

Sea Level Rise: Successful Responses and Indicators

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Chief Modeler

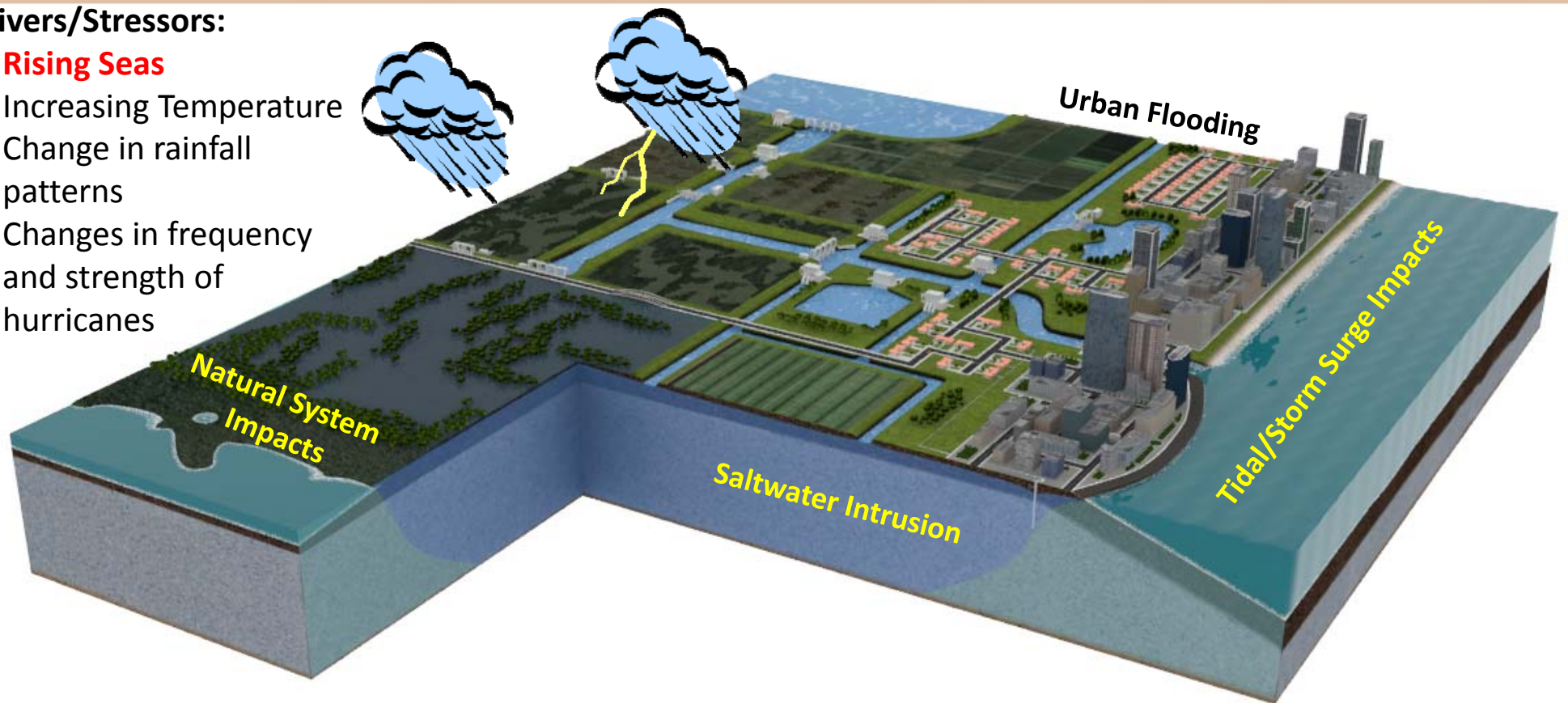
3rd Sea-Level Rise Summit
FAU Center for Environmental Studies
May 3-5, 2016



Regional Water Management System

Drivers/Stressors:

- **Rising Seas**
- Increasing Temperature
- Change in rainfall patterns
- Changes in frequency and strength of hurricanes



Potential Impacts on Water Management



Adaptation Portfolio

Everglades Restoration

Impoundments
& Pumps

Green
Infrastructure

Revised Stormwater
Permitting Criteria

Pre-storm Drawdown

Wellfield Relocation/
Interconnect/Alternative
Water Supply (Reuse)

