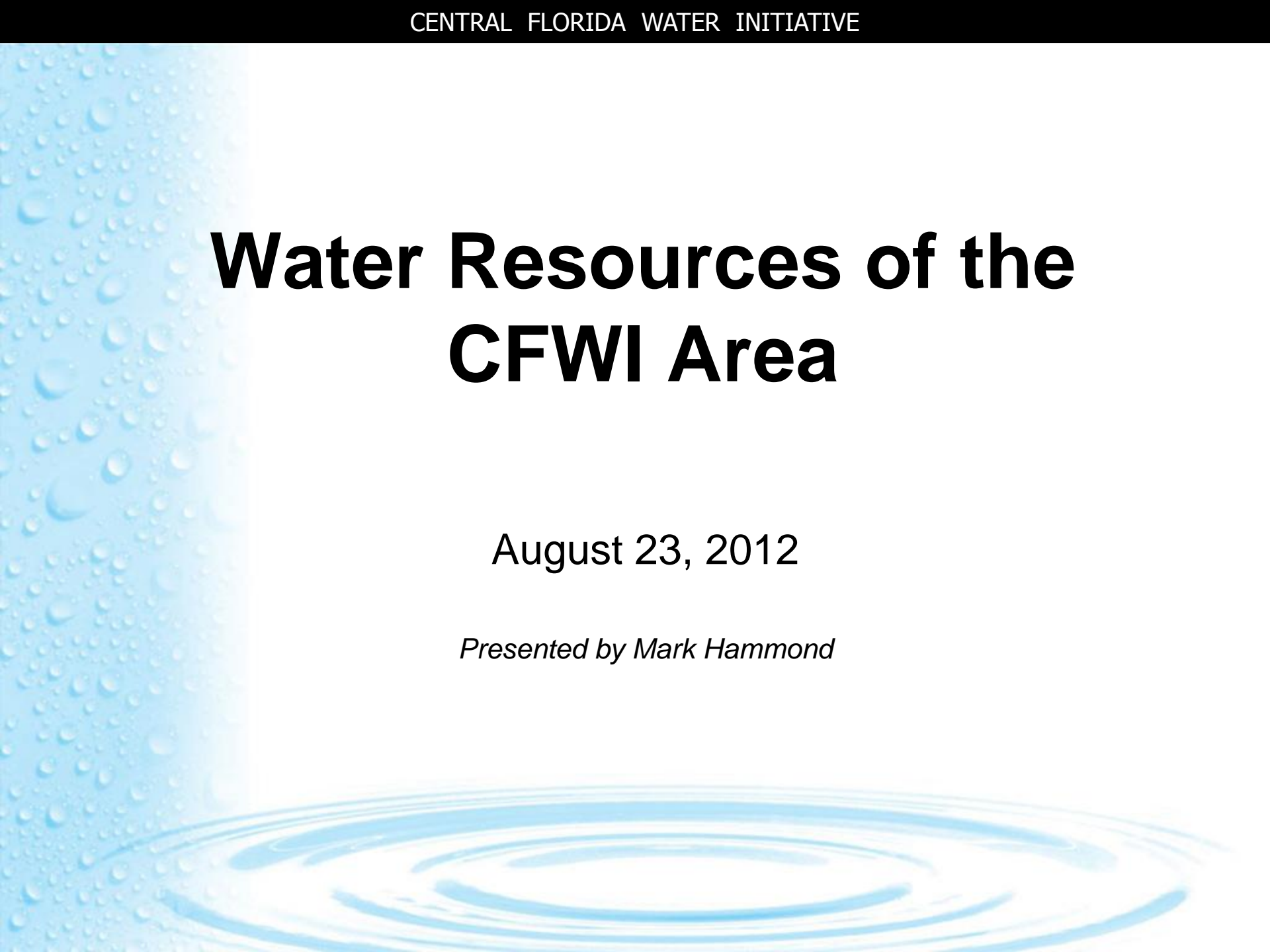


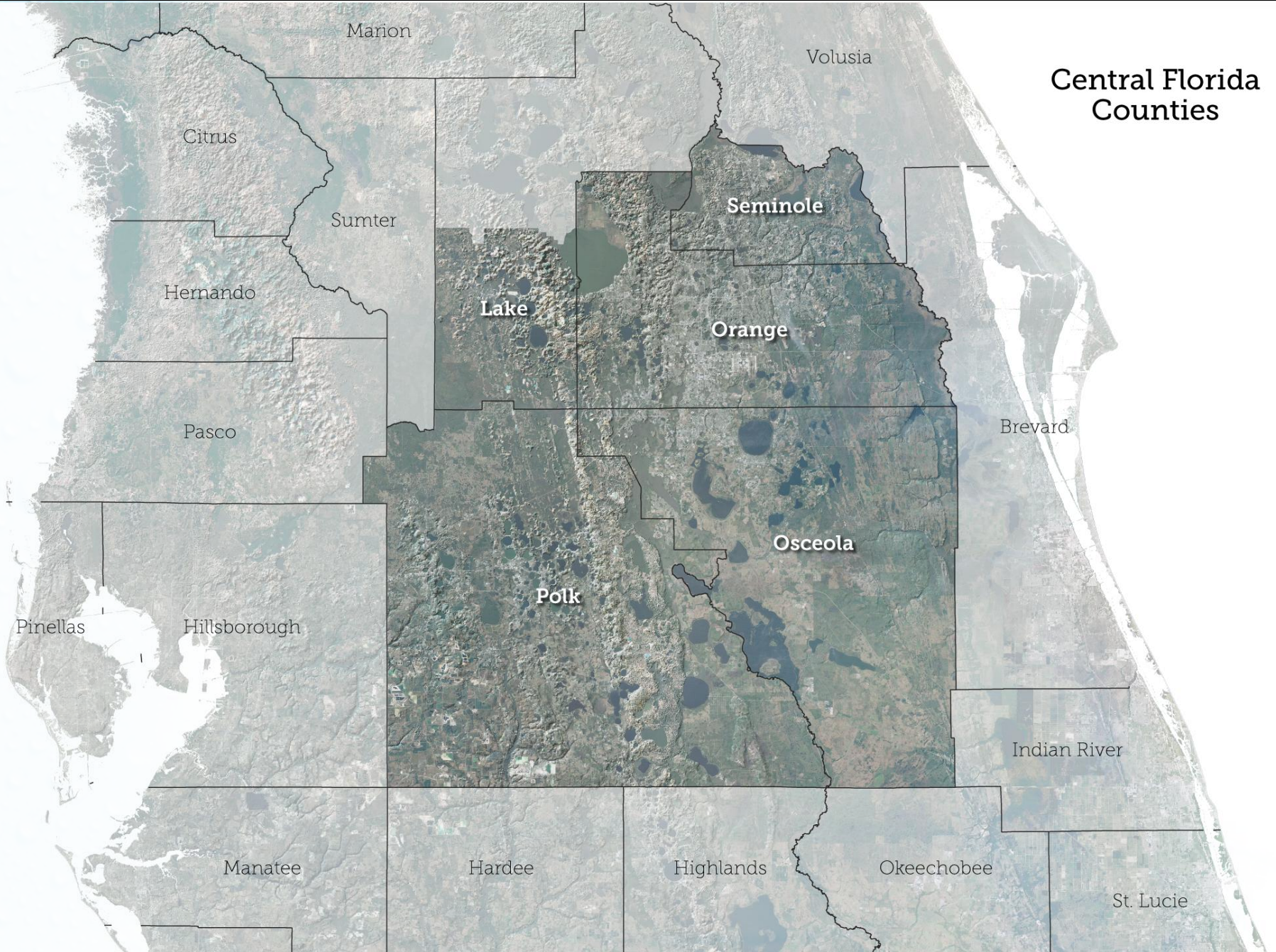
Water Resources of the CFWI Area

August 23, 2012

Presented by Mark Hammond

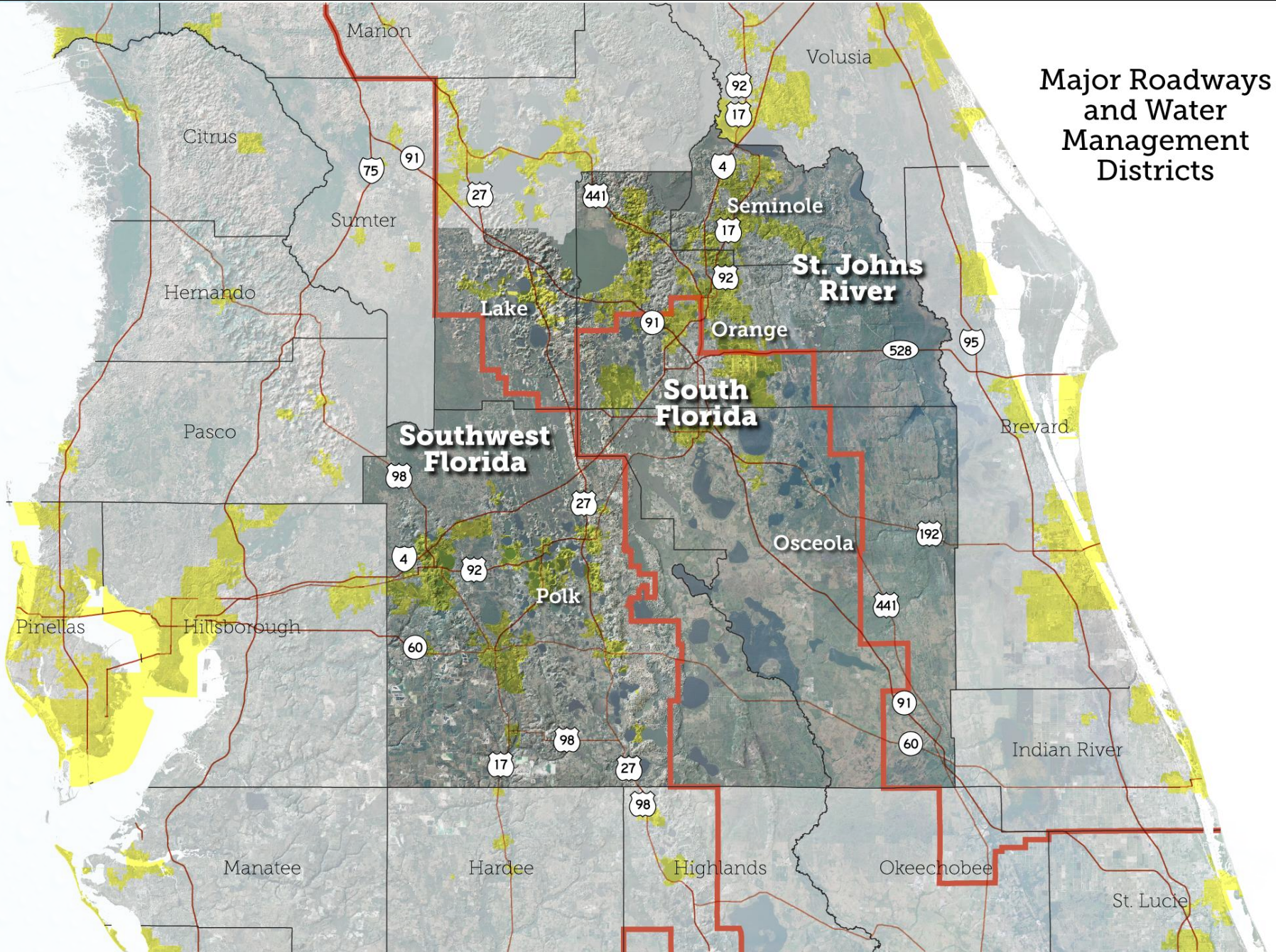


CENTRAL FLORIDA WATER INITIATIVE



Central Florida
Counties

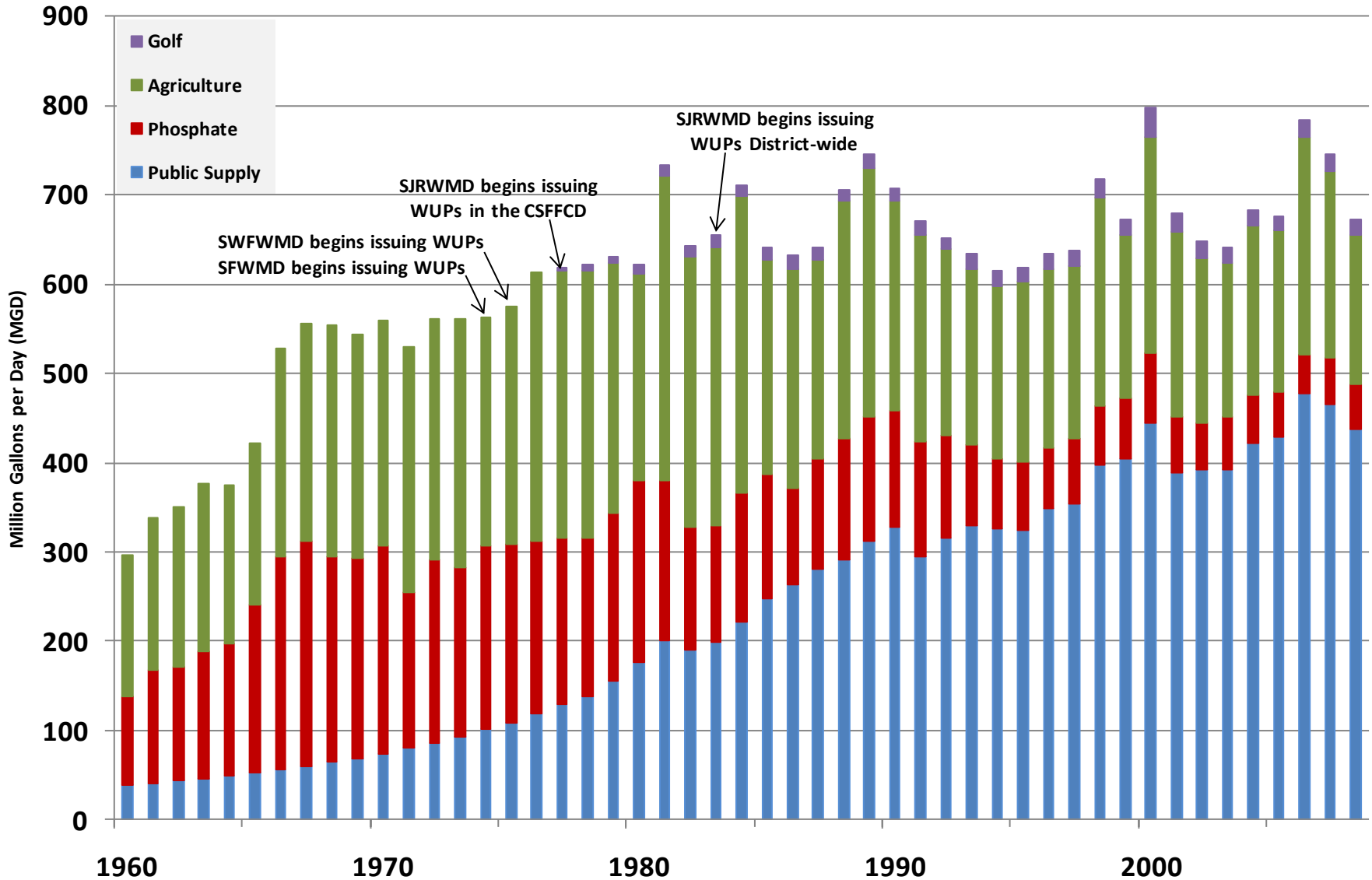
CENTRAL FLORIDA WATER INITIATIVE



Major Roadways
and Water
