SOUTH FLORIDA WATER MANAGEMENT DISTRICT

AGENDA

WATER RESOURCES ADVISORY COMMISSION

Thursday, December 3, 2009, 9:00 AM
Marriott Hotel - Key Largo
103800 Overseas Highway (U.S. Highway 1)
Key Largo, FL 33037

Joint meeting with the WRAC Lake Okeechobee Committee

1.	Welcome and Introductions: Chair Shannon Estenoz *Agenda changes (if any) *Announcements *Status: WRAC Issues Workshop on Adaptive Protocols for Lake Okeechobee Regulation Schedule, 2008	15m
2.	Member Issues	30m
3.	South Florida Water Management District/Monroe County Activities Update: Tom Genovese, Director, Florida Keys Service Center, Intergovernmental Programs Dept., Regulatory and Public Affairs, SFWMD See supporting document: KeysUpd TGenovese 12 3 09.pdf	5p 10d
4.	Lake Okeechobee Committee Items: *Water Conditions Summary: Matahel Ansar, Deputy Director, Operations Control and Hydro Data Mgt. Dept., Operations and Maintenance, SFWMD *Lake Ecology Update and Lake Okeechobee Burn Plan: David Unsell, Director, Lake Okeechobee Division, Restoration Sciences Dept., Everglades Restoration and Capital Projects, SFWMD	40p 30d
5.	S-9 Basin Update: Tommy B. Strowd, P.E., Assistant Deputy Executive Director, Everglades Restoration and Capital Projects, SFWMD	15p 20d
	• Public Comment	15m
6.	Lunch: 12:00 - 12:45	45m

7. Comprehensive Everglades Restoration Plan Projects Update and Projects for Possible Inclusion in WRDA, 2010: Kimberley Taplin, Deputy for Restoration, South Florida, U.S. Army Corps of Engineers, Jacksonville District — 30p 30d

8. Aquifer Storage and Recovery Briefing: Robert Verrastro, Lead Hydrogeologist, Project Coordination Div., Policy and Coordination Dept., Everglades Restoration and Capital Projects, SFWMD — 15p 15d

See supporting document: WRAC Update-Dec-09-rv jw-rv11-23-09.pdf

9. Climate Change Impacts on South Florida: Jayantha Obeysekera, Director, Hydrologic & Environmental Systems Modeling Dept., Everglades Restoration and Capital Projects, SFWMD — 15p 30d

See supporting document: Climate Change Impacts on South Florida.WRAC_03Dec2009.pdf

- Public Comment — 15m

10. Adjourn: 3:15 p.m

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*Agenda changes (if any)

*Announcements

*Status: WRAC Issues Workshop on Adaptive Protocols for Lake Okeechobee Regulation Schedule, 2008

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15m

2. Member Issues 30m

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3. South Florida Water Management District/Monroe County Activities Update: Tom Genovese, Director, Florida Keys Service Center, Intergovernmental Programs Dept., Regulatory and Public Affairs, SFWMD 5p 10d

See supporting document: KeysUpd TGenovese 12 3 09.pdf

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Monroe County Activities Update

Tom Genovese
Florida Keys Service Center Director

sfwmd.gov

Monroe County Activities Update

Stormwater Projects in Monroe County and the Cities of Key Colony Beach, Marathon, and Key West

Water Conservation Hotel and Motel Program (Water CHAMP)

Monroe County Activities Update

Relocation of the Florida Keys Service Center

CELEBRATING 60 YEARS

Questions?

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4. Lake Okeechobee Committee Items:

*Water Conditions Summary: Matahel Ansar, Deputy Director, Operations Control and Hydro Data Mgt. Dept., Operations and Maintenance, SFWMD

*Lake Ecology Update and Lake Okeechobee Burn Plan: David Unsell, Director, Lake Okeechobee Division, Restoration Sciences Dept., Everglades Restoration and Capital Projects, SFWMD 40p 30d

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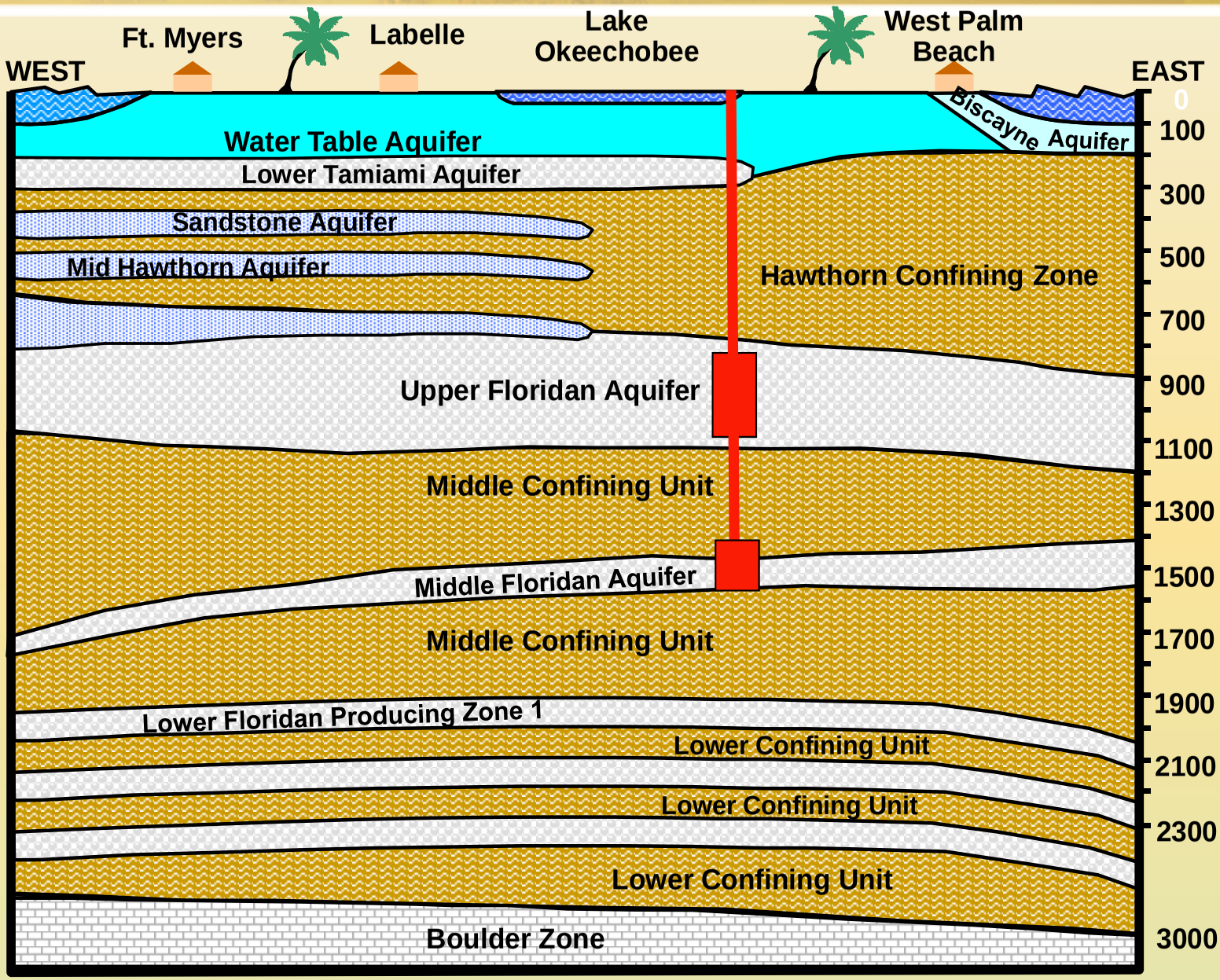
Update on Aquifer Storage and Recovery Projects

