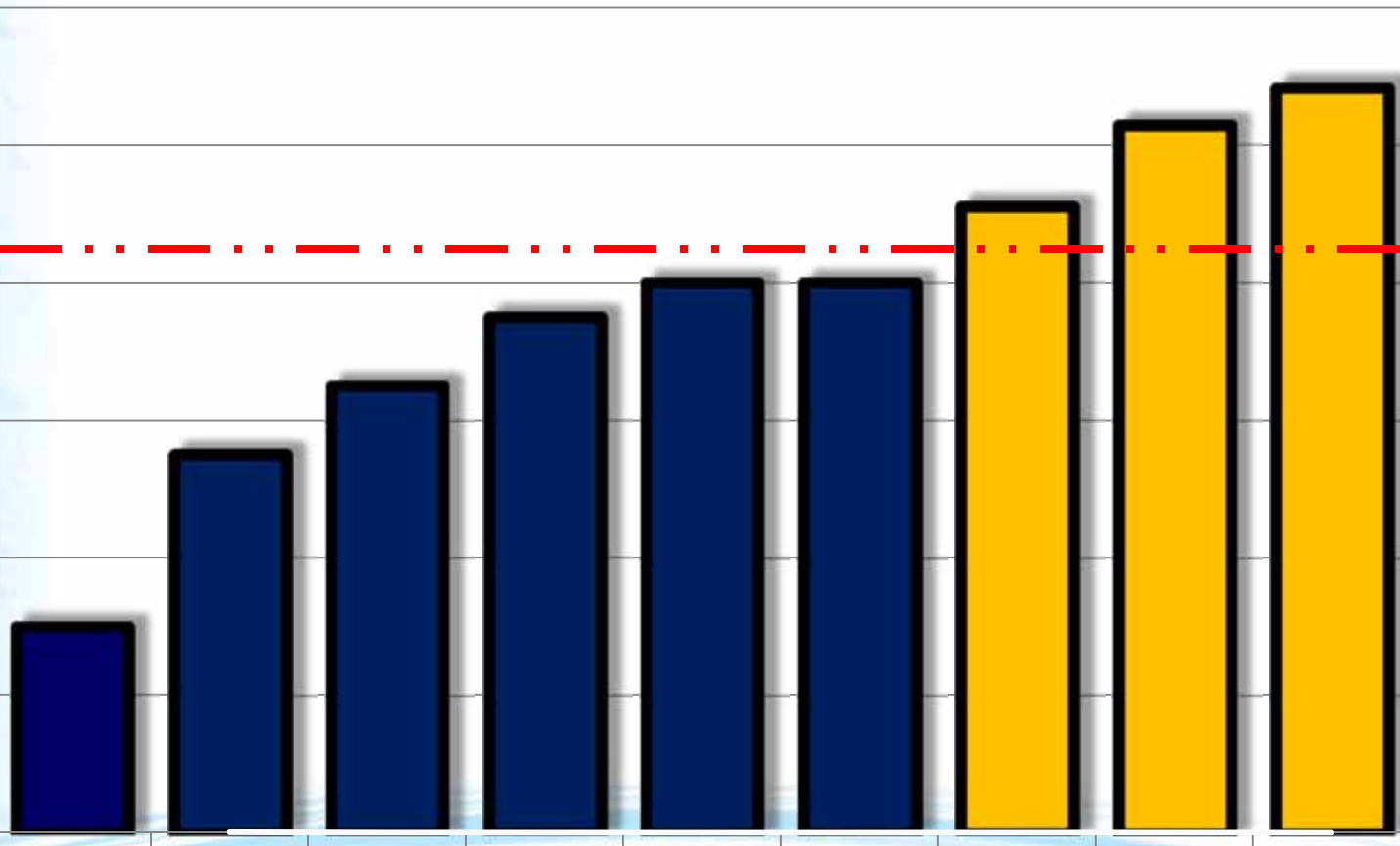
2000

2010

2020

2030

2035



Comparative Costs

| Water Supply Source | Total Unit Cost (\$/1000 gal) | Compare to UFA groundwater |
|---------------------------------|--|---------------------------------------|
| Upper Floridan Aquifer | \$0.26 | - |
| Surface Water | \$2.08 | 8x |
| Brackish Ground Water | \$2.30 | 9x |
| Seawater | \$7.86 | 30x |
| Reclaimed water | | |
| Saltwater Intrusion Barrier | \$0.89 | |
| Rapid Infiltration Basin | \$1.25 | |
| Direct Potable Aquifer Recharge | \$3.40 | |
| Aquifer Storage and Recovery | \$3.41 | |
| Direct Reuse | \$3.88 | |