Management
Districts

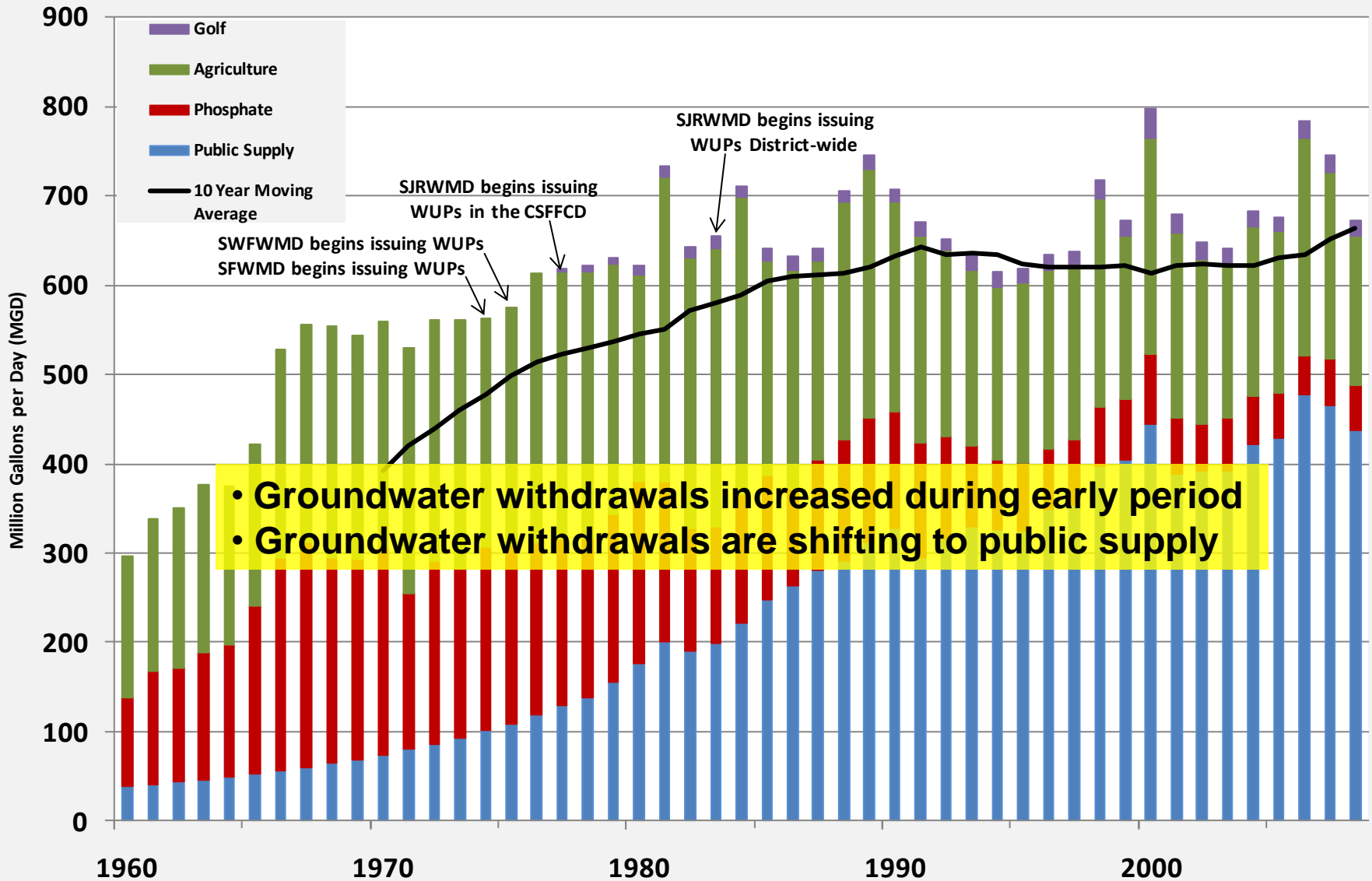
Estimated Groundwater Use in Central Florida Area

(Includes area adjacent to the CFWI area)

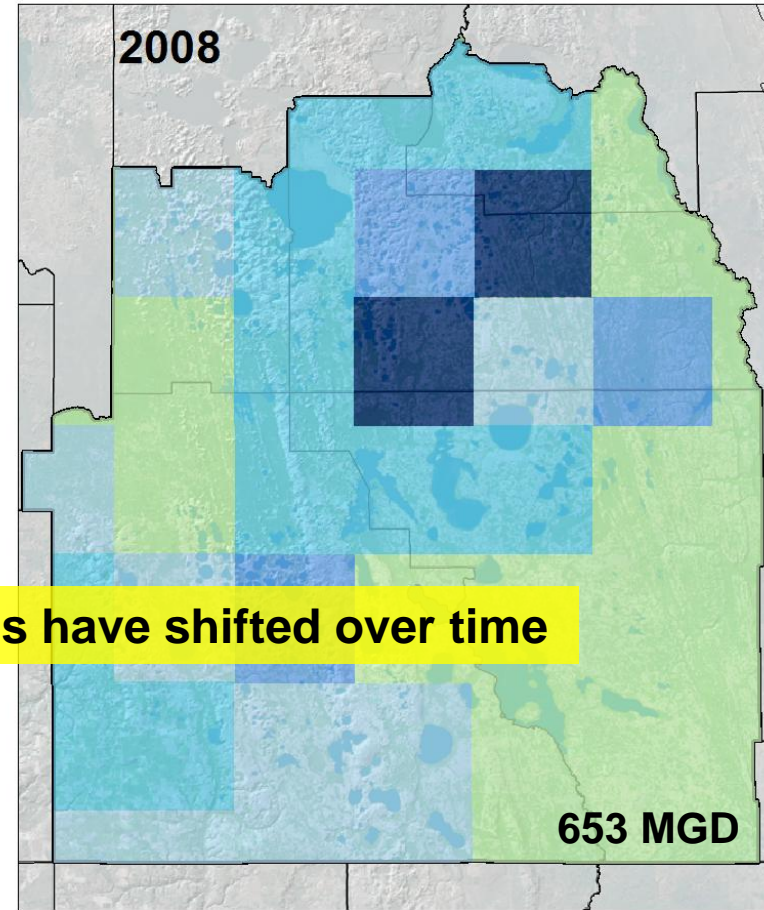
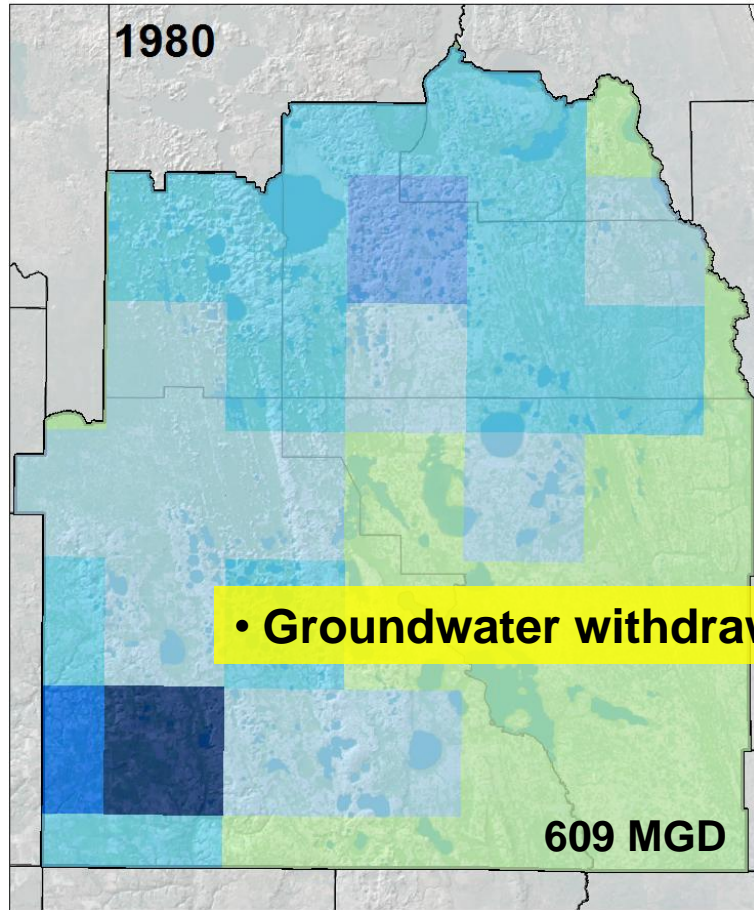


Estimated Groundwater Use in Central Florida Area

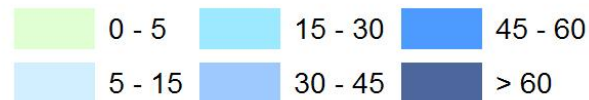
(Includes area adjacent to the CFWI area)