Water Resources Advisory Commission
December 3, 2009

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

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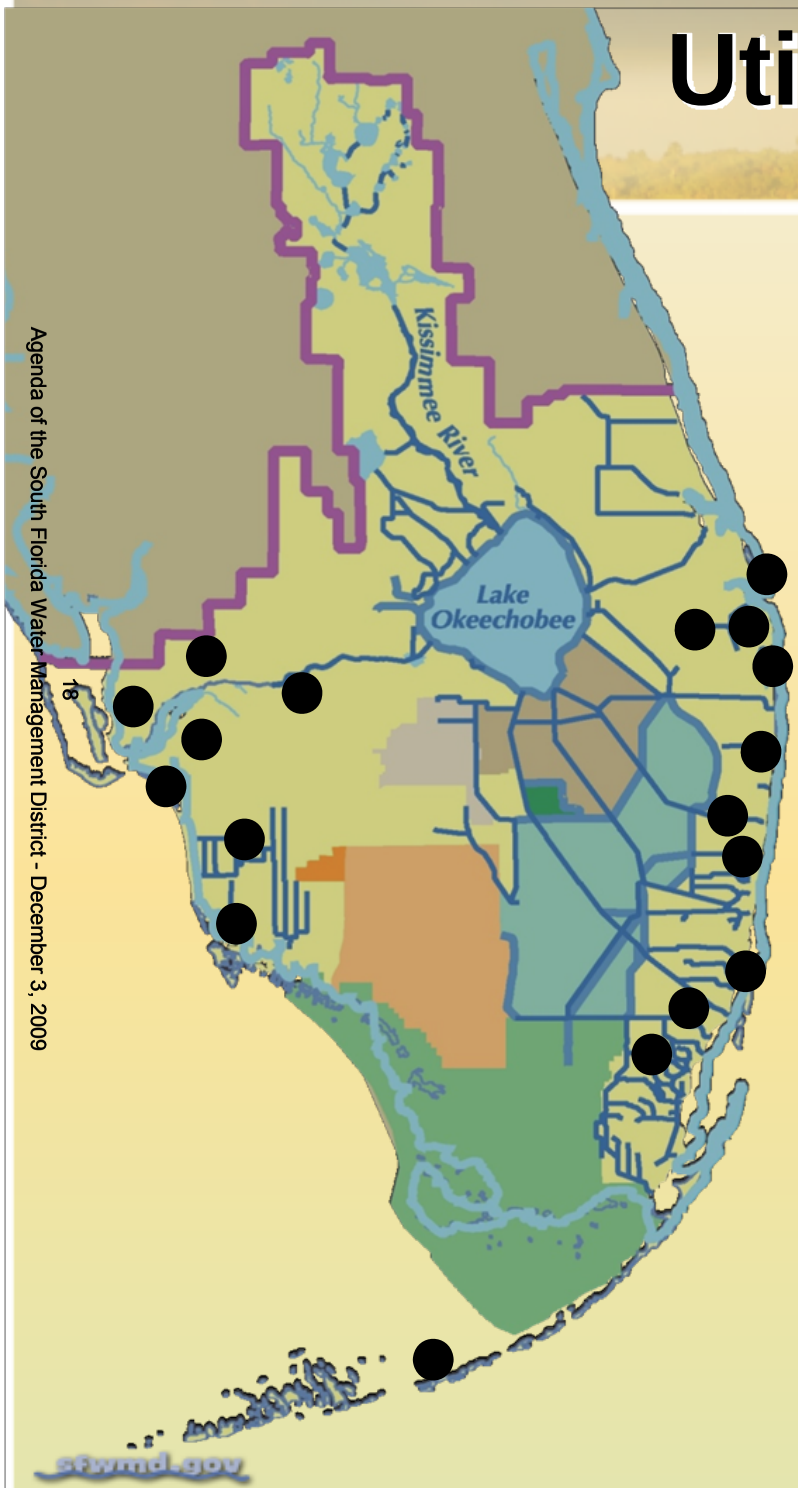
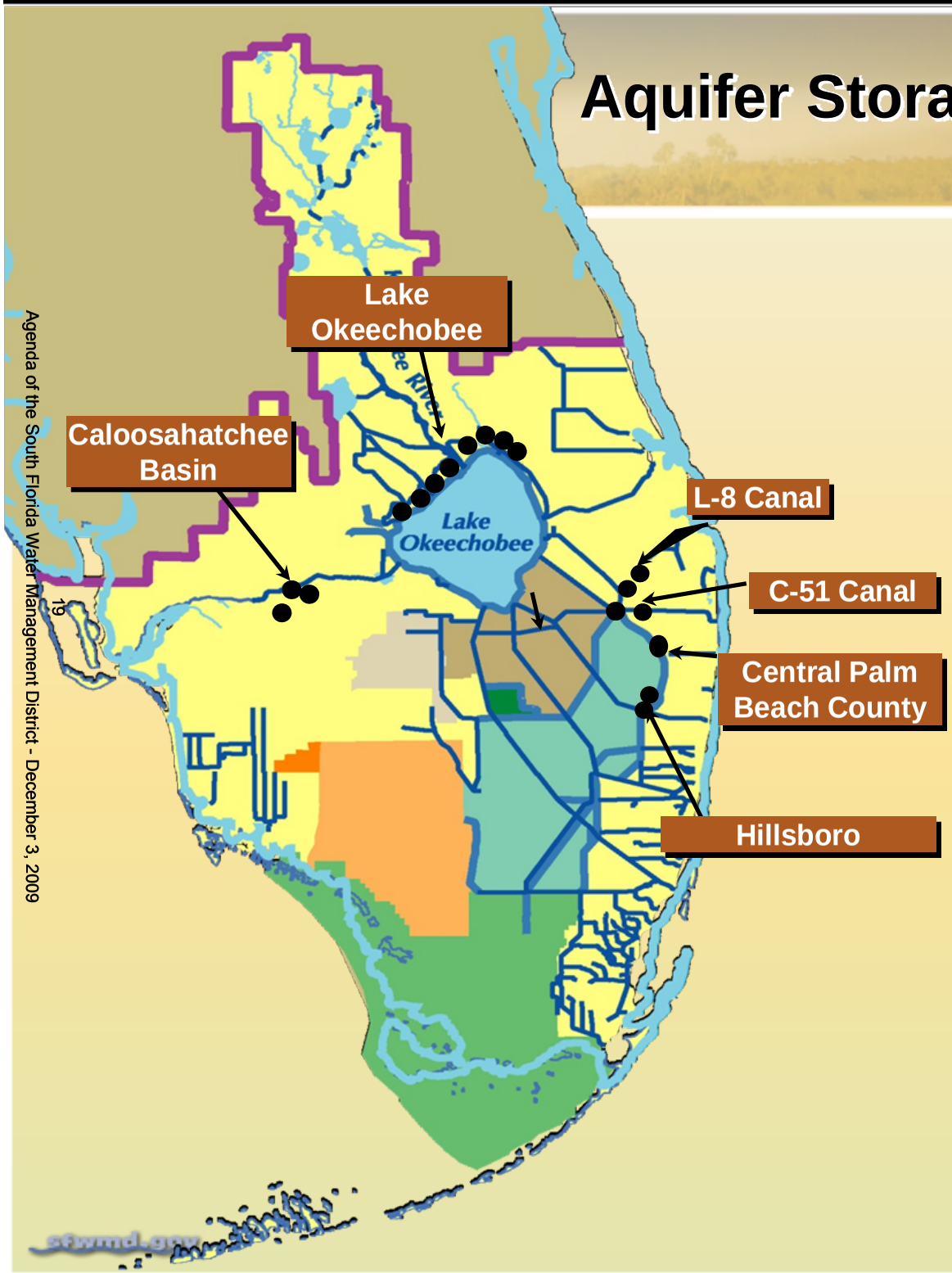
Utility Systems in the SFWMD



