

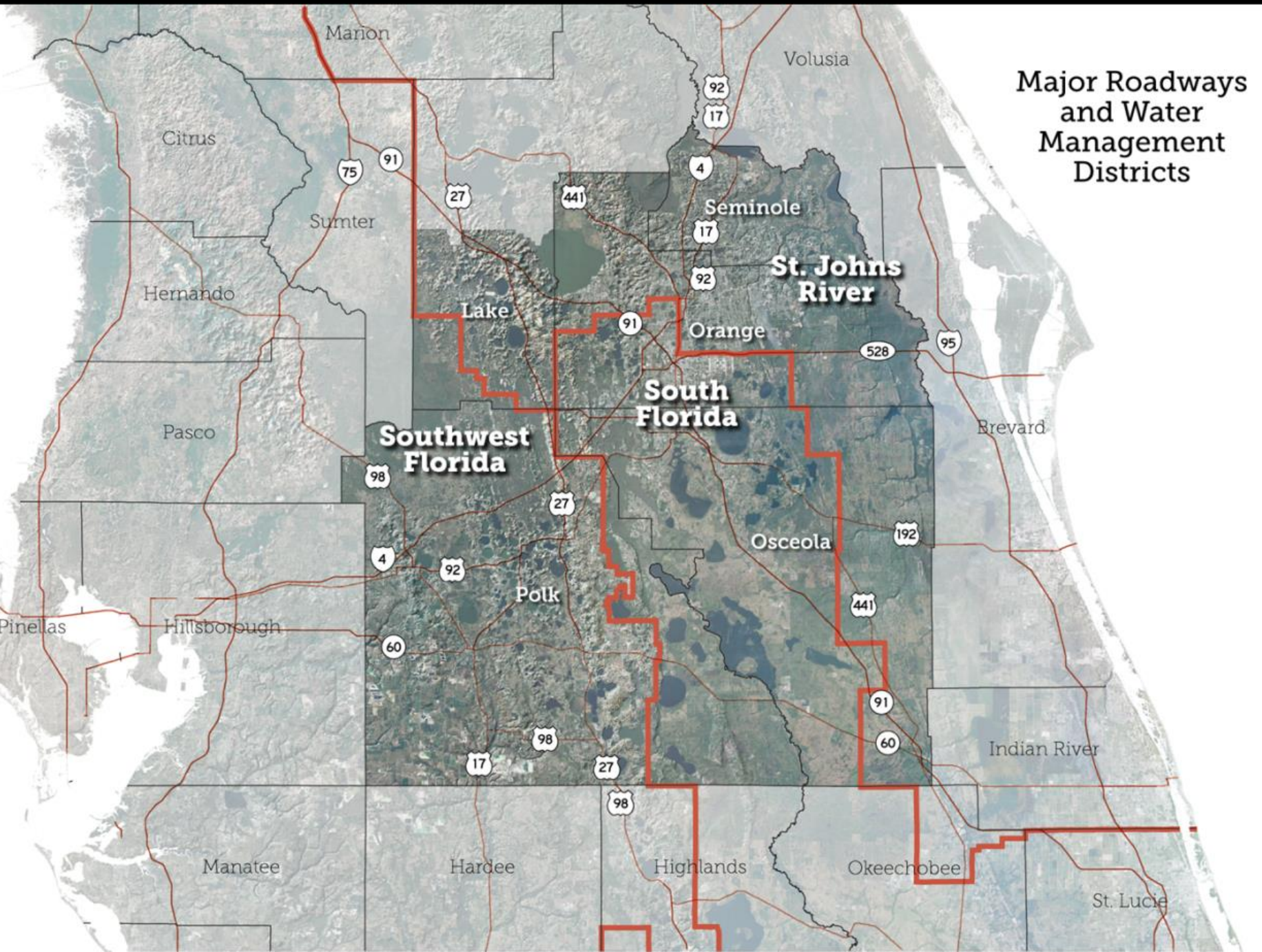
Central Florida Water Initiative (CFWI)

Background and Model Overview

February 2013

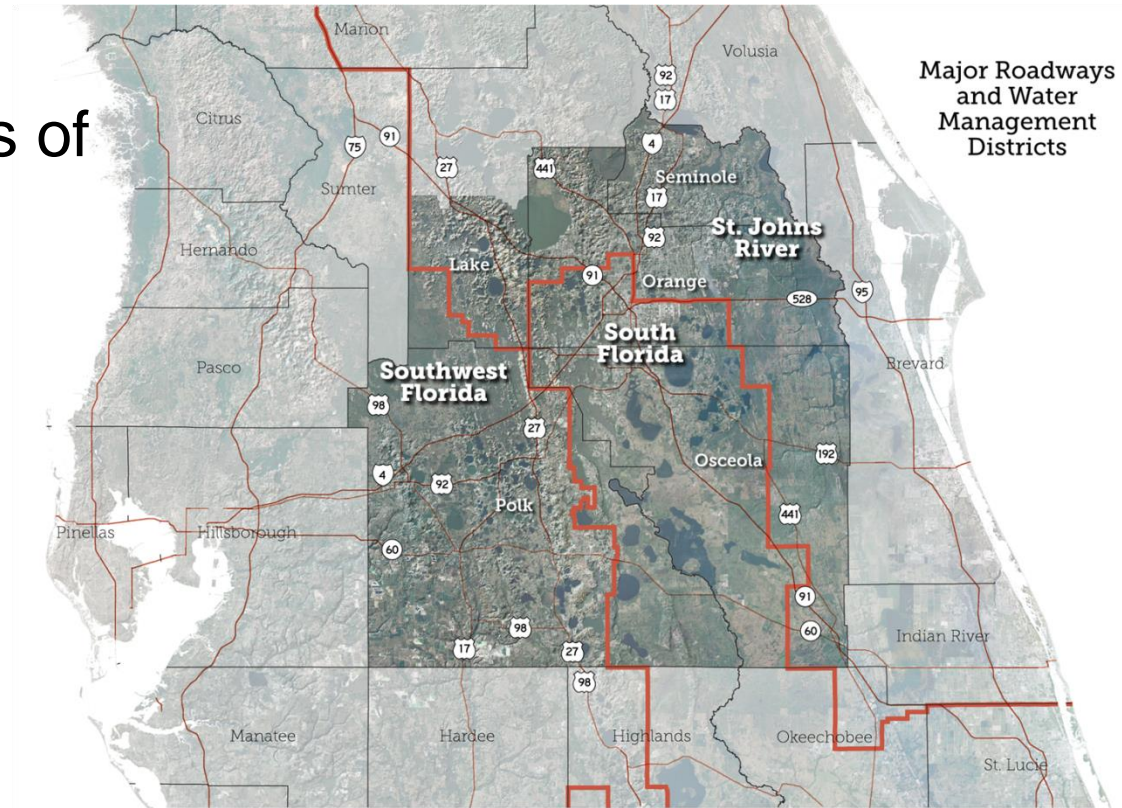
*Presented by Ken Herd, Water Resources Bureau Chief
Southwest Florida Water Management District*

CENTRAL FLORIDA WATER INITIATIVE



Guiding Principles

- Sustainable quantities of groundwater sources
- Strategies to meet future demands
- Consistent rules and regulations



