

Renewable Energy Systems and Sustainability Conference

Florida Polytechnic University
August 1, 2017

*Creative Partnerships for Sustainable Water Supply
Solutions*

Jason Mickel
Water Supply Section Manager

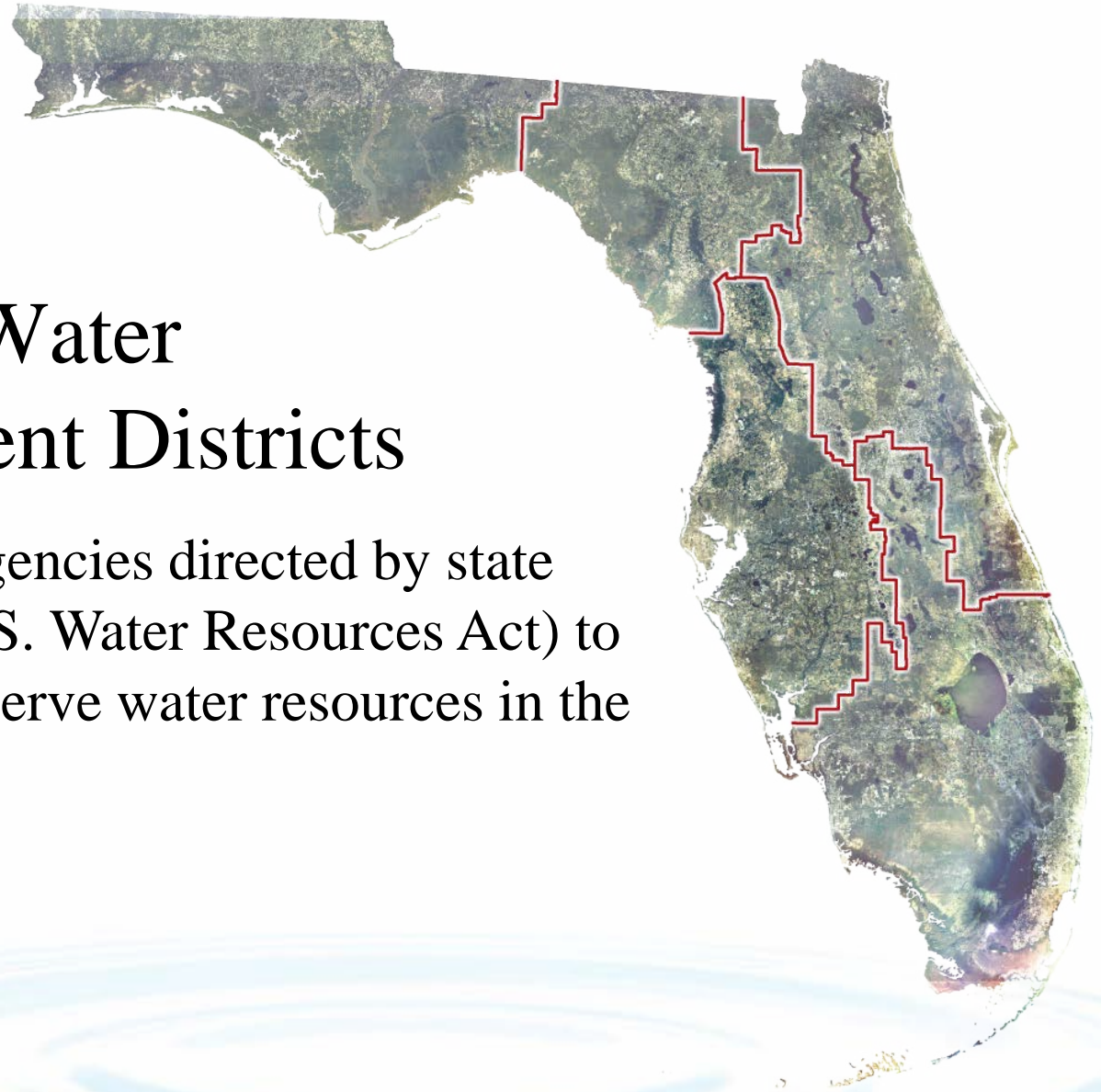
Discussion Topics

- About the District
- Managing Water Resources
- Sources of Water and Water Use
- Sustainability and Creative Partnerships