- 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

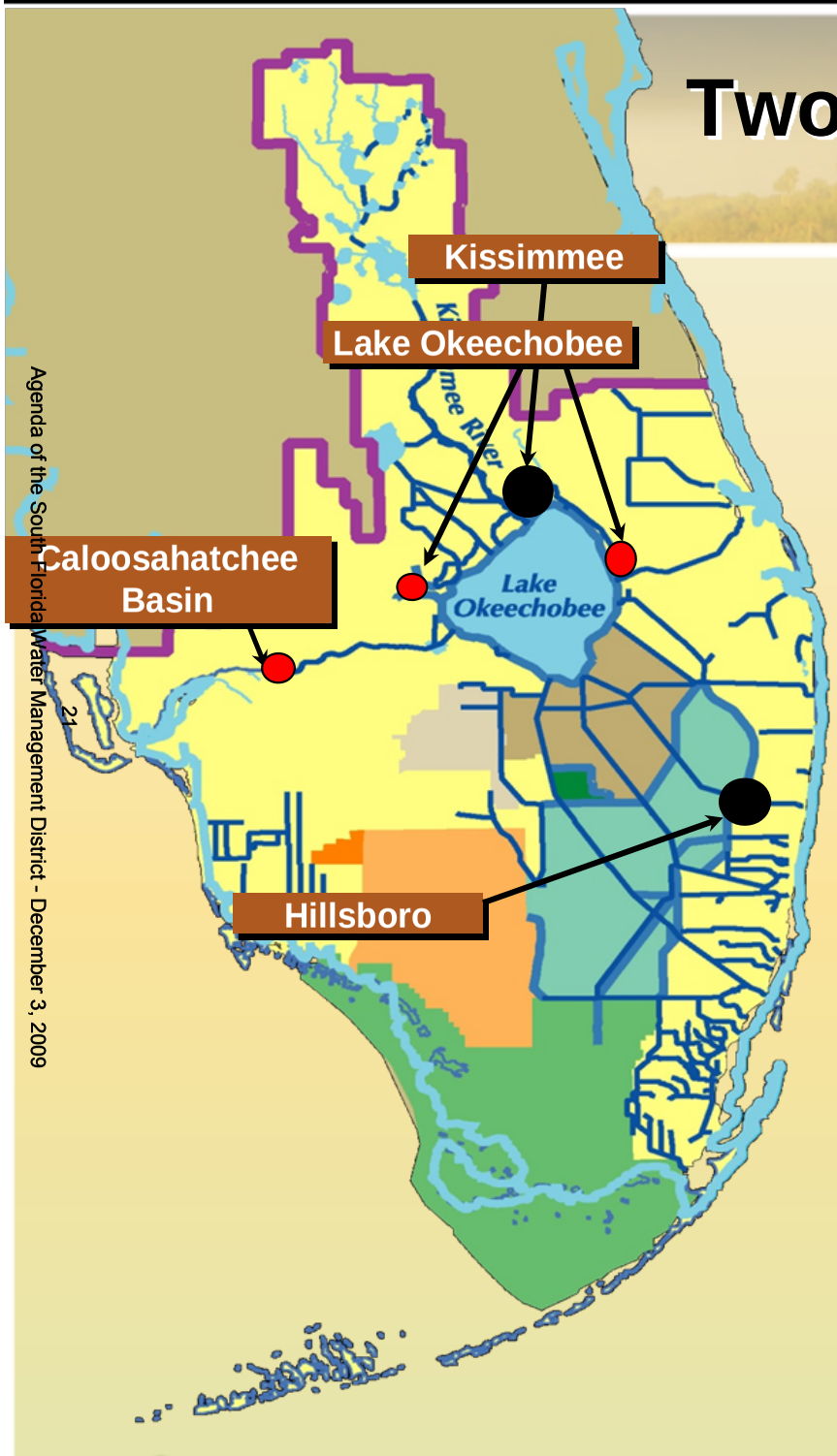


- 333 wells = 1.6 billion gallons per day
- Flexibility in siting
- Reservoirs work better
- Lower storage rates, but higher volumes and durations
- Extended recovery
- Experience in Florida

