RISING TIDE: ADAPTING EVERGLADES ECOSYSTEM RESTORATION TO CLIMATE CHANGE

National Conference on Ecosystem Restoration
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Everglades National Park

• A World Heritage Site in Danger
• Home to 68 Threatened & Endangered Species
• An International Biosphere Resource
• A Wetland of International Importance
• An economic engine for Miami-Dade County, Florida

NATIONAL PARKS CONSERVATION ASSOCIATION
Comprehensive Everglades Restoration Plan “CERP”

- Historic Flow
- Current Flow
- The Plan Flow
Climate Change Concerns for Florida

Sea Level Rise
• Salinity changes in coastal bays, plus tidally influenced creeks and rivers
• Shoreline retreat with natural habitat changes/losses
• Increasing flood frequency and depth in coastal areas
• Saltwater intrusion in water supply wells, OR higher canal stages and flood risks
• Uncertainties and risks in rate and depth of sea level rise

Warmer Temperatures
• Evaporation losses up; water supply down
• Stresses on plant, animal, and marine ecosystems
• Changes in growing season and migratory patterns

Hydrologic Pattern Changes
• Potential for less frequent and more intense rain events
• Potential increased tropical storm intensity or frequency
Sea Level Rise Scenarios

EC 1165-2-211 SLR Projection for Key West

U.N. Climate Change Science Compendium 2009
0.8 to 2.0 meters (2.62 to 6.56 feet) by 2100

- High - Modified NRC - III
- Intermediate - Modified NRC - I
- Low - Historic
Rainfall Projections

Annual 1901 - 2000 Average = 54.02 Inches
Annual 1895 - 2008 Trend = 0.30 Inches / Decade

Trends in the change in the length of the hot season
1950-2007

- Decrease of 9 days or more
- Decrease of 8 days to increase of 8 days
- Increase of 9 days to 25 days
- Increase of 26 days to 34 days
- Increase of 34 days or more

Large Increases
- Hialeah - 72 days
- Miami - 45 days
- Fort Lauderdale - 33 days
- Fort Myers - 24 days
- West Palm Beach - 23 days

Large Decreases
- Inverness - 27 days
- Jacksonville - 18 days
- Ocala - 18 days
- Madison - 7 days
- Fernandina Beach - 6 days
Photo Credit: Dr. Harold R. Wanless; University of Miami, Department of Geological Sciences; co-chair of Miami-Dade Climate Change Task Force
Southeast Florida