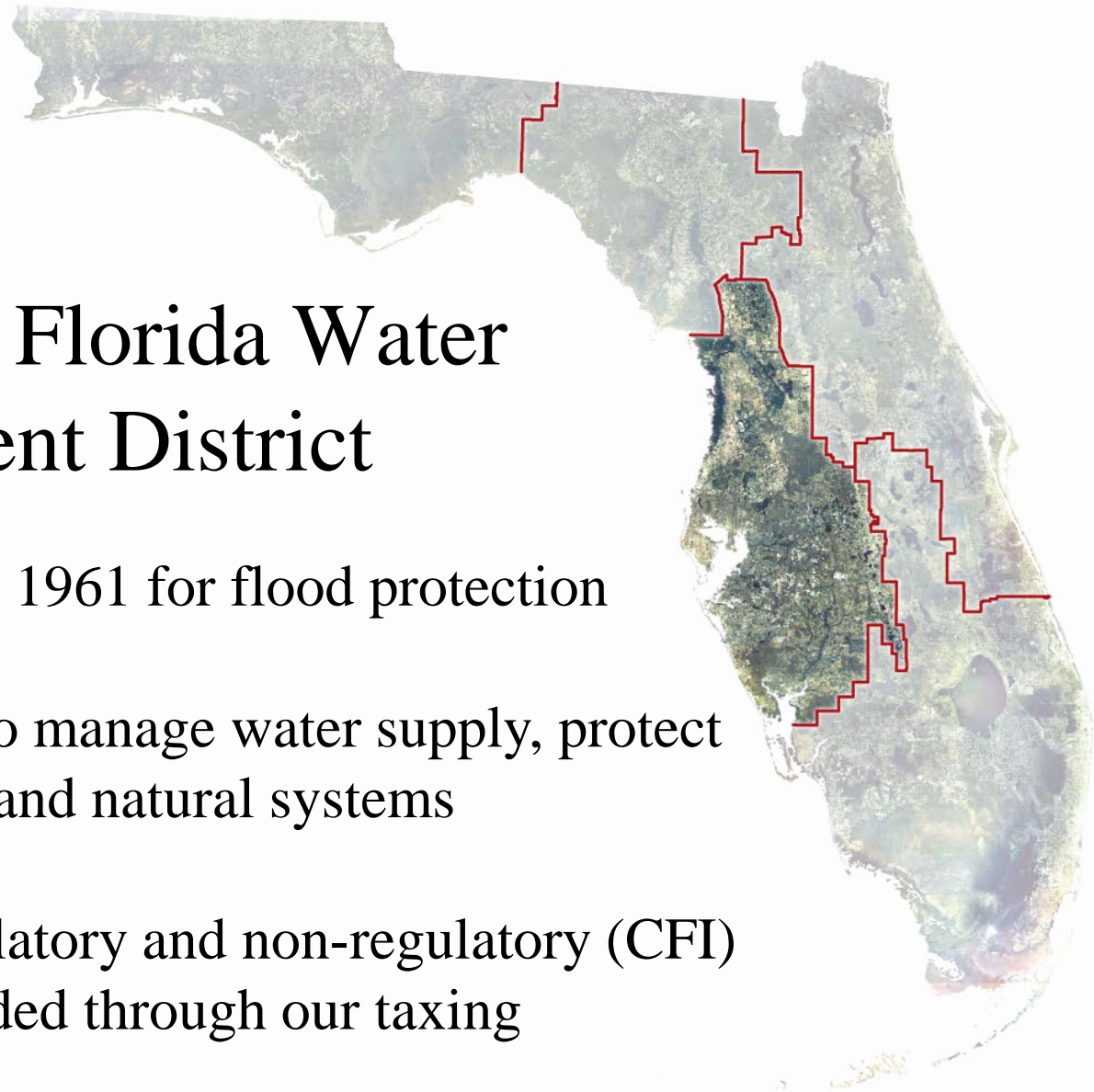
Florida's Water Management Districts

Five regional agencies directed by state law (Ch. 373 F.S. Water Resources Act) to protect and preserve water resources in the state



Southwest Florida Water Management District

- Established in 1961 for flood protection
- Today, we also manage water supply, protect water quality and natural systems
- We have regulatory and non-regulatory (CFI) programs funded through our taxing authority



Southwest Florida Water Management District

- Encompasses 16 counties, 10,000 sq. miles
- Abundance of water resources - 1,800 lakes, 13 major rivers, 3 estuaries of national recognition and thousands of acres of wetlands



The Hydrologic Cycle



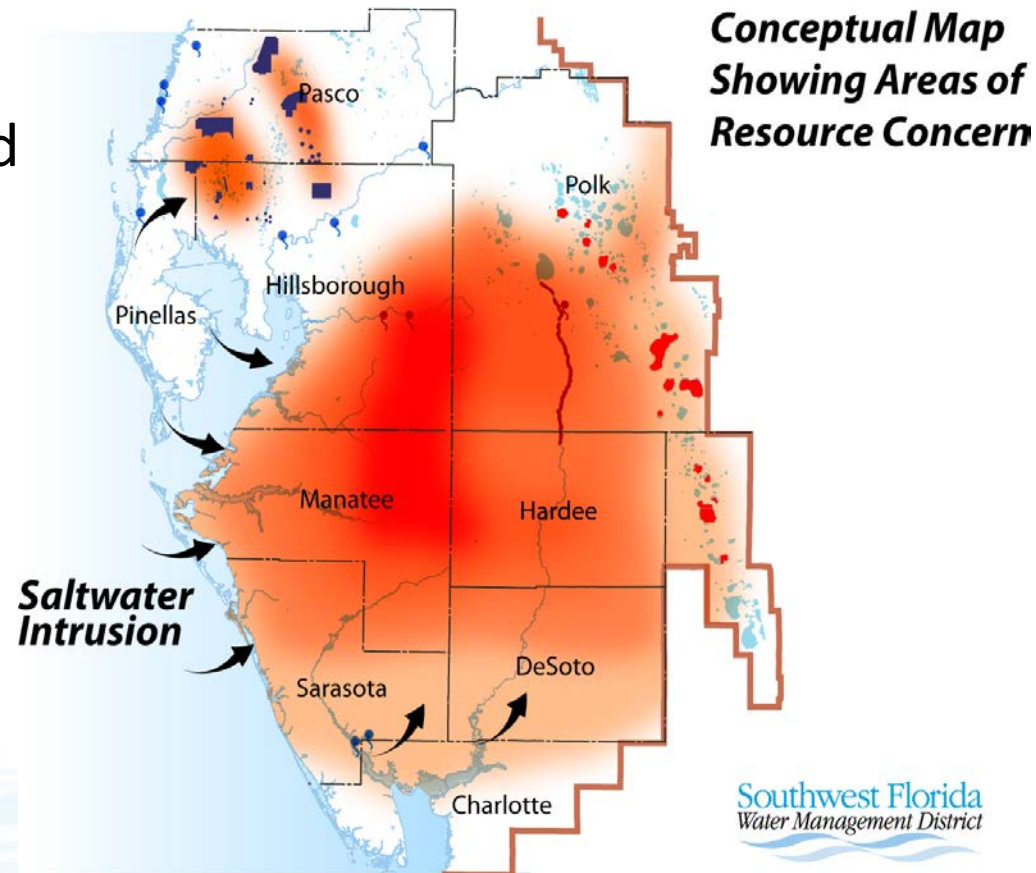
Managing Water Resources

- 5.6 million people live within District boundary - expected to increase to 7 million by 2035
- Not just people need the water
 - Agriculture
 - Wildlife
 - Natural Systems
 - Business and Industry
 - Recreational Activities