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

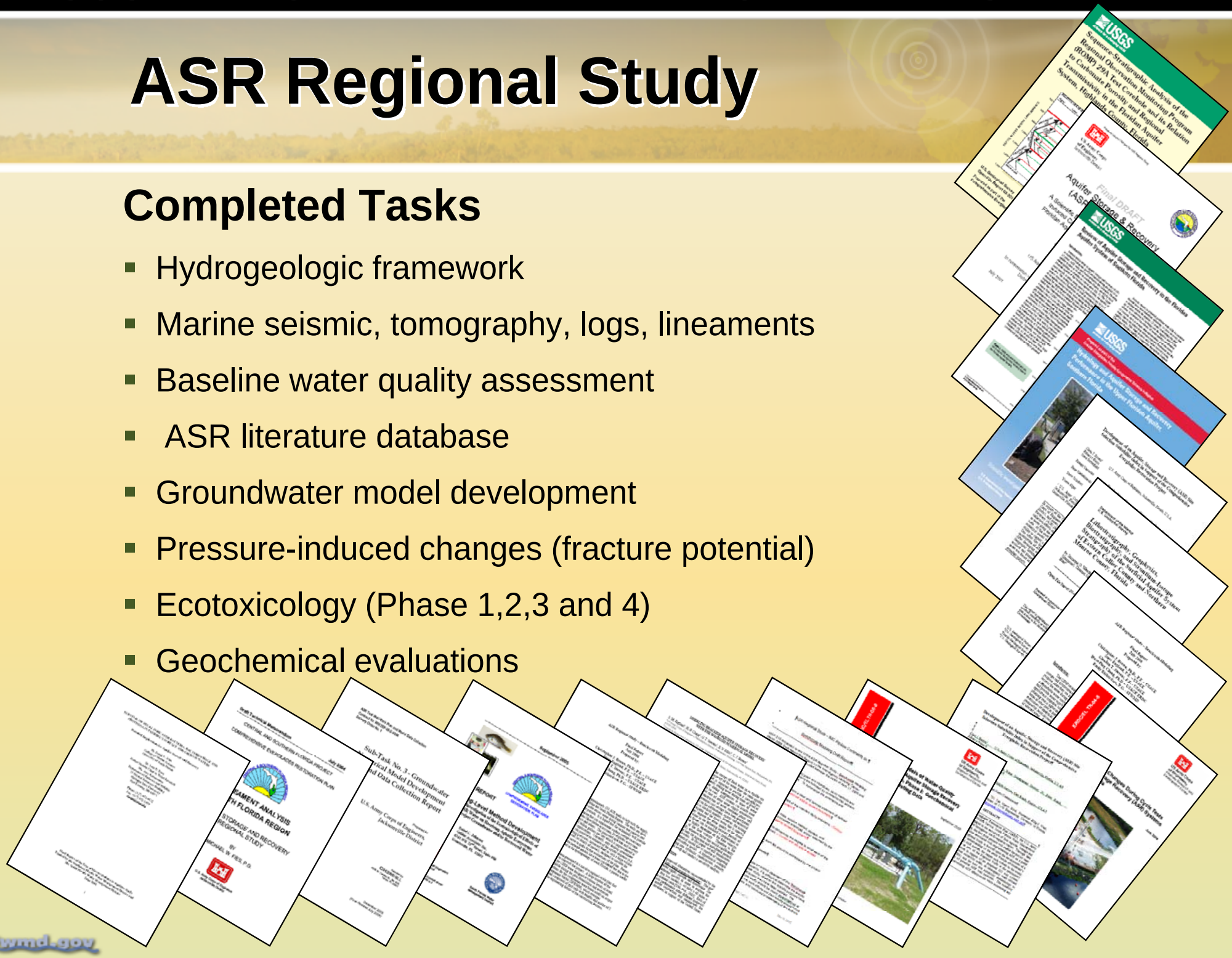
Hillsboro ASR Pilot Project

- 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

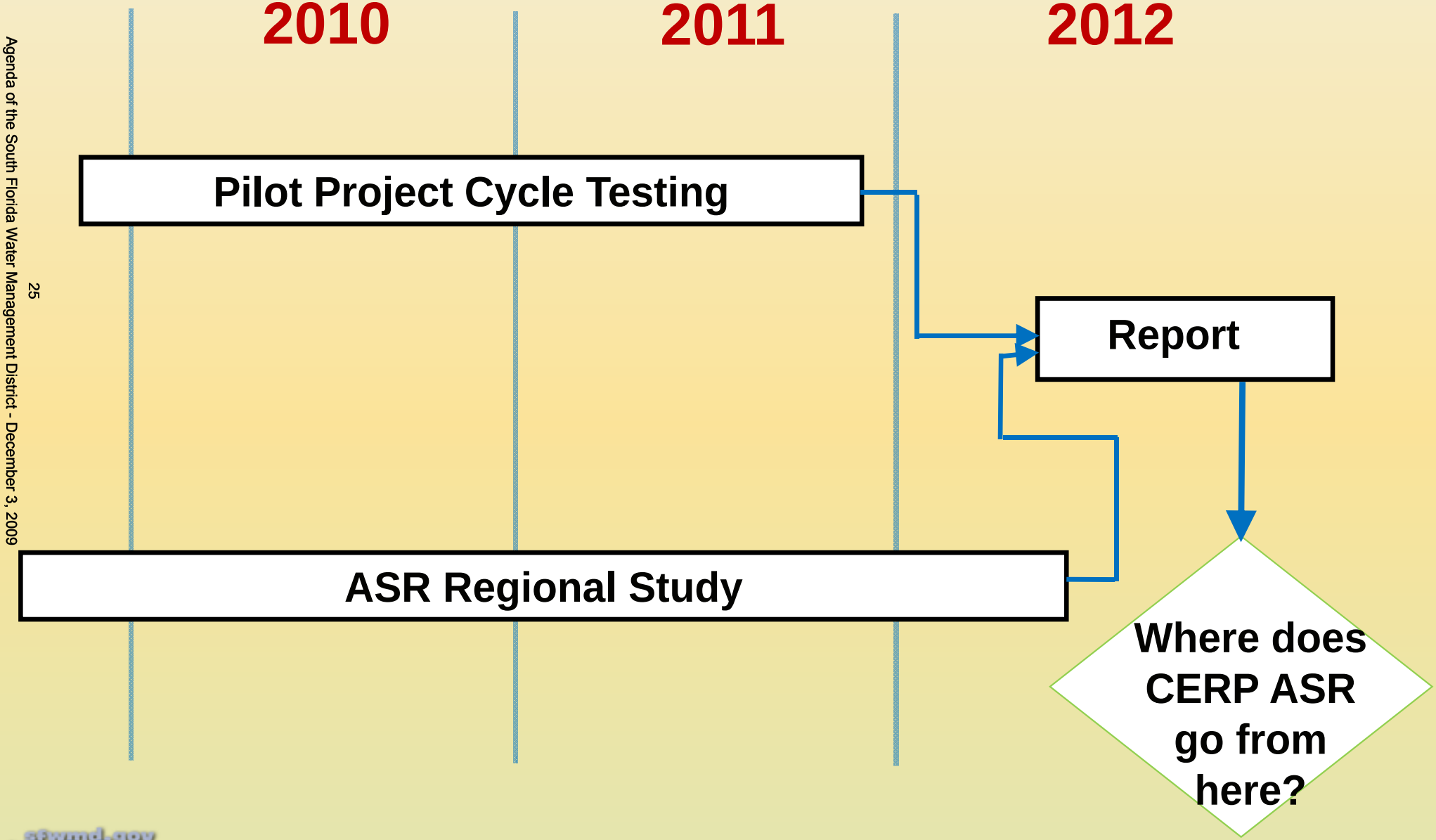
Completed Tasks

- 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

Calendar Year



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

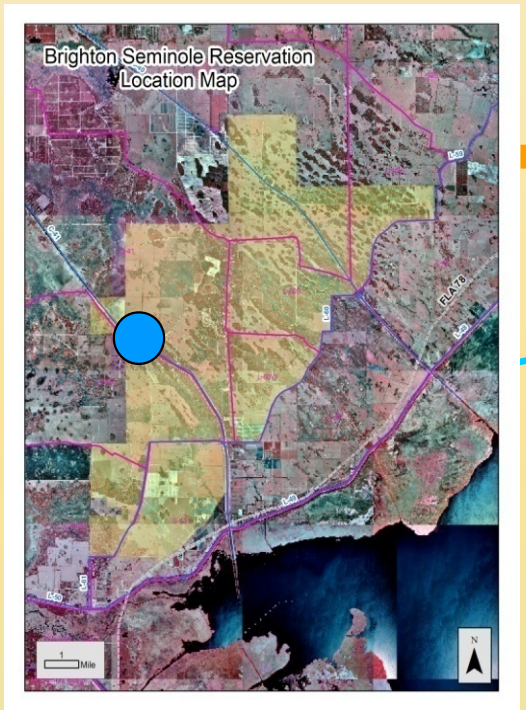
- Lake Okeechobee ASR – 200 wells
- Raise or lower the lake 2.5’ in one year
  - **“Yellow Book” 1999 estimate - $1.1 billion**
    - assumed microfiltration coupled with chlorine disinfection and per well capacity at 5 million gallons per day, but higher-capacity wells are possible
  - **Assuming the 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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- Public Comment — 15m

Climate Change and Water Management in South Florida

Kim Shugar
Intergovernmental Programs

Jayantha Obeysekera (obey)
Hydrologic & Environmental Systems Modeling

Joint WRAC/LO Committee Meeting
December 3, 2009

Confronting Climate Change

- Regional Water Resources System
- Two pronged approach:
  - What does science (global & regional) tell us?
  - Coordination with local/state/federal agencies
- Potential impacts on our mission
- Adopting a more measured approach

Confronting Climate Change (cont.)

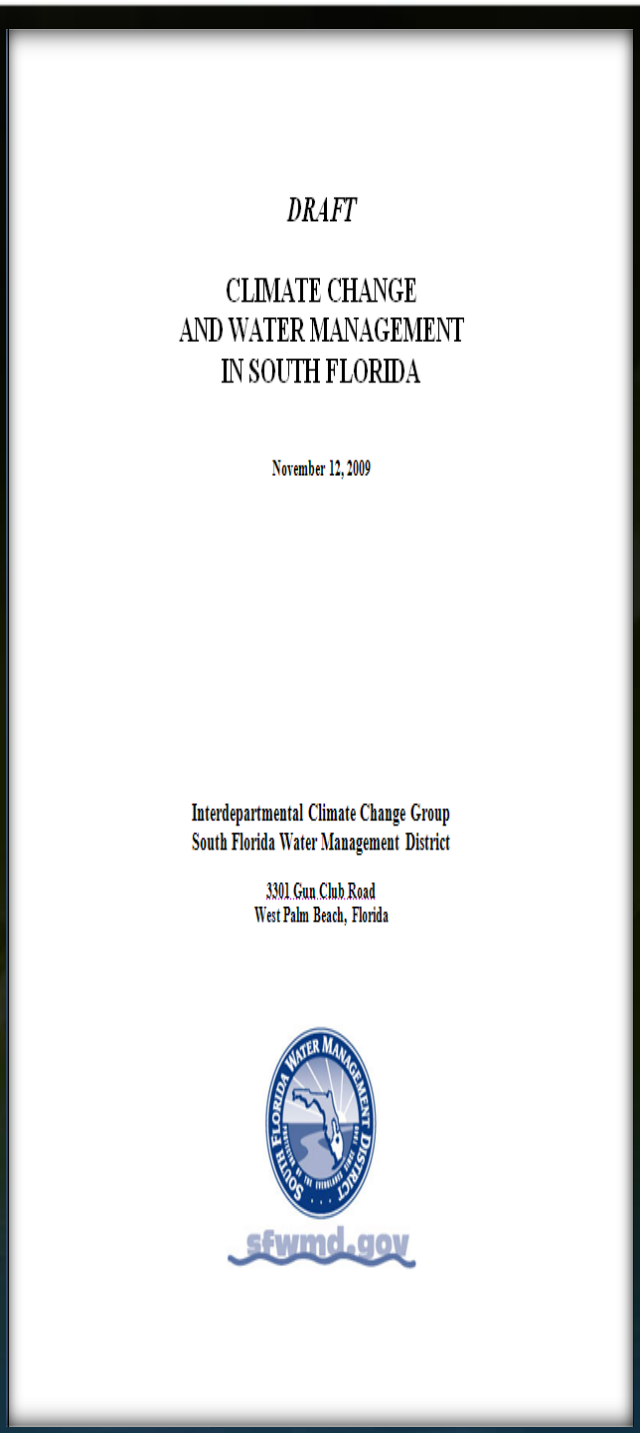
- Two Important Questions:
  - Which decisions are likely to be affected and could benefit from adaptation strategies (Type I) in the short term?
  - Which decisions are likely to be affected but for which adaptation strategies (Type II) could be deferred without serious consequences?

