

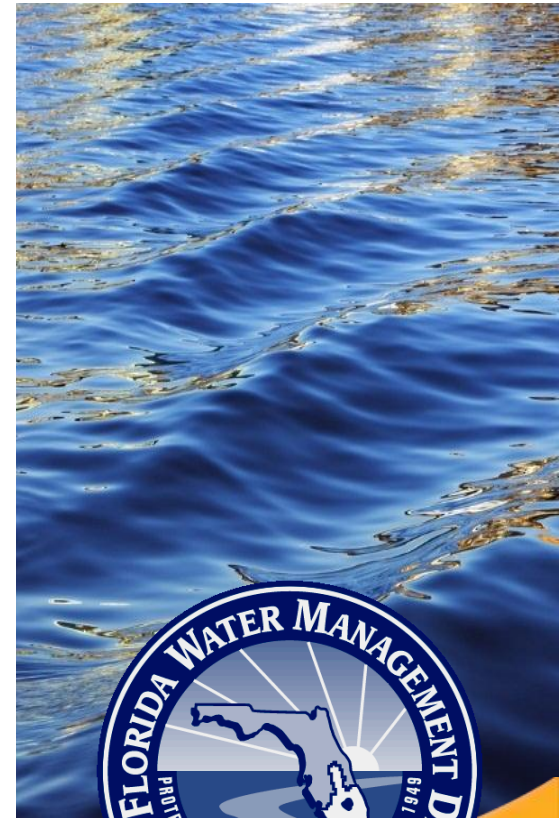
The Federal Flood Control Project

The Implications of Sea Level Rise on Water Management

Tommy B. Strowd, P.E.
Assistant Executive Director
Operations, Maintenance & Construction
South Florida Water Management District

