# Update on Aquifer Storage and Recovery Projects

Water Resources Advisory Commission
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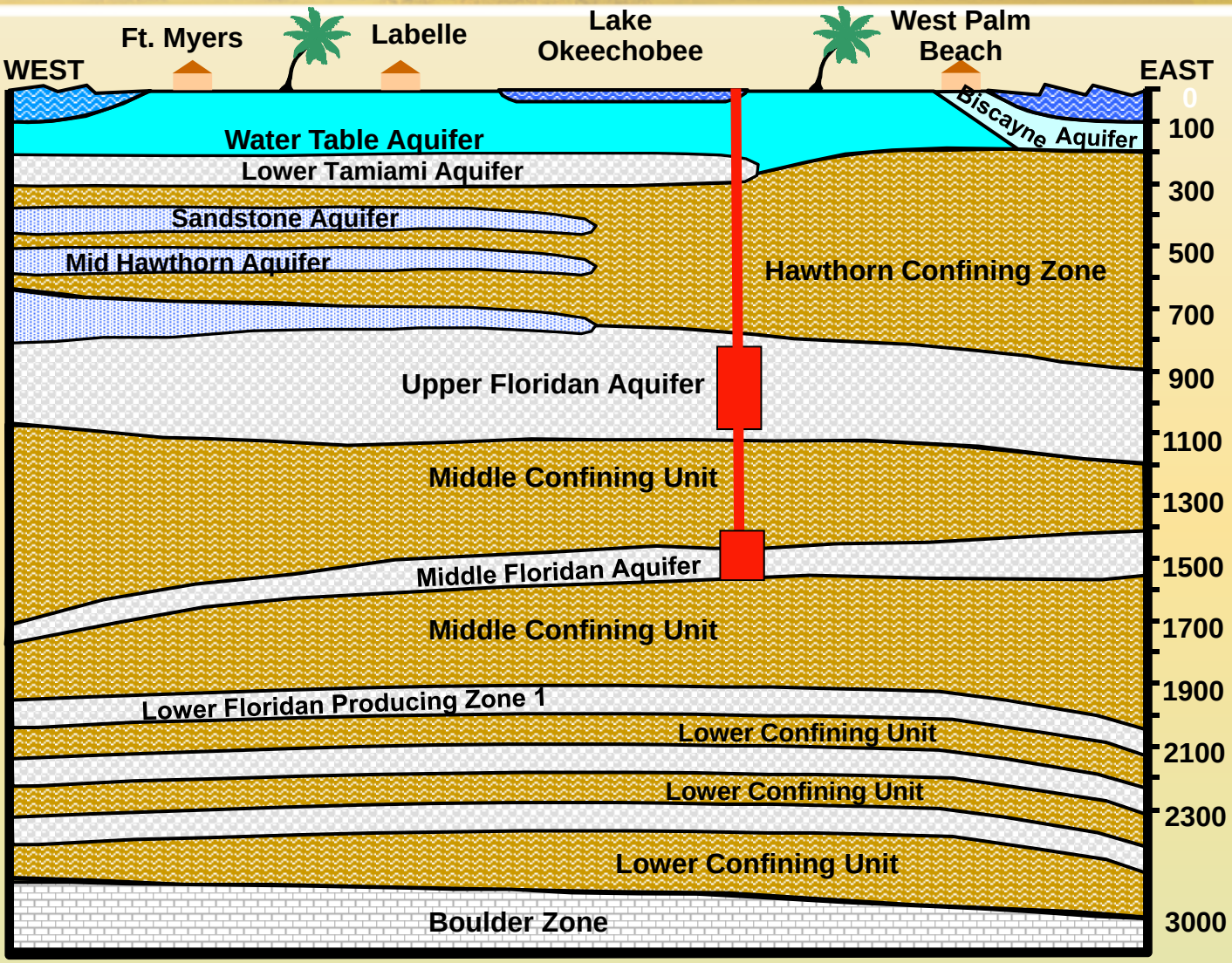
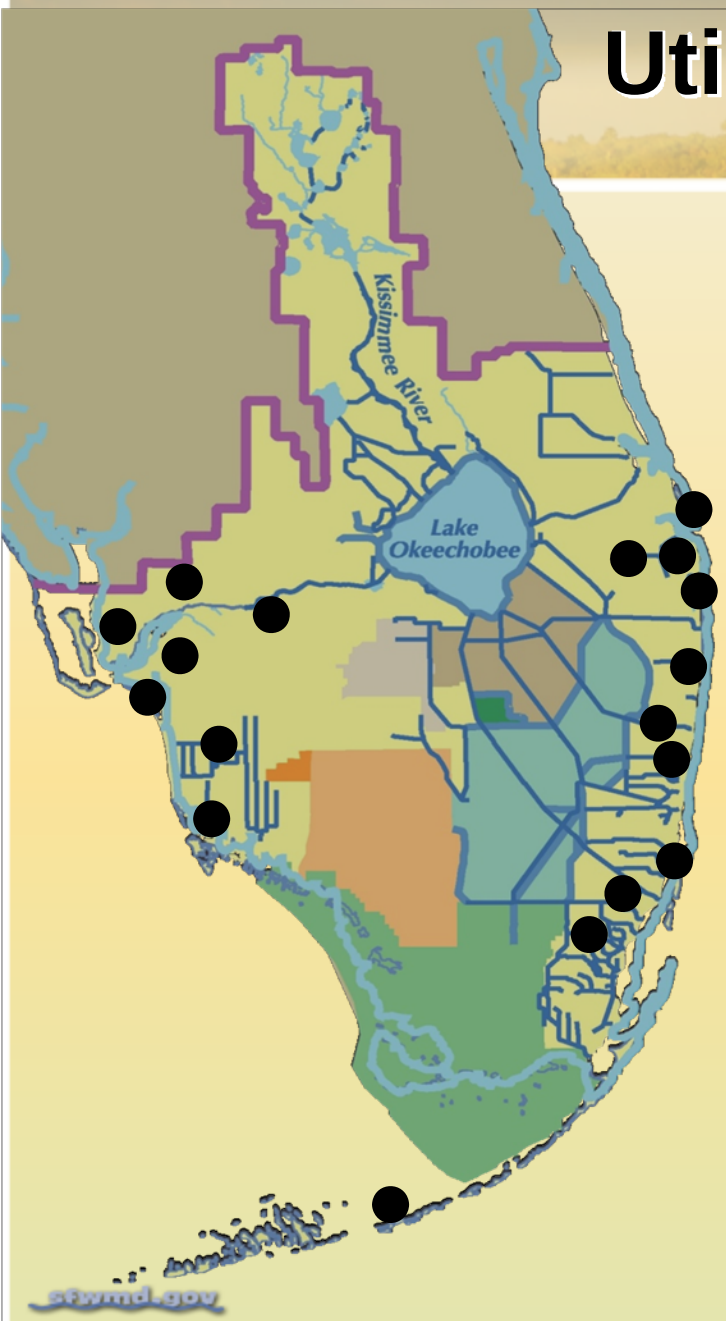
*Bob Verrastro, P.G., Lead Hydrogeologist,*
*Everglades Restoration and Capital Projects*