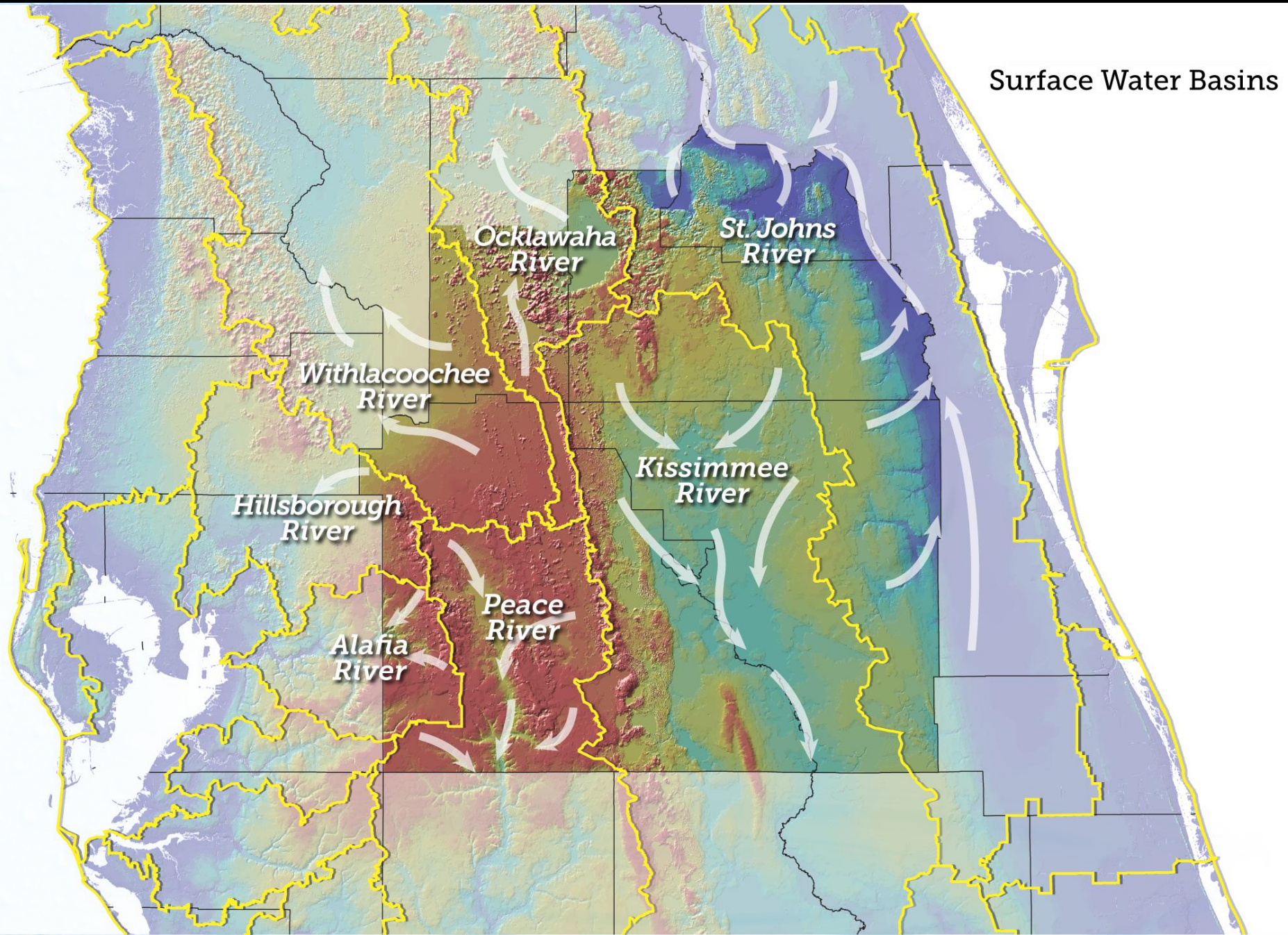
Steering Committee Oversight

- Public Water Supply Utility Representative
- Board Member from 3 Districts
- DEP
- DACS

Technical Teams

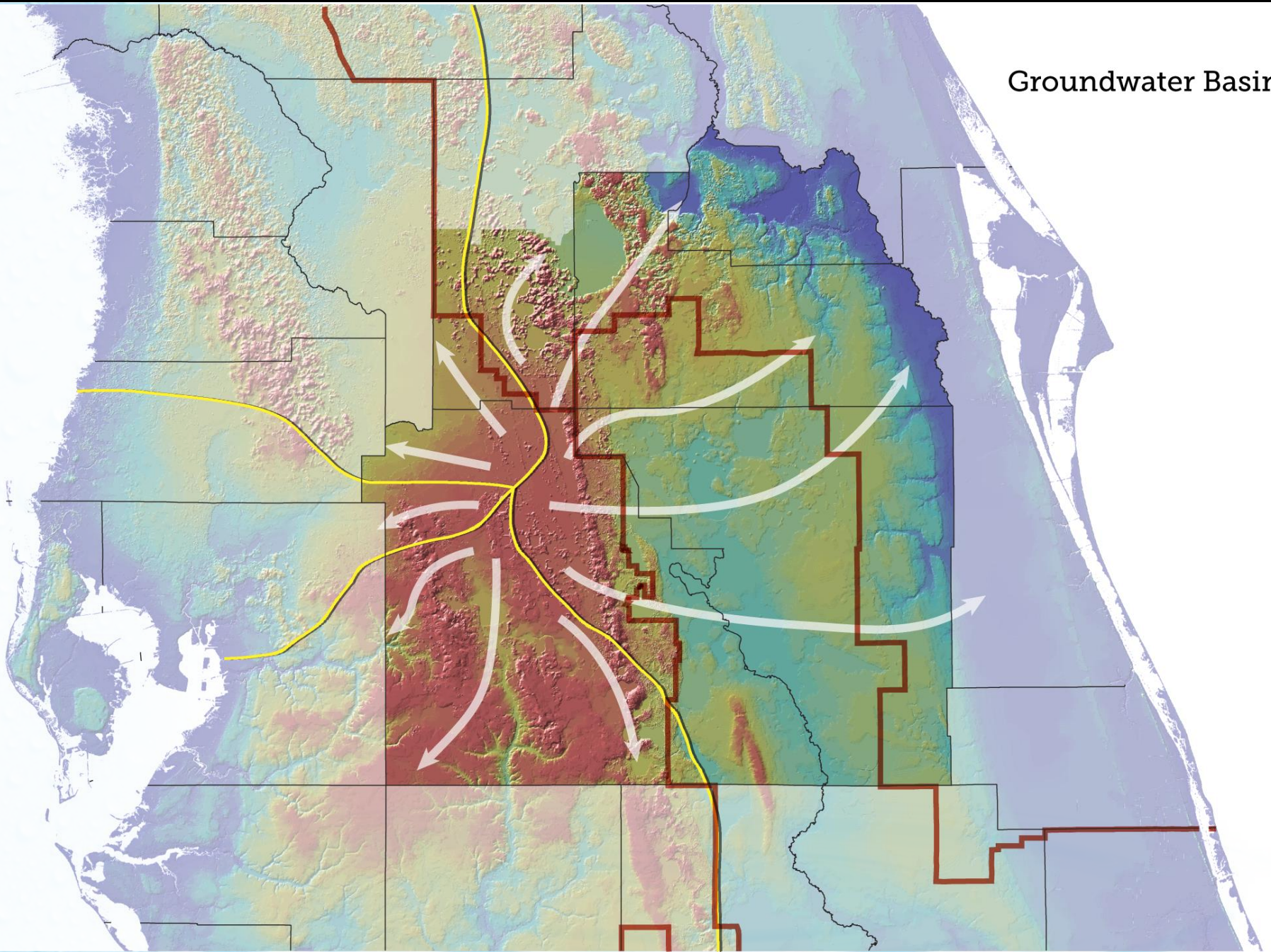
- Environmental Measures
- Hydrologic Analysis
- Minimum Flows and Levels and Reservations
- Data, Monitoring and Investigations
- Groundwater Availability
- Regional Water Supply Plan