RWSP

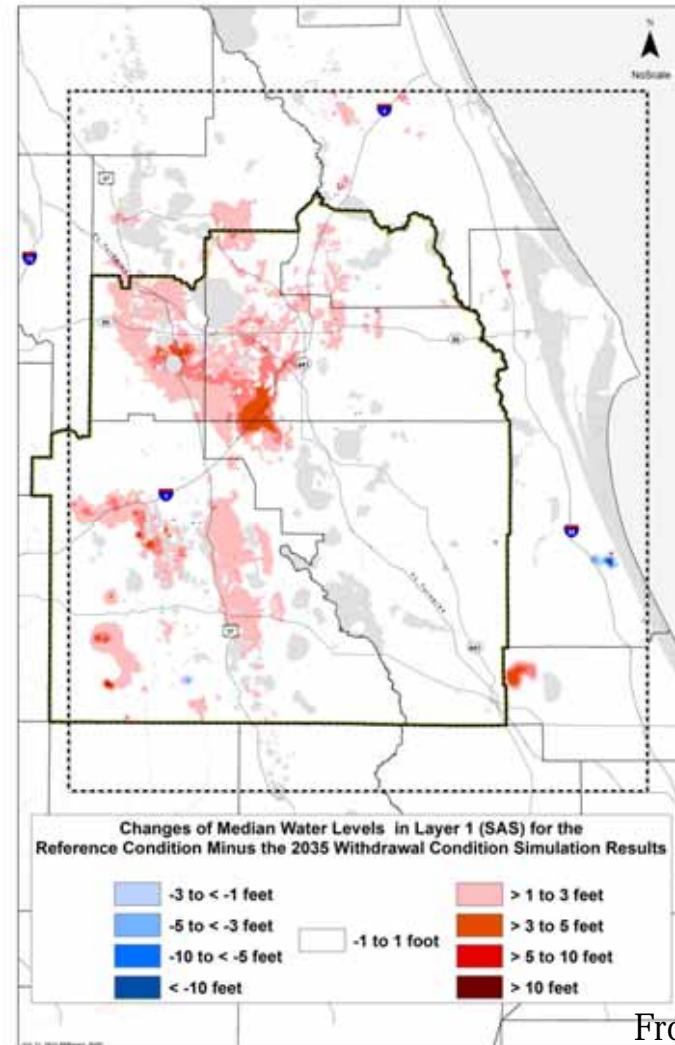
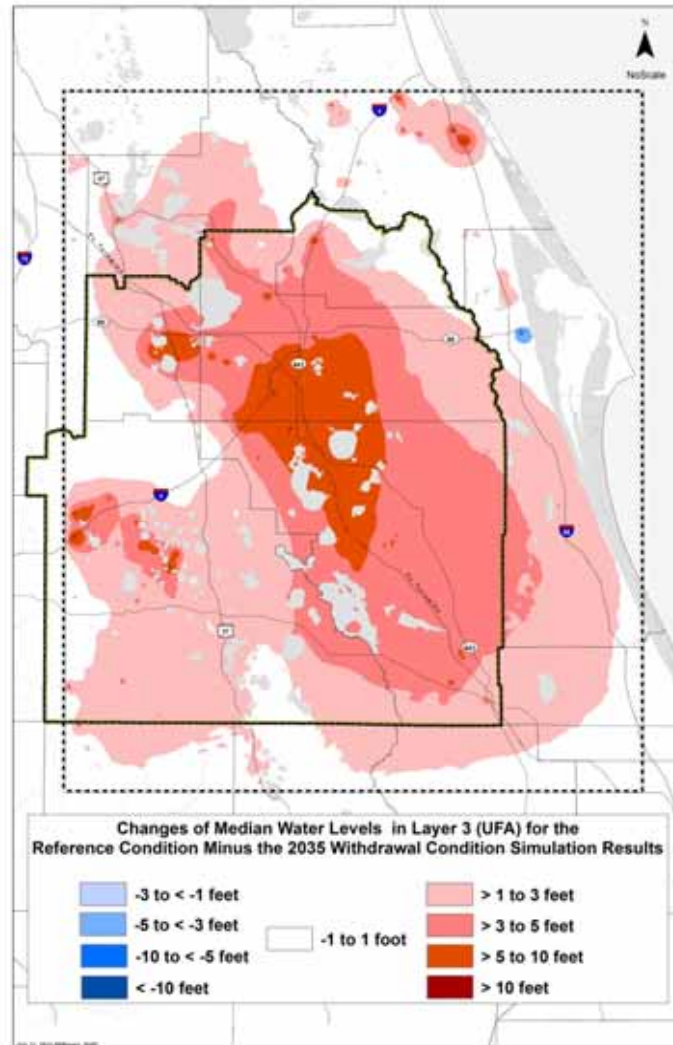
Technical Team