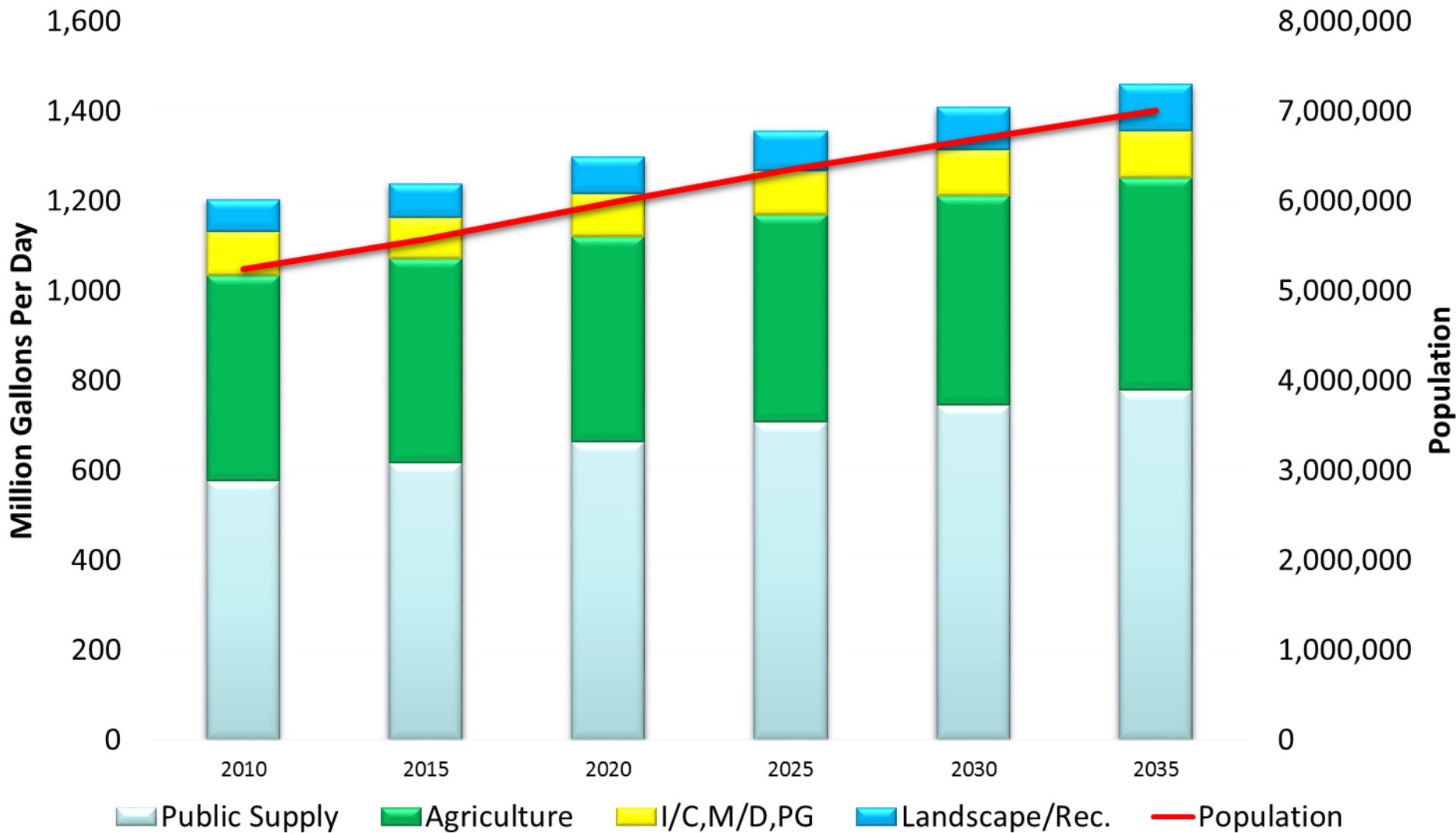


Existing Water Management Concerns

- Excessive groundwater pumping has:
 - Lowered lake, wetland and aquifer levels
 - Reduced river flows
 - Increased saltwater intrusion in the aquifer along the coast
 - Imposed limits on groundwater use
- Climate variations and uncertainty



District Projected Total Water Use and Population



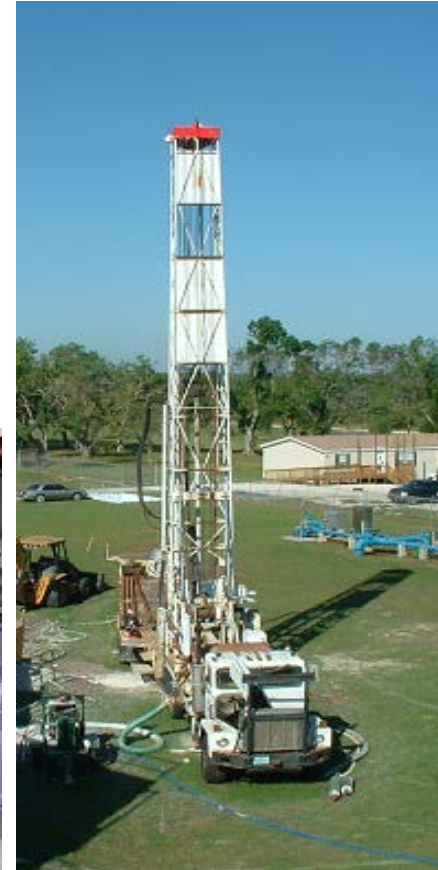
Where Does The Water Come From?

- **Fresh Traditional Groundwater**
- **Surface Water**



Where Does The Water Come From?