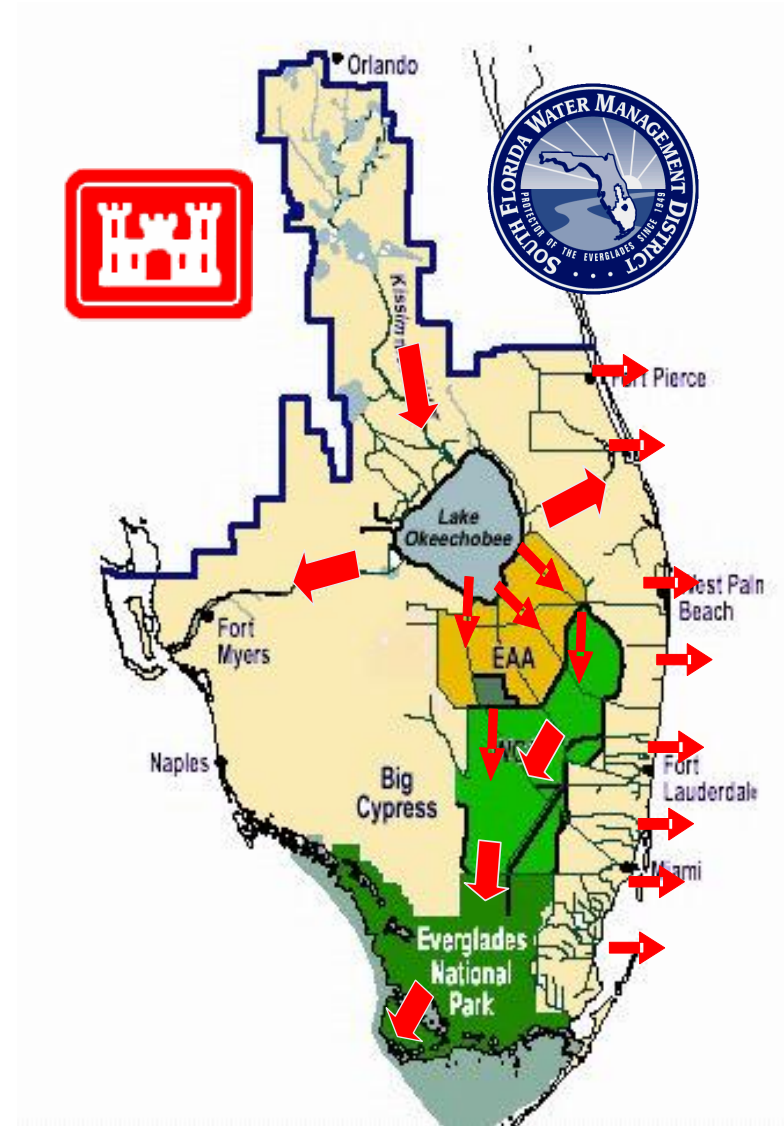
Miami-Dade Sea Level Rise Task Force

December 20, 2013

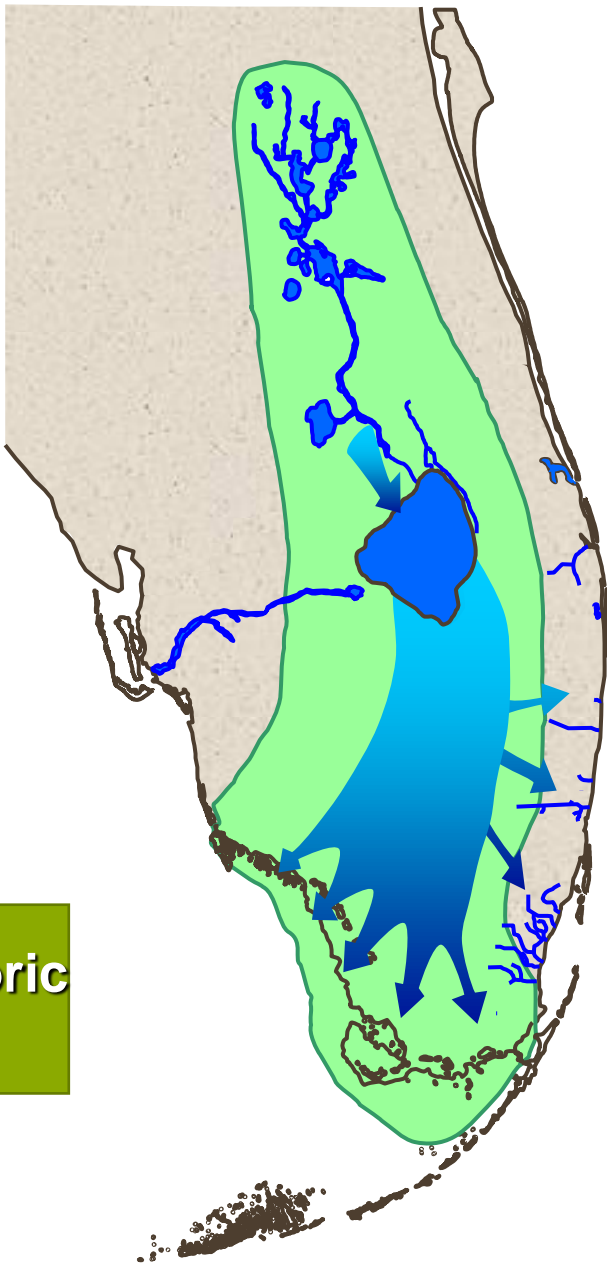


Central and Southern Florida Project for Flood Control and Other Purposes

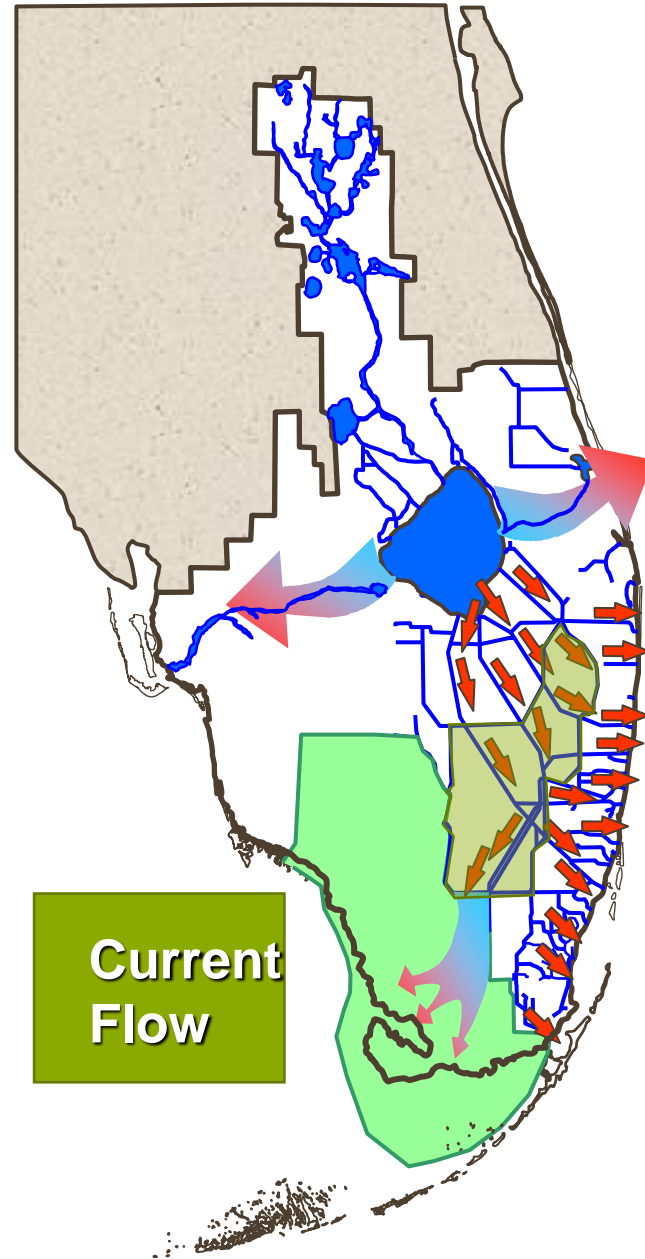
- Authorized in 1948
- Designed for multiple purposes
 - Flood Control
 - Water Supply
 - Navigation
 - Prevention of Saltwater Intrusion
 - Protection of Fish & Wildlife
- Constructed by the U.S. Army Corps of Engineers between 1950 and 1970
- Operated by the South Florida Water Management District