Interdepartmental Climate Change Group at SFWMD

District Leadership Team Members		
Deena Reppen	Ken Ammon, P.E.	Sharon Trost

Staff (Over 30) members from:	
Creative Services	Operations & Maintenance
Everglades Restoration	Regulation
Intergovernmental Programs	Restoration Sciences
Modeling	SCADA & Hydro Data Management
Office of Counsel	Water Supply

SFWMD White Paper



DRAFT

CLIMATE CHANGE
AND WATER MANAGEMENT
IN SOUTH FLORIDA

November 12, 2009

Interdepartmental Climate Change Group
South Florida Water Management District

3301 Gun Club Road
West Palm Beach, Florida

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Includes: What is known, What is probable, What is possible, and Information gaps

Change: Types and Potential Impacts

Climate Change Type

Natural Cycles
El Nino...(3-7yrs)
AMO* (multi-decadal)
Solar Cycle
Glacial (~thousands of years)

Human Induced
Greenhouse Gases
Global Warming

Quartet of change (Drivers)

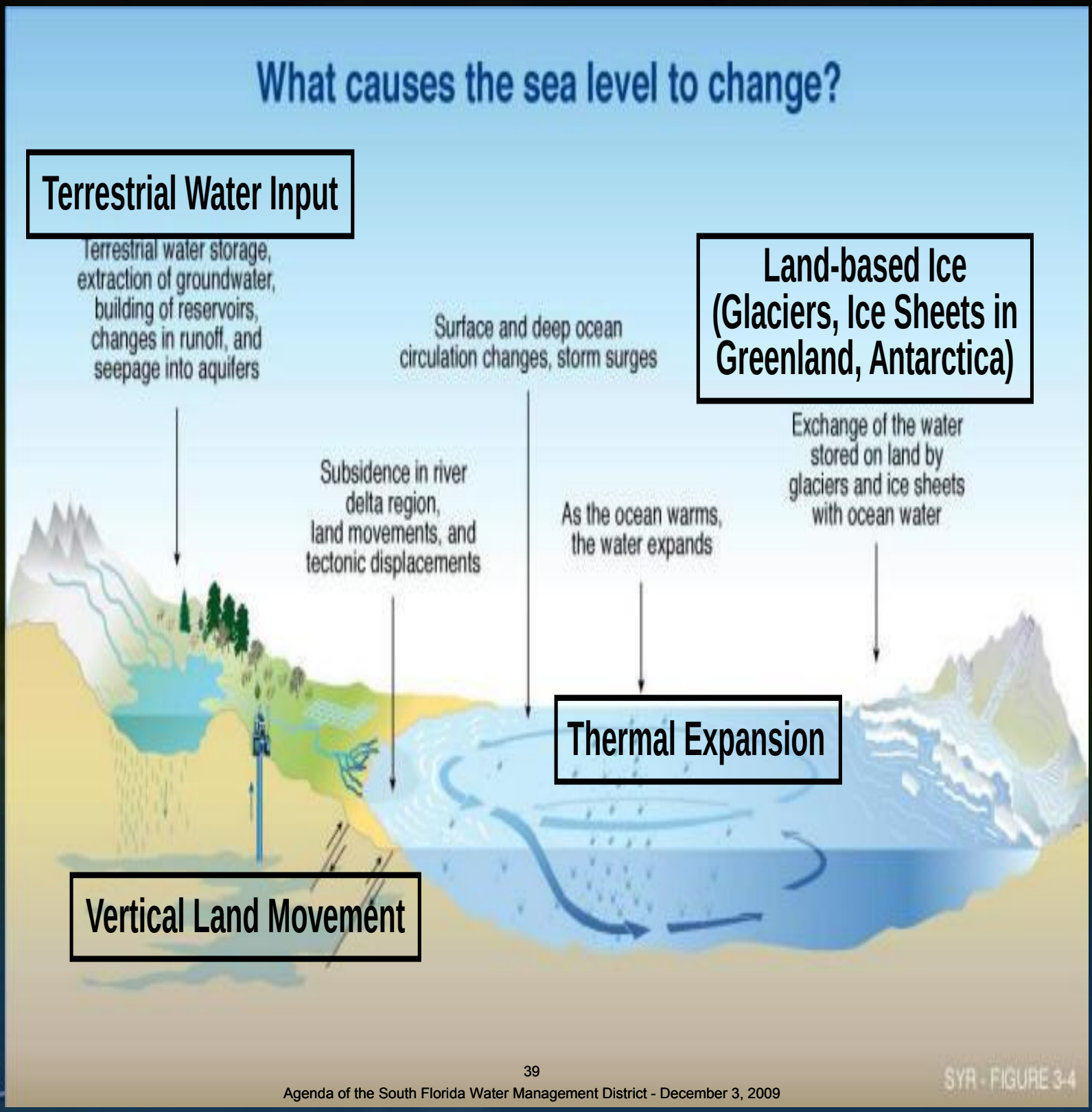
- Rising Seas
- Temperature
- Rainfall, floods, and droughts
- Tropical Storms & Hurricanes

Water Management Impacts

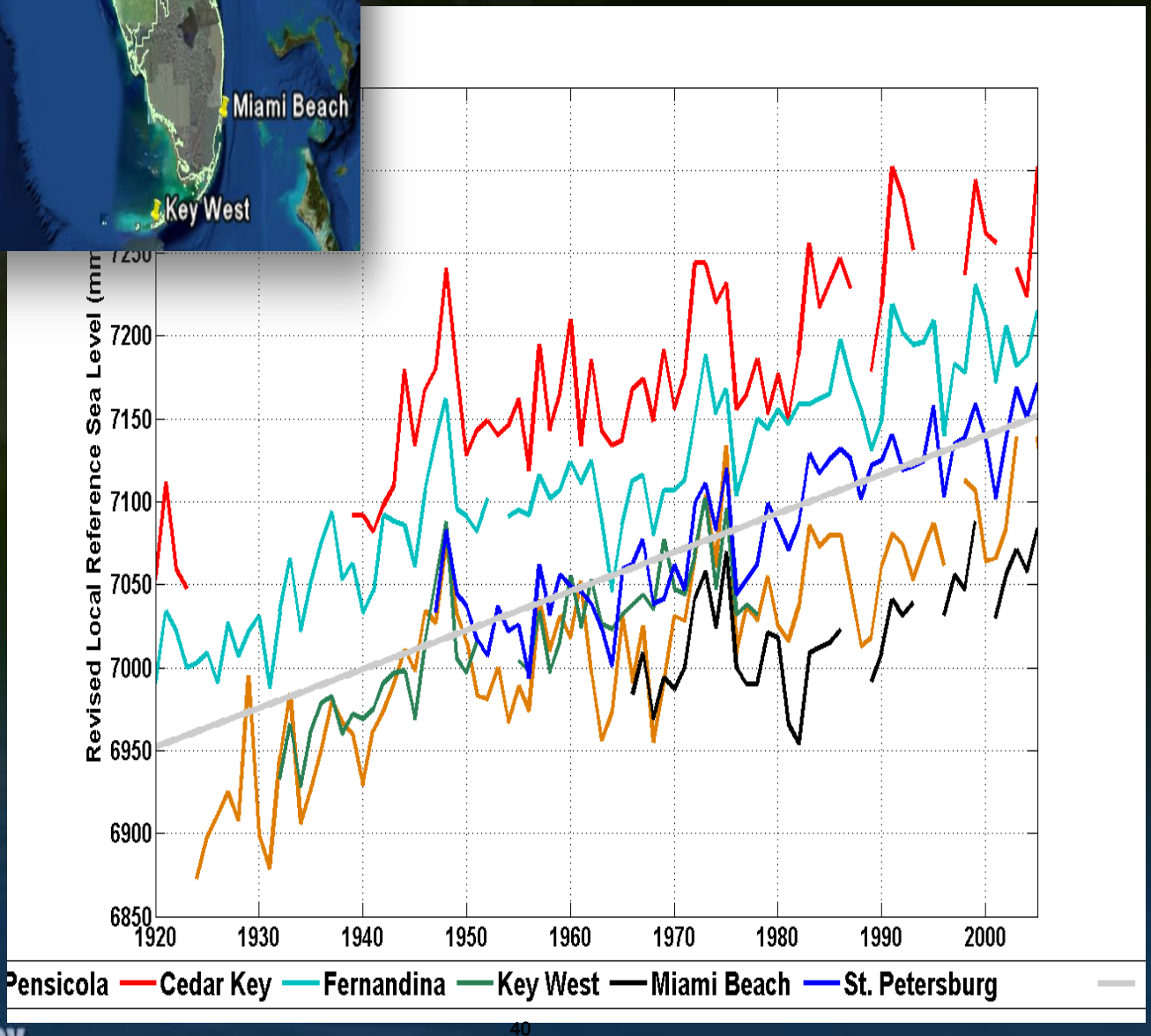
- Direct landscape impacts (e.g. storm surge)
- Water Supply (e.g. droughts, saltwater intrusion)
- Flood Control (e.g. urban flooding, hurricanes)
- Restoration (e.g. ecosystem impacts, both coastal and interior)