- **Seawater Desalination**
- **Brackish Groundwater**
- **Reclaimed Water**



Meeting Future Demands

- Planning and Partnerships
- Reclaimed Water
- Conservation
- Development of Alternative Water Supplies
 - Groundwater (Brackish)
 - Surface water
 - Seawater
 - Increase storage (reservoirs and ASR)

Planning & Partnerships

- Central Florida Water Initiative
- Polk Regional Water Cooperative
- Water Supply Authorities
- Local Governments, Utilities
- Agriculture
- Business, Industry

2015 Reuse Within the District



**8,700 acres
of agriculture**



**10 power
plants**



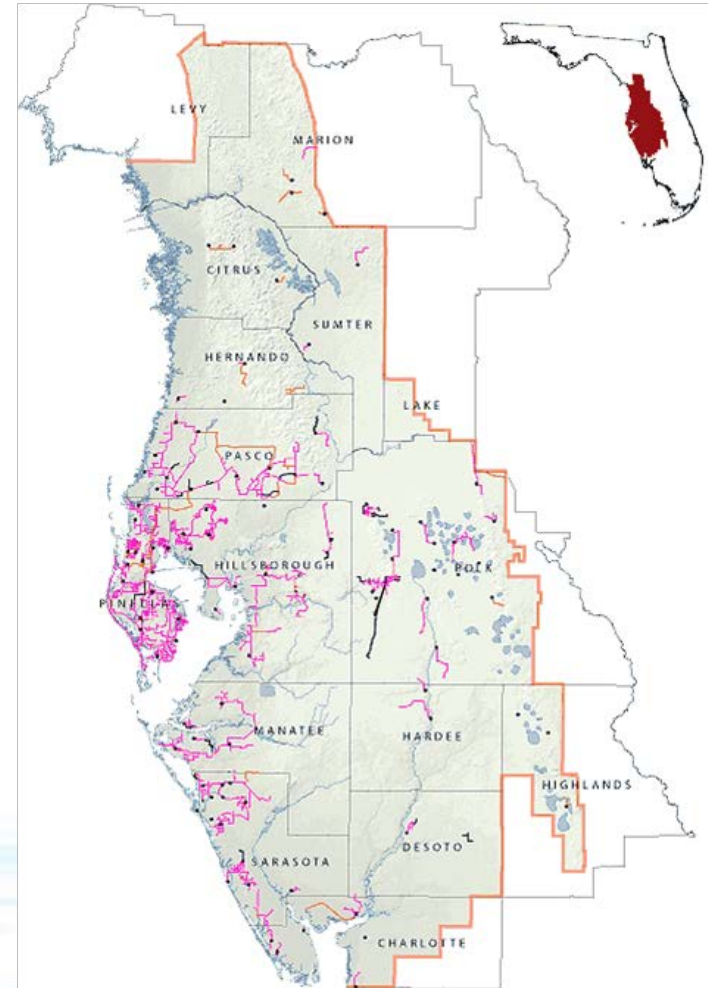
**116,000
residential
irrigation
customers**



**189 golf
courses**

District Reuse Projects and Benefits

- 377 projects since 1987
- 1,000 miles of pipelines
- 159 mgd of beneficial reuse
- 13% of Districtwide total water use
- \$450 M in District funding
- Cost effective - \$8 per gal