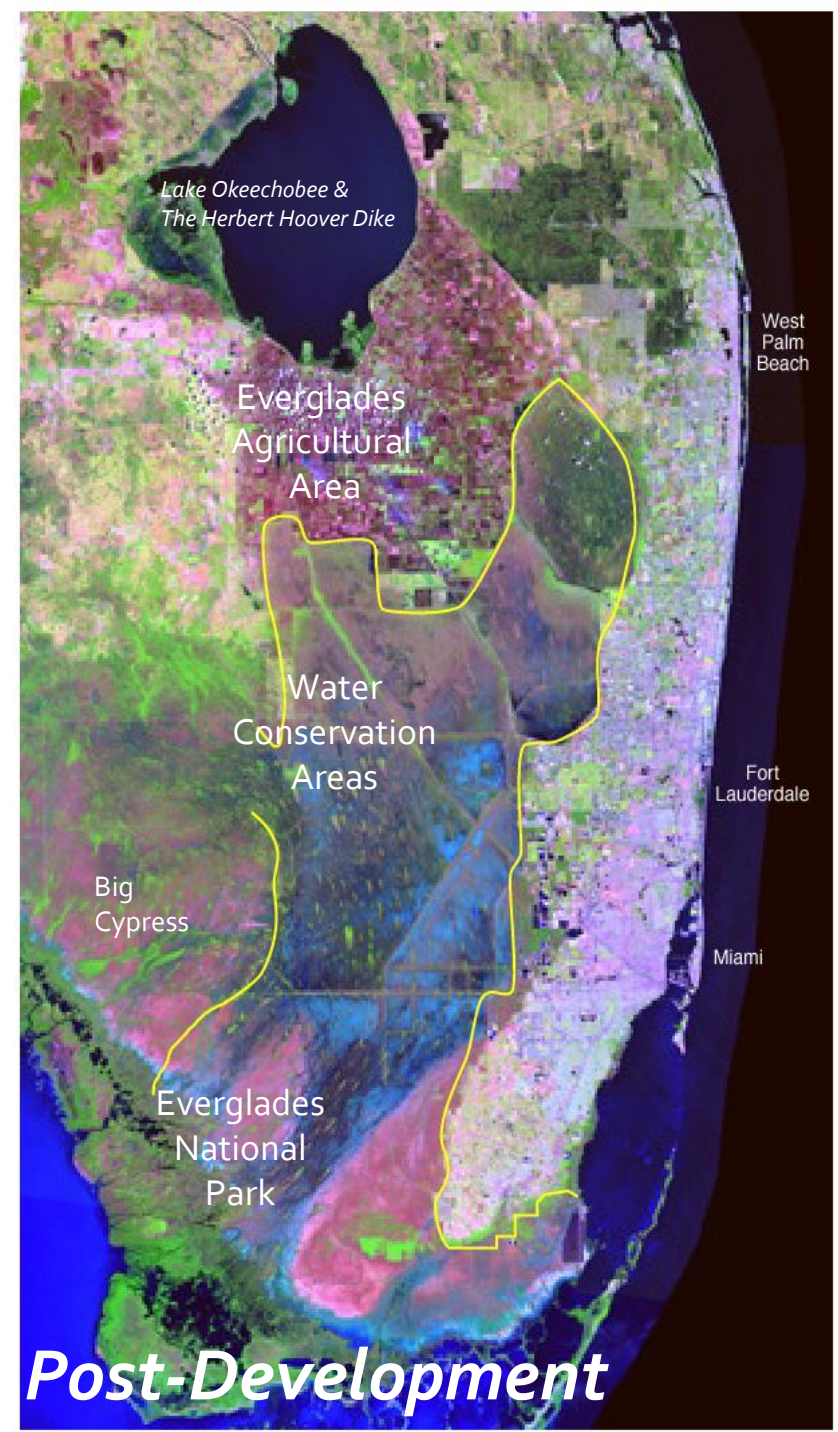
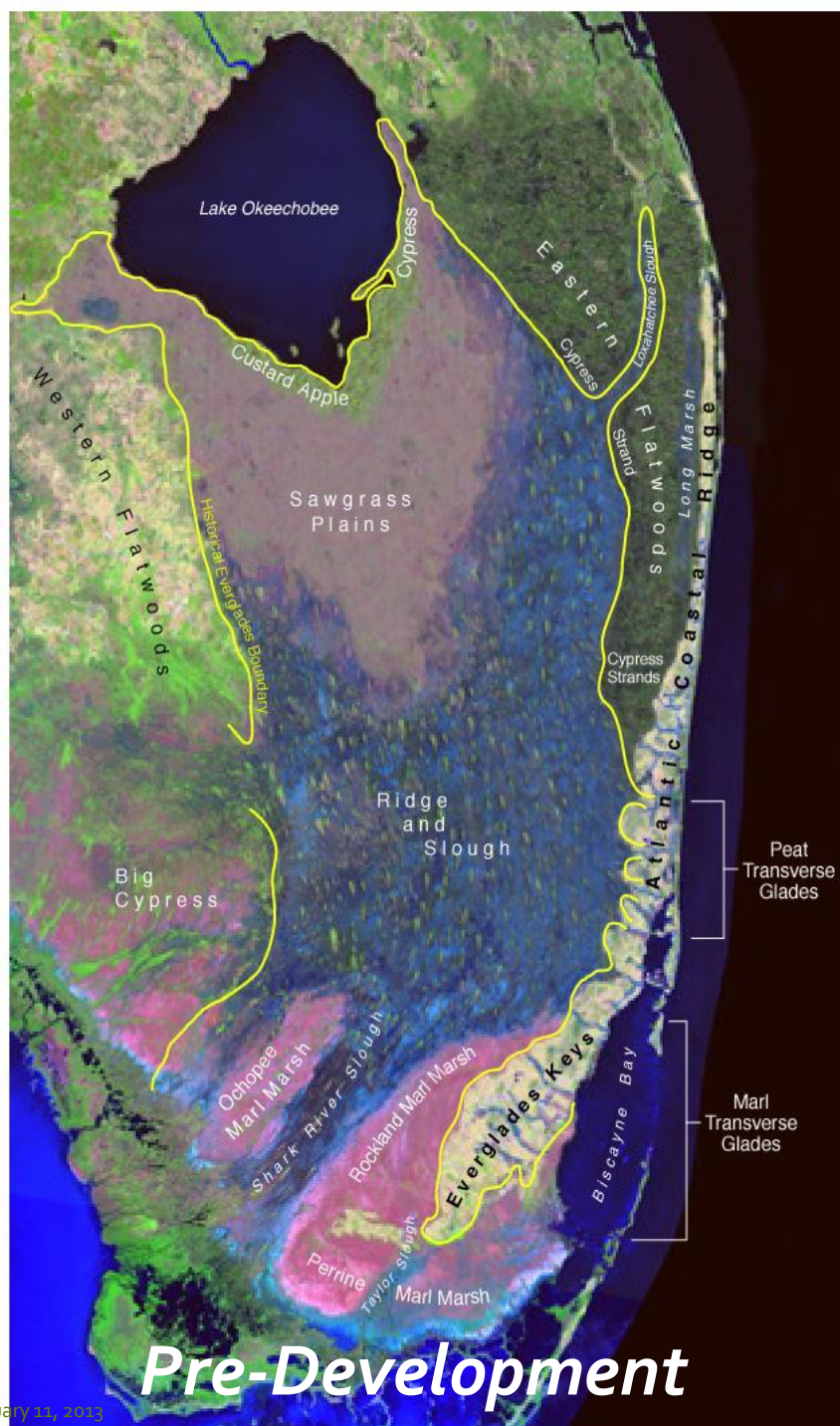


**Historic
Flow**



**Current
Flow**

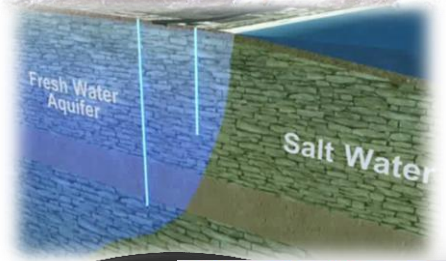




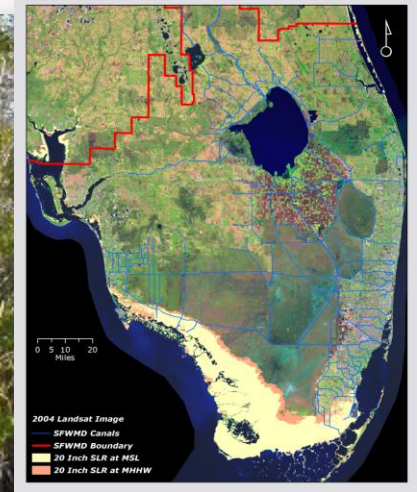
Potential Impacts on Water Management

- Rainfall patterns including extremes (water budget, droughts, flooding, storm surge, hurricanes, coastal structures)
- Drinking Water Supply (saltwater intrusion, freshwater wells)
- Natural Environment (Everglades, Ocean acidification, Coral Bleaching)