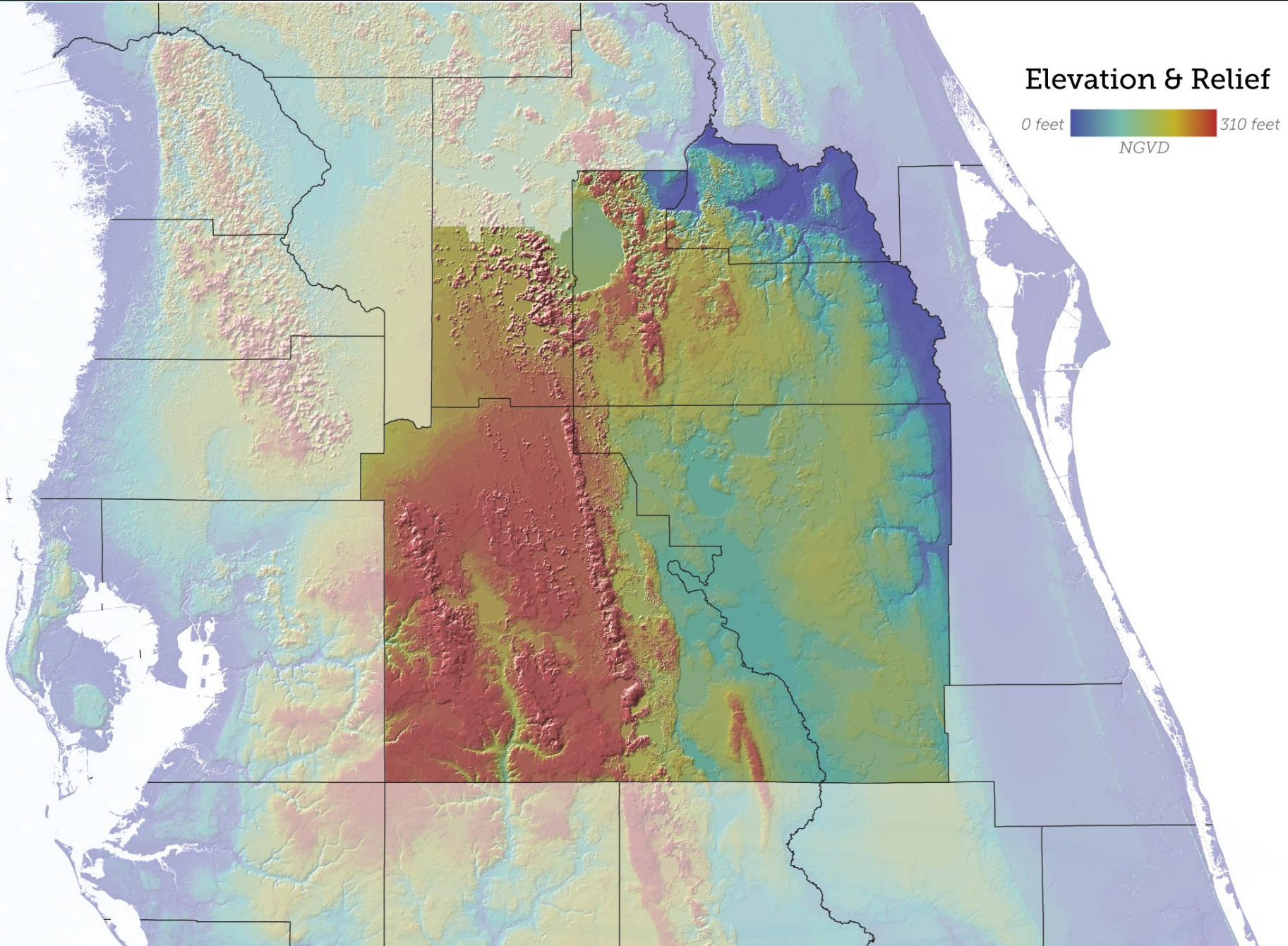
Generalized Map of Historical Groundwater Withdrawals



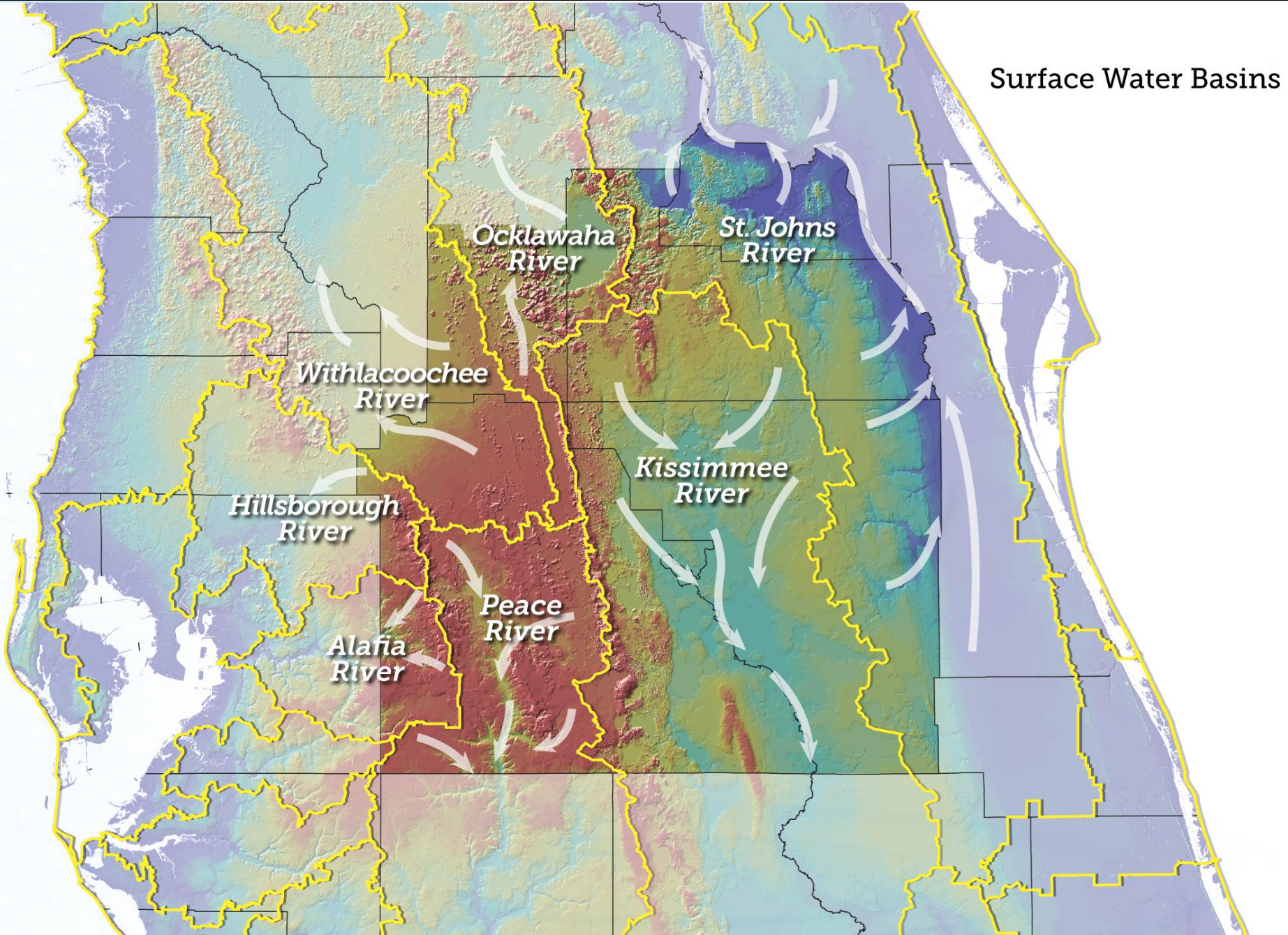
Withdrawals in Million Gallons per Day

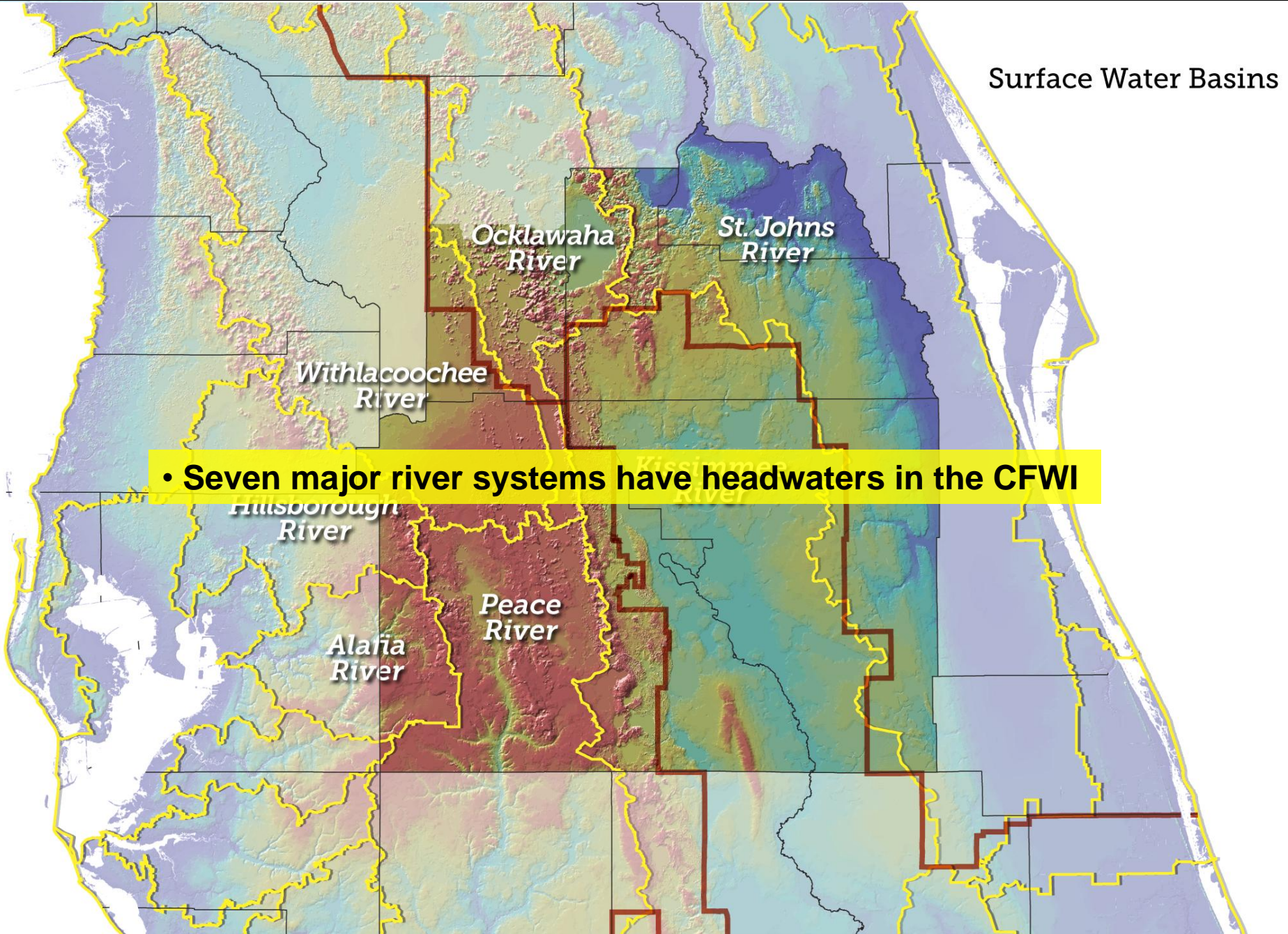


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Surface Water Basins

Ocklawaha
River

St. Johns
River

Withlacoochee
River

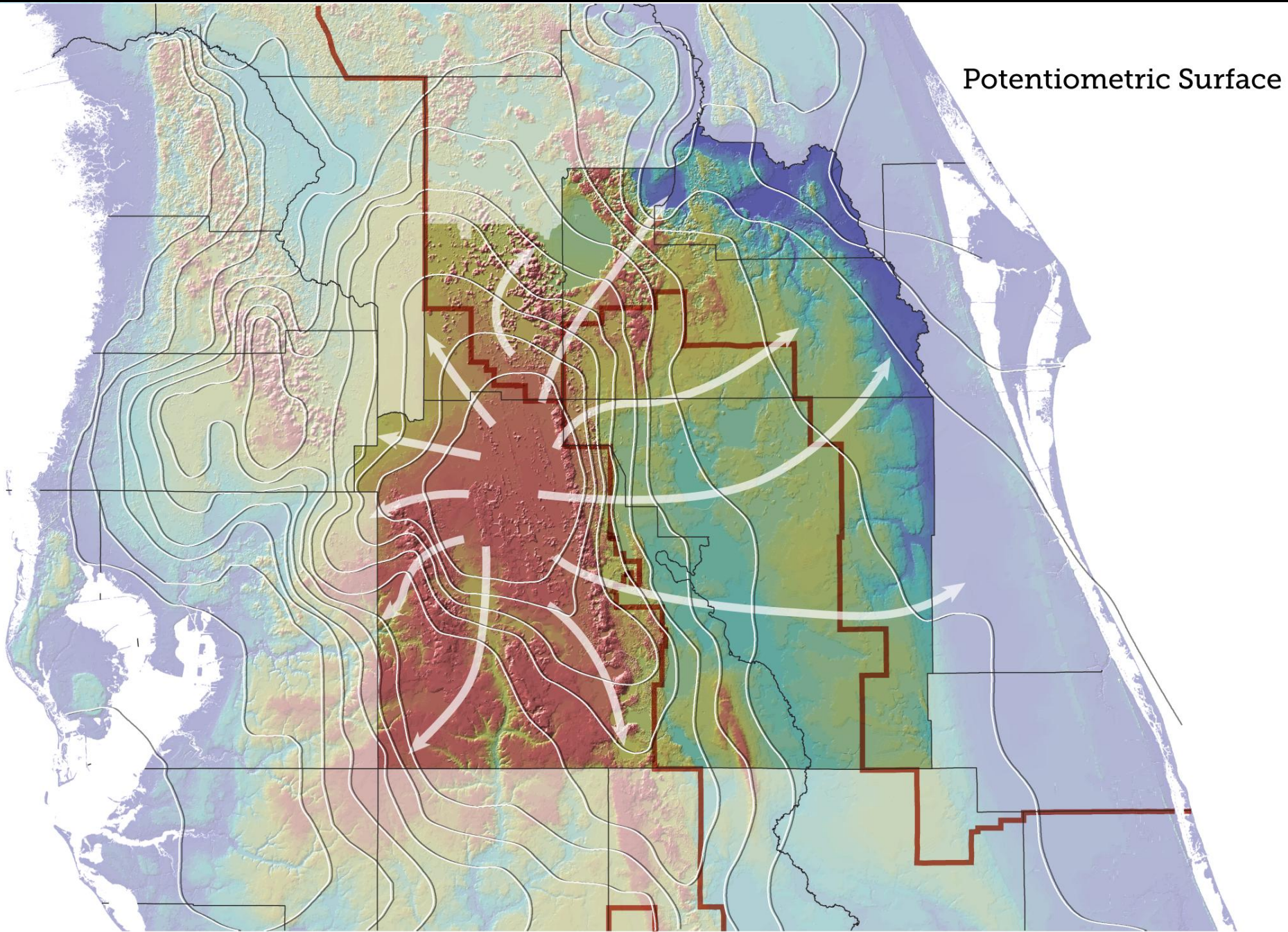
• Seven major river systems have headwaters in the CFWI