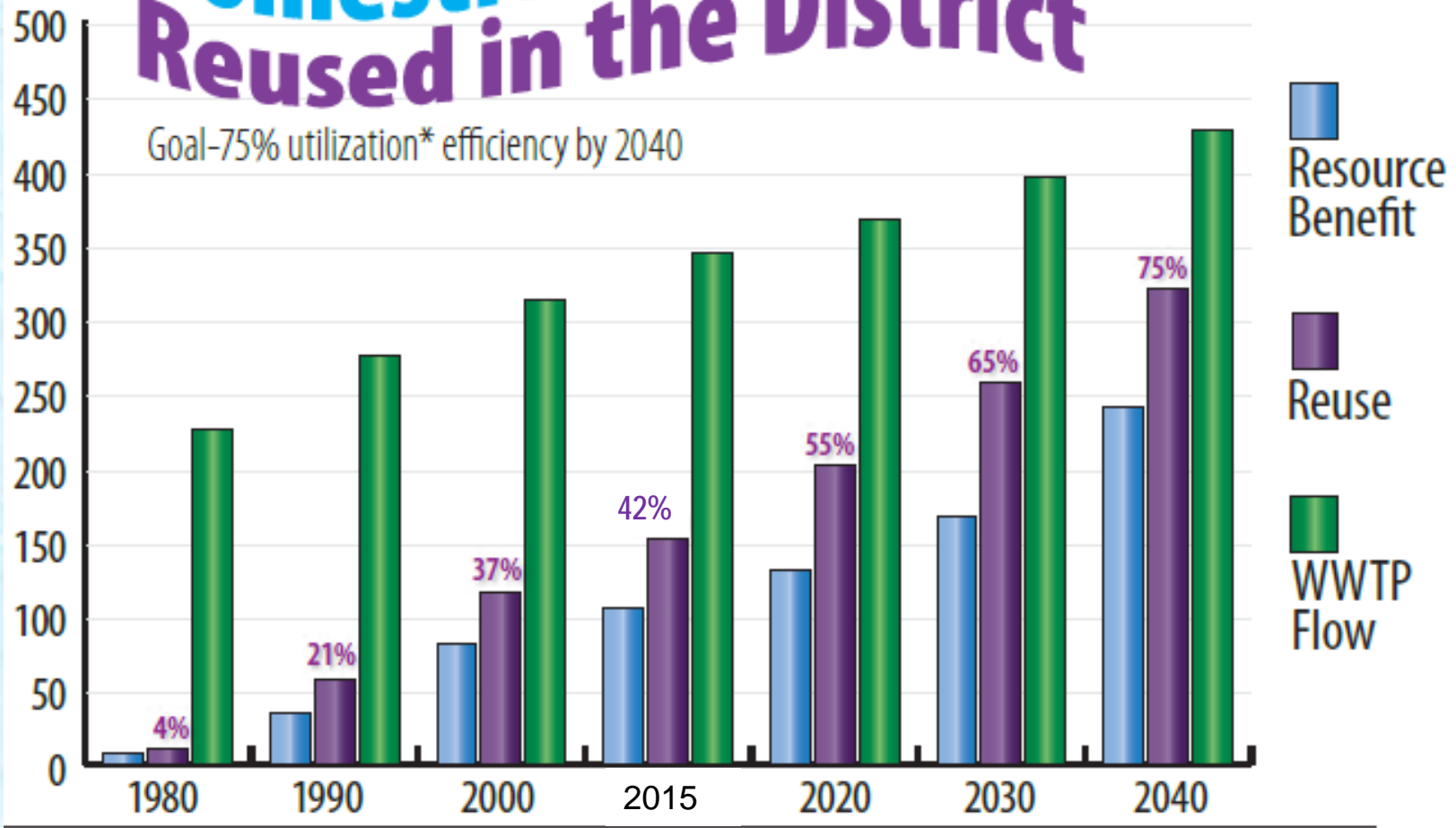
2015 Reclaimed Water



- 159 mgd beneficial reuse out of 376 mgd (FDEP)
- 499 mgd beneficial reuse out of 1,671 mgd (FDEP)
- 2,240 mgd reuse out of 32 **billion** gpd (USEPA)

Domestic Wastewater Reused in the District

Goal-75% utilization* efficiency by 2040

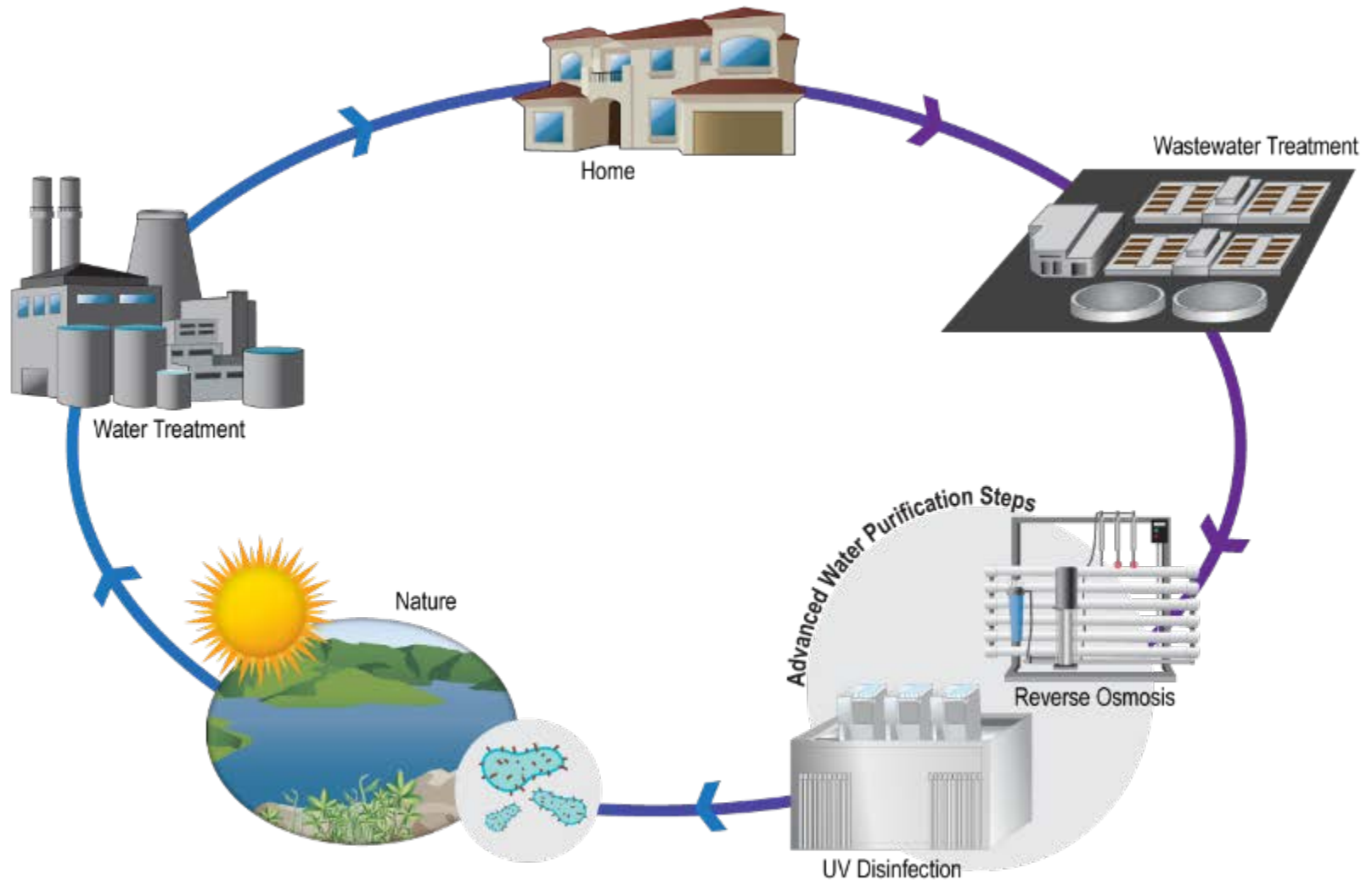


How Do We Reach Our Goal?