# Hydrogeology of South Florida Aquifer Storage and Recovery Projects (ASRs)



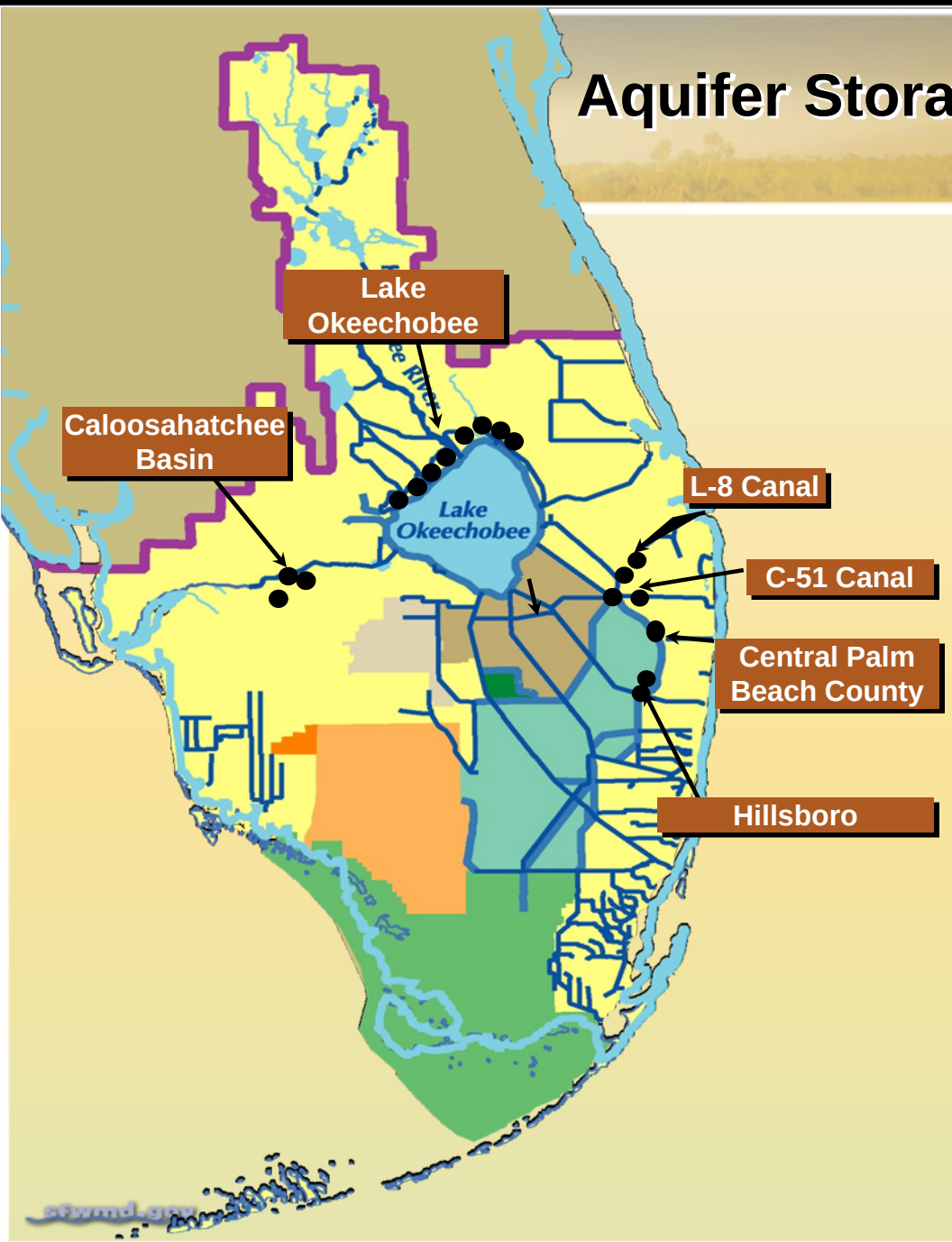

Targeting the Upper and Middle Floridan Aquifer

# Utility Systems in the SFWMD




- 20 utility systems in five counties
  - Potable, raw groundwater, treated surface water and reclaimed water systems
- 30 operational ASR wells
  - Approximately 40 million gallons per day of installed capacity
- 10 test/pilot projects completed or under way