Hillsborough
River

Alafia
River

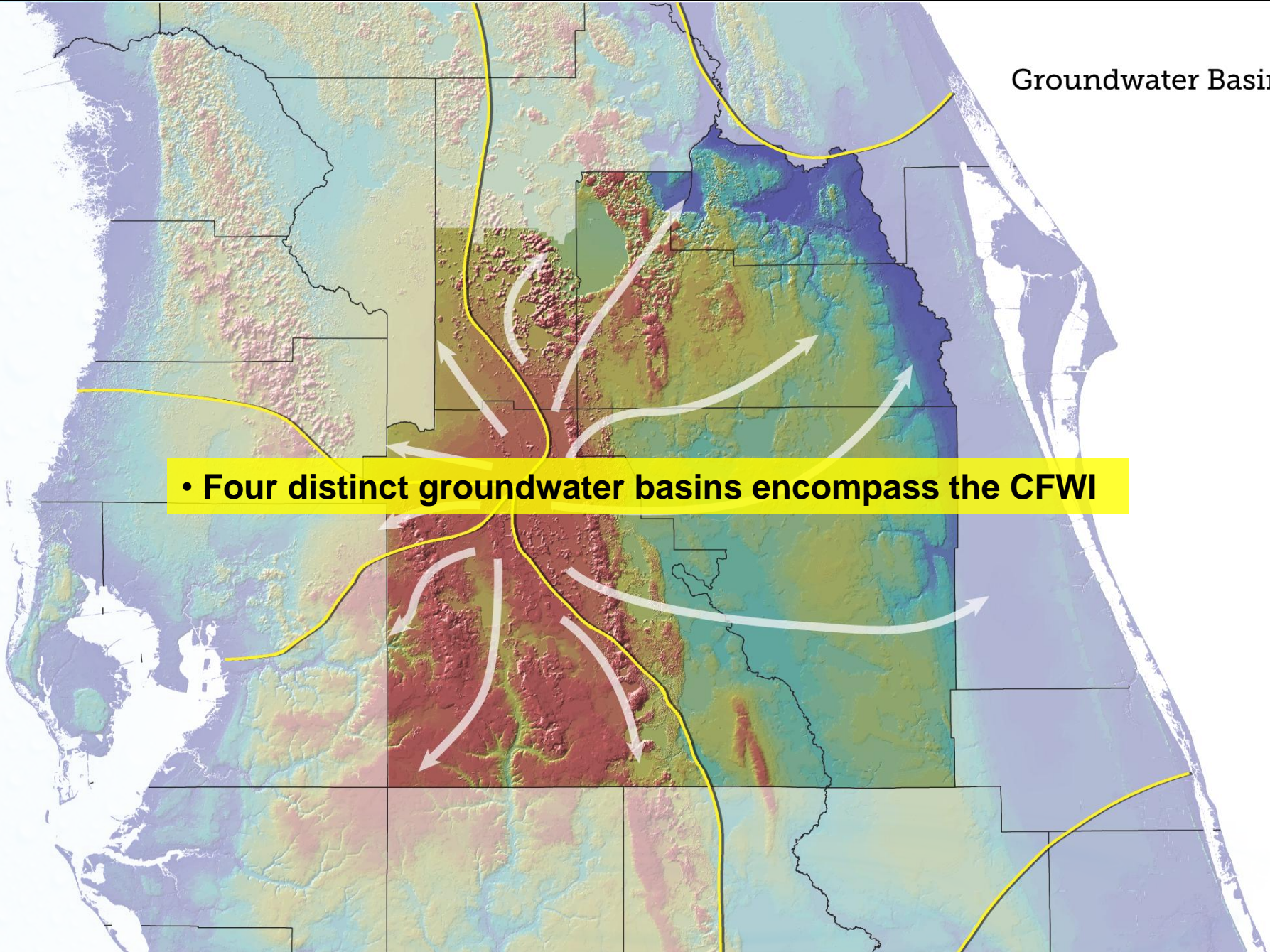
Peace
River

CENTRAL FLORIDA WATER INITIATIVE



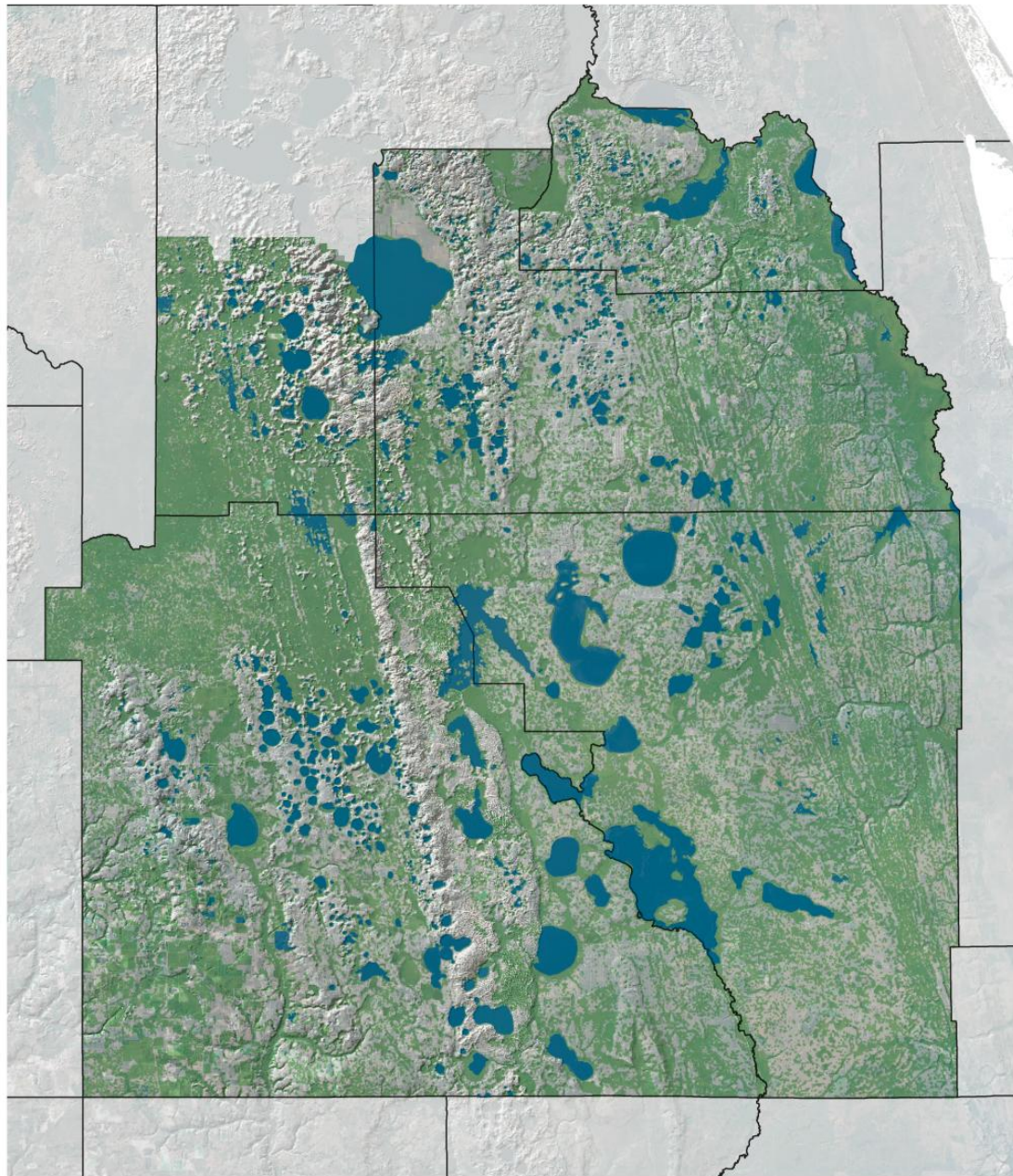
Groundwater Basins

- Four distinct groundwater basins encompass the CFWI



Lakes and Wetlands

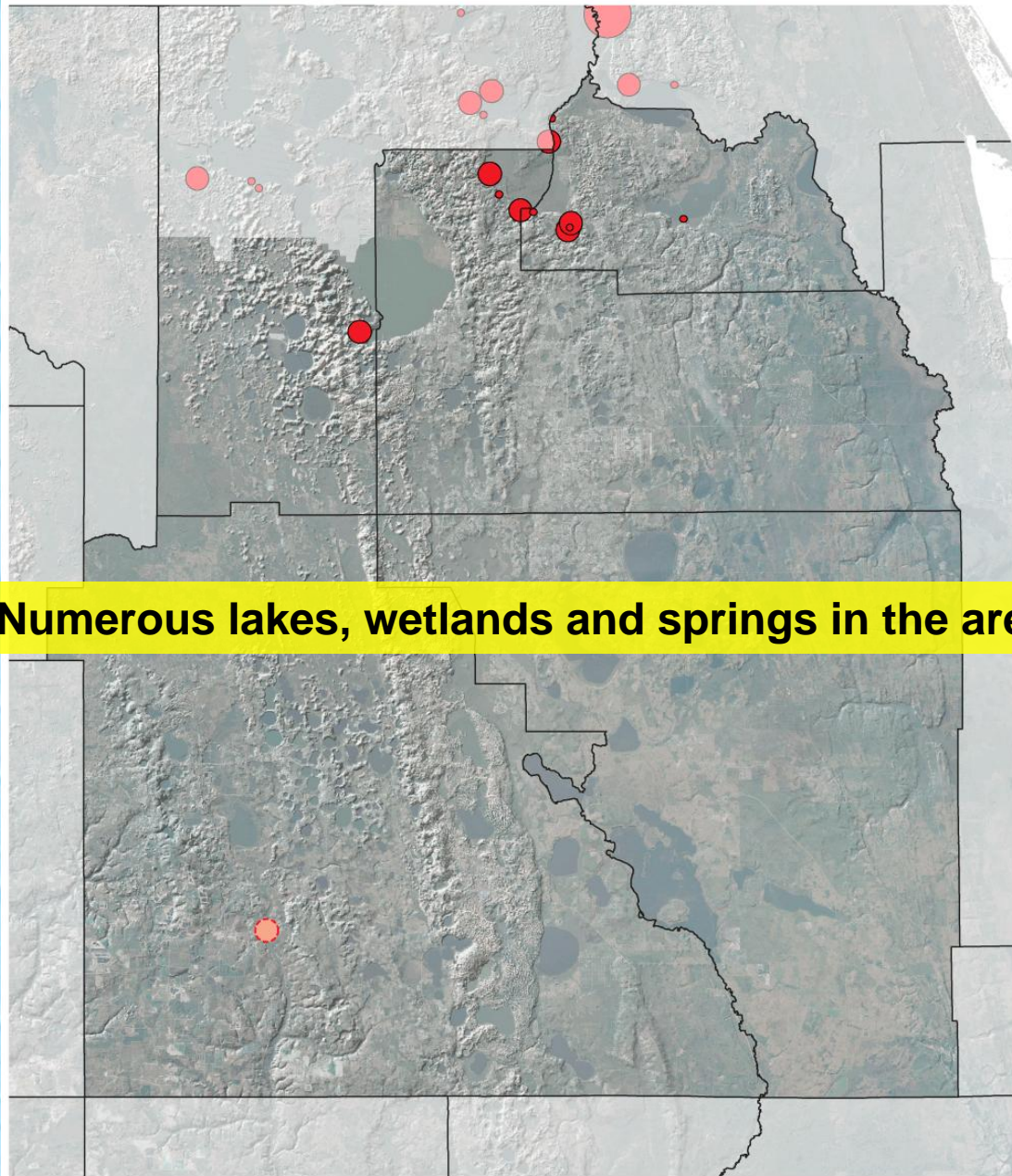
-  lakes
-  wetlands



Springflow

2006 Annual Average

- > 6.5 mgd (Magnitude 3)
- $6.5-64.6$ mgd (Magnitude 2)
- > 64.6 mgd (Magnitude 1)
- Kissengen Spring (former magnitude 2)

