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)
- Seawalls/Natural Barriers
- Water Conservation
- Water Storage
- Levees/Elevated infrastructure
- Forward Pumps
Adaptation Examples: Forward Pumping at S-26 Structure Near Miami Airport and Room for Flood Waters

Spillway

New Pump Station

Western C-4 Impoundment
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
Thank you!
Unified SLR Projections: 2011 versus 2015
(using Key West gage)
Natural Systems: Inundation of Freshwater Wetlands

Dead sawgrass, substrate decay

Remnant living sawgrass

Peat collapse

Credit: Prof. Hal Wanless

Coral Bleaching

Credit: sfwmd.gov
Adaptation in Miami Beach

STORMWATER UPGRADES

STORMWATER UPGRADES

sfwmd.gov
## Declining Per Capita Usage

Gallons Per Capita Per Day

### Chart

![Declining Per Capita Usage Chart](chart.png)

### Table

<table>
<thead>
<tr>
<th>County</th>
<th>Gallons Per Capita Per Day</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2000</td>
</tr>
<tr>
<td>Palm Beach</td>
<td>219</td>
</tr>
<tr>
<td>Broward</td>
<td>153</td>
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<tr>
<td>Miami-Dade</td>
<td>168</td>
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<tr>
<td>Monroe (includes permanent and seasonal population)</td>
<td>114</td>
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<tr>
<td>LEC Area Average</td>
<td>176</td>
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