# Aquifer Storage and Recovery in CERP

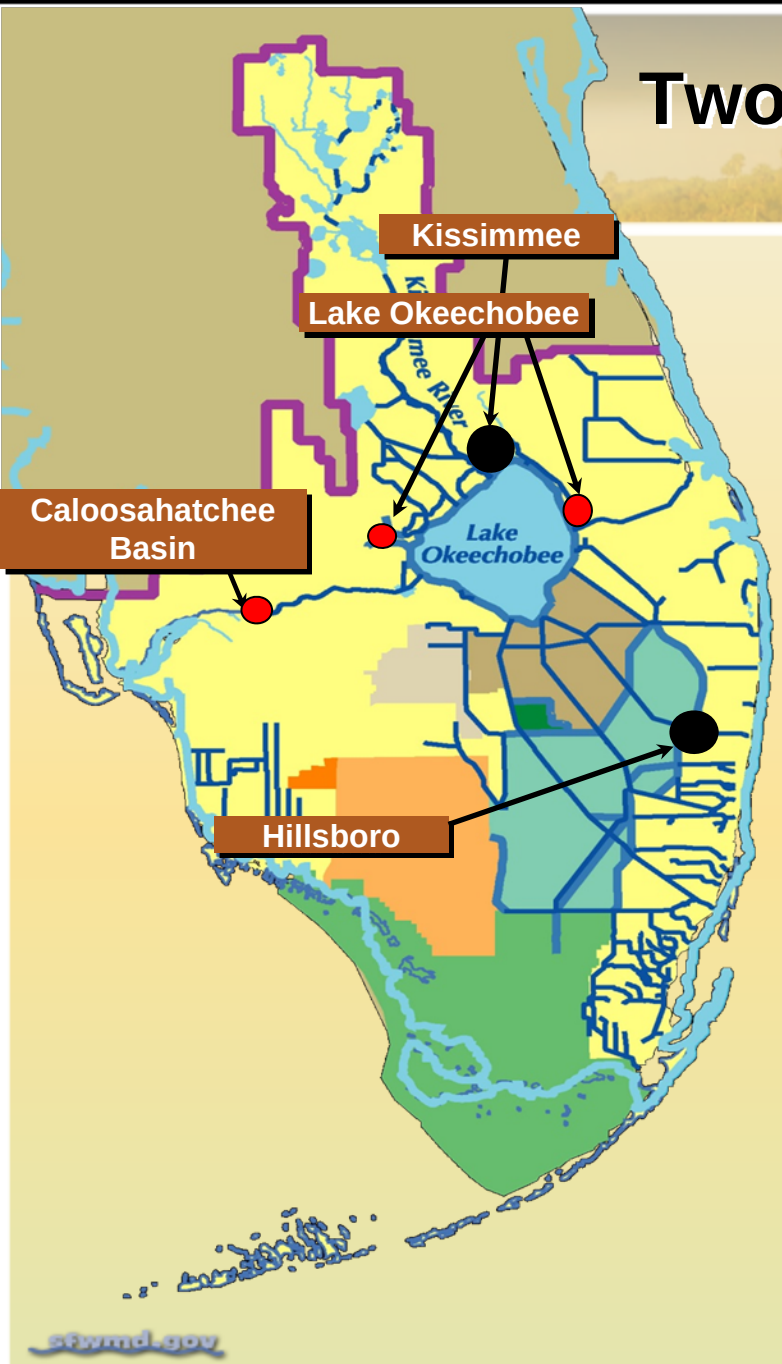



- 333 wells = 1.6 billion gallons per day
- Flexibility in siting
- Reservoirs work better
- Lower storage rates, but higher volumes and durations
- Extended recovery
- Experience in Florida

# CERP ASR Pilot Projects

- Water quality characterization
- Exploratory wells
- Design studies
- Permitting
- Pilot project design report
- Environmental impact statements
- Project cooperation agreements
- Originally - five sites
- Construction of only two sites
- Cycle testing

# Two Pilots have been constructed



# Kissimmee River ASR Pilot Project

- Excellent recovery efficiency
- No toxicity or bioaccumulation
- Some arsenic
- Apparent nutrient reduction
- Already into cycle #2
- Ultraviolet disinfection works, but it is impacted by canal water variability
- Periodic rehabilitation may be required