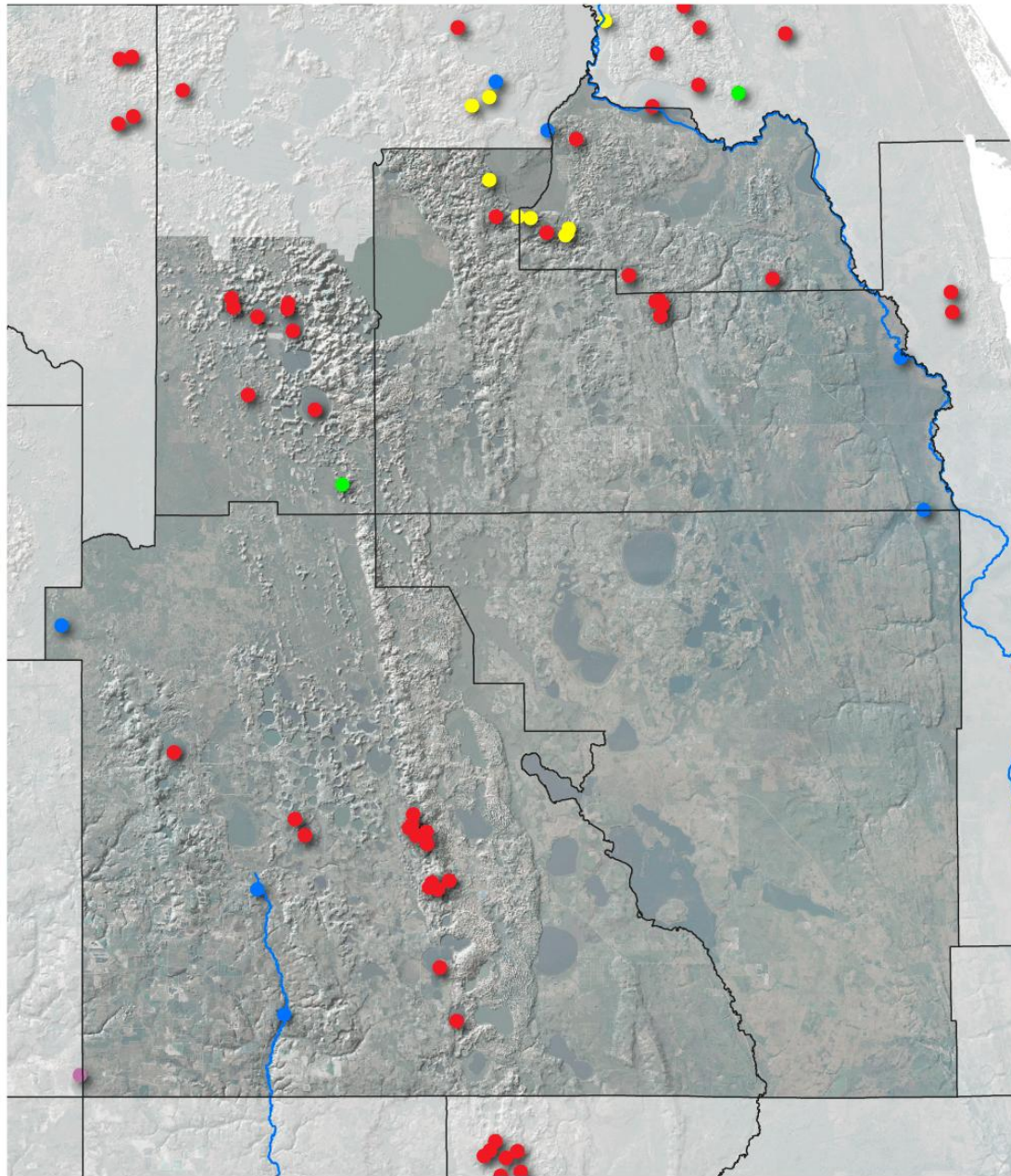


• Numerous lakes, wetlands and springs in the area

Minimum Flows & Levels

Adopted

- Lakes
- Rivers
- Springs
- Wetlands
- Aquifers

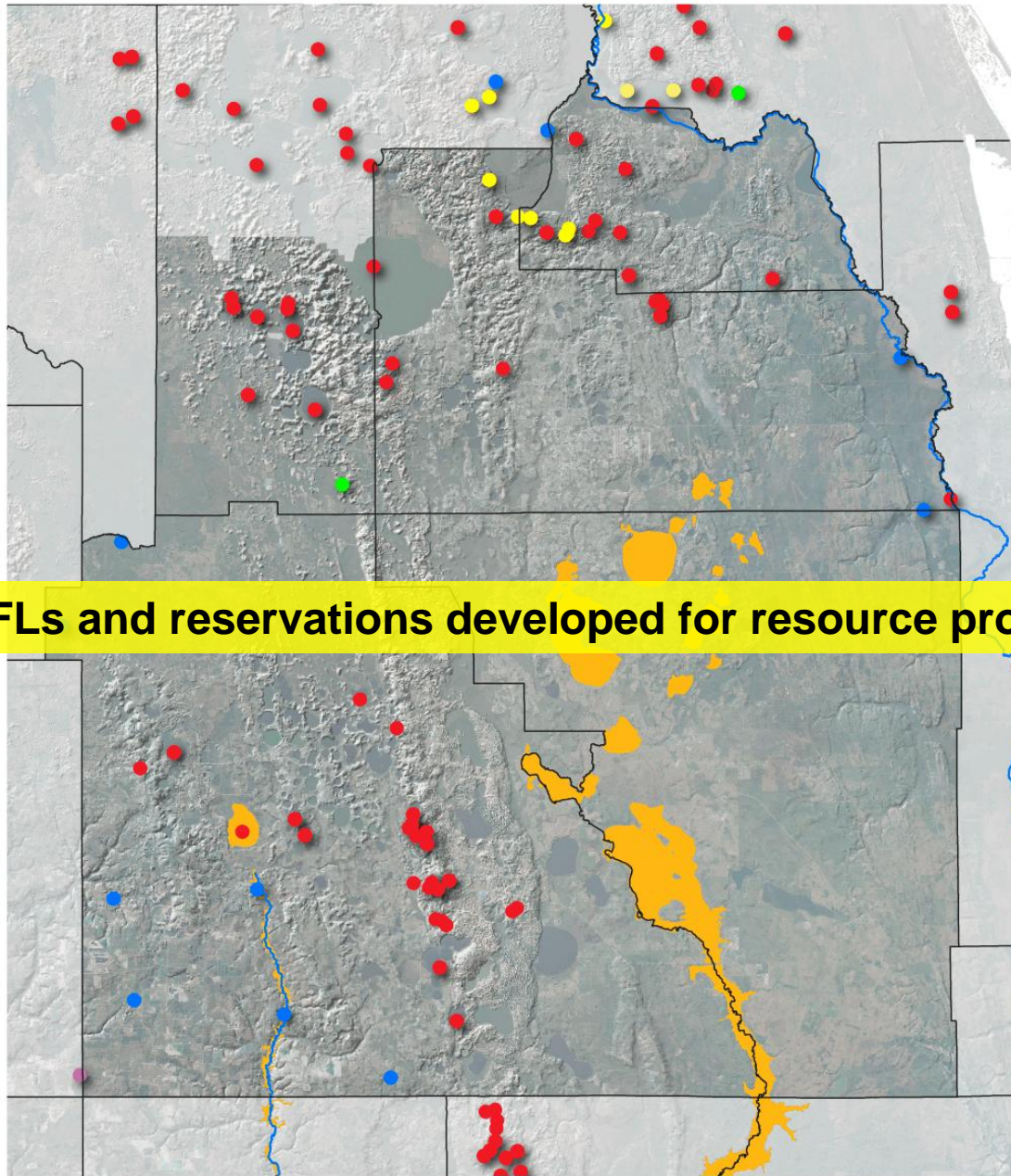


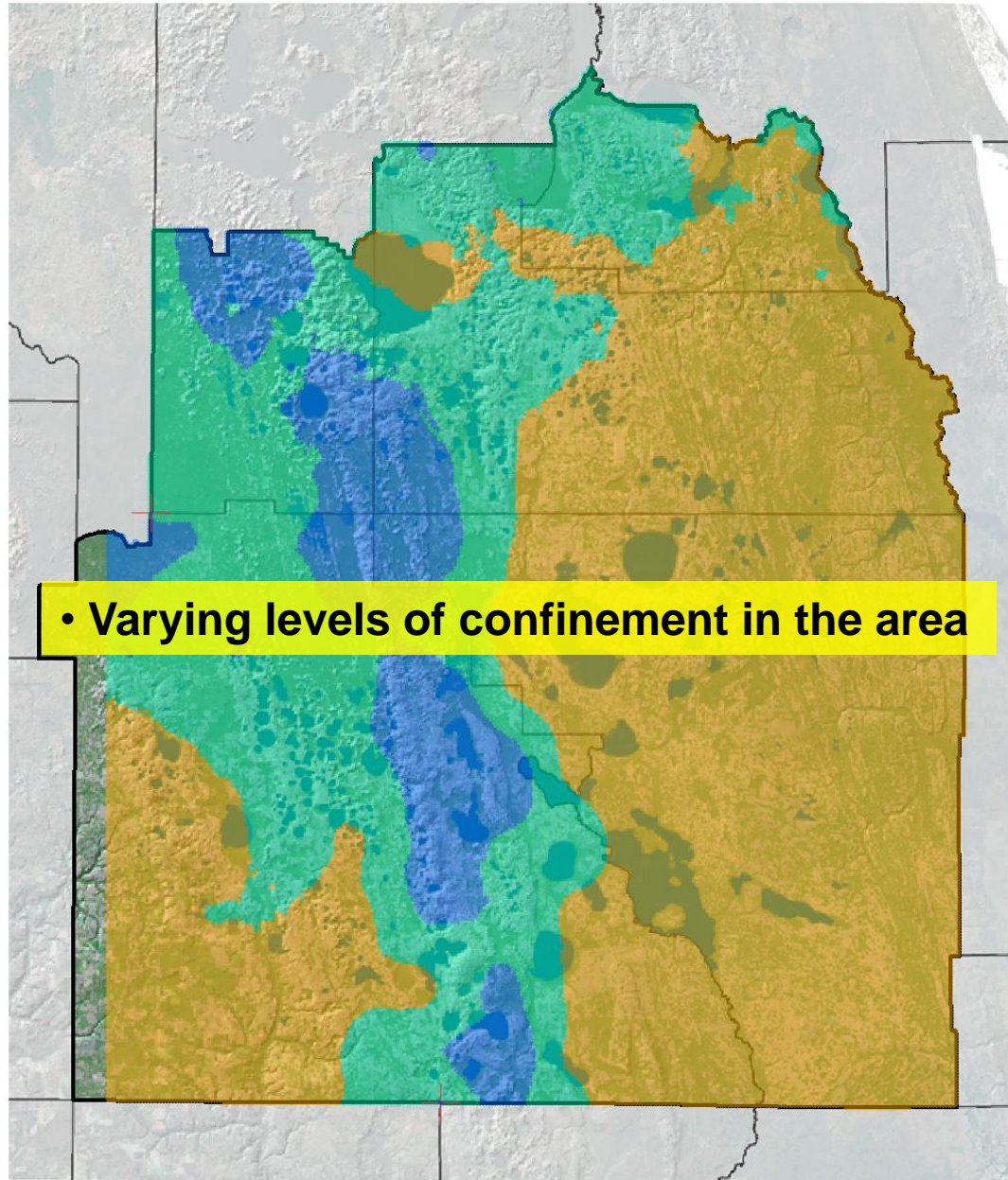
Minimum Flows & Levels and Reservations

Adopted and Proposed

- Lakes
- Rivers
- Springs
- Wetlands
- Aquifers
- Reservations




• MFLs and reservations developed for resource protection