...Initial focus on sea level rise

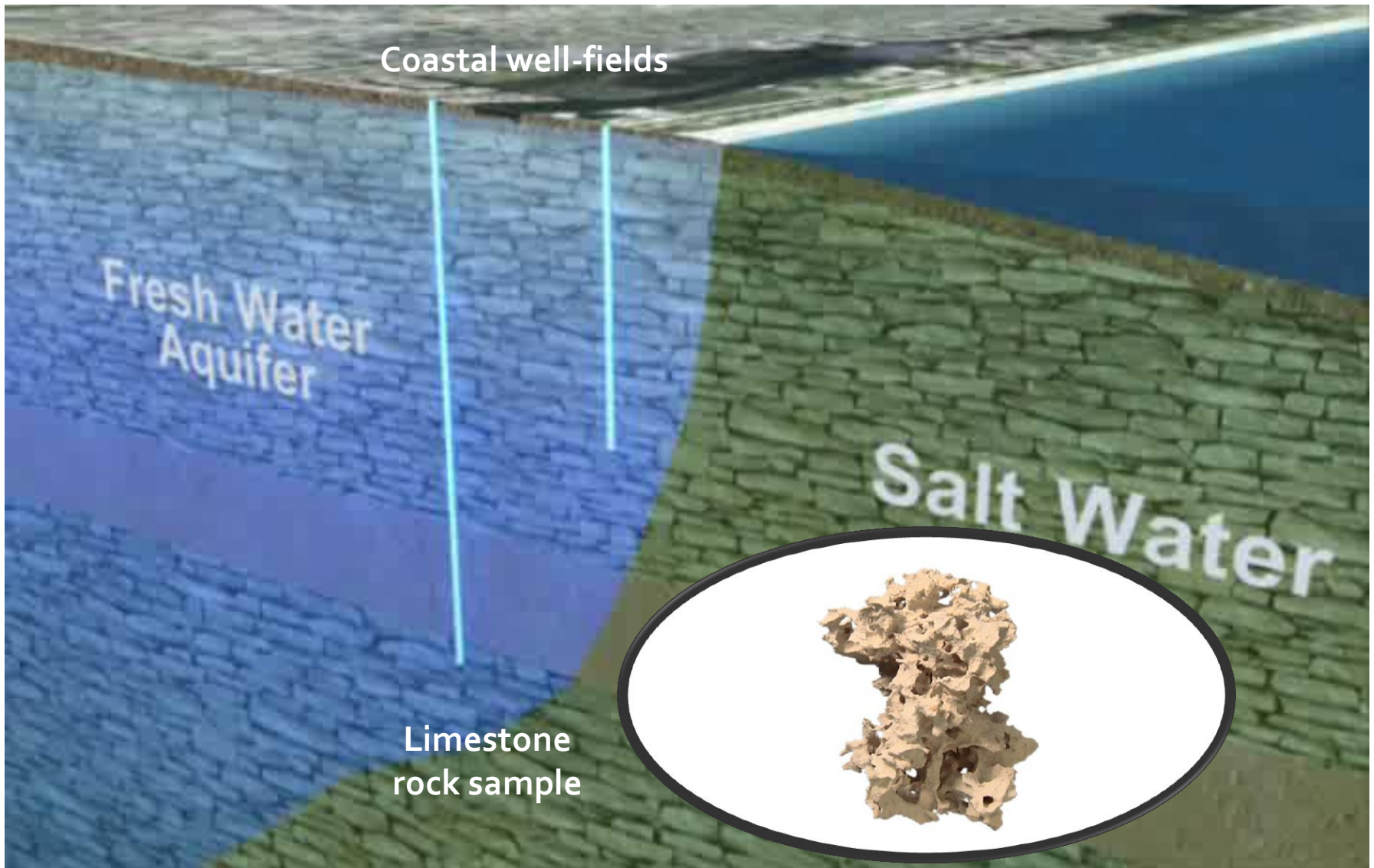


Inundation & Collapse of Freshwater Wetlands in the Southern Coasts



Credit:
Prof. Hal
Wanless

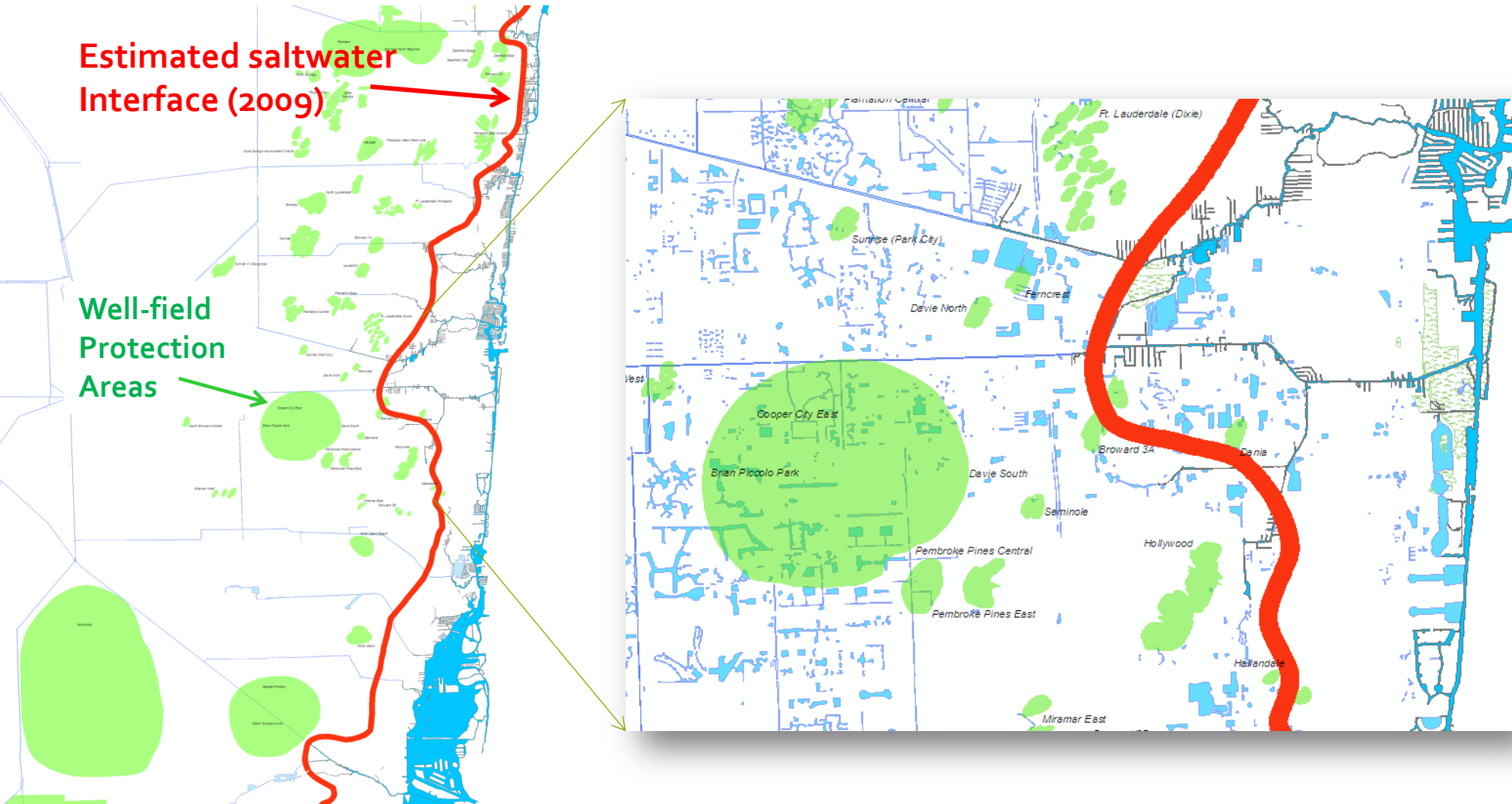
Saltwater Intrusion



Threat to Wellfields

Estimated saltwater
Interface (2009)