Water
Conservation



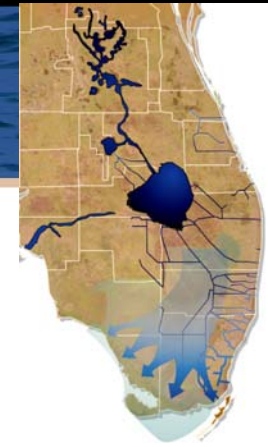
Water Storage

Levees/Elevated infrastructure

Forward Pumps



Seawalls/
Natural Barriers



Adaptation Examples: Forward Pumping at S-26 Structure Near Miami Airport and Room for Flood Waters

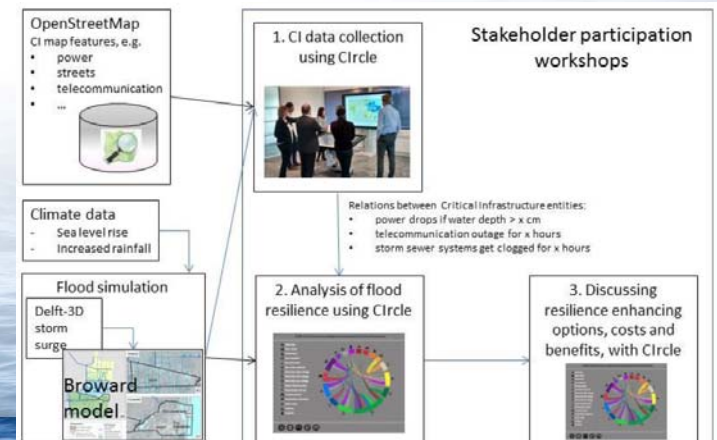
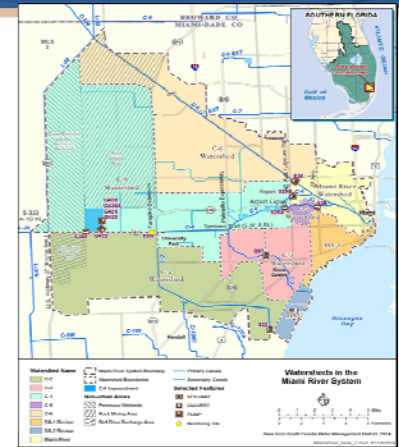
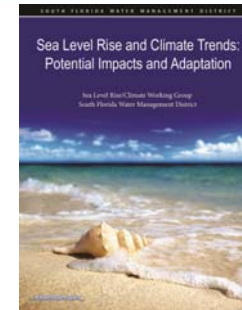


Saltwater Intrusion Fronts: 2009 vs. 2014



SFWMD Efforts and Collaboration

- Technical assistance in SLR projections & DEM
- White Paper on “Sea Level Rise & Climate Trends” (released soon!)
- Review of “Level of Service” for flood protection and adaptation
- MoA with The Netherlands
- External Funding
 - NOAA (Two studies in Miami-Dade & Broward)
 - FEMA (Study in Broward)
 - USACE (Study in Miami-Dade)
- Florida Climate Institute (FCI)



Climate Change Indicators



Indicators

- Nuisance Flooding
- Greenhouse Gas (GHG)
- Sea Level Rise trends
- Temperature/Public Health
- Rainfall Extremes & Droughts
- Saltwater Intrusion
- Natural Systems
- Sea Surface Temperature
- Plant Hardiness

Current Efforts

- Indicator Development Team (Compact Partners)
- Collaboration with Florida Climate Institute
- “Forum on Indicators of Coastal Flooding and Flood Impact” at SFWMD, May 26th, 2016 (jointly with NOAA and USACE)
 - Monitoring trends, attribution
 - Crowdsourcing and Citizens Science