CENTRAL FLORIDA WATER INITIATIVE

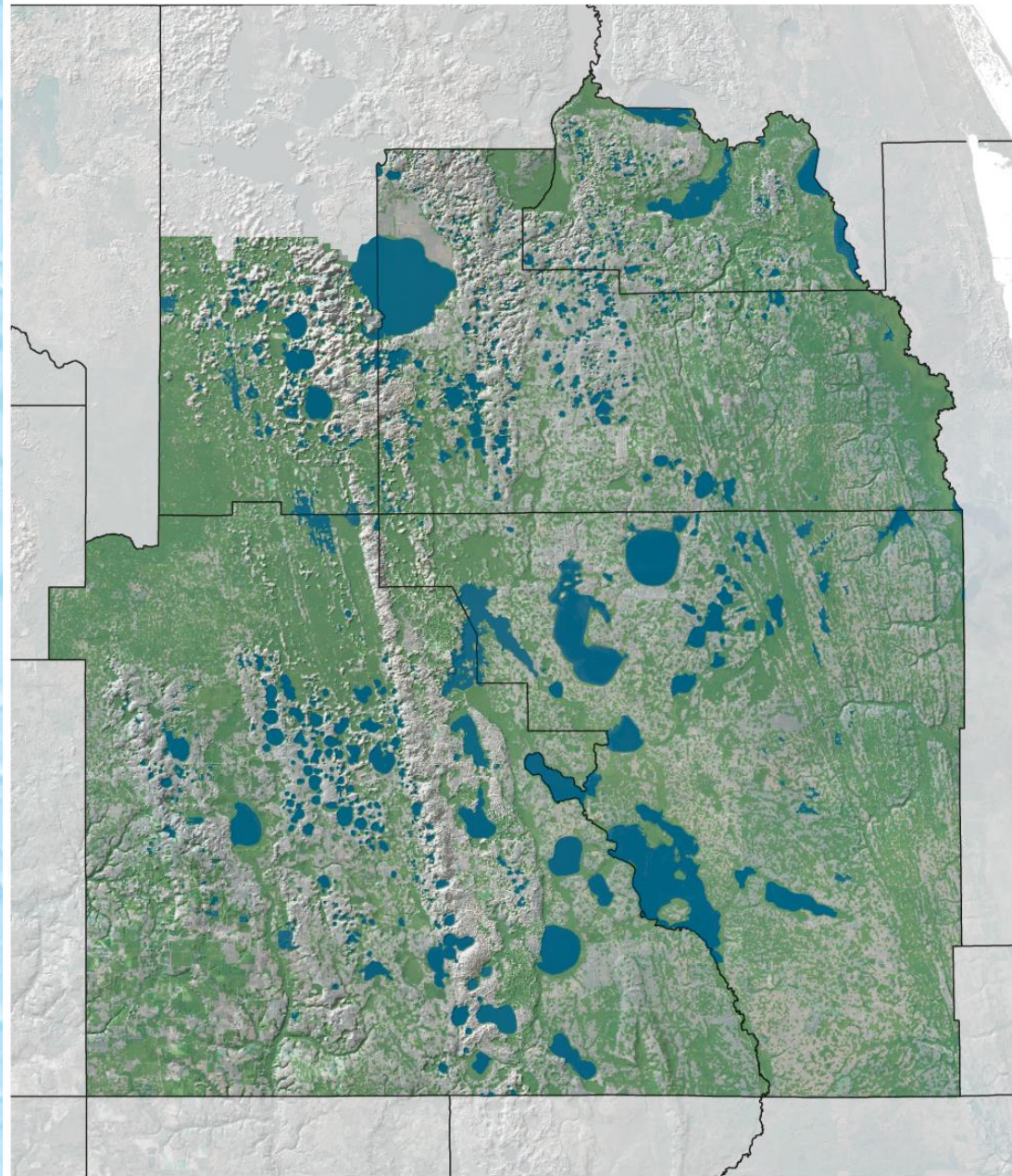


CENTRAL FLORIDA WATER INITIATIVE

Groundwater Basins

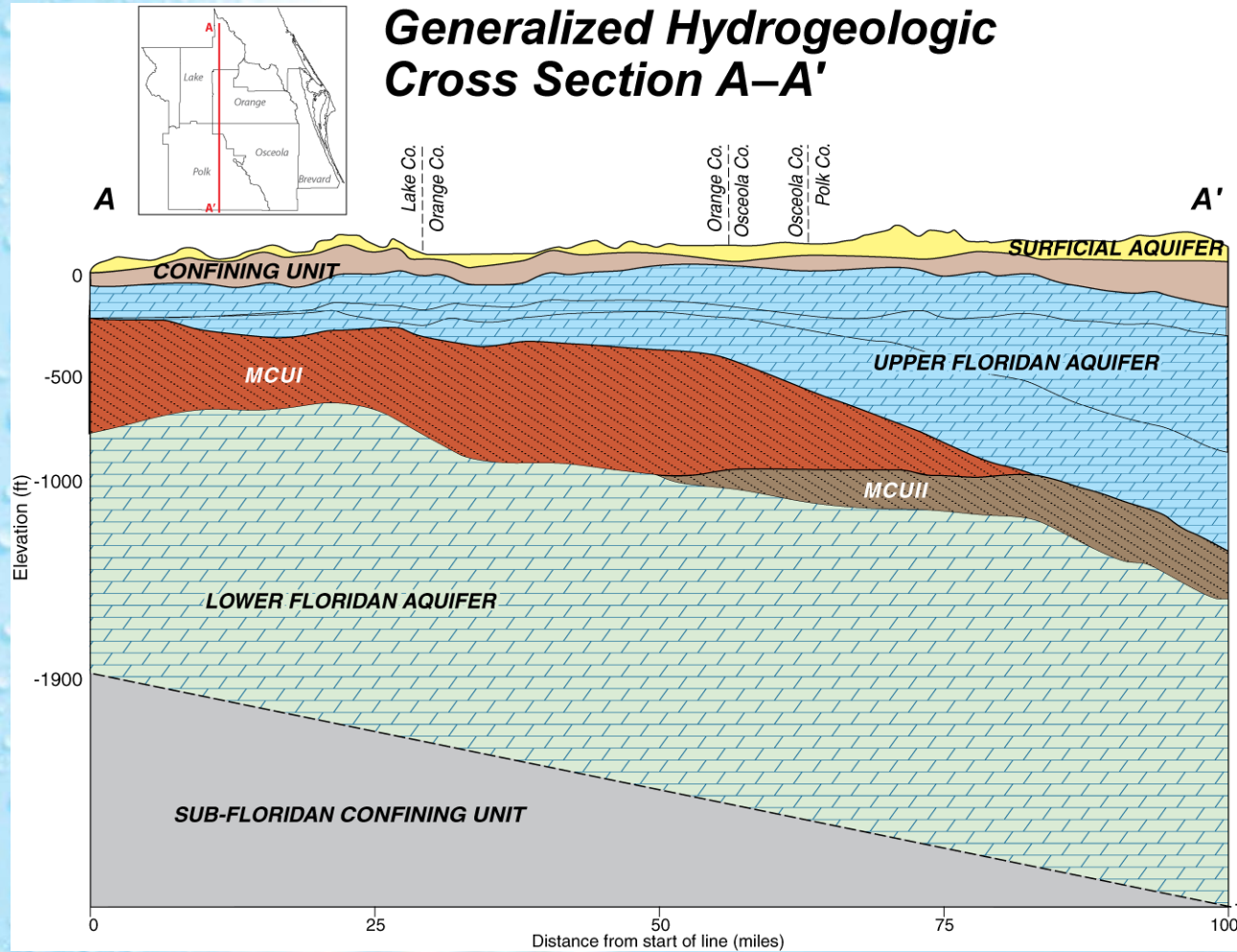


Lakes and Wetlands

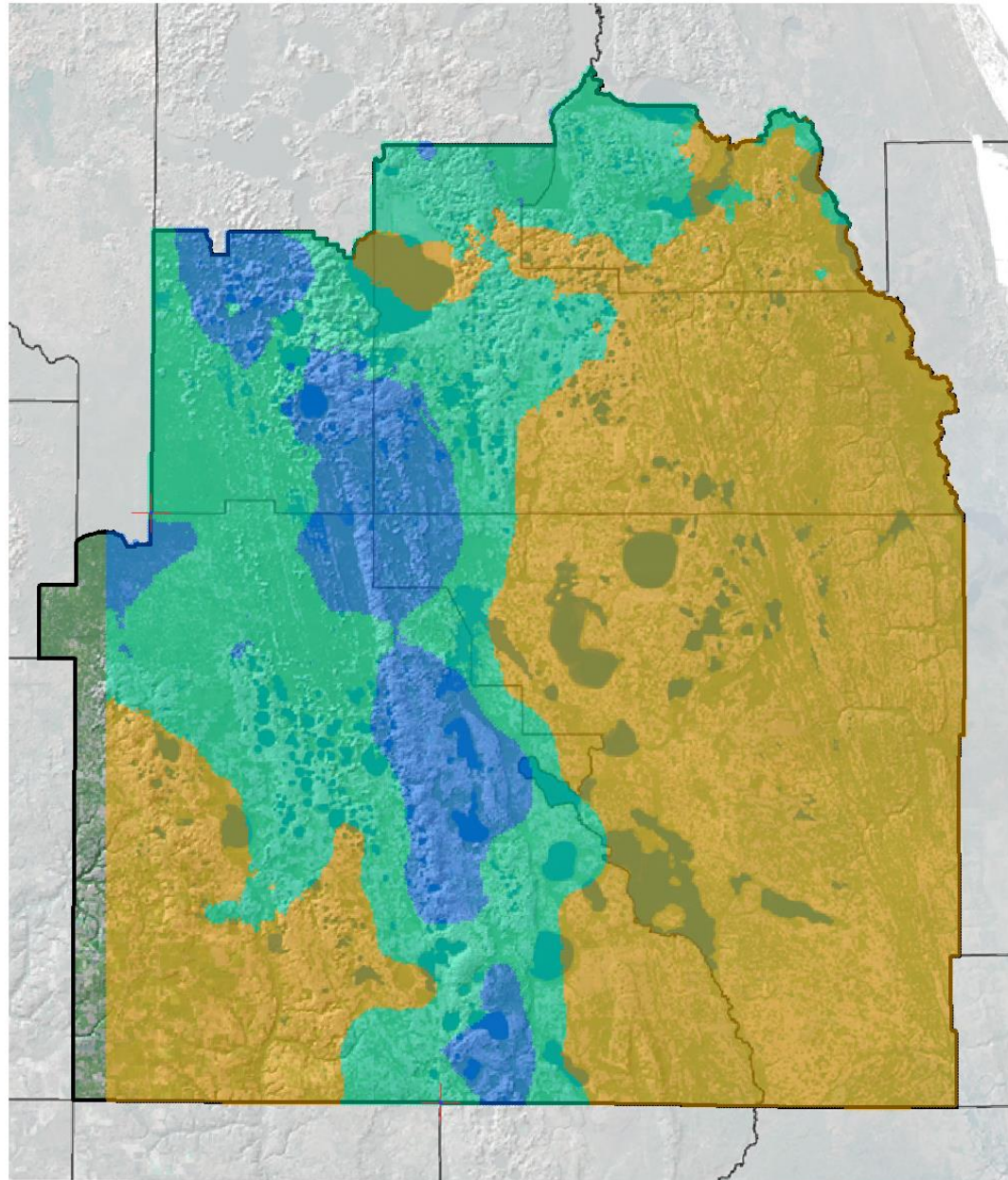


lakes
wetlands

Generalized Hydrogeologic Cross Section A-A'






STRATIGRAPHIC UNIT	LOCAL MODEL LAYER
SURFICIAL DEPOSITS	LAKES, STREAMS, AND SURFICIAL AQUIFER SYSTEM (LAYER 1)
HAWTHORN GROUP	INTERMEDIATE CONFINING UNIT OR INTERMEDIATE AQUIFER SYSTEM (LAYER 2)