Well-field
Protection
Areas





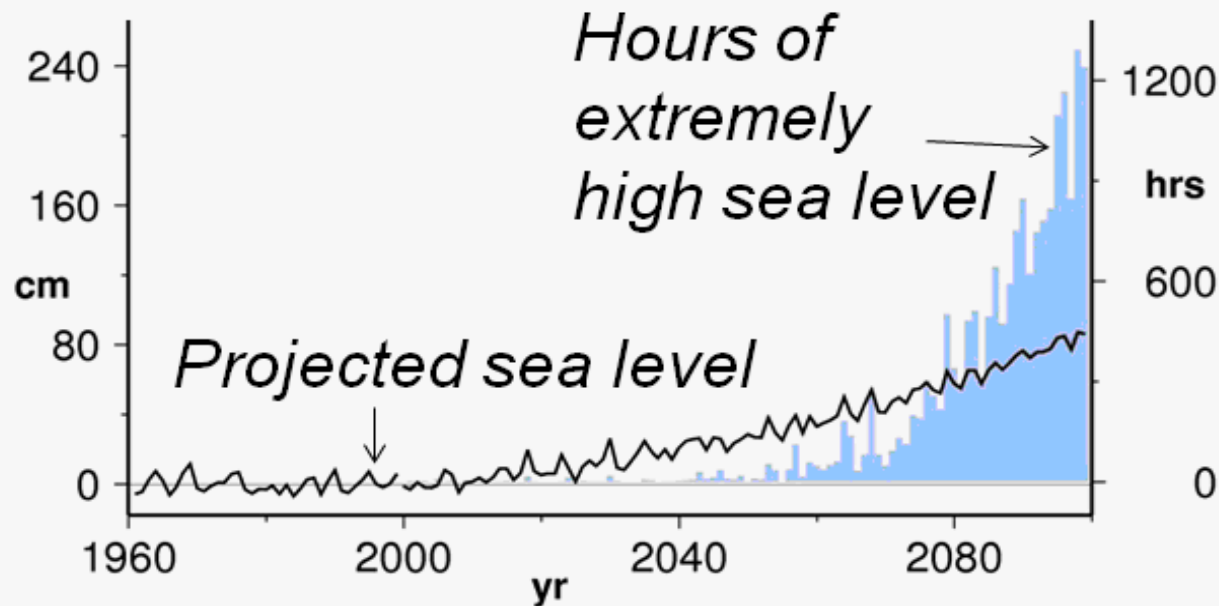
Photos from the Miami NewTimes website

Recent Observations along SE Coast ("Sunny Day Flooding")



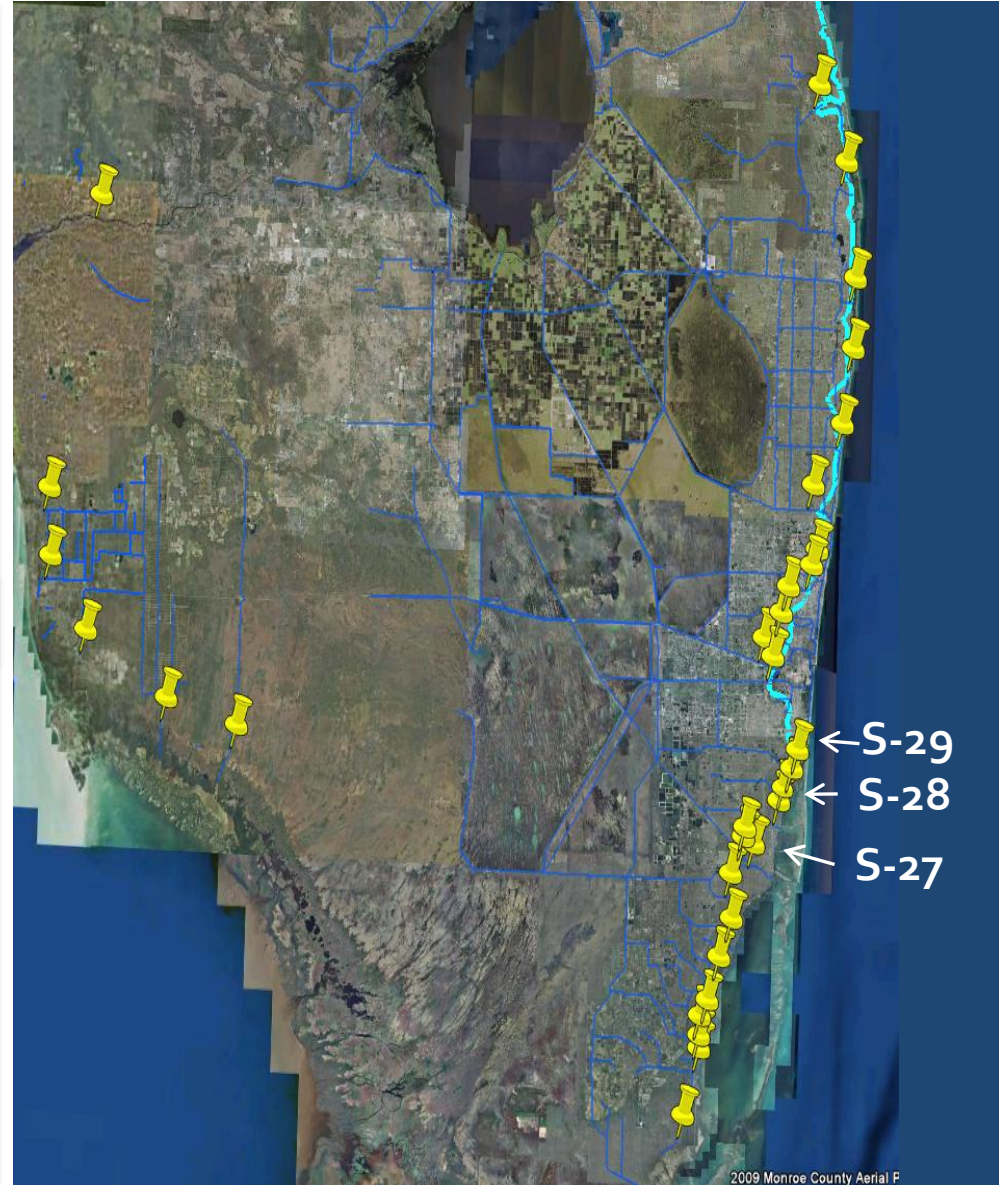
Miami-Dade County
Credit: Miami-Dade DERM

Sea-level rise will magnify the adverse impact of storm surges and high waves on the coast



Extreme high sea level events (>1.4 m above historical mean sea level) in San Francisco Bay is projected to increase substantially with sea-level rise based on model results