- Team Leader: Tammy Bader (SJRWMD)
- Scope of Work (see Guidance Document)
- Schedule
 - Task A – Overall Schedule- Completion by **May 2016**, ongoing
 - Task B – Population & water demands update- Completion by **December 2017**
 - Task C – Notifications & technical assistance. To be determined, **ongoing**
 - Task D – Monitor & report progress. To be determined, **ongoing**
 - Task E – Assist recovery & prevention to WRAT. **To be determined**
 - Task F – Project Options Update. Completion by **December 2018**
 - Task G – Conduct Public Workshops. Draft 2020 CFWI RWSP by **May 1, 2019**

Water Resource Assessment Team

- **Update** the East Central Florida Transient model by December 2017.
- Review any needed **recovery or prevention strategies**.
- Continue the effort to **implement the next steps** from the CFWI 2015 Plan not specifically assigned to one of the existing Collaborative Technical Teams.
- **Ensure technical coordination** between the teams.

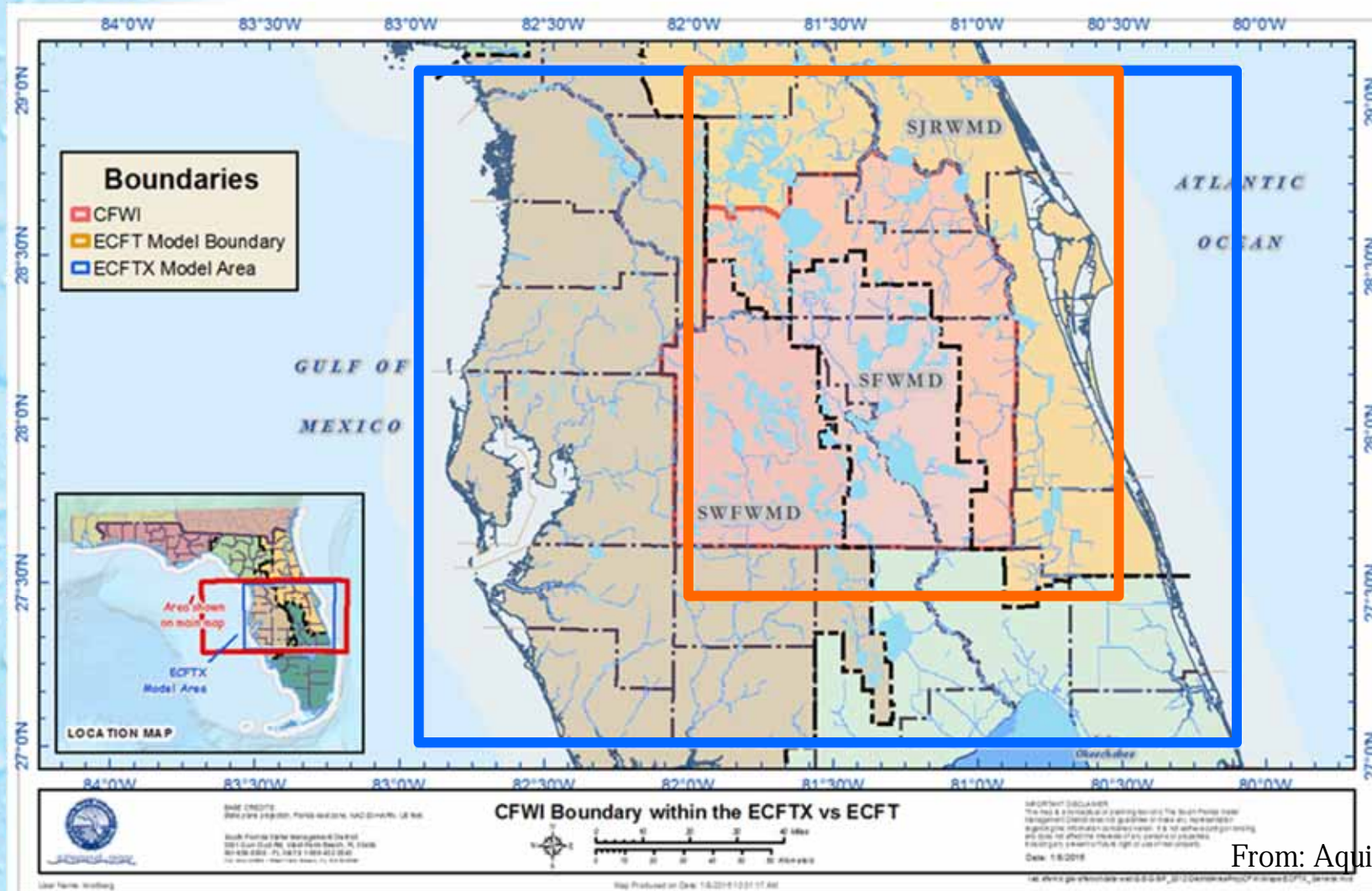
Example Scenario Results 2035 UFA & SAS Drawdown