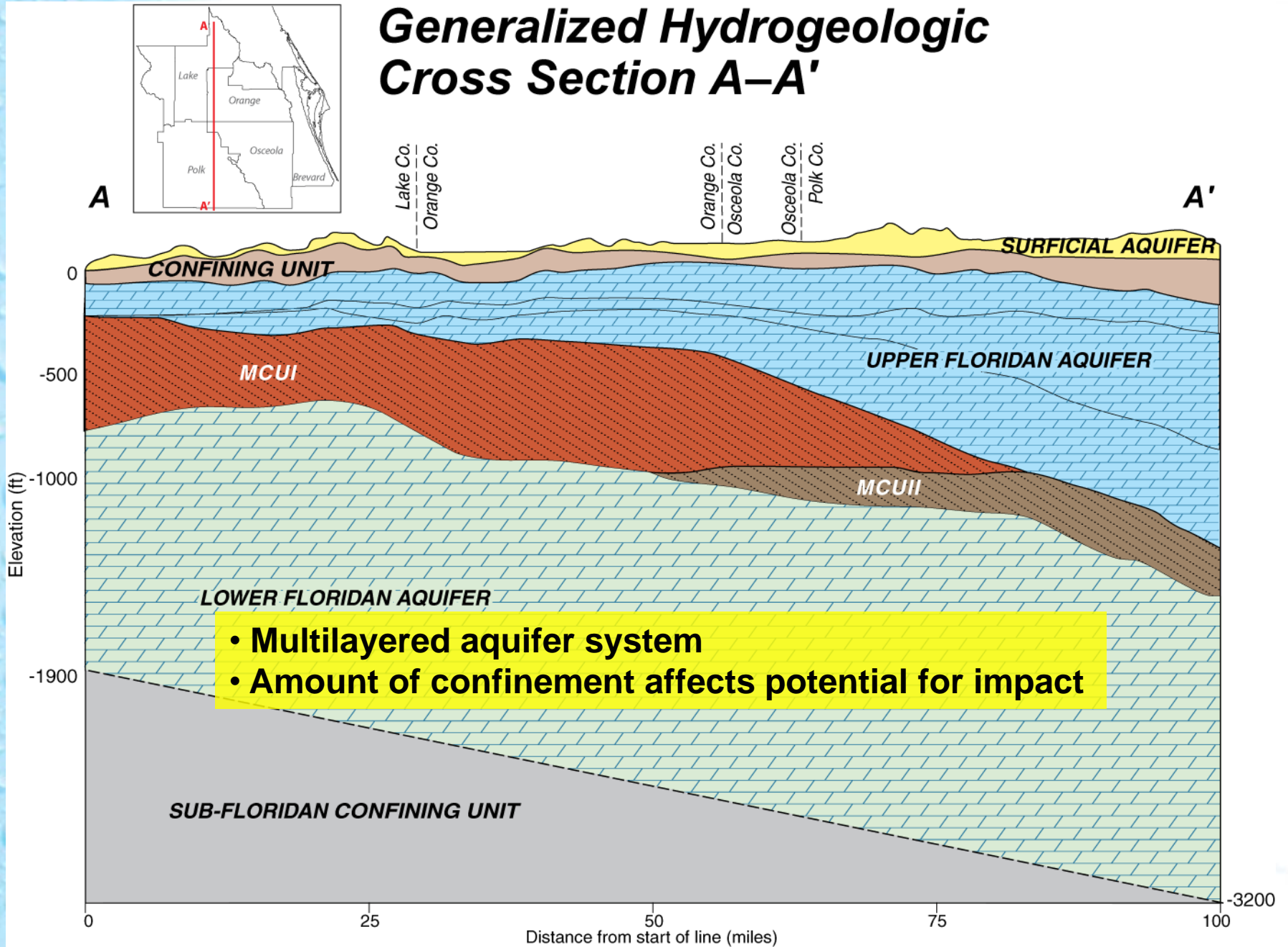
**Generalized Map Showing
Relative Areas of
Susceptibility of Surficial
Features to Lowering of
Groundwater Levels**

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

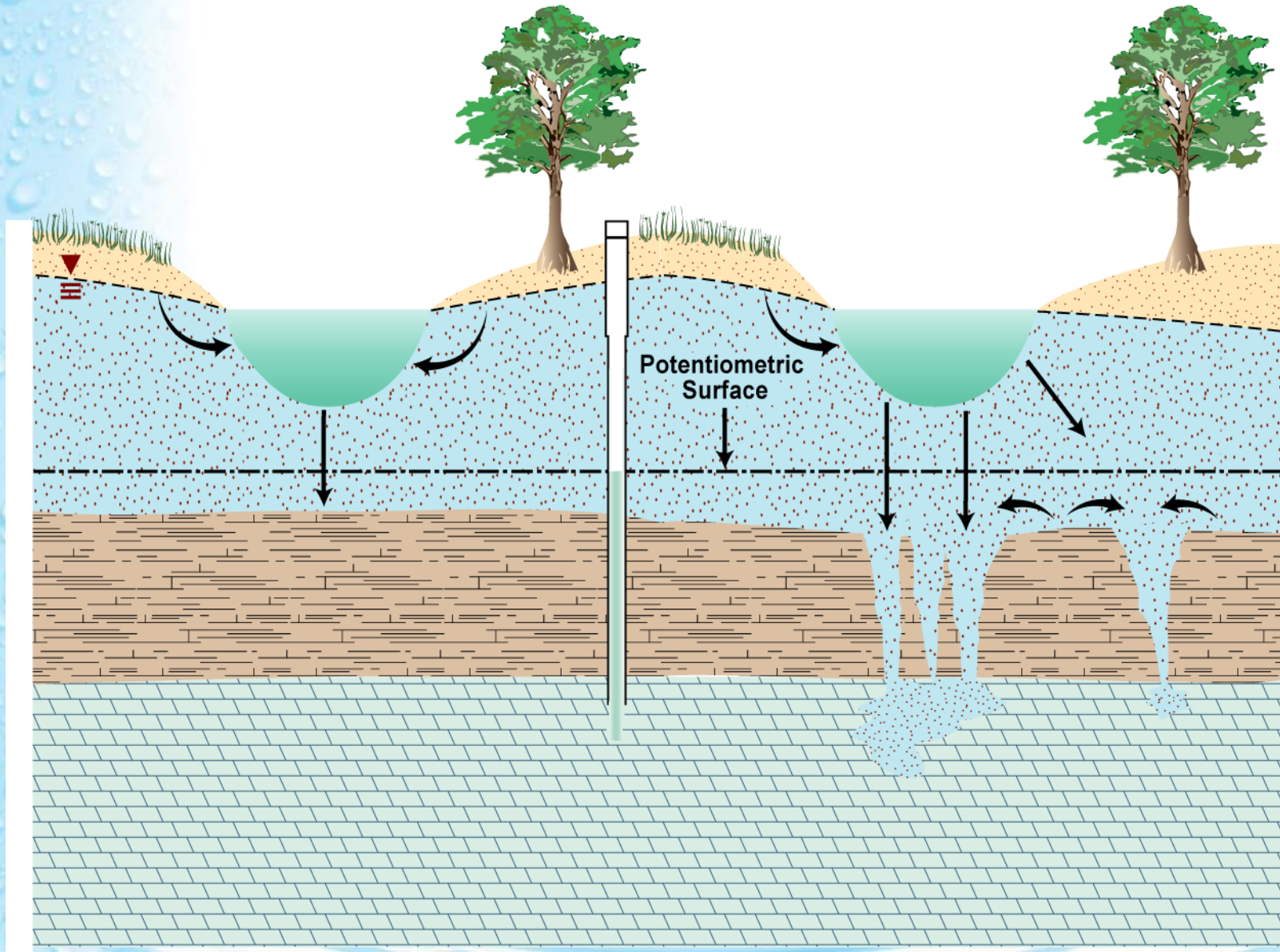
-  Least Susceptible
-  Moderately Susceptible
-  More Susceptible

• Varying levels of confinement in the area

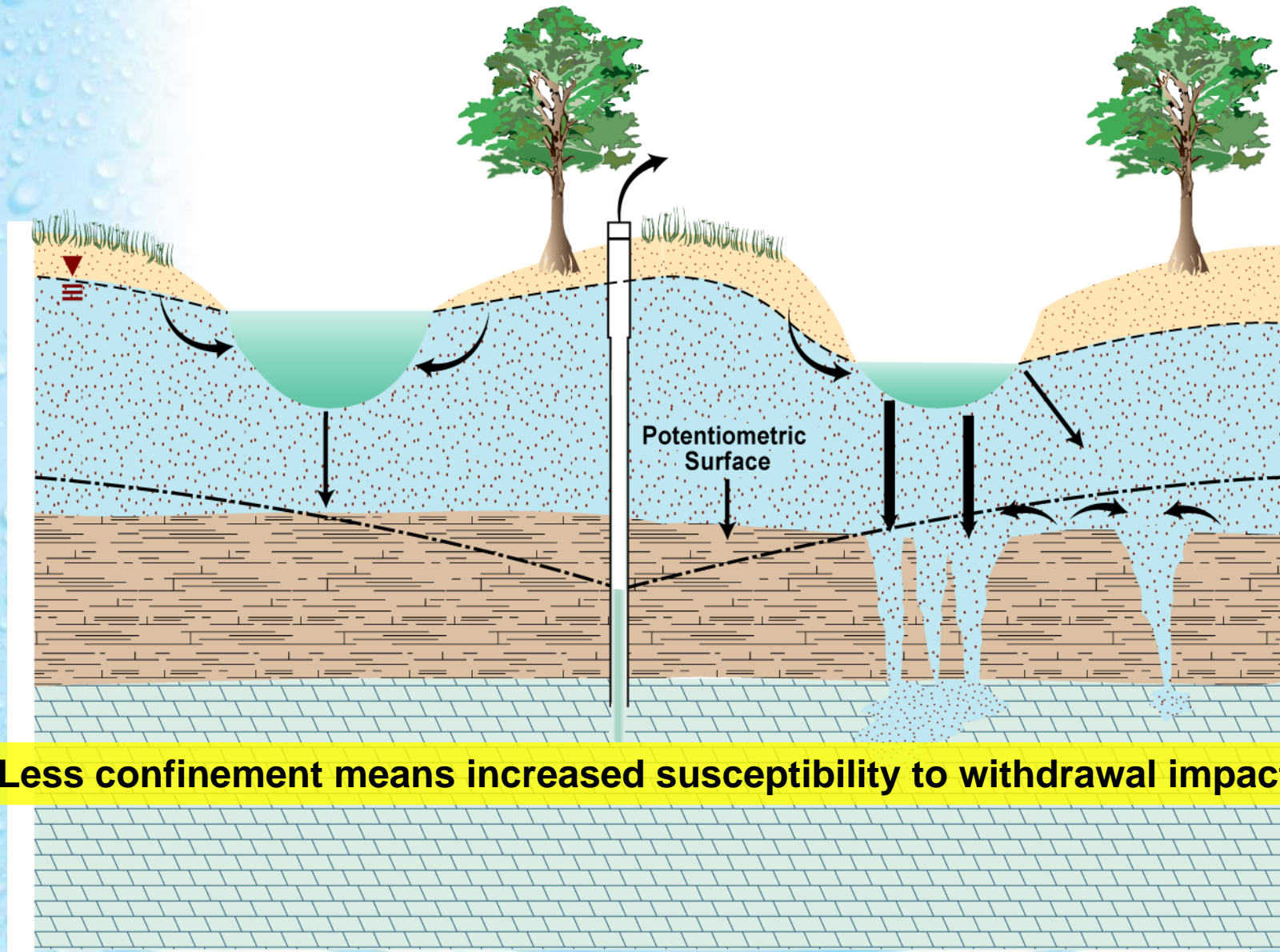
Generalized Hydrogeologic Cross Section A-A'