*Atlantic Multi-decadal Oscillation of temperature in the Atlantic Ocean

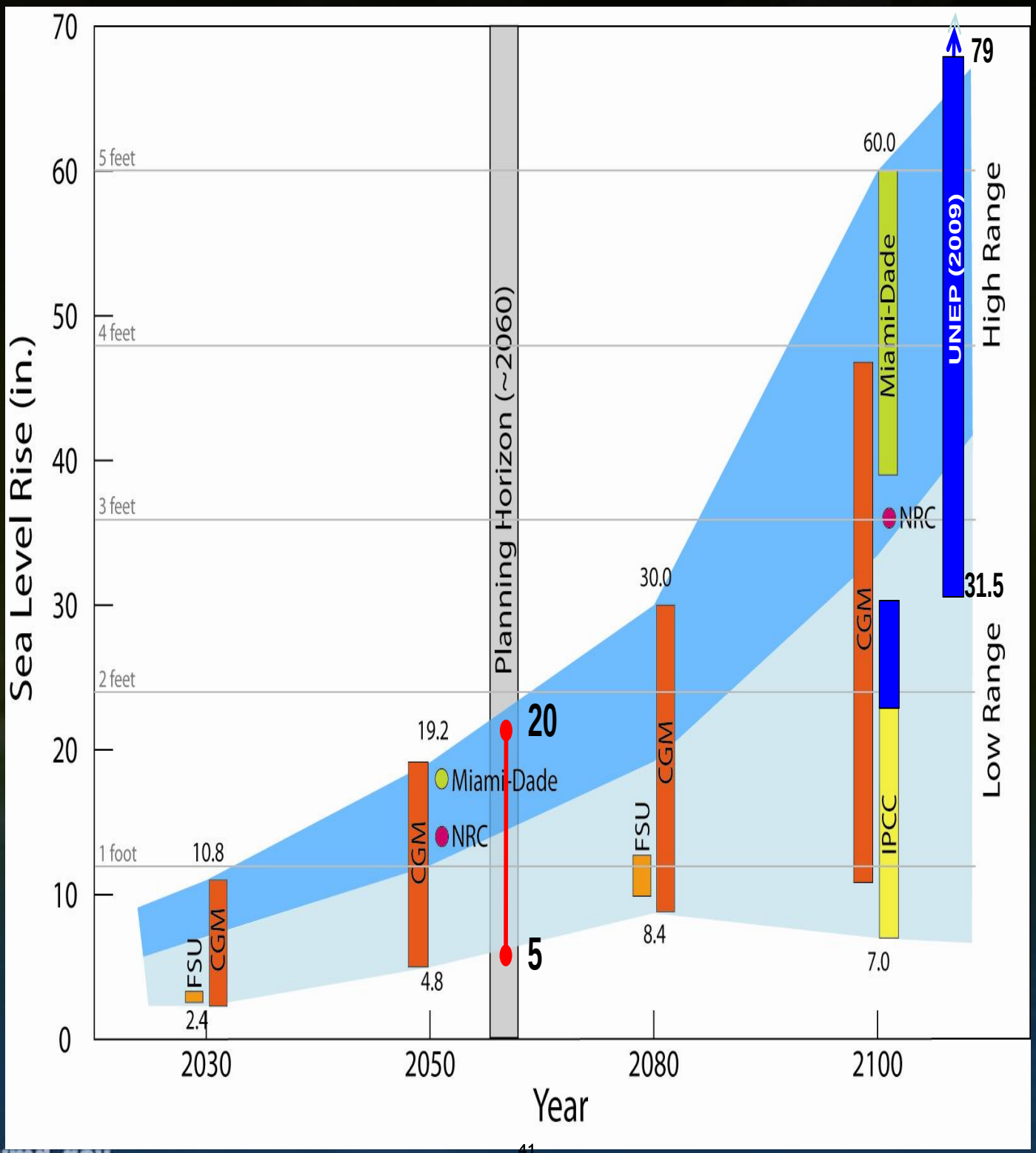
Sources of Sea Level Rise



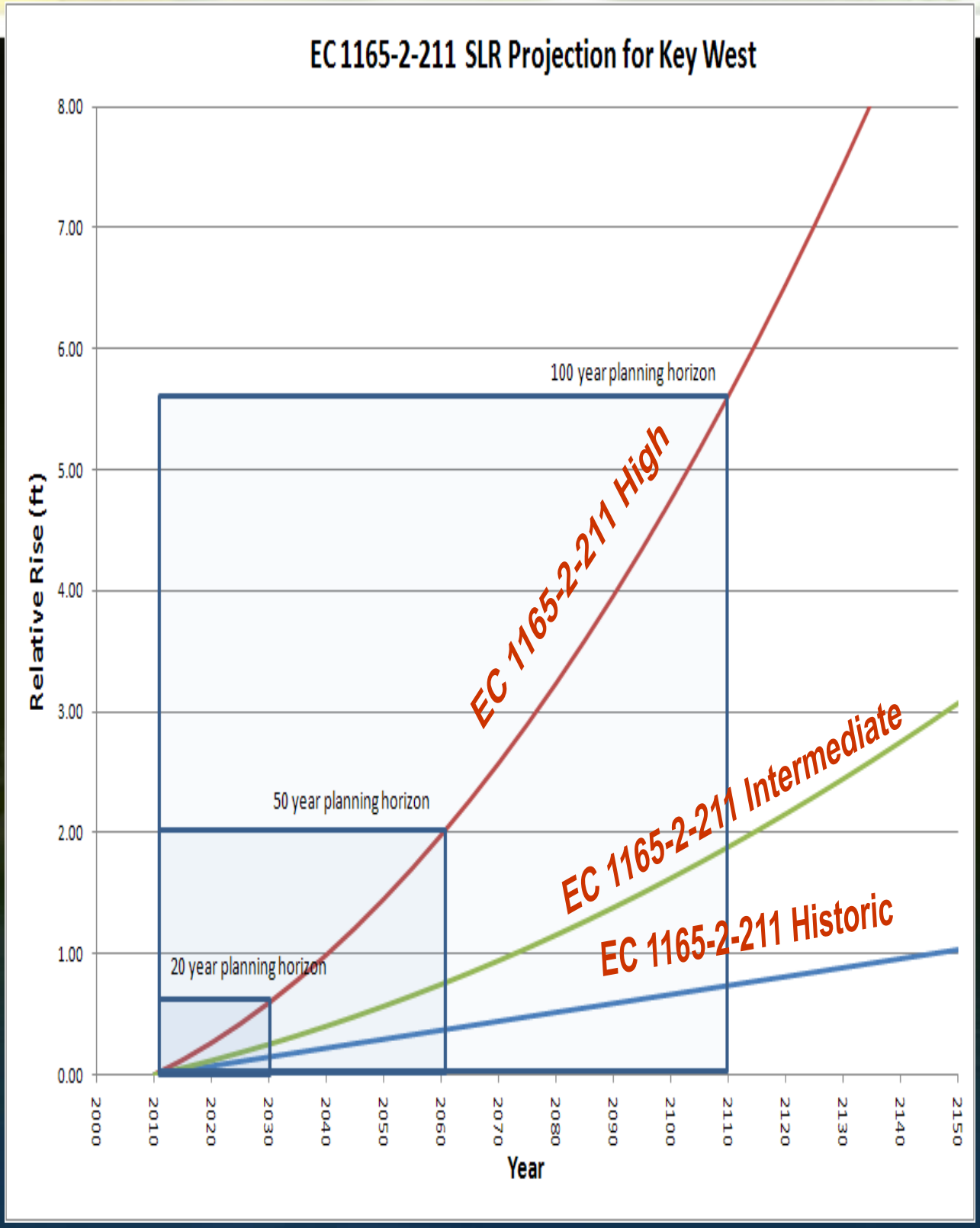
Rising Seas – already a reality