ECFT to ECFTX Groundwater Flow Model

- Expand model domain to include all of CFWI area without boundary condition constraints
- Same simulation objectives as ECFT
- Support future CFWI planning processes

ECFT vs. ECFTX Model Domains



From: AquSciTech

Principal Changes

| MODEL ATTRIBUTE | ECFT | ECFTX |
|--|--|--|
| 1. East/West Domain Dimension (miles) | 92 | 167 |
| 2. North/South Domain Dimension (miles) | | |
| 3. Number of | | |
| 4. Number of | | |
| 5. Lakes Level | | Package |
| 6. Rivers Flow | | Package |
| 7. Unsaturated Zone Flow Simulation | MODFLOW-2D Package | ARC2D pre-processor |
| 8. Infiltration & Runoff Partitioning Method | Green-Ampt | NRCS |
| 9. Simulation Period | 12 years of varying climatic input (1995-2006) | 20 years of varying climatic input (1995-2014) |

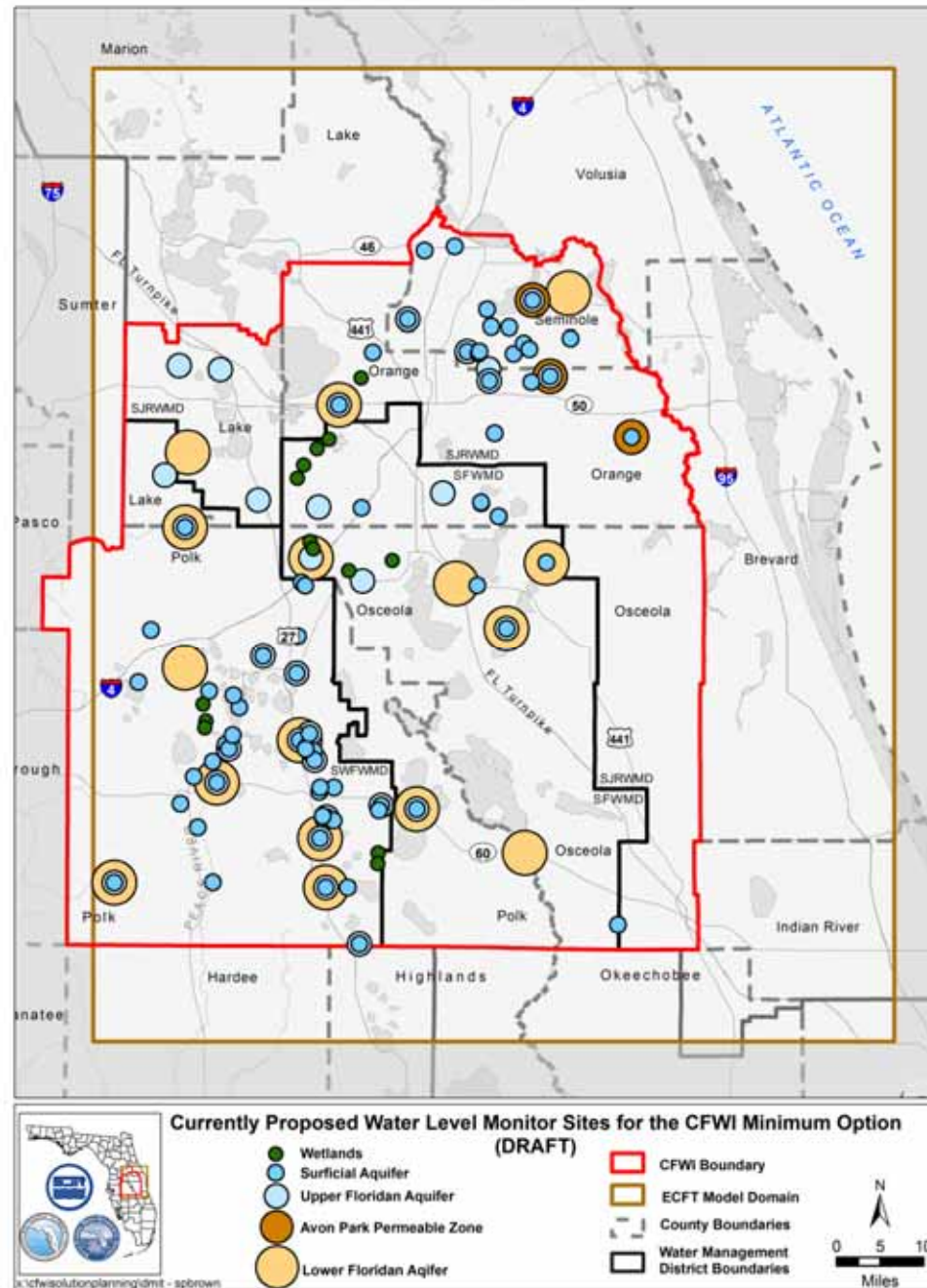
Thank You...
David MacIntyre, AquiSciTech