Groundwater Flow in a Karst Environment

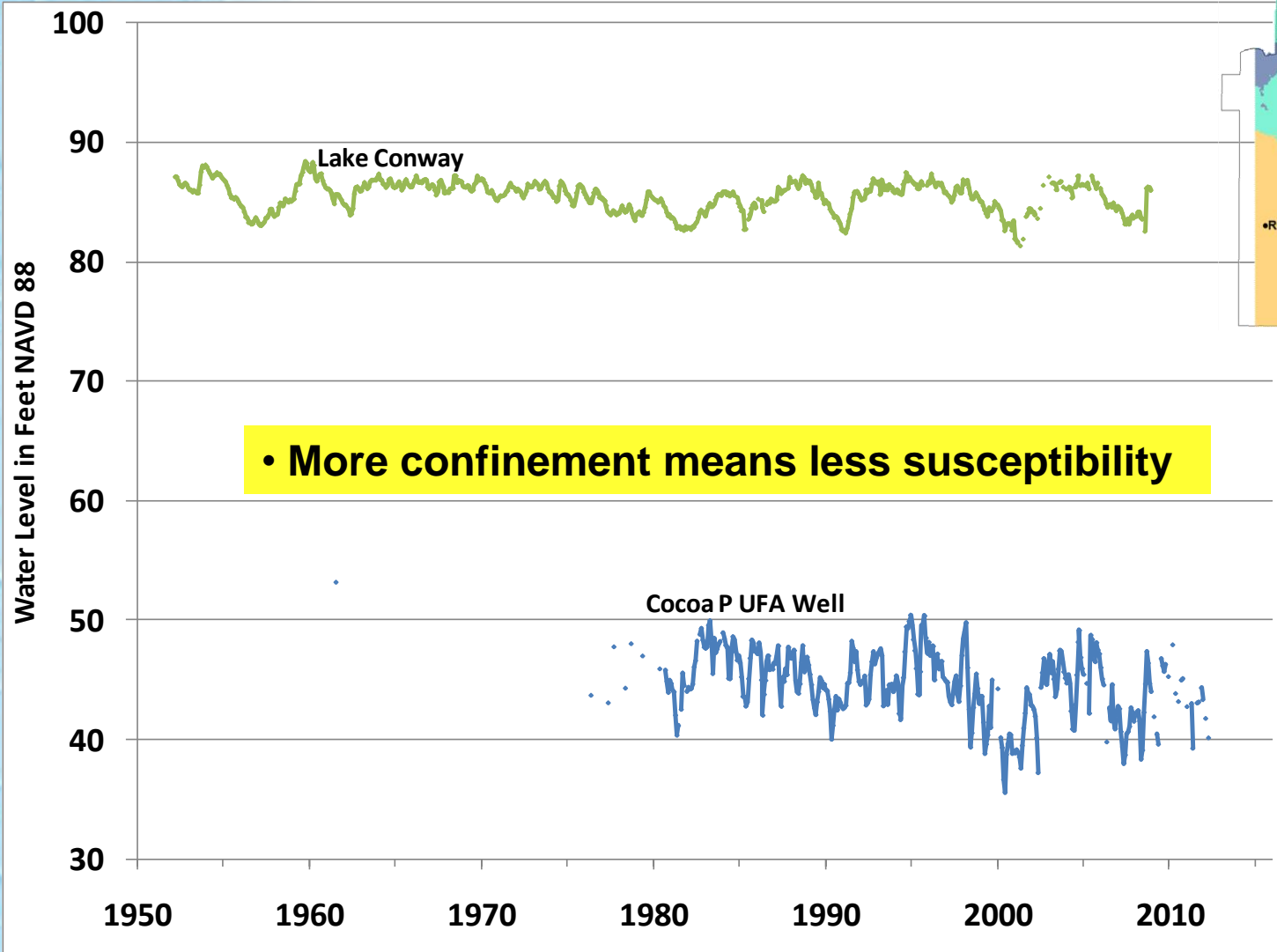
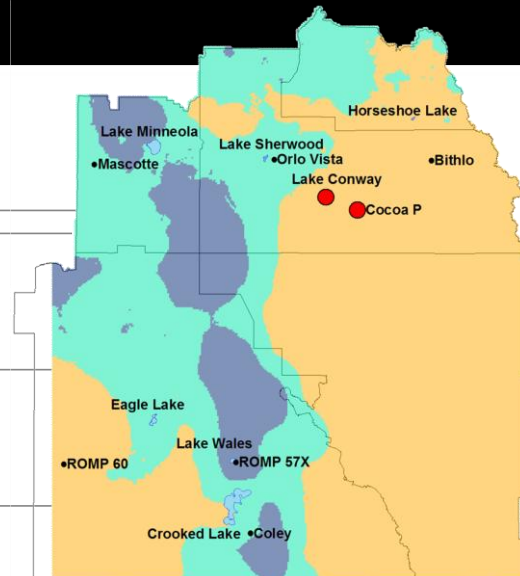


Groundwater Flow in a Karst Environment



• Less confinement means increased susceptibility to withdrawal impacts

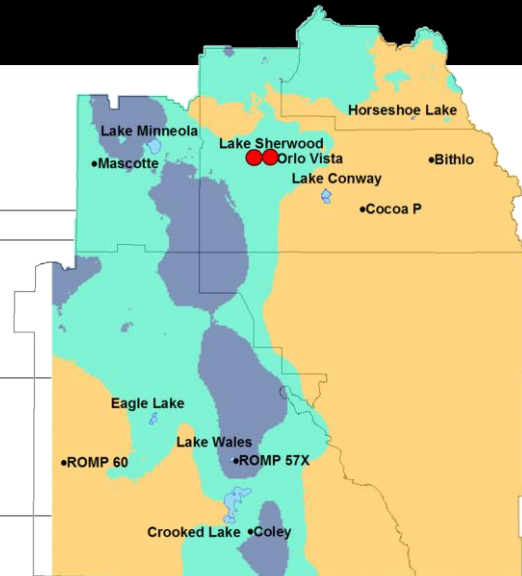
CENTRAL FLORIDA WATER INITIATIVE



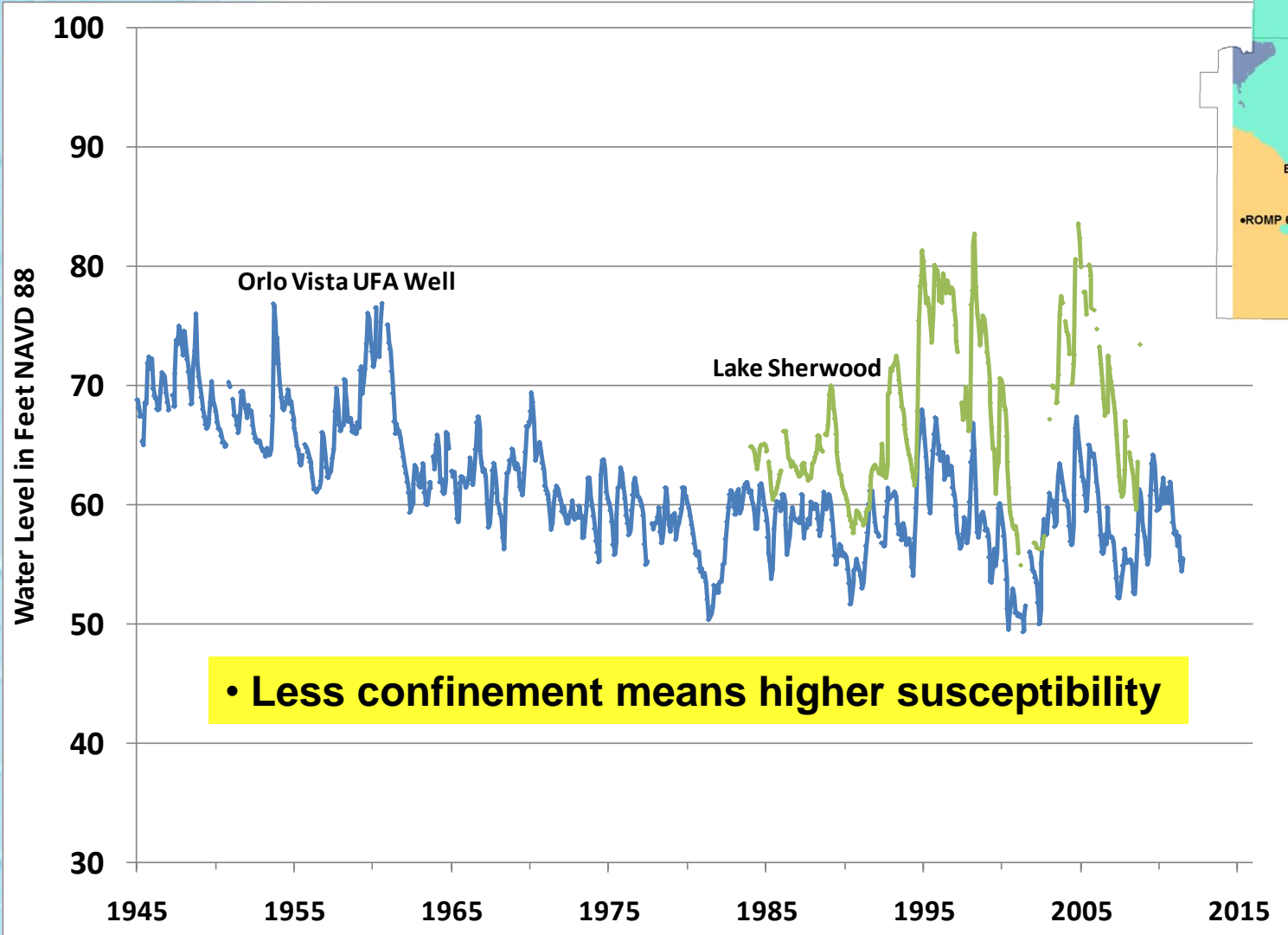
• More confinement means less susceptibility

- Least Susceptible
- Moderately Susceptible
- Most Susceptible

CENTRAL FLORIDA WATER INITIATIVE



- Least Susceptible
- Moderately Susceptible
- Most Susceptible



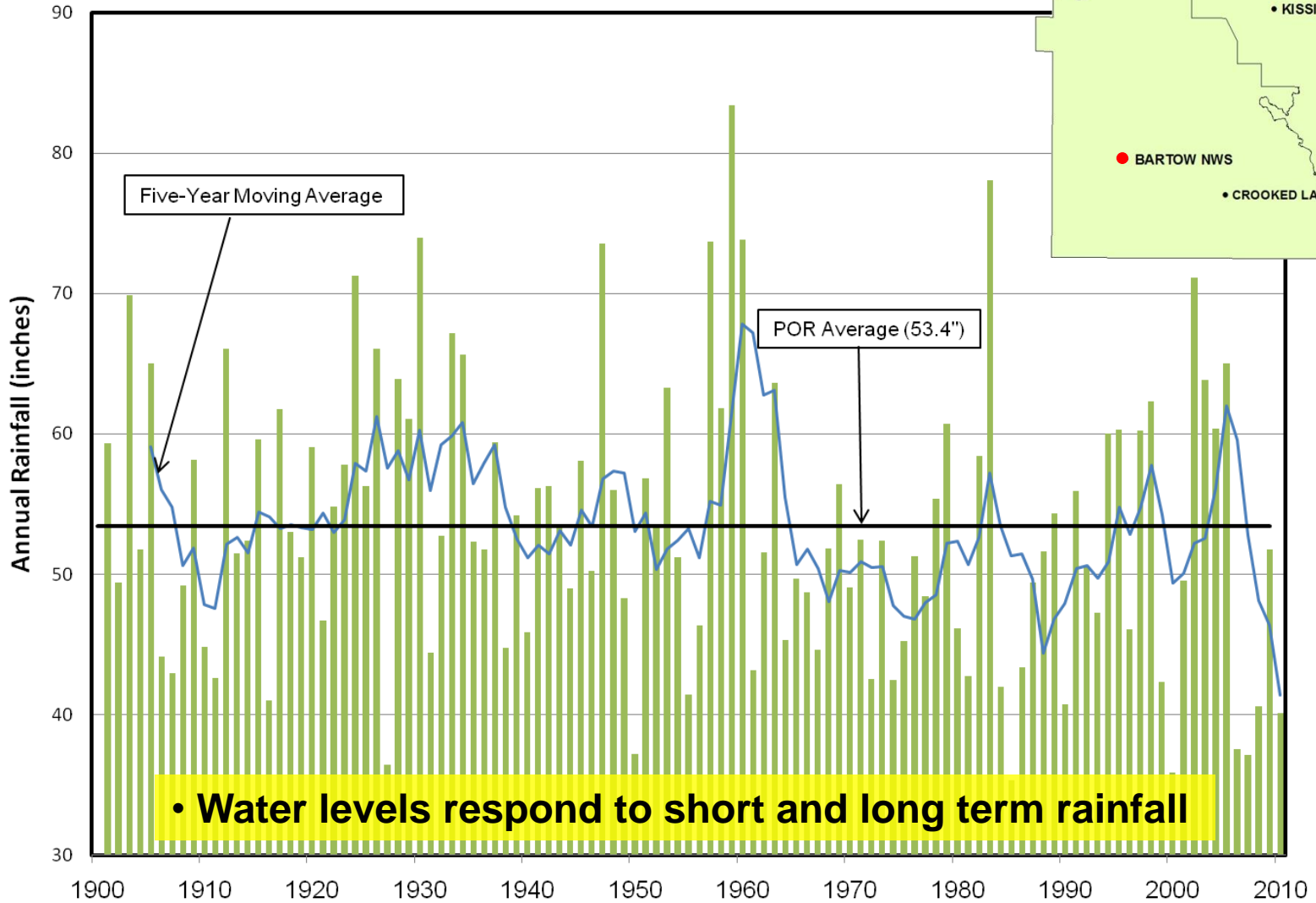
• Less confinement means higher susceptibility