SUWANNEE LIMESTONE	SUWANNEE/OCALA PERMEABLE ZONE (LAYER 3)
OCALA LIMESTONE	OCALA LOW PERMEABLE ZONE (LAYER 4)
AVON PARK FORMATION	AVON PARK PERMEABLE ZONE (LAYER 5)
	MIDDLE CONFINING UNIT I OR MIDDLE CONFINING UNIT II (LAYER 6)
OLDSMAR FORMATION	LOWER FLORIDAN AQUIFER (LAYER 7)
CEDAR KEYS FORMATION	SUB-FLORIDAN CONFINING UNIT (LOW PERMEABILITY)



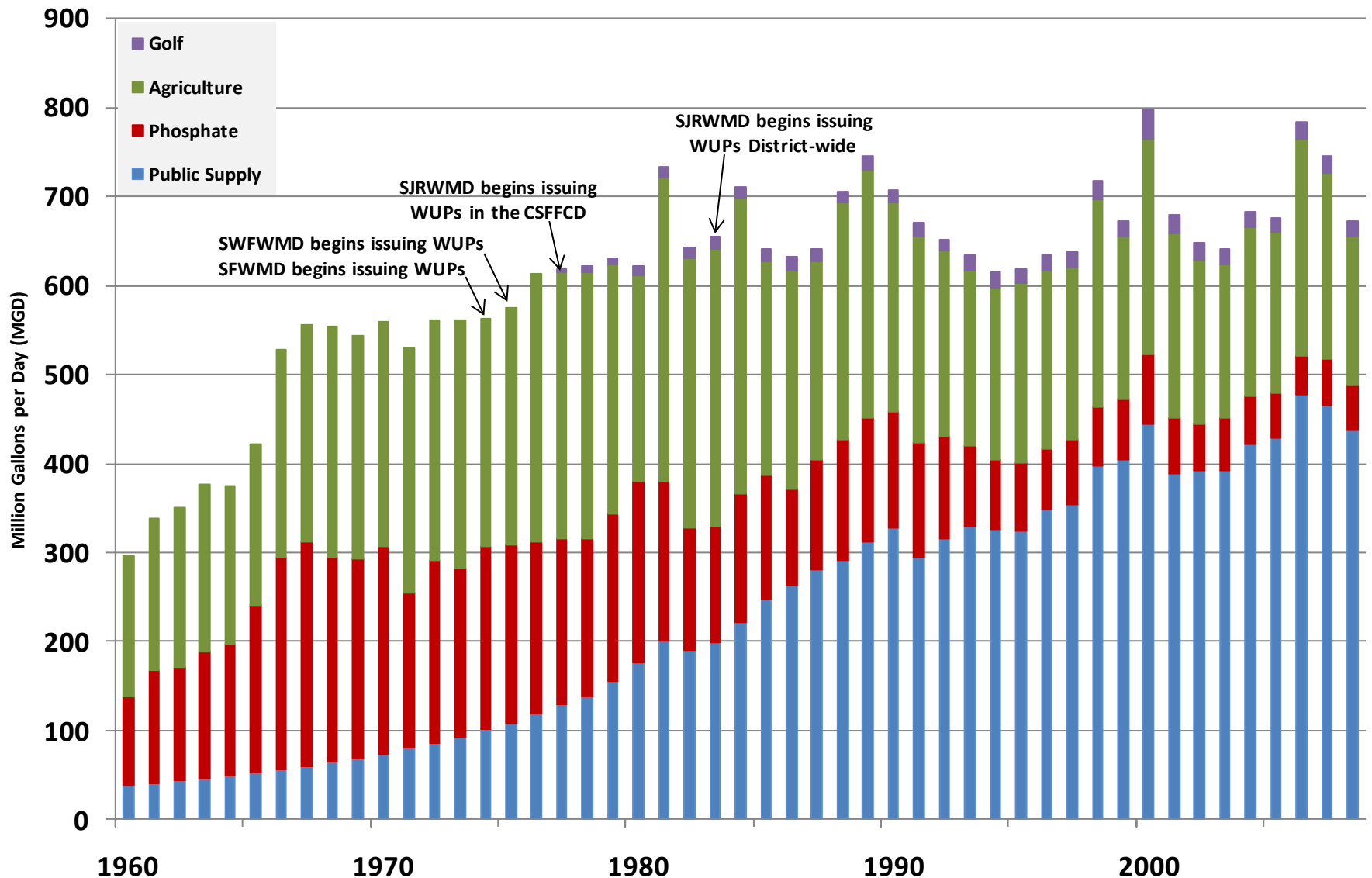
**Generalized Map Showing
Relative Areas of
Susceptibility of Surficial
Features to Lowering of
Groundwater Levels**