More information:
ASCE Water Resources Seminar
April 8, 2016
Orlando, FL

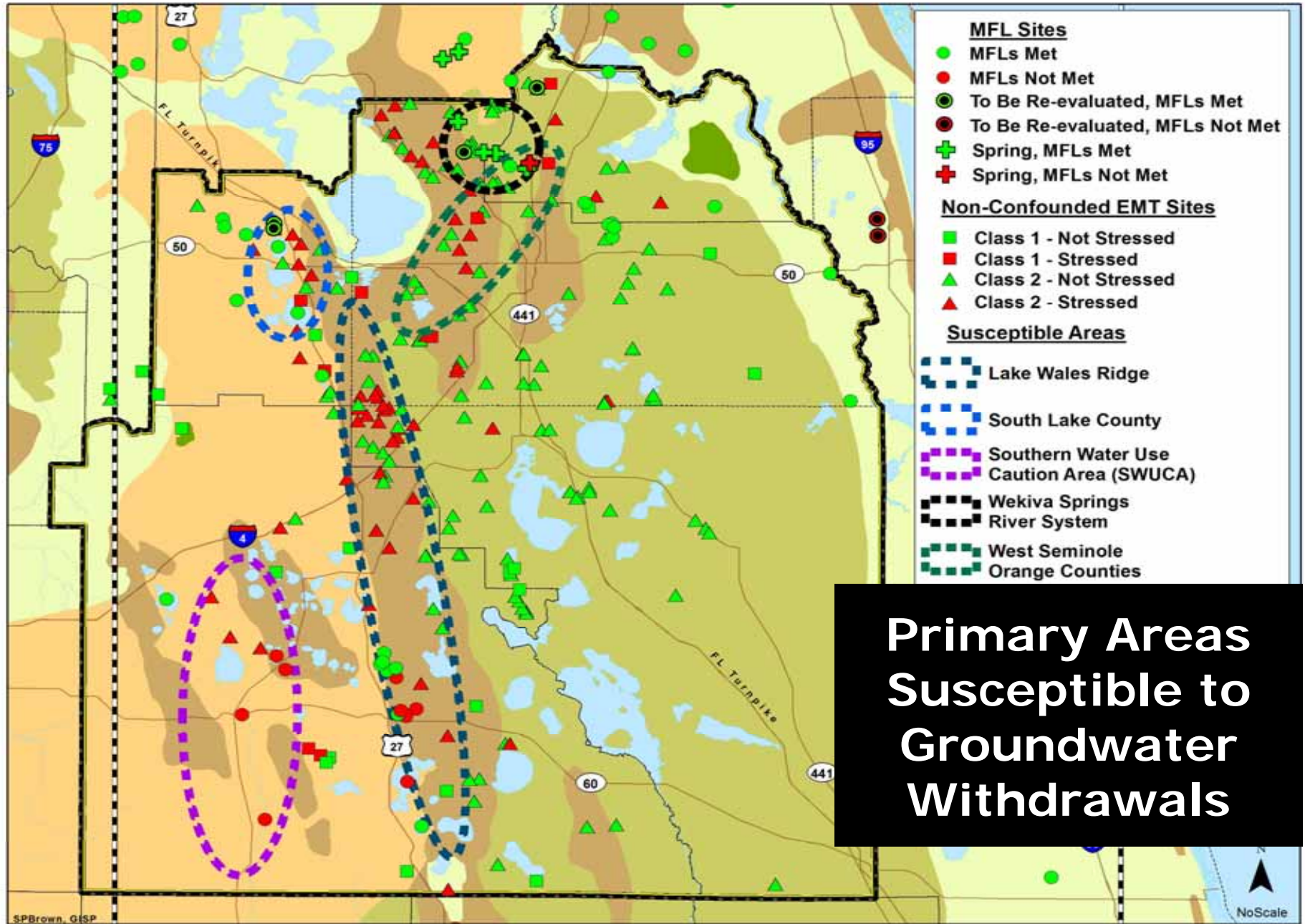
Central Florida Water Initiative

Data, Monitoring & Investigations

- 5 year plan
- “Minimum” recommendations
 - Lower/upper Floridan
 - Surficial
 - Wetlands



Central Florida Water Initiative



**Primary Areas
Susceptible to
Groundwater
Withdrawals**

Water Resource Assessment Technical Team

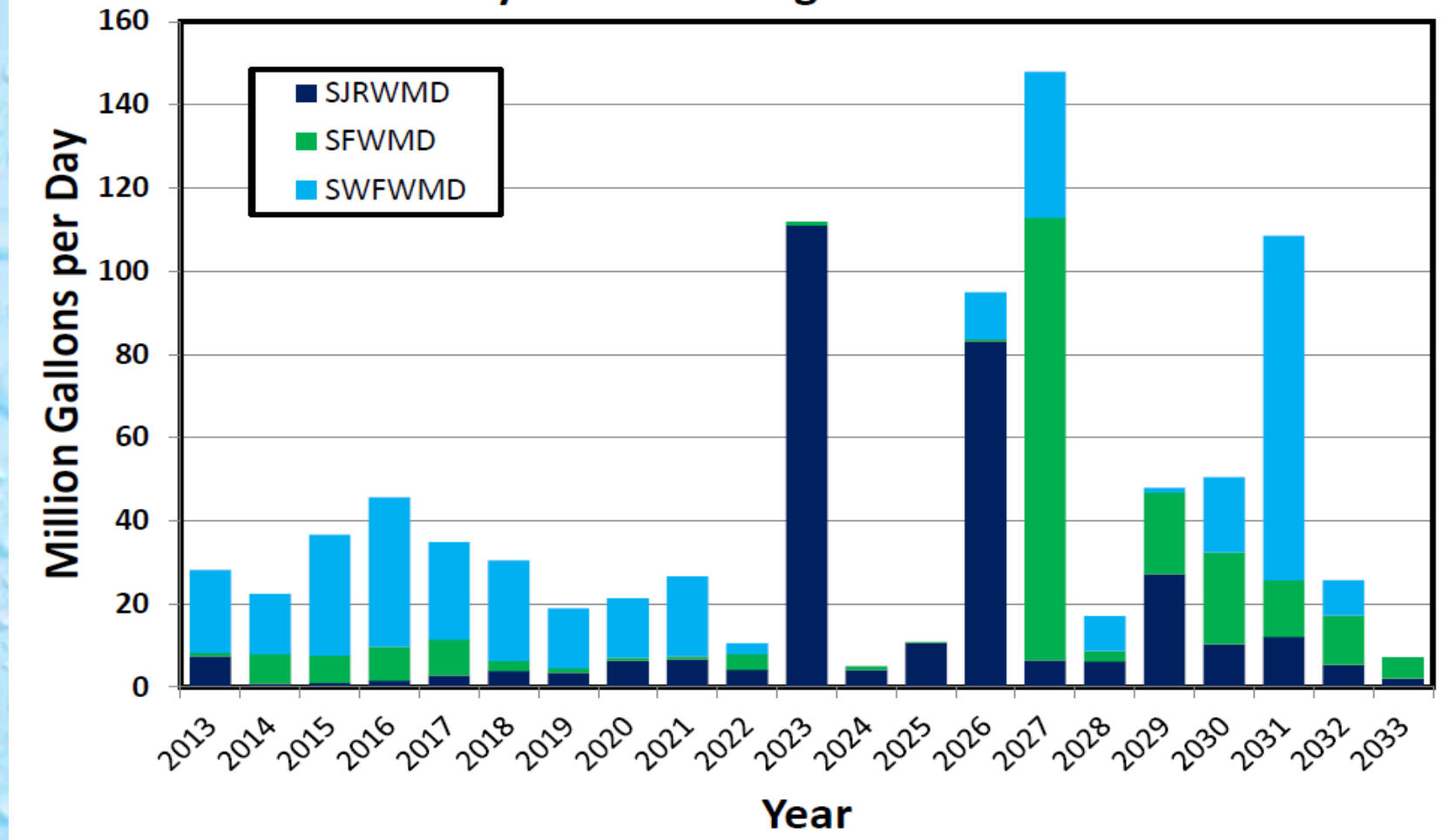
- Team Leader: Mark Hammond (SWFWMD)
- Scope of Work (see Guidance Document)
- Schedule
 - W2 – Progress of ECFT model update
 - The Hydrologic team will:
 - 1) Begin calibration by **August 2016**
 - 2) Complete calibration by **June 2017**
 - 3) Finalize model documentation and peer review by **November 2017**
 - W3 – Progress DMIT Workplan
 - The DMIT will: 1) Provide annual status report on the Five Year Work Plan to the Steering Committee **by July of each year.**
 - W4 2015 CFWI Plan “next steps”
 - Report progress to MOC each year **by April.**
 - W5 – Support other Collaborative Technical Teams
 - Report to MOC **by January** of each year regarding proposed activities.