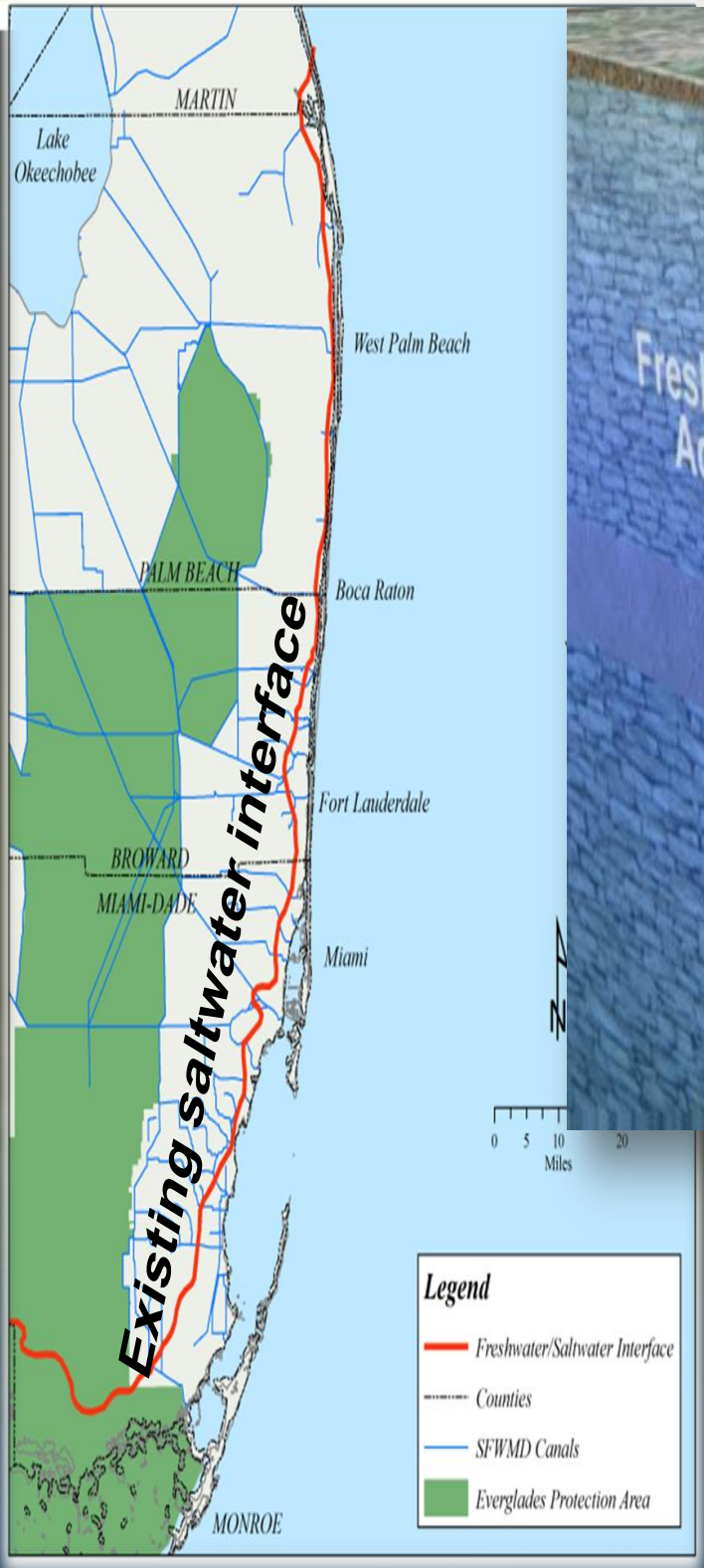
Future Projections: Considerable Spread

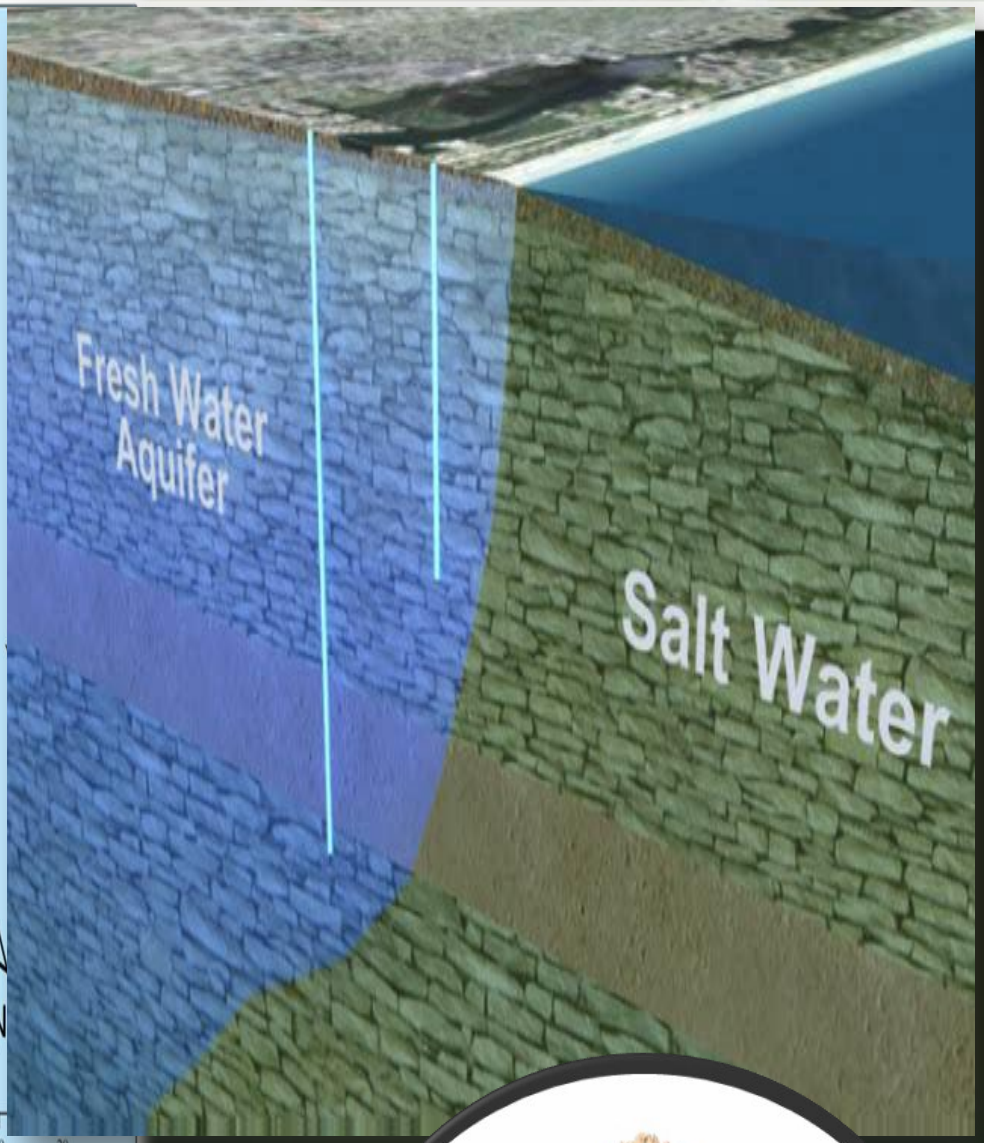


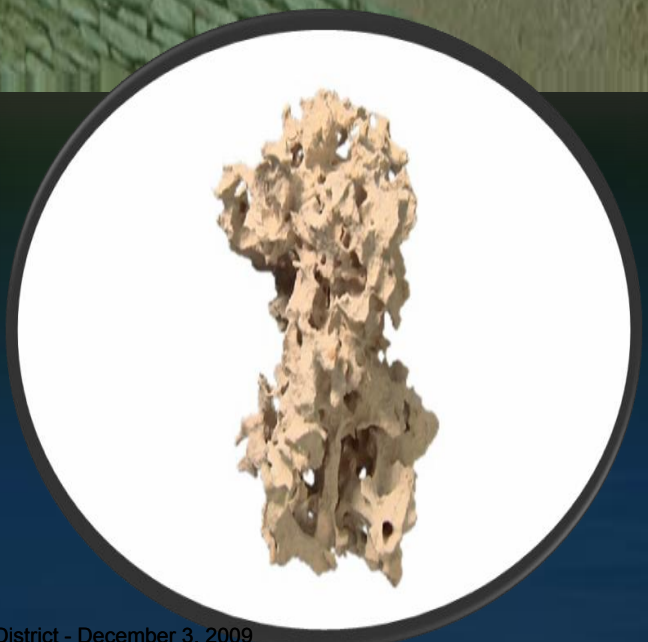
U. S. Army Corps of Engineers' Engineering Circular (EC 1165-2-211) Released July 2009