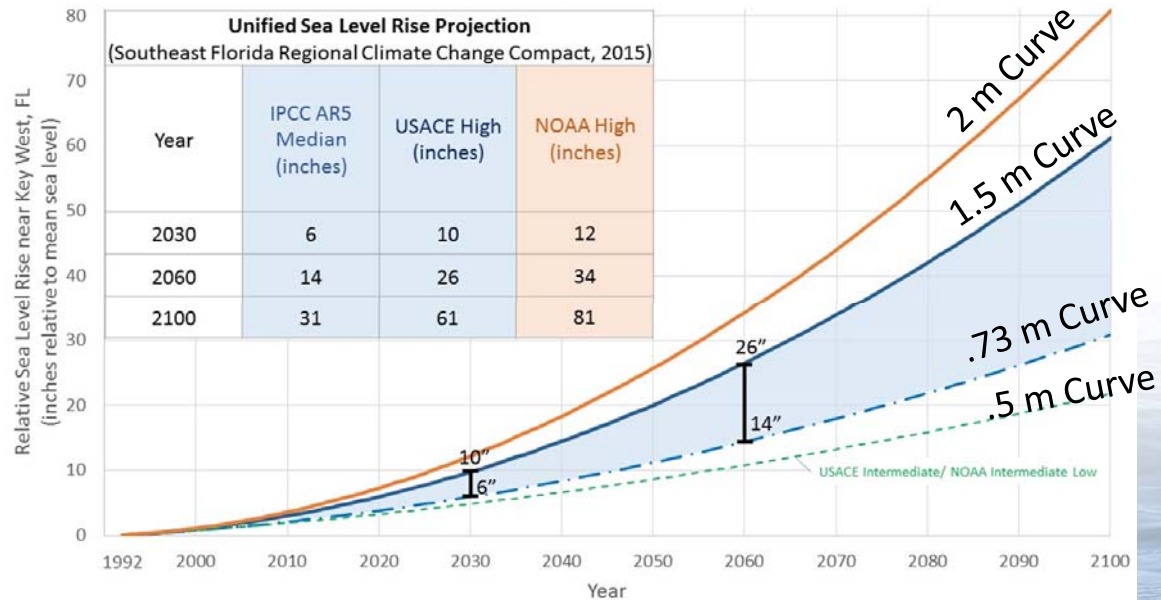
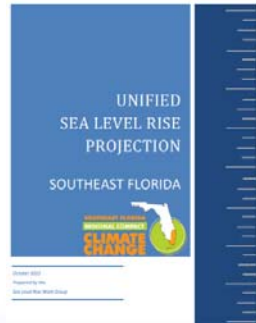
SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Thank you!



sfwmd.gov

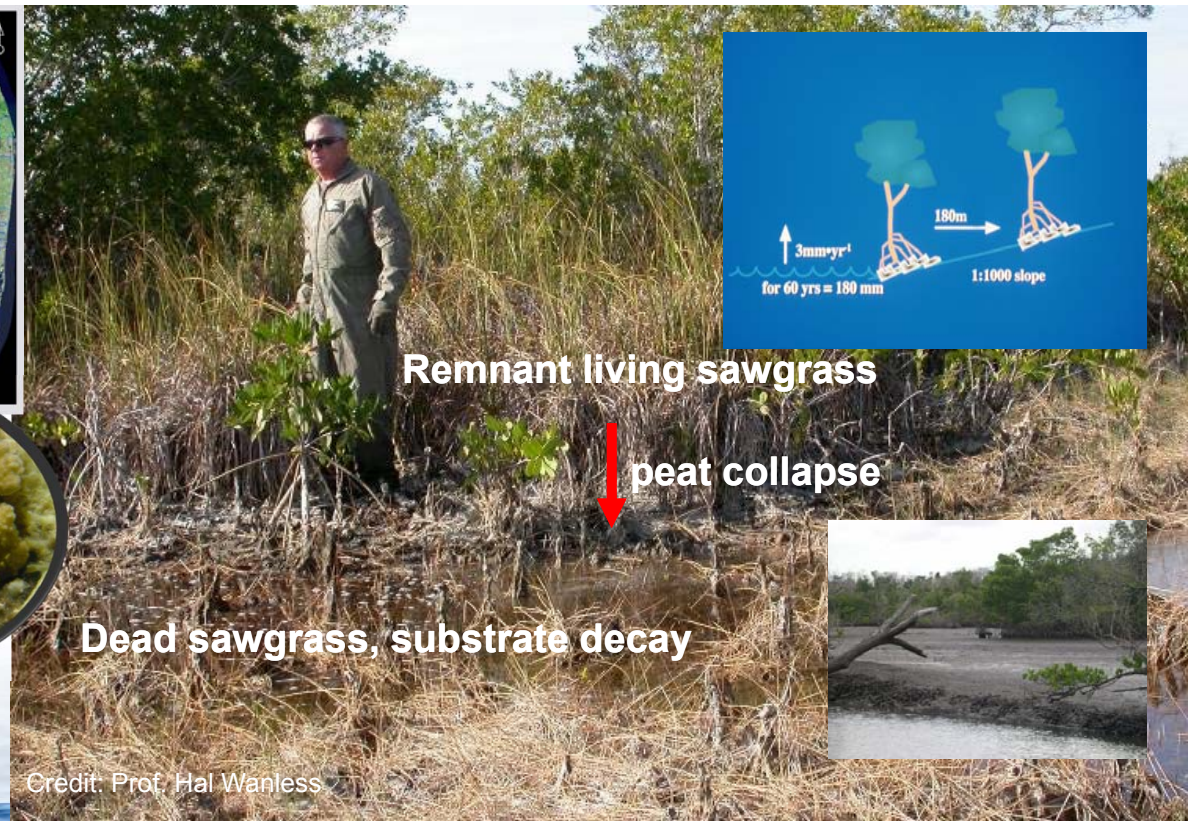
Unified SLR Projections: 2011 versus 2015 (using Key West gage)