Regulatory Team

Support CFWI 2020 Guiding Principle three to “establish consistent rules and regulations for the three water management districts that meet the Collaborative Process Goals and implement the results of this Central Florida Water Initiative,” consistent with the statutory directive for the development of uniform rules for application within the CFWI in s. 373.0465(2)(d), F.S.

Central Florida Water Initiative

Permitted Groundwater Allocations up for Renewal in CFWI by Water Management District



Regulatory Technical Team

- Team Leader: Len Lindahl (SFWMD)
- Scope of Work (see Guidance Document)
- Schedule
 - The RT will provide products to the MOC and TOC in accordance with 2020 RWSP and **legislatively mandated timeframes**
 - Determine conceptual approach for rule options for each topic - **June 1, 2016**
 - Provide initial draft rule language options for each topic – **October 1, 2016**
 - Publish Notice of Rule Development for CFWI rules (DEP) - **December 31, 2016**

DRAFT

CFWI 2020 Funding Principle

- #4- Encourage funding for regional strategies necessary to achieve the objectives of the CFWI

Final funding decisions will be by the Managing Entity, the Governing Board(s) of the individual Water Management District(s) involved in the effort, the Governor's Office and/or the Florida Legislature.

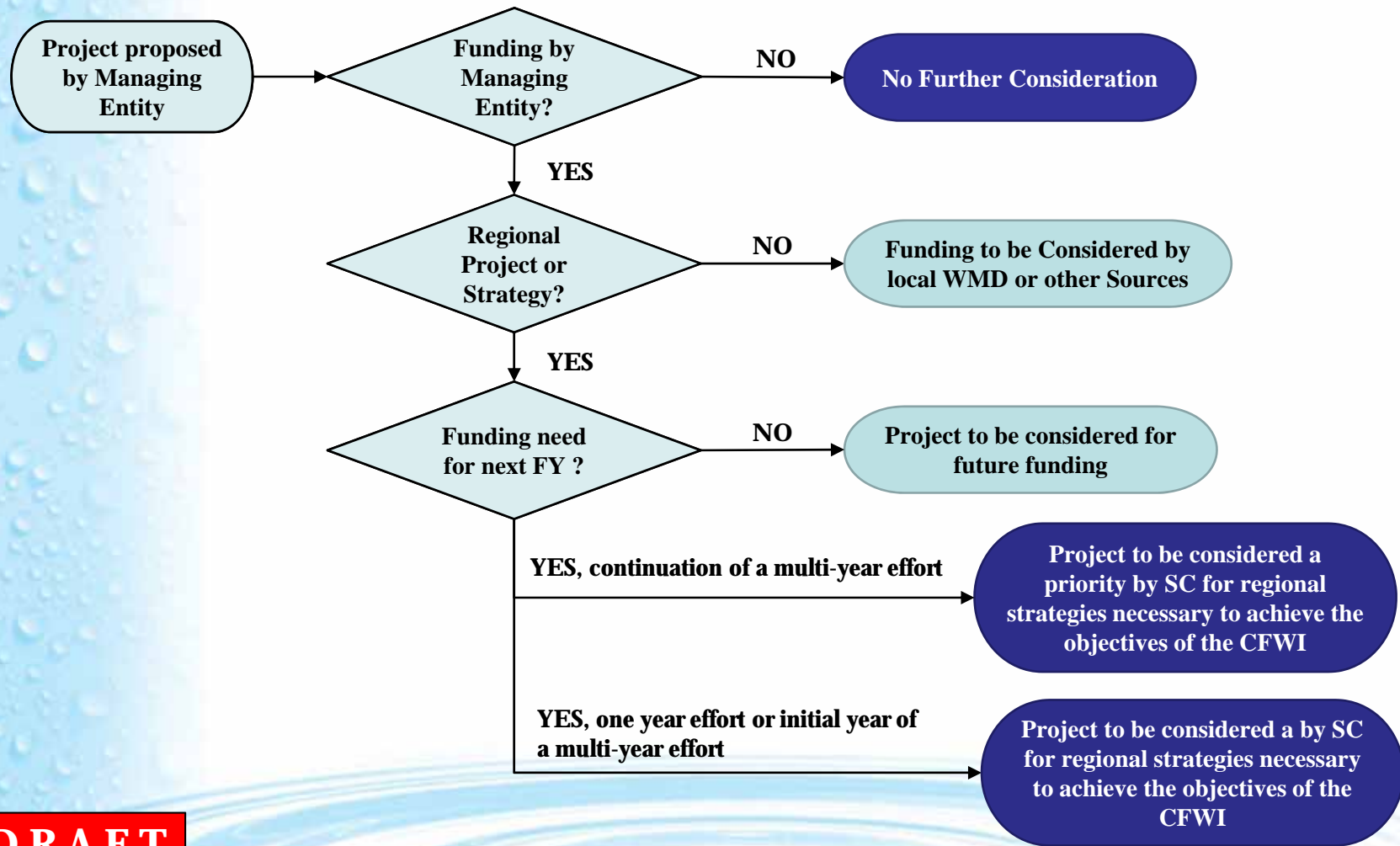
Central Florida Water Initiative

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Central Florida Water Initiative

Potential process to encourage State funding for regional strategies necessary to achieve the objectives of the CFWI



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State Funding Schedule

DRAFT

- Steering Committee Meeting April 1, 2016
 - Process Review and Guidance