(Based on generalized
hydraulic properties of the
intermediate confining unit)

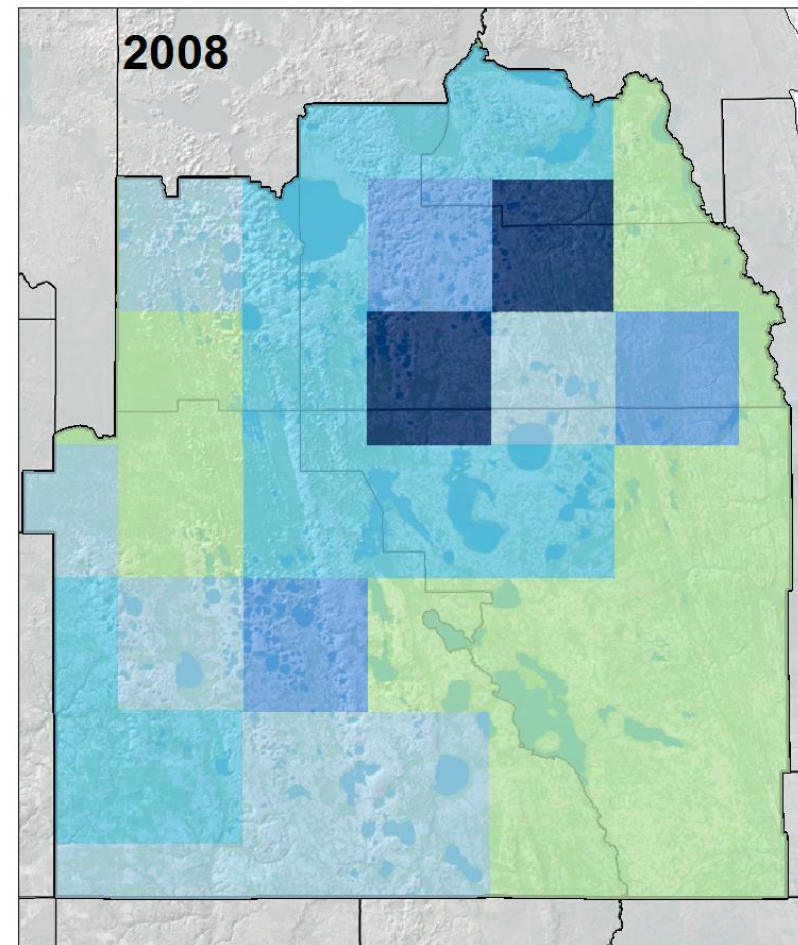
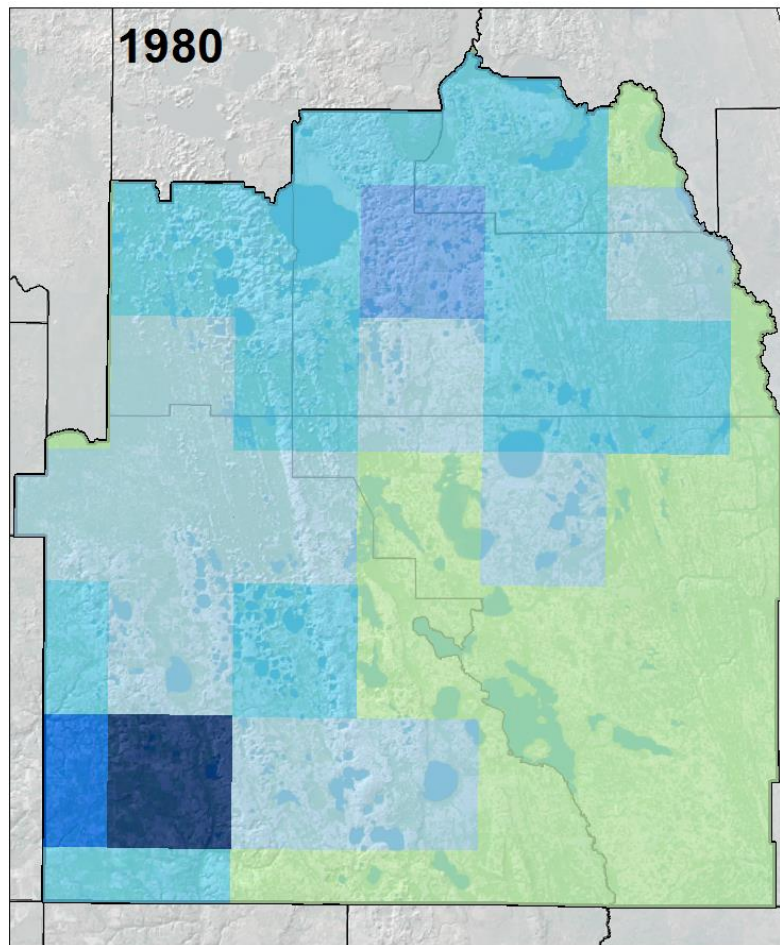
-  Least Susceptible
-  Moderately Susceptible
-  More Susceptible

Estimated Groundwater Use in Central Florida Area

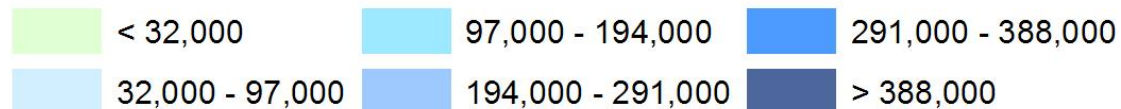
(Includes area adjacent to the CFWI area)