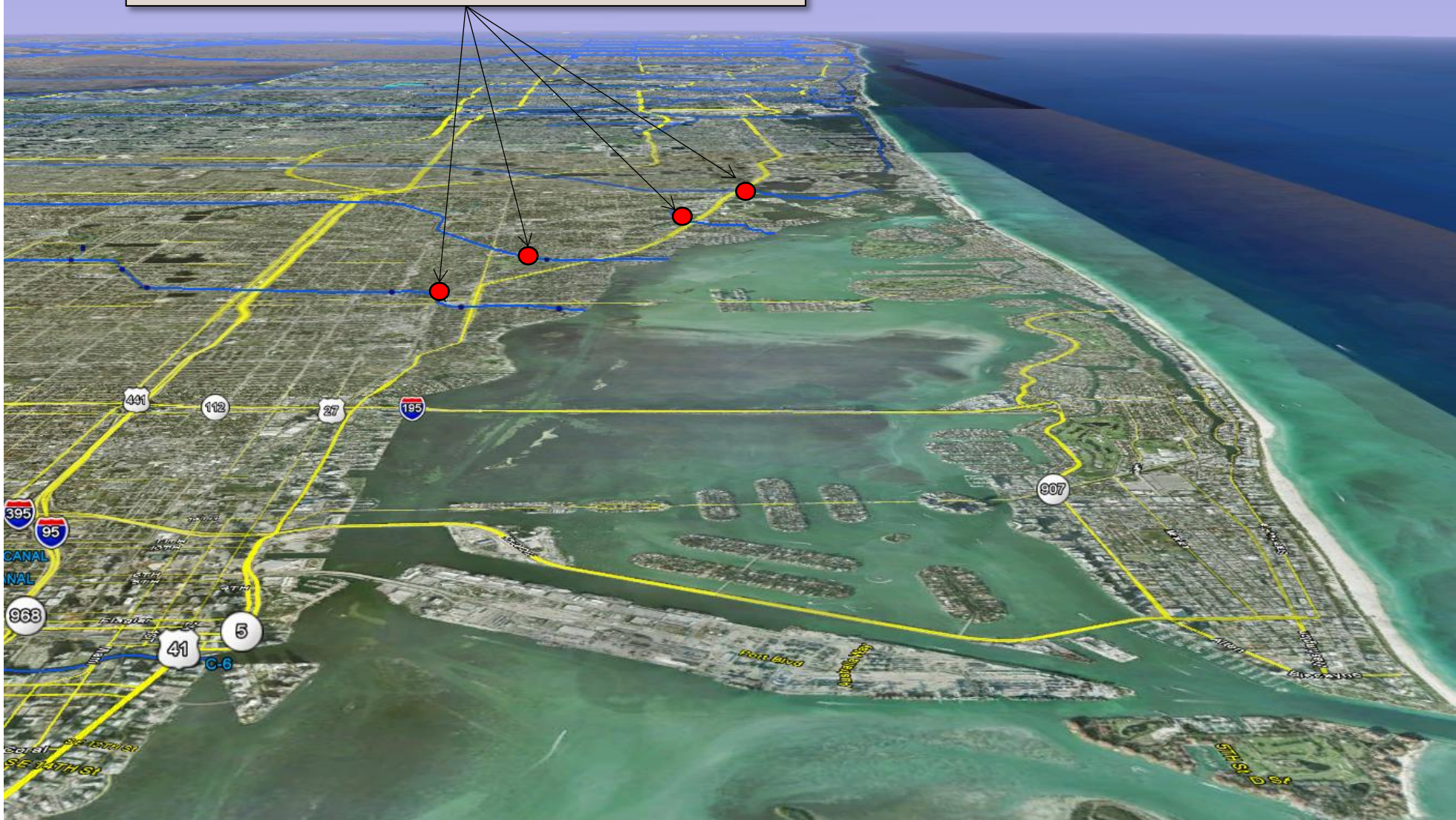
Coastal Infrastructure Risks



2009 Monroe County Aerial F

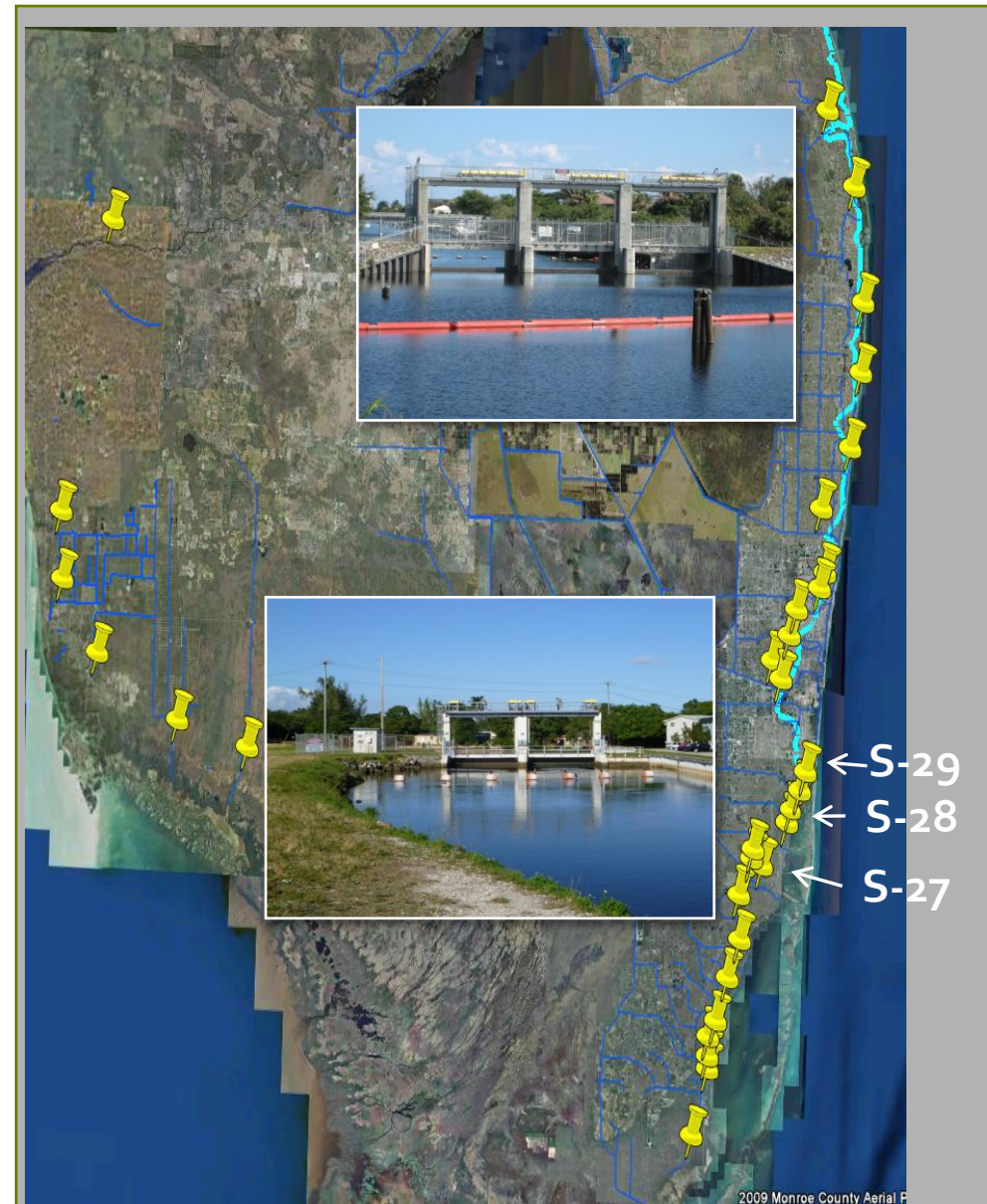
Regional Water Control System

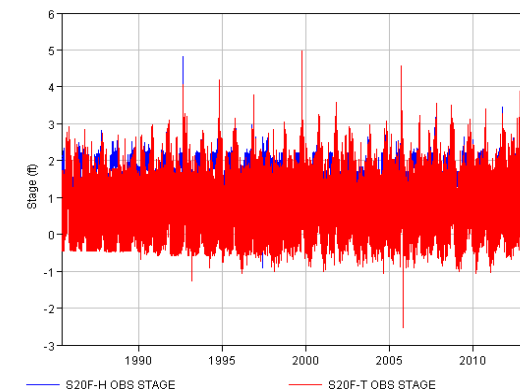
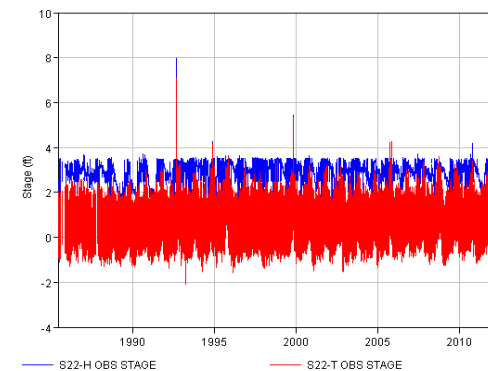
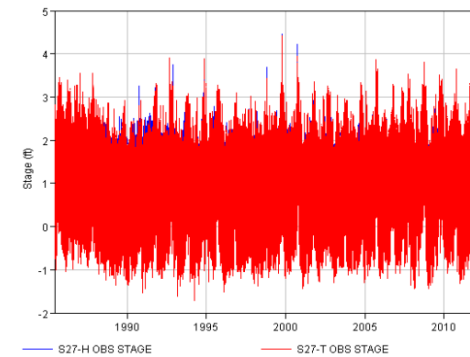
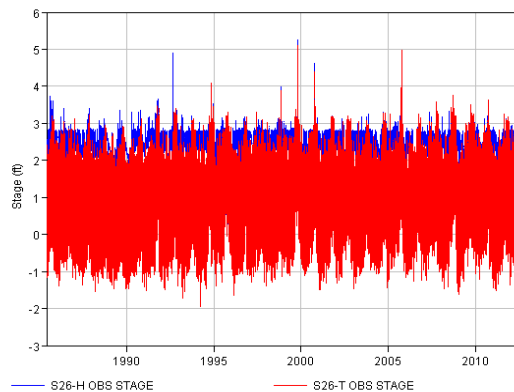
Regional Coastal Water Control Structures

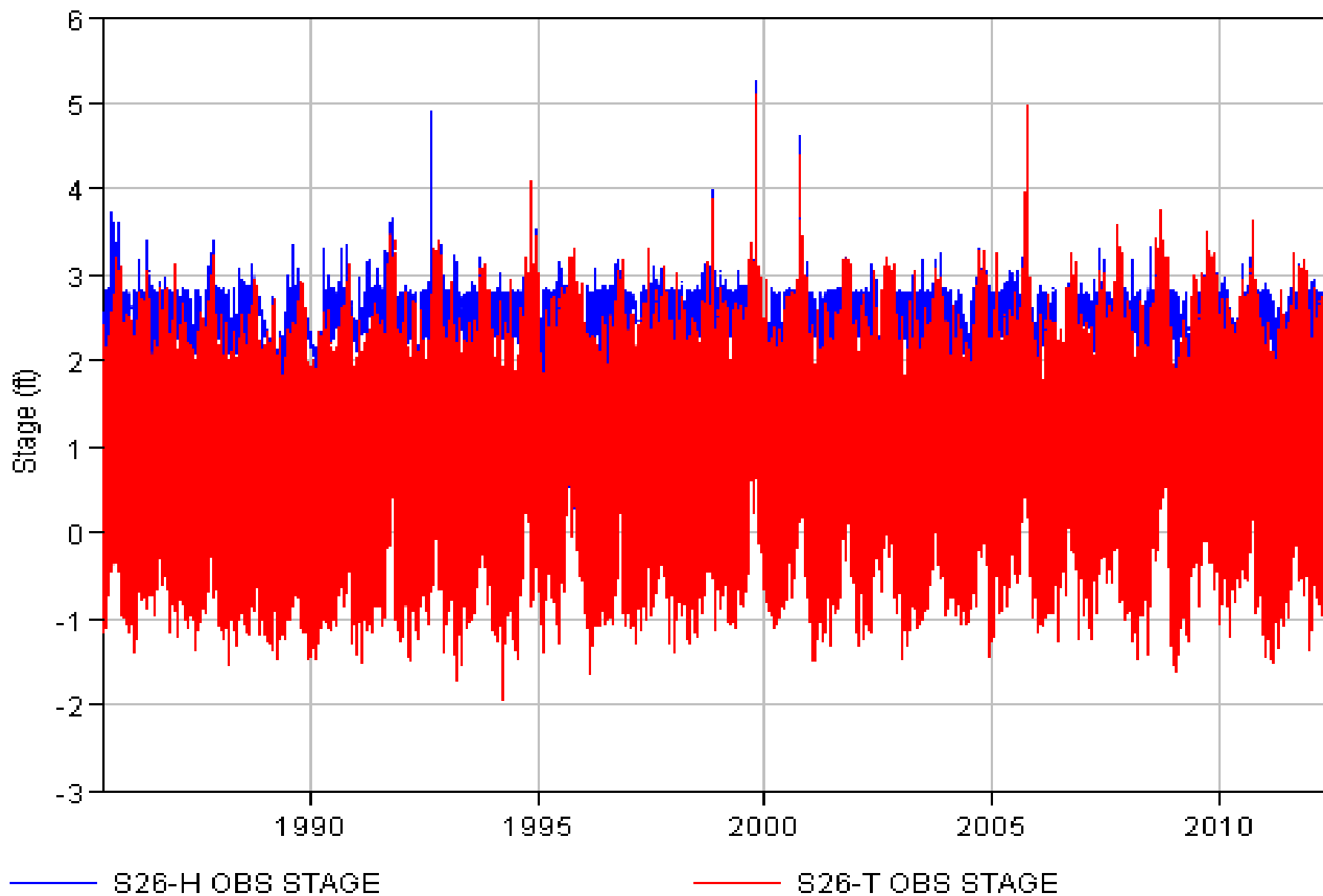


Review of Coastal Infrastructure

- Salinity Control Structures provide two primary functions: Barrier for saltwater intrusion and Flood Control
- C&SF system is approaching or exceeding design life expectancy. SFWMD routinely evaluates infrastructure on a 5 year cycle.
- 5 year and 10-year capital improvement budgets (~\$50 million annually)
- Complexity requires a thorough analysis: frequency and duration of flooding, impacts on downstream areas
- Coordination with local governments in dealing with local flooding
- Federal interest?...