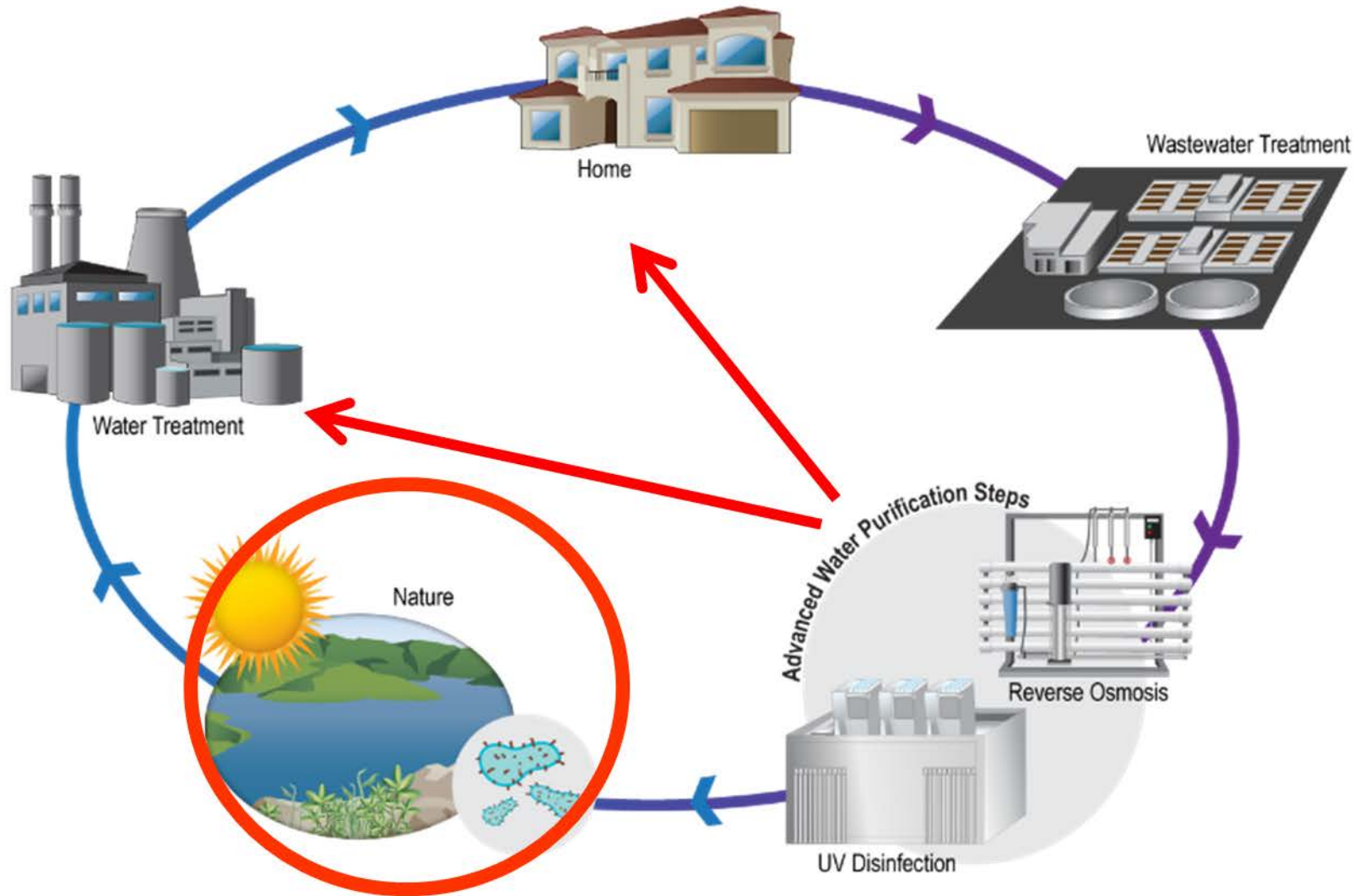
- Traditional projects
- Natural systems enhancement
- Storage strategies
 - Reservoirs
 - ASR
- **Potable Reuse**



Indirect Potable (IPR)



Direct Potable (DPR)



Why Implement Potable Reuse?

- Limitations with traditional reuse
- Increases in water supply demands
- Water scarcity and drought
- New water source
- Good policy
 - Diversified water portfolio





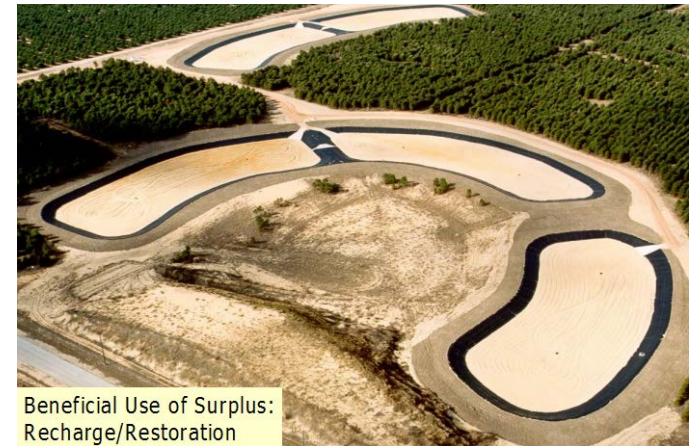
Why Potable Reuse as a Source?

- Sustainable and Reliable
- Locally-Controlled
- Safe
- Supported by Research
- Based on Sound Science
- Technology and Innovation



Indirect Potable Reuse (IPR)

- Rapid Infiltration Basins (RIBs)
- Surface discharge to potable sources
- Infiltrating wetlands
- Injection to potable aquifers