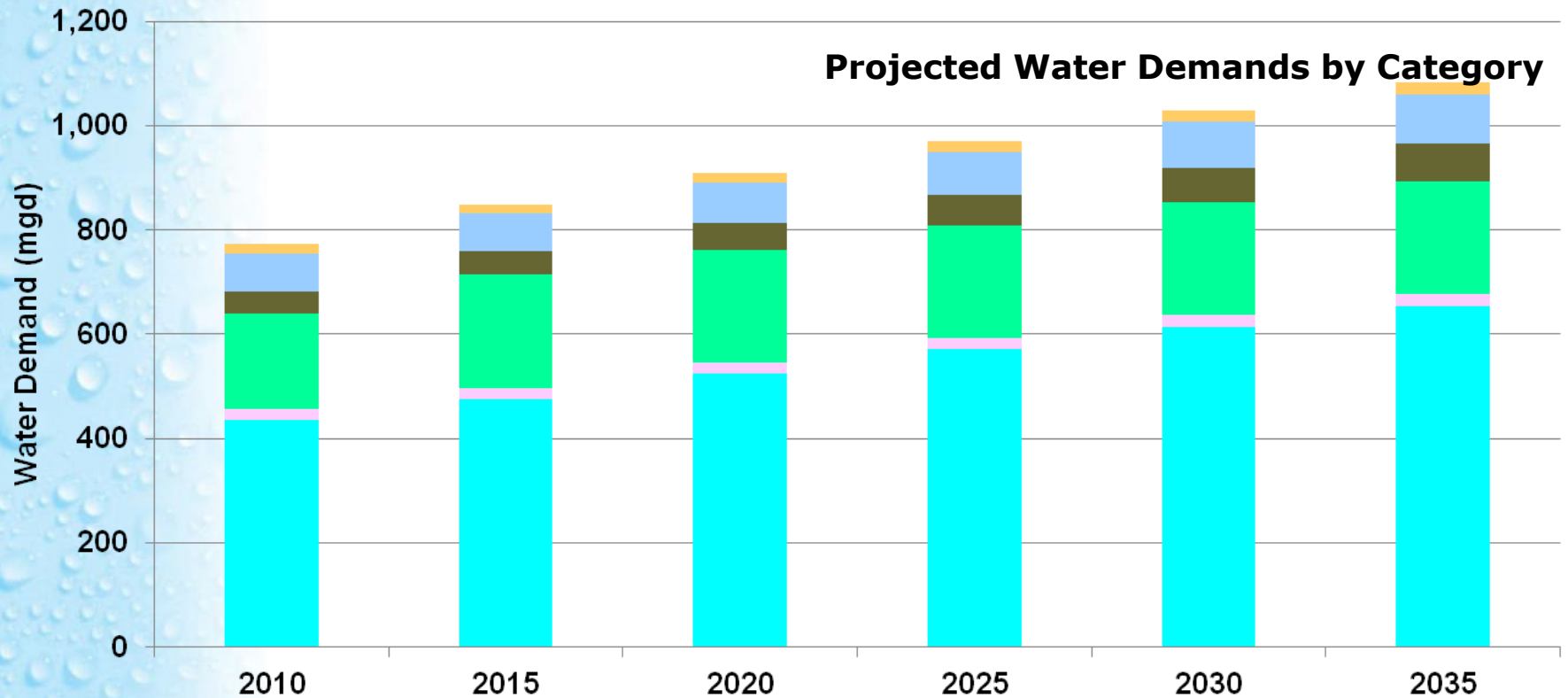
Generalized Map of Historical Groundwater Withdrawals



Withdrawals in Gallons per Day per Square Mile



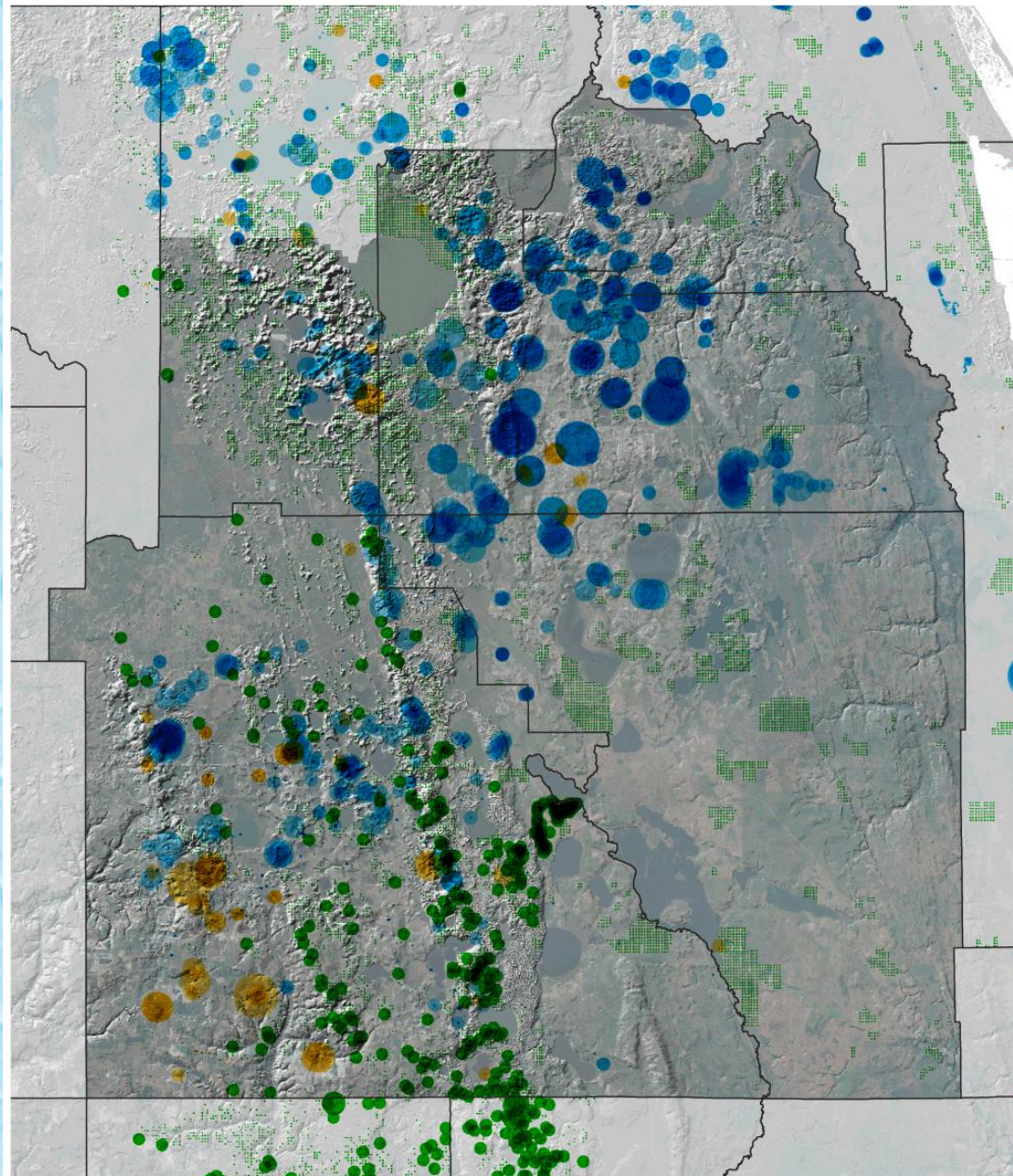
Water Demand



- Public Supply
- Domestic Self-supply and Small Utilities
- Agriculture
- Landscape / Recreational / Aesthetic
- Commercial / Industrial / Institutional and Mining / Dewatering
- Power Generation