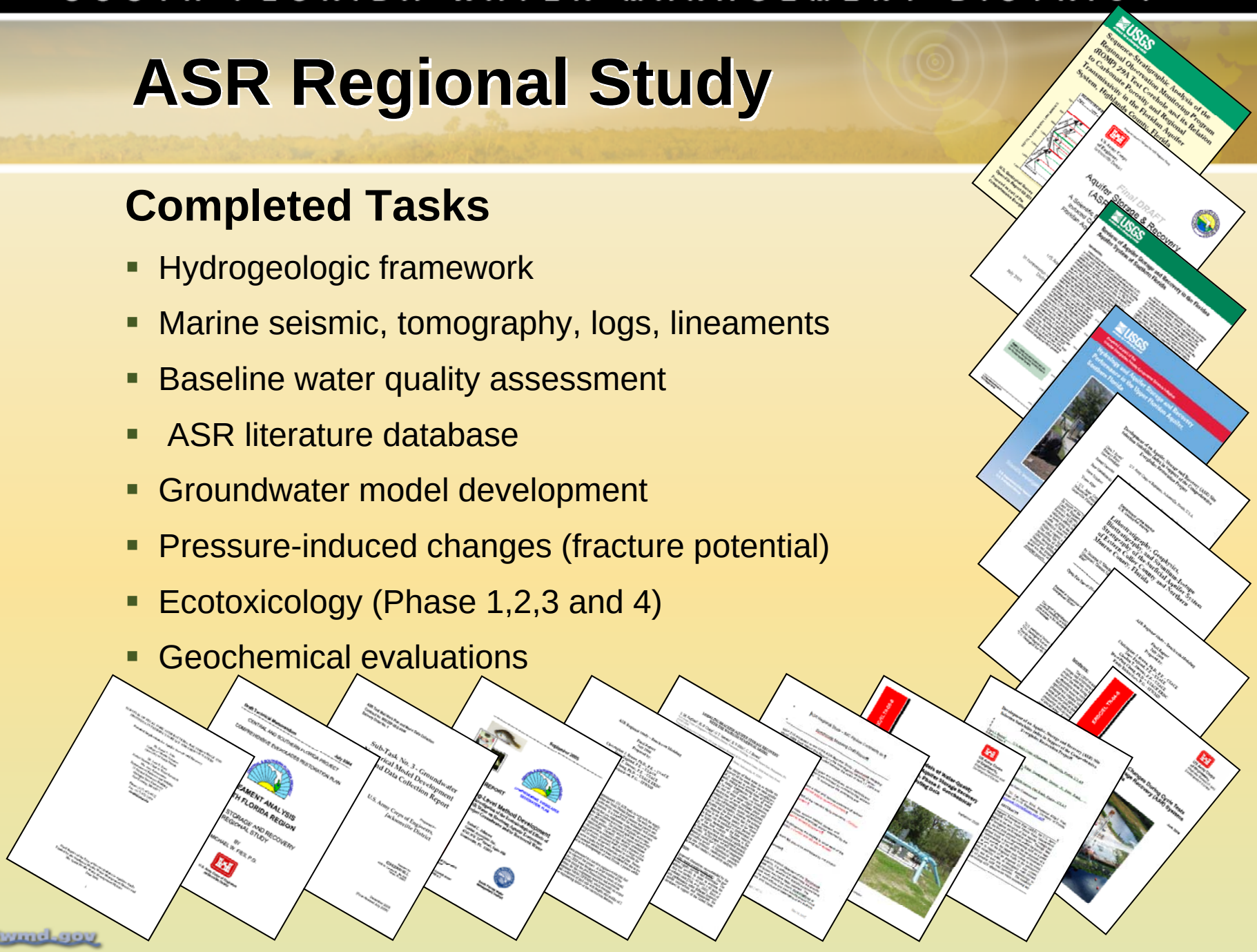
# Hillsboro ASR Pilot Project

- Should begin cycle testing in December
- Very simple design
- ASR wells will be integrated into Site 1 Impoundment
- High-capacity well (10 million gallons per day) – will probably need fewer wells