Adaptation to Rising Seas

Example: Forward Pumping at S-26 Structure



Adaptation to Rising Seas

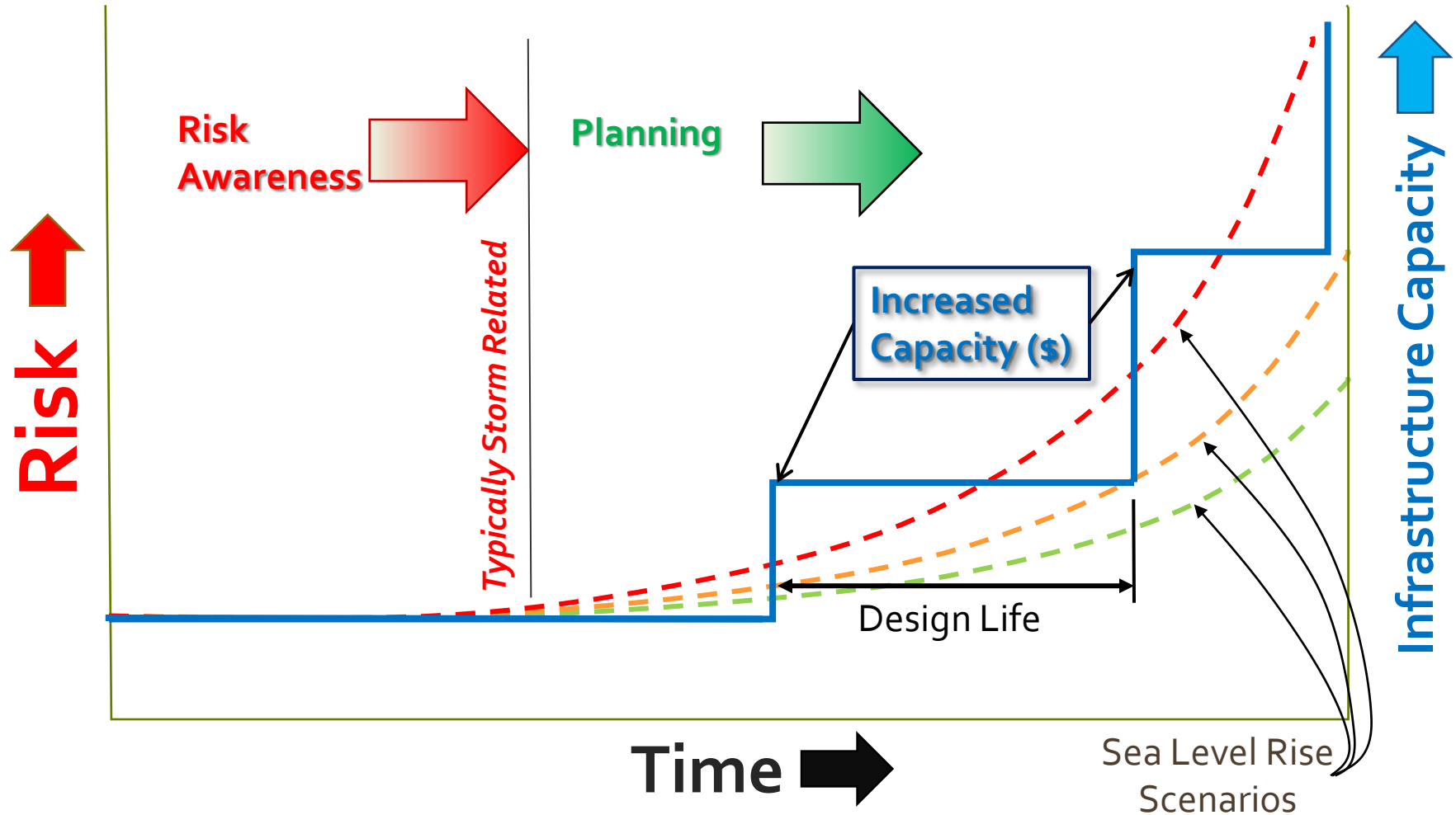
Example: Forward Pumping at S-26 Structure



Federal Post Authorization Changes

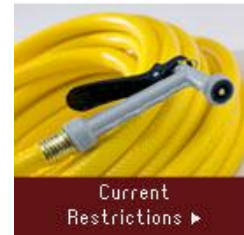
- Feasibility Reports – new projects, like CERP
- ER 1165-2-119, MODIFICATIONS TO COMPLETED PROJECTS
 - "...a general policy of the Chief of Engineers that completed Corps projects be observed and monitored by the Corps to ascertain whether they continue to function in a satisfactory manner and whether potential exists for better serving the public interest."
- Section 216-the Flood Control Act of 1970 (Public Law 91-611)
 - "The Secretary of the Army, acting through the Chief of Engineers, is authorized to review the operation of projects the construction of which has been completed and which were constructed by the Corps of Engineers in the interest of navigation, flood control, water supply, and related purposes, when found advisable due to significantly changed physical or economic conditions, and to report thereon to Congress with recommendations on the advisability of modifying the structures or their operation, and for improving the quality of the environment in the overall public interest."
- Federal Floodplain Mapping / Flood Mitigation (FEMA)

Conceptual Adaptive Resilience Model



“No-regret” strategies

- Continue looking at opportunities and technologies to reduce amount of additional freshwater needed for water supply
- Implement water conservation measures
- Develop alternative water supply options
- Maintain the existing flood protection system (regional, right-of-way etc.)



Current Restrictions ▶



Florida-Friendly Landscaping ▶



More Water-Saving Tips ▶

Progress to Date

- Briefings to GB & WRAC since May 2008
- Monitoring of science (climate variability & sea level rise)
 - Interdepartmental working group
- White paper & Technical report
- Preliminary assessment of coastal water control structures – identified 3 priority structures
- Baseline mapping of saltwater intrusion front
- Technical assistance to local government committees and task forces
- Participation in workshops and conferences
- Ongoing coordination with FDEP and other WMDs

Thank You...
Questions