Water Demands by Category

Category	Demand Projections						2010-2035 (5-in-10) Change
	2010	2015	2020	2025	2030	2035	
Public Supply	435.15	476.36	524.56	571.39	614.88	653.27	218.12
Domestic Self-supply and Small Utilities	20.36	20.22	20.75	21.92	23.13	24.42	4.06
Agriculture	185.24	218.78	217.24	216.09	215.30	214.84	29.60
Landscape / Recreational / Aesthetic	40.21	44.78	51.05	57.54	64.31	72.18	31.97
Commercial / Industrial / Institutional and Mining / Dewatering	74.05	71.47	76.74	82.82	89.29	95.85	21.80
Power Generation	17.20	17.93	18.93	20.00	21.18	22.41	5.21
Total	772.21	849.54	909.27	969.76	1,028.09	1,082.97	310.76



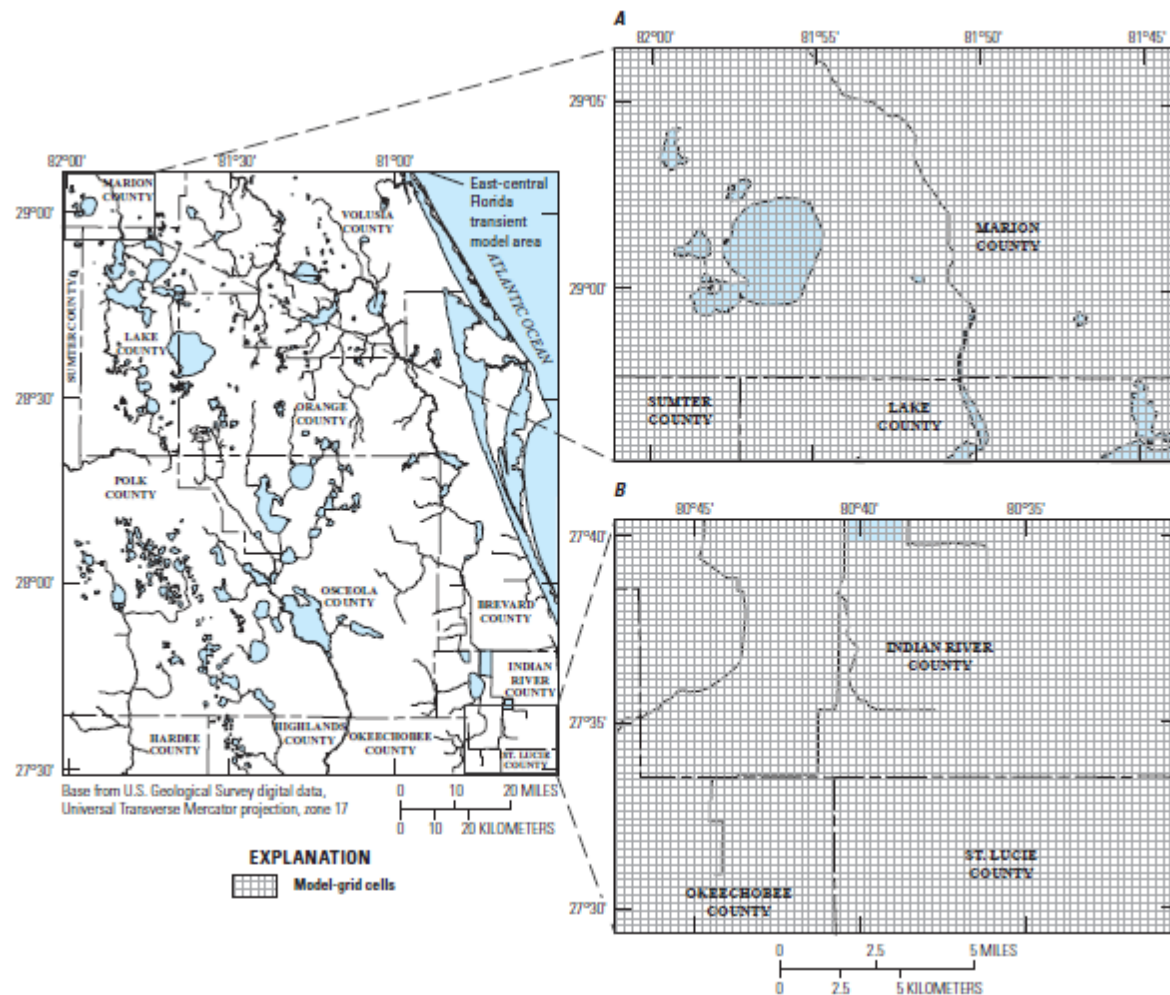
Withdrawal Types 2006 Annual Average

- < 0.1 mgd
- 0.1–0.5 mgd
- 0.5–1 mgd
- 1–3 mgd
- > 3 mgd

- Public Supply
- Agriculture
- Commercial/Industrial

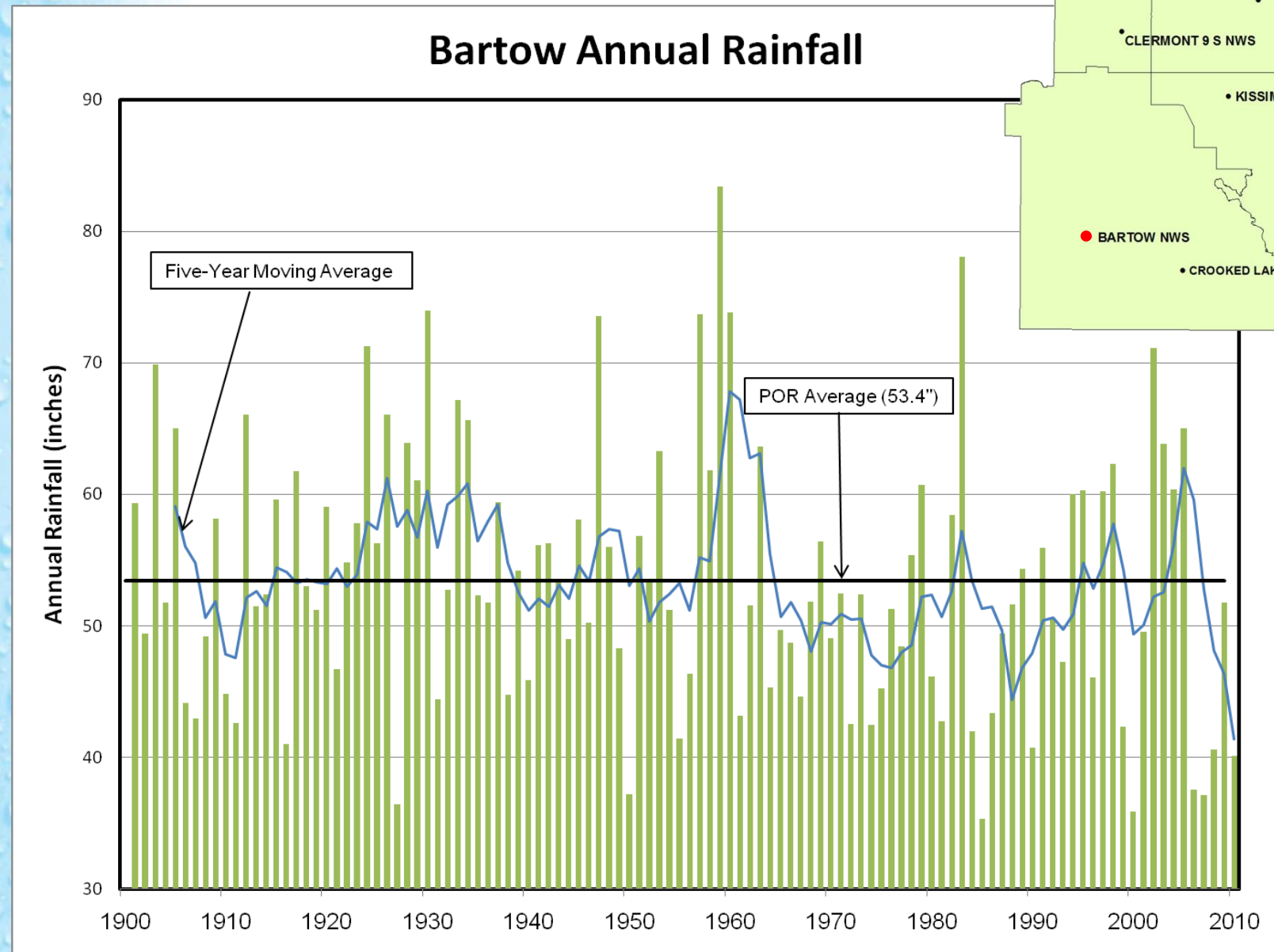
East-Central Florida Transient (ECFT) Groundwater Flow Model