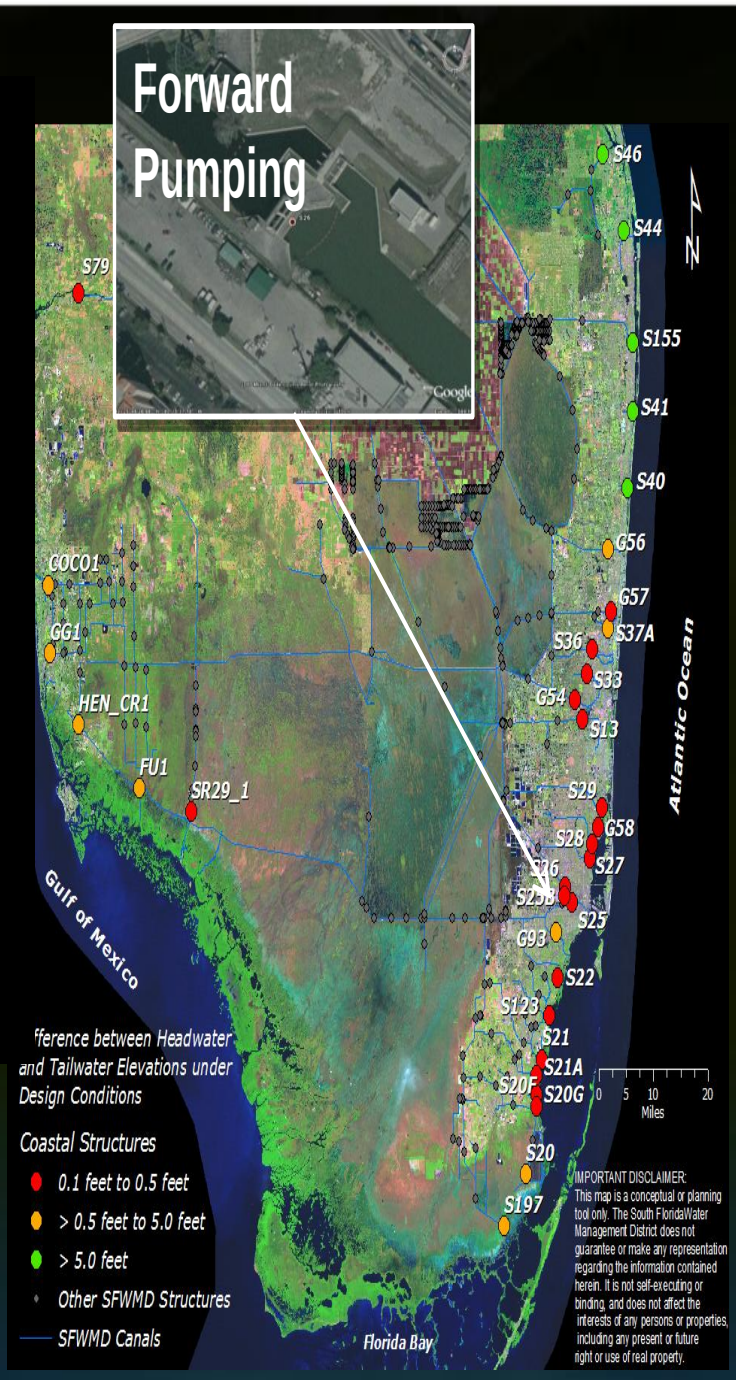
Rising Seas: Water Supply Impacts
Saltwater Intrusion





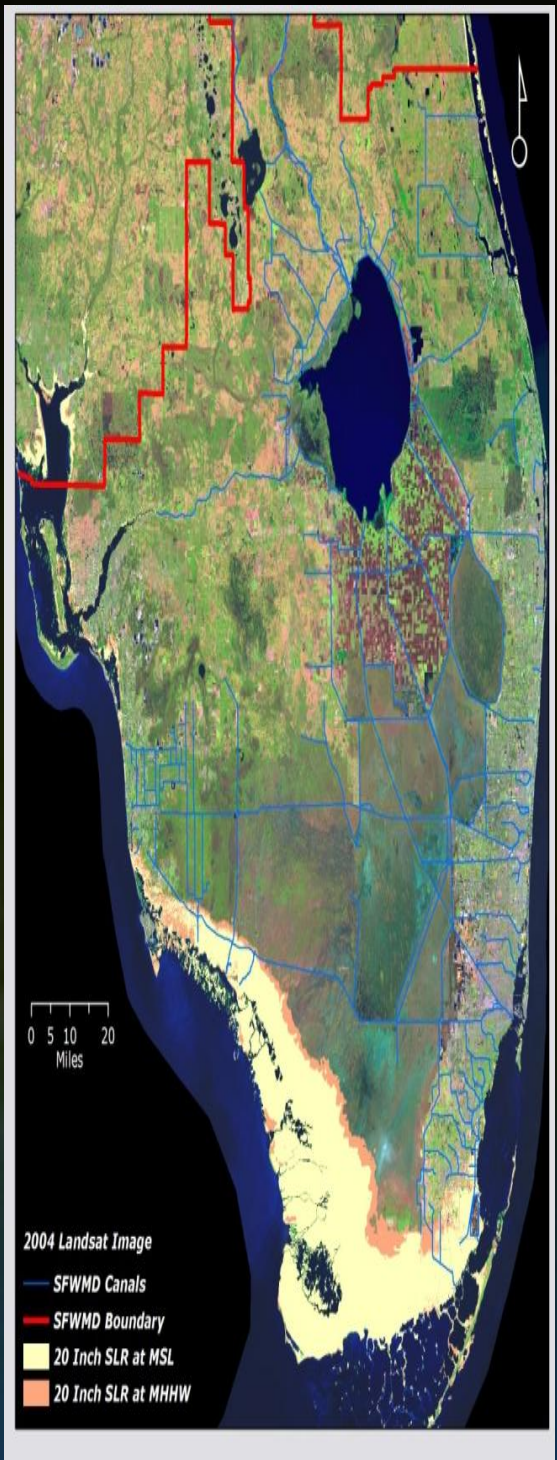


Rising Seas: Flood Control Concerns



- Small water level difference across coastal structures during high tides and local storms
- Flooding during high tide and storm surge

Rising Seas: Southern Everglades Restoration



- Relocation and possible reduction of mangrove forests
- Forced migration of wading birds north
- Potential peat collapse, coastal erosion, and redistribution of sediments
- Salinity intrusion into freshwater marshes can: discharge toxic hydrogen sulfide, cause coastal fish kills, and increase habitat loss

Conclusions

- History is not sufficient to make predictions.
- Sea Level Rise is more certain but significant uncertainties exist in projections.
- Current Climate Change projections:
  - 5 to 20 inches of sea levels by 2060. Need regional information and coordination with other agencies
  - Increase in temperature up to 7º F and Evapotranspiration up to 15%
  - Change in rainfall up to ±20 percent
  - Changes in the strength and frequency of tropical storms and hurricanes. Exact extent is uncertain

Preliminary Recommendations

TASK	FY10 FY11 FY12 FY13 FY14
Continue to analyze historical trends & uncertainties of regional climate projections	
Jointly with other agencies develop modeling tools, and agree on planning parameters	
Understand vulnerabilities	
Develop & implement Type I adaptation strategies	
Develop & implement Type II adaptation strategies	

Local Government Climate Change Initiatives

- Primarily focus on greenhouse gas reduction and green initiatives
  - 16 cities have task forces/committees
  - 57 cities and 2 counties part of "Cool Mayors" program
  - 3 counties (Monroe, Orange and St. Lucie)
- Only 2 counties are looking at water resources – Broward and Miami-Dade

State and Federal Climate Change Initiatives

- 5 federal and national and 3 international initiatives

- Department of Environmental Protection – Initiated process to look at water resource impacts from climate change

Questions!

Recent cabinet meeting of the island nation, Maldives

10. Adjourn: 3:15 p.m

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