- Projects & Programs Submitted by Managing Entities to MOC by May 1, 2016
- Steering Committee Meeting July 22, 2016
 - Propose Projects by Managing Entities Reviewed
- **Districts Submit FY 17 Tentative Budgets August 1, 2016***
- Steering Committee Meeting September 2, 2016
 - Final Approval projects to be considered by SC for “encouragement” of the regional strategies necessary to achieve the objectives for FY 17
- **Districts FY 17 Budget Begins Oct 1, 2016***
- Letter sent to FDEP of proposed project priorities for CFWI October 2016
- FDEP Review of Projects & regional strategies necessary to achieve the objectives of the CFWI for FY 17 October 2016
- **FDEP Prepares FY 17/18 Budget October 2016**
- **Districts submit FY 18 Preliminary Budgets January 15, 2017***
- **Committee Meetings December to February 2017**
- **Session Starts March 2017**
- **State FY 17/18 Budget Begins June 2017**

*WMD Governing Board responsibility

Central Florida Water Initiative

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WATER FOR TOMORROW



The basics of water and CFWI

Learn about where your water comes from today and planning for tomorrow.



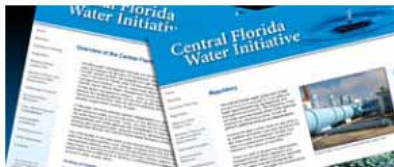
Regional Water Supply Plan

View central Florida's water supply planning documents, including



Meetings and events

Find details about public involvement opportunities.



Steering committee and technical teams

Find information about steering committee, technical teams and



Water conservation

Discover some of the most popular and preferred ways to save water.



Other helpful information

Explore the world of water through related links, publications and videos.

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QUESTIONS?

ADDITIONAL INFORMATION

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