IPR: Historical Examples

- **Unplanned**

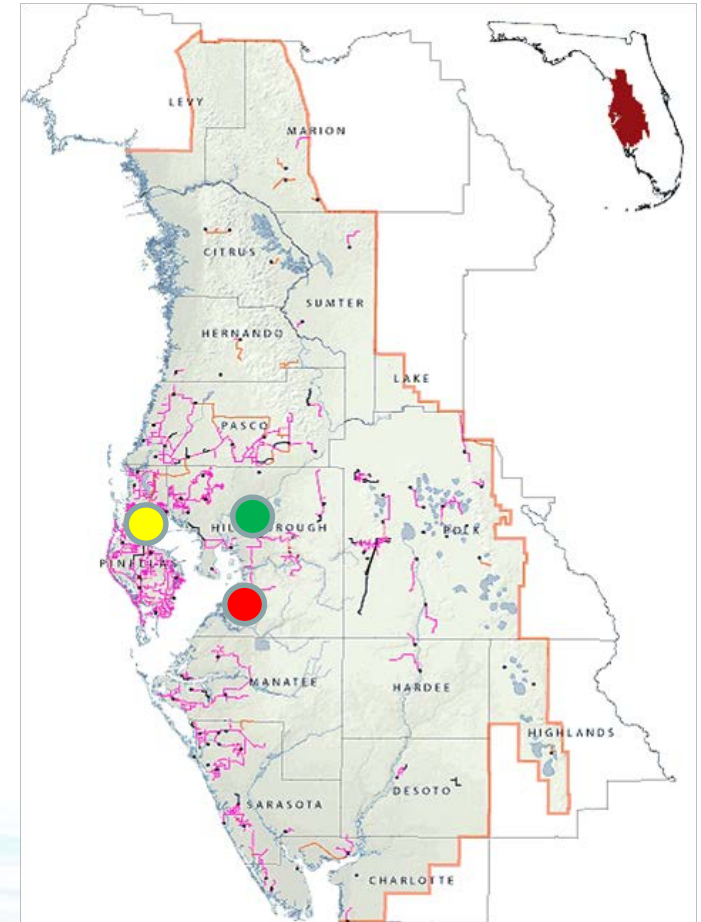
- Mississippi River
- Ohio River
- Trinity River (Texas)
- Colorado River

- **Planned**

- Orange County Groundwater Replenishment System (California)
- CONSERV II (Orlando)
- Upper Occoquan (Washington DC Metro Area)

IPR: District Supported Examples

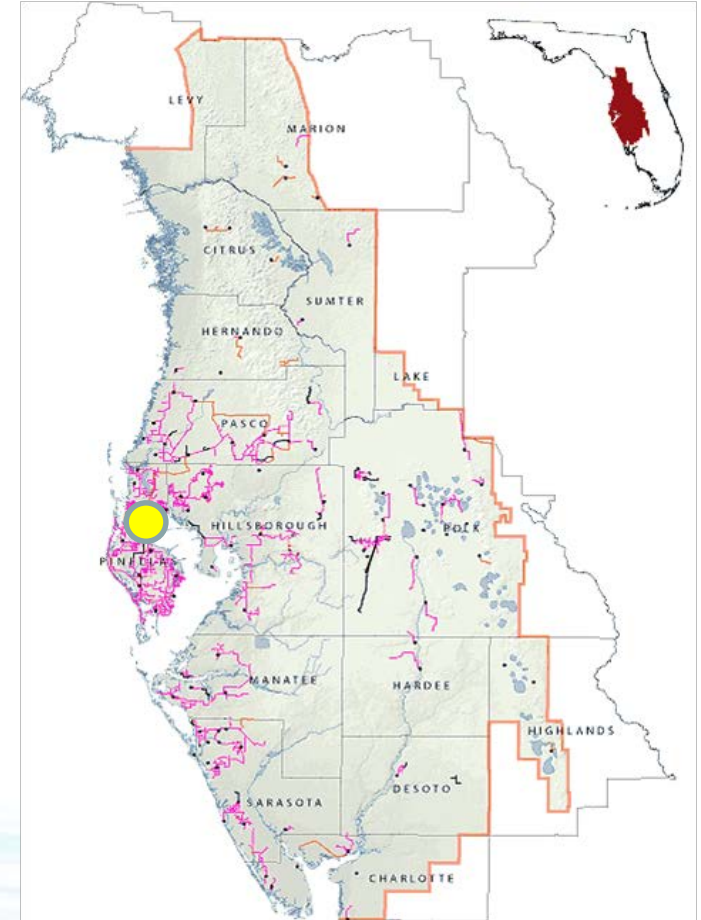
- Clearwater Groundwater Replenishment Project, 2.4 mgd
- South Hillsborough Aquifer Recharge Project (SHARP), up to 16 mgd
- Tampa Augmentation Project (TAP) up to 20 mgd



IPR: District Supported Examples

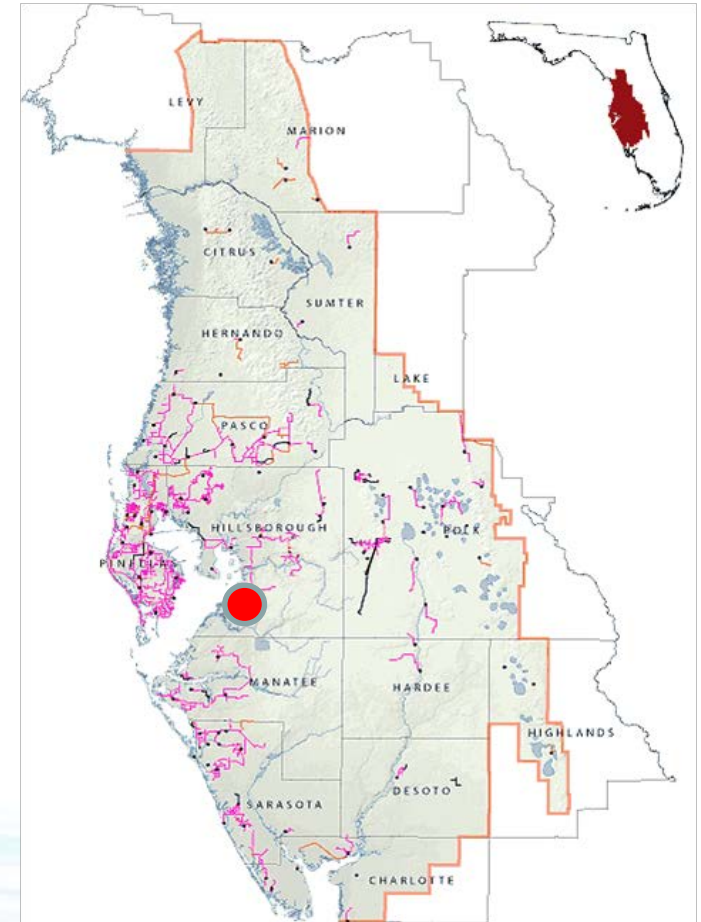
Clearwater Groundwater Replenishment Project, 2.4 mgd