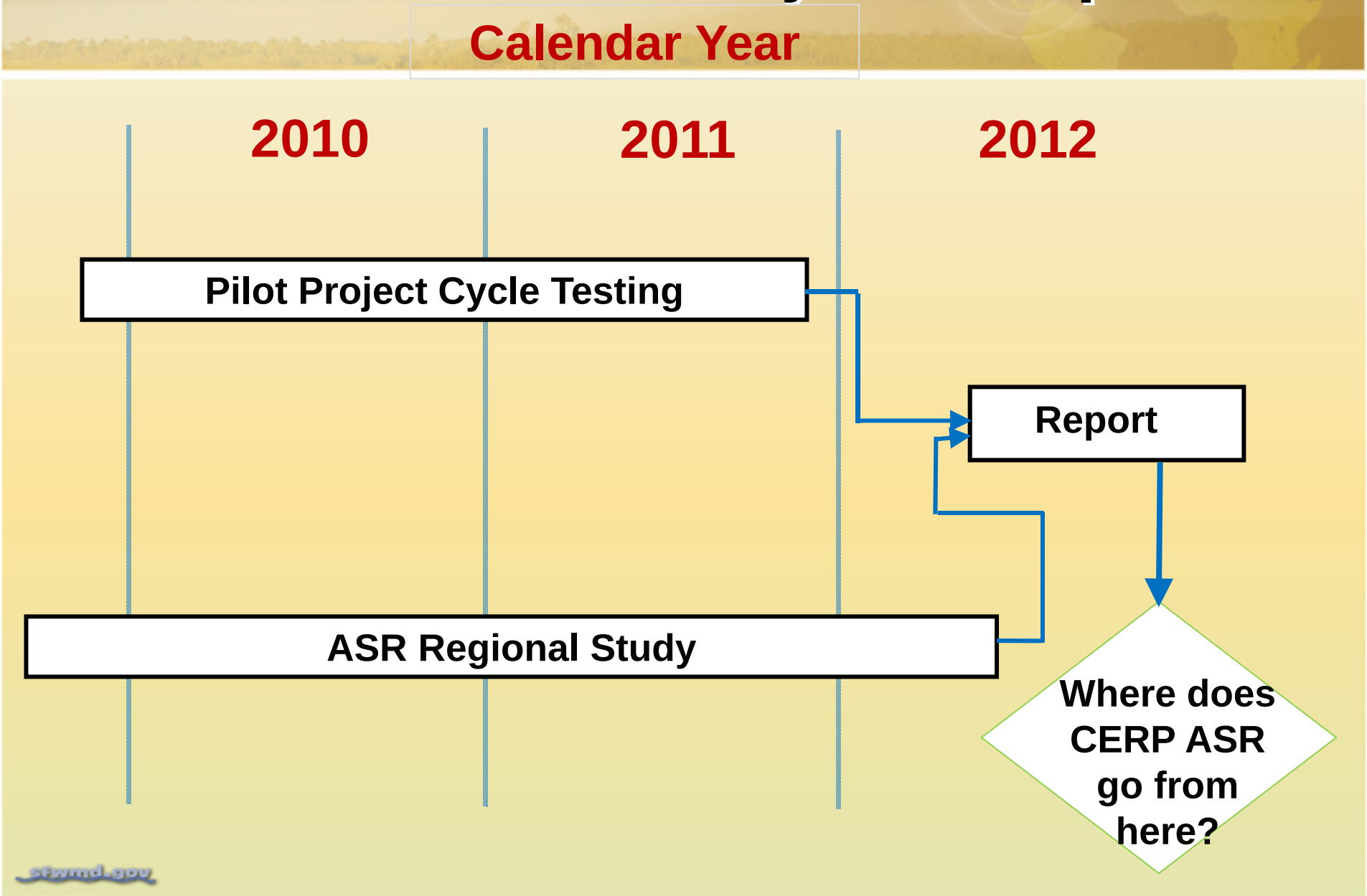
# ASR Regional Study

## Completed Tasks

- Hydrogeologic framework
- Marine seismic, tomography, logs, lineaments
- Baseline water quality assessment
- ASR literature database
- Groundwater model development
- Pressure-induced changes (fracture potential)
- Ecotoxicology (Phase 1,2,3 and 4)
- Geochemical evaluations