Natural Systems: Inundation of Freshwater Wetlands



Coral Bleaching



Remnant living sawgrass

peat collapse

Dead sawgrass, substrate decay

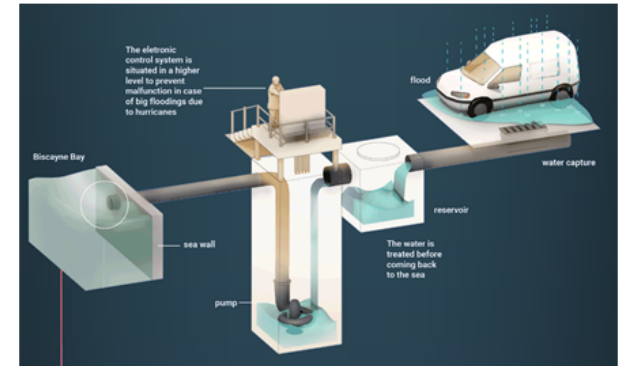
Credit: Prof. Hal Wanless



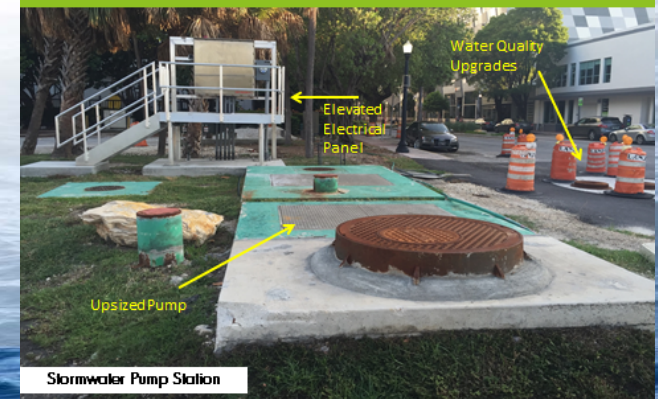
Adaptation in Miami Beach



STORMWATER UPGRADES

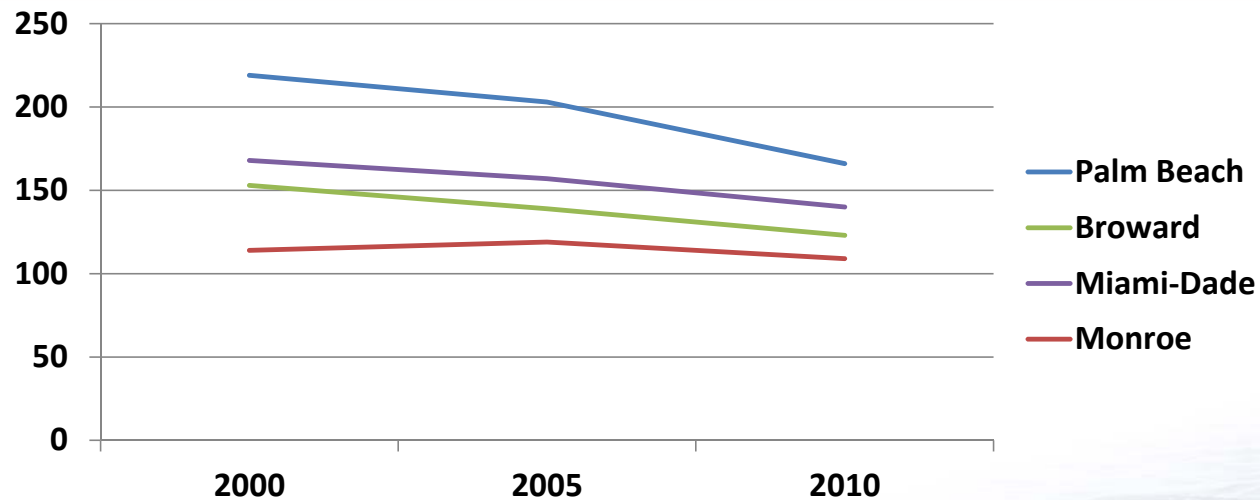


STORMWATER UPGRADES



Declining Per Capita Usage

Gallons Per Capita Per Day



County	Gallons Per Capita Per Day		
	2000	2005	2010
Palm Beach	219	203	166
Broward	153	139	123
Miami-Dade	168	157	140
Monroe (includes permanent and seasonal population)	114	119	109
LEC Area Average	176	163	142