- Clearwater - Injection of purified water into a brackish zone of the UFA
- Benefits of 2.4 mgd
- \$28M, District share \$14M
- At 90% design, permitting ongoing, and construction to start 2018



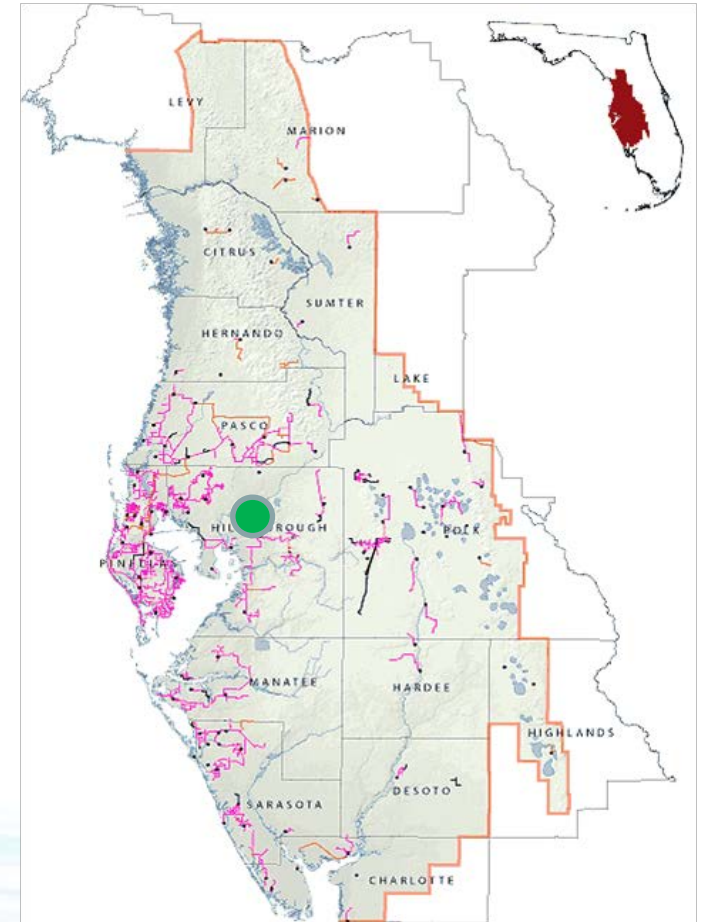
IPR: District Supported Examples

- South Hillsborough Aquifer Recharge Project (SHARP), up to 16 mgd
 - A Regional Aquifer Recharge System with potential net benefit to the SWUCA
 - 1-2 mgd Pilot
 - \$2.8M, District Share \$1.4M
 - In testing phase



IPR: District Supported Examples

- Tampa Augmentation Project (TAP) up to 20 mgd
 - TAP - aquifer recharge/recovery system to augment the Hillsborough River Reservoir
 - \$3M study, District Share \$1.5M
 - Possible DPR



Direct Potable Reuse (DPR)



Direct Pipe-to-Pipe
“Purified Water”

1969 Namibia

2003 Singapore NEWater

2007 Cloudcroft, New Mexico
PUREwater

2013 Big Spring, Texas

2014 Wichita Falls, Texas

Empirical Support

- ❖ Purified Water is a Viable Option

WateReuse California 2011 Direct Potable Report

- ❖ In many parts of the world, DPR may be the most economical and reliable method of meeting future water supply needs

USEPA 2012 Guidelines for Water Reuse

- ❖ DPR can meet or exceed all drinking water standards, is safe for direct human consumption and is comparable in costs to most alternative water supplies

WateReuse 2014 The Opportunities and Economics of Direct Potable Reuse

- ❖ Increased construction of “DPR” supplies around the world

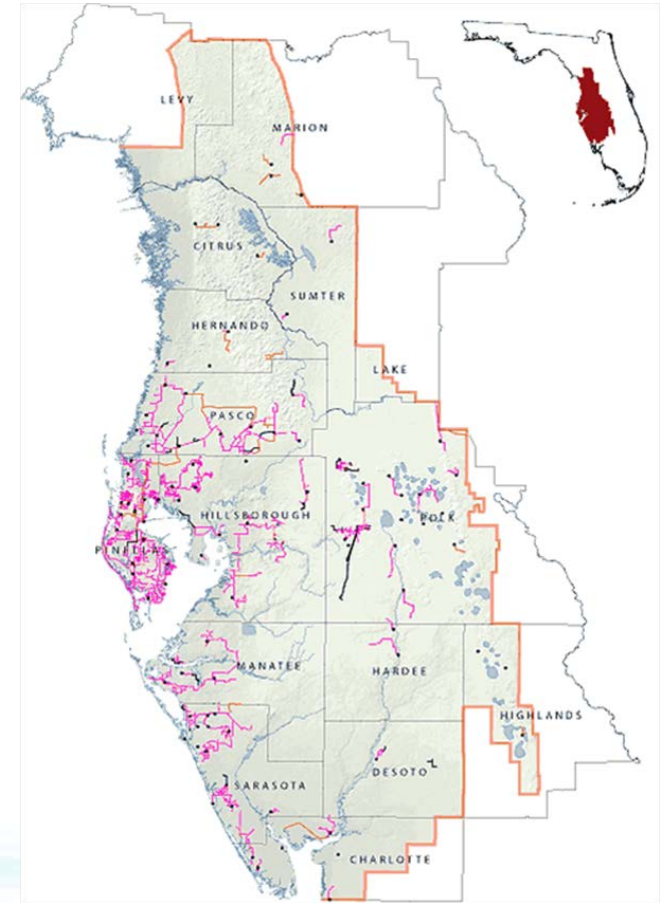
Potable Reuse Future

Challenges:

- Public perception
- Regulatory framework
- Utility Training
- Competing uses/disposal
- Funding

Opportunities:

- 685 mgd of potential in Florida
- 150 mgd of potential in District



Questions

Jason Mickel

Water Supply Section Manager



jason.Mickel@watermatters.org