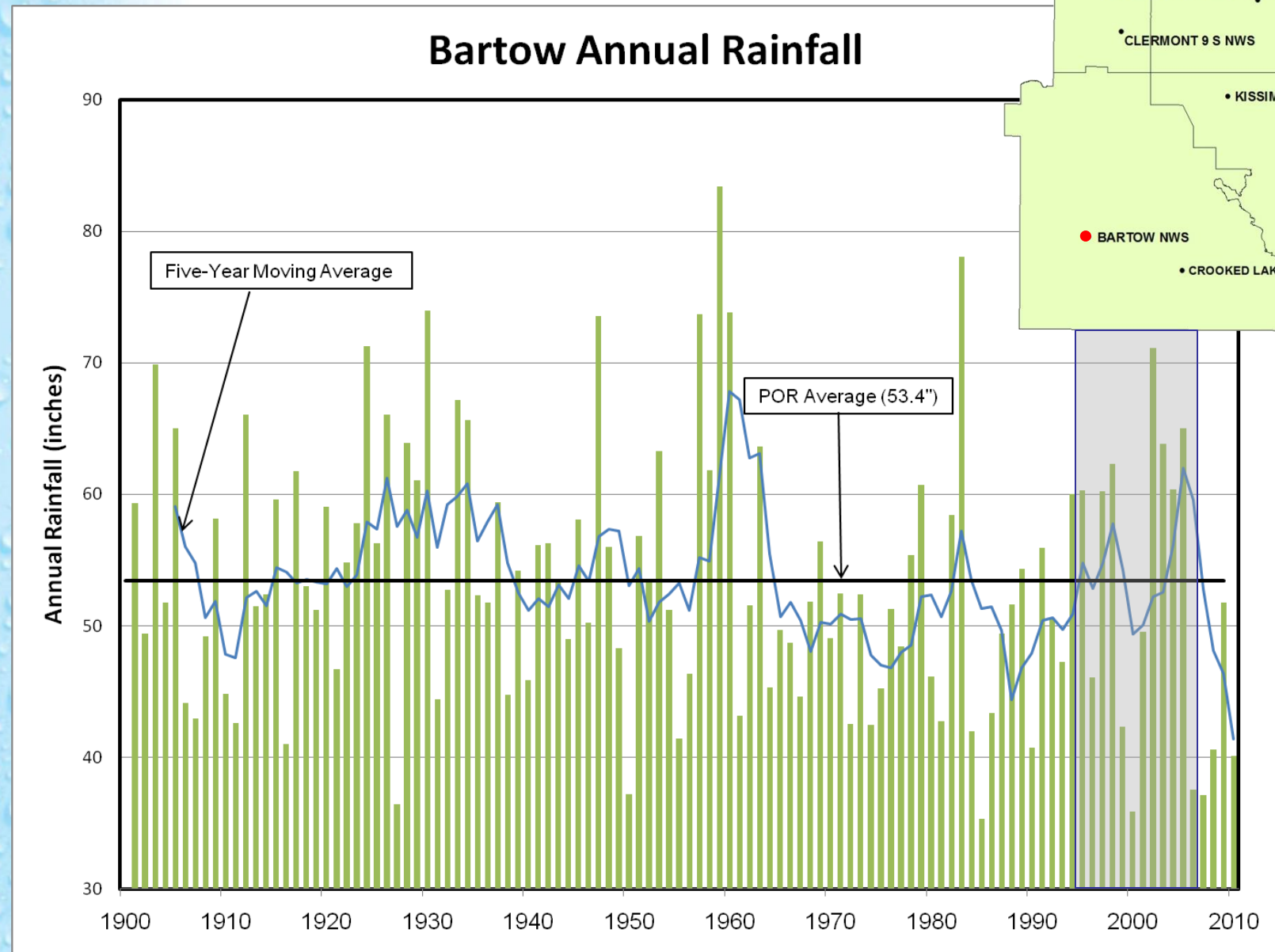
- 9,000 square miles
 - 112 miles north/south
 - 92 miles east/west
- grid spacing – 1,250 ft by 1,250 ft
- 472 rows and 388 columns



Hydrologic Process/Component	General Comment
1. Unsaturated zone	Simulates changes in soil moisture
2. Green-Ampt Infiltration	Calculates runoff and infiltration from daily rainfall and ET
3. Stream Flow	Routes water in streams and receives runoff from the surface and lakes discharging to streams
4. Lakes	Simulates water levels at over 277 lakes
5. ET	Actual ET rates – surface and groundwater ET
6. Fully three dimensional	Simulates groundwater flow in 7 layers
7. Simulates 12 years with varying climatic input	144 monthly stress periods using daily rainfall and ET to define recharge to water table
8. Lateral boundaries	General Head boundaries based on observed heads

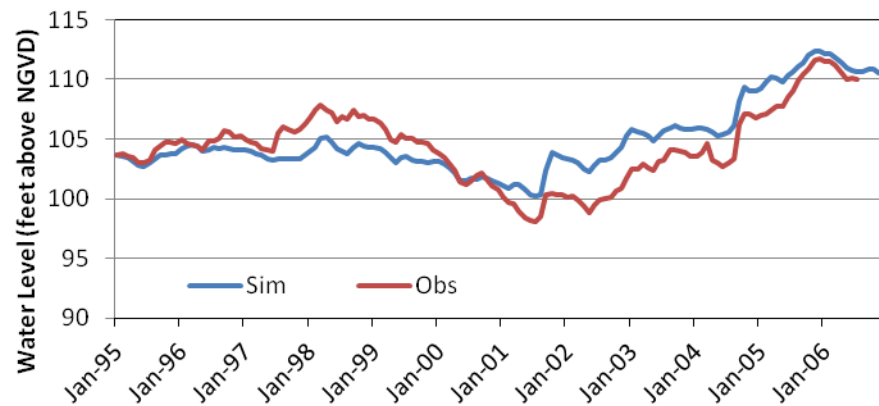
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Example Model Results

**ECFT Model Results:
Lake Wales**



**ECFT Model Results:
ROMP 57X (UFA) at Lake Wales**



CFWI Groundwater Availability Scenarios

- Calibration from 1995 to 2006
- Scenarios include rainfall for 1995 to 2006 and varying withdrawals to service demands
- Current Conditions
 - 1995 demands
 - 2005 demands (Reference Condition)
 - 2006 demands
- Future Conditions
 - End of permit (EOP)
 - 2035 projected demands

Closing Points

- Planning Report – October 2013

Closing Points

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- CFWI model for planning purposes only

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- Future supplies will be from combination of sources

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- Public water supply will have greatest need
- Success will require trust and cooperation
- Regional solutions need to be encouraged

Questions