Factors Affecting Water Levels

- Rainfall
- Land use and drainage
- Groundwater withdrawals



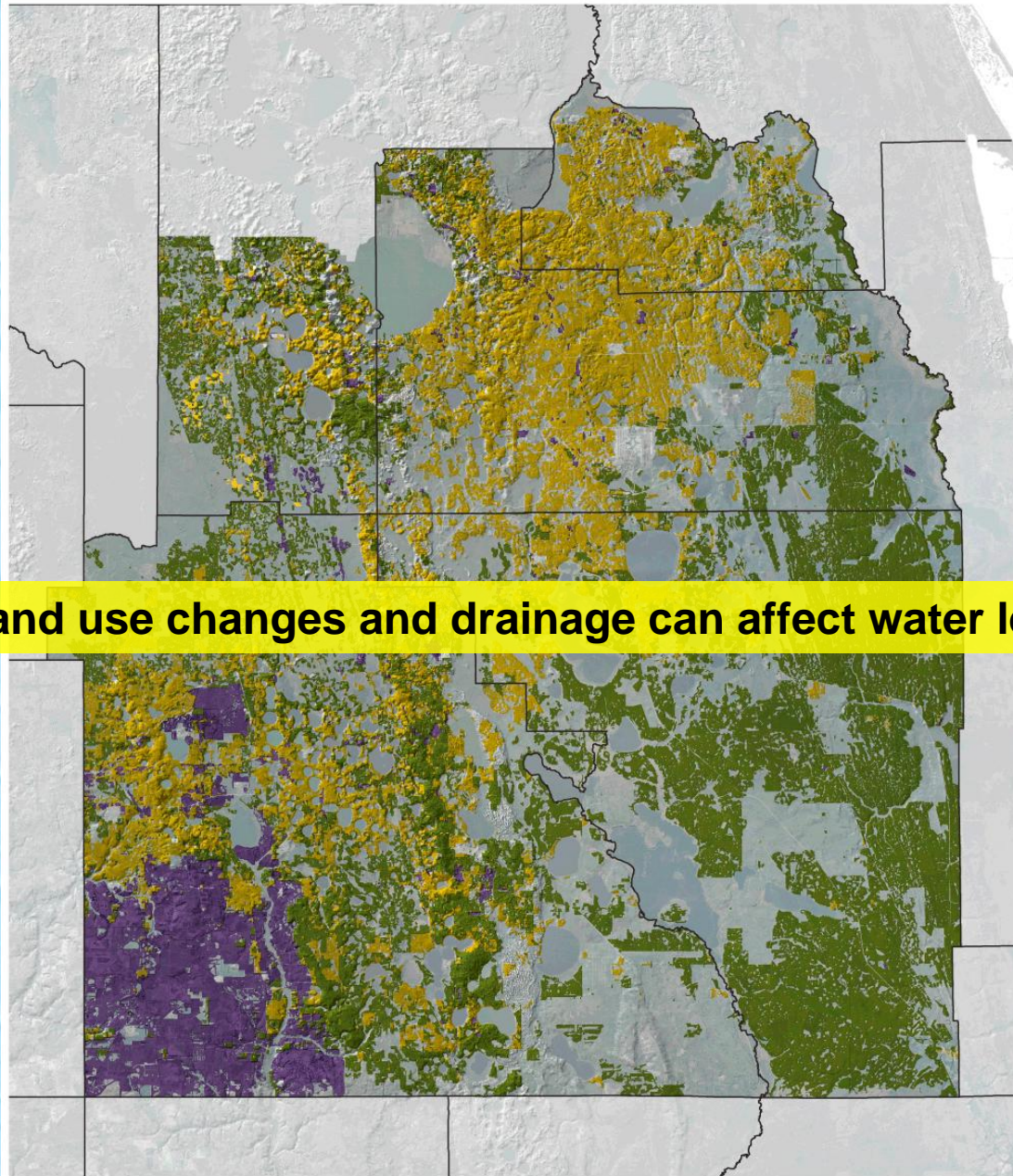
Bartow Annual Rainfall



Land Use

2009

- mining
- urban
- agriculture



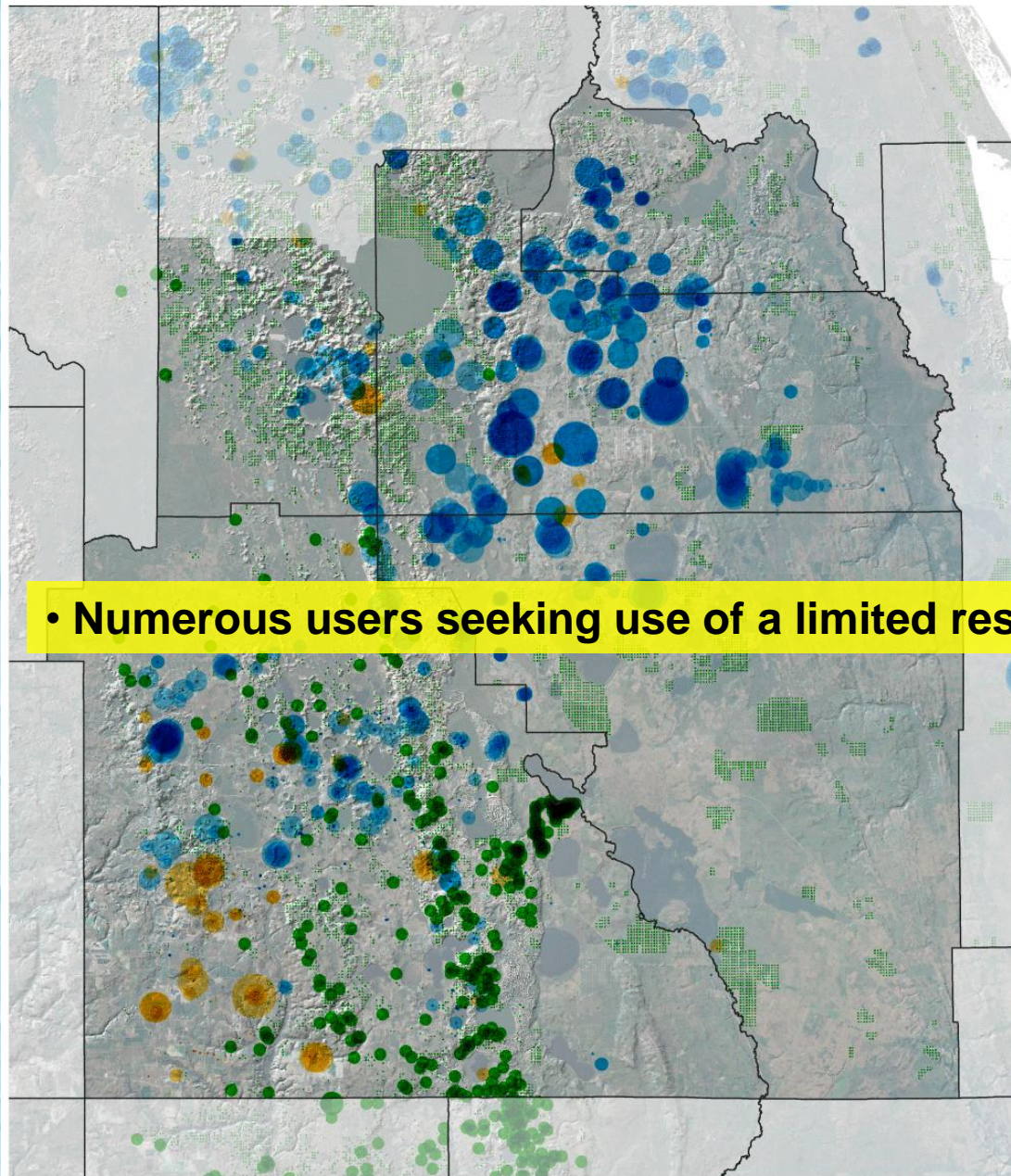
- Land use changes and drainage can affect water levels

Withdrawal Types

2006 Annual Average

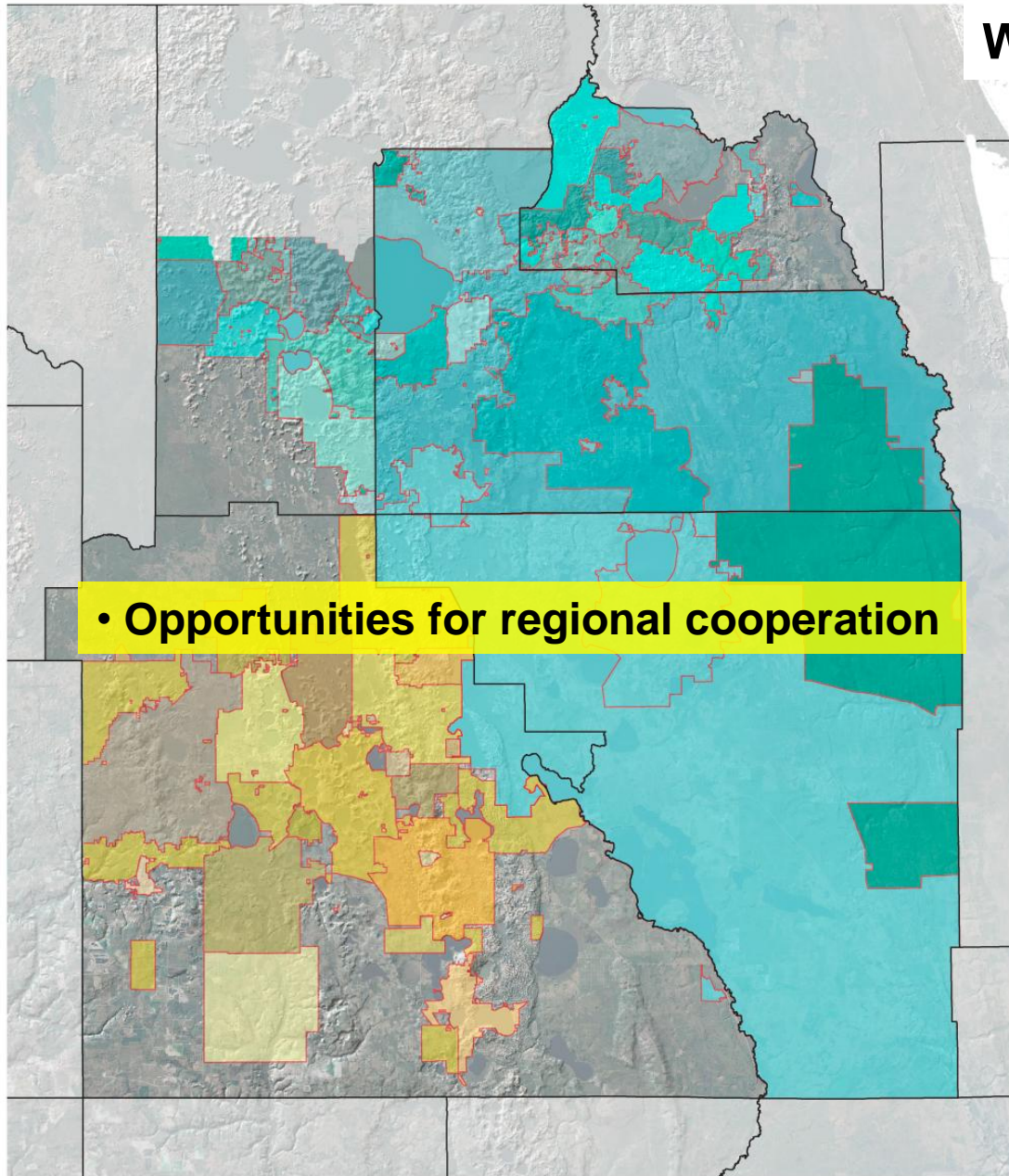
- < 0.1 mgd
- 0.1–0.5 mgd
- 0.5–1 mgd
- 1–3 mgd
- > 3 mgd

- Public Supply
- Agriculture
- Commercial/Industrial



• Numerous users seeking use of a limited resource

Water Utility Service Areas



• Opportunities for regional cooperation

Summary

- **Historical groundwater withdrawals have increased, are shifting to public supply, and are moving to different areas**
- **Area is encompassed by four groundwater basins and comprises the headwaters for seven major river systems**
- **MFLs have been adopted to protect the numerous environmental systems**
- **Multilayered aquifer system with varying levels of confinement affecting susceptibility to withdrawal impacts**
- **Different factors affect water levels**
 - **Rainfall**
 - **Land use changes and drainage**
 - **Groundwater withdrawals**
- **Numerous users seeking use of a limited resource**