# Schedule for ASR Project Completion



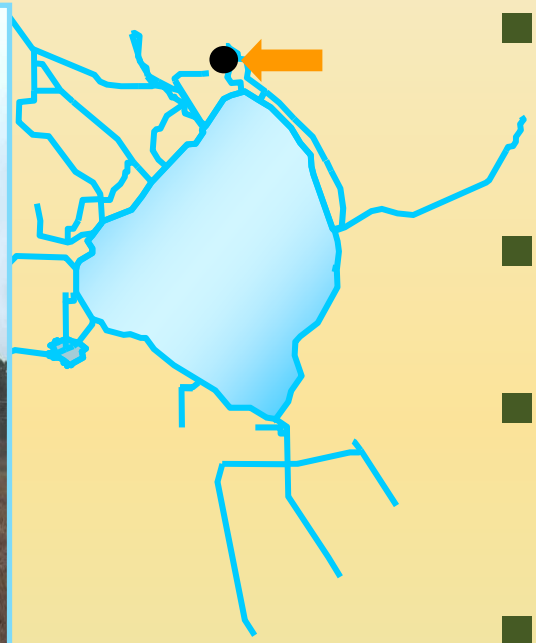
# Upcoming Near-Term Tasks

- Lake Okeechobee ecological and water quality model simulations
- Continued groundwater model development
- Mercury methylation evaluation
- Fate of microorganisms in aquifers study with USGS
- Ecological risk assessment development
- Bradenton oxygen removal system evaluation
- Pilot project operations and maintenance costs evaluation

# Update on CERP ASR Costs

- Lake Okeechobee ASR – 200 wells
- Raise or lower the lake 2.5' in one year
  - **"Yellow Book" 1999 estimate - $1.1 billion**
    - assumed microfiltration coupled with chlorine disinfection and per well capacity at 5 million gallons per day, but higher-capacity wells are possible
  - **Assuming the Hillsboro pilot design is sufficient, the current estimate is $1.1 billion – <u>costs have not escalated since 1999</u>**
    - Operations and maintenance costs will be dependent upon level of treatment and monitoring

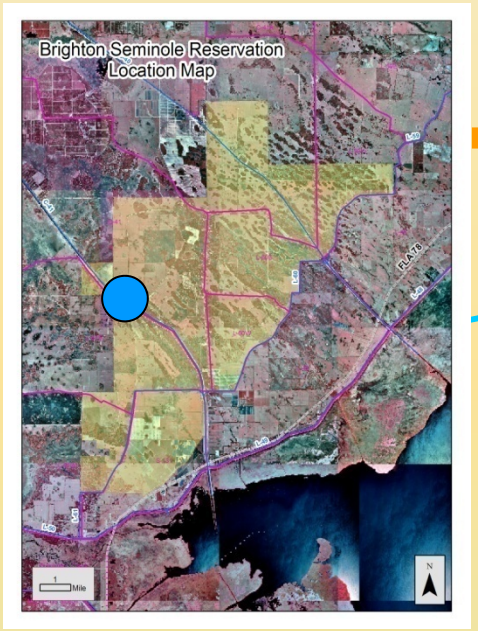
# L-63N Canal (Taylor Creek) ASR



- High-capacity well, in the middle Floridan aquifer
- Canal water is resistant to disinfection
- Petition for a limited aquifer exemption filed with FDEP
- Reactivation design is 90% complete

# Seminole Brighton ASR Project

**Brighton Reservation**



- Exploratory well constructed
- Geotechnical investigations completed
- Permitting in process
- Conceptual design could use bank infiltration

# Wrap Up

- Cycle testing, groundwater model and environmental risk assessment next
- Nutrient reduction – Could it be a hidden benefit?
- Disinfection – Is it necessary?
- Northern Everglades Plan - ASR projects north of Lake Okeechobee
- U.S. Sugar – ASR storage will be evaluated within some alternatives. Exploratory well already constructed.
- ASR is still a viable tool!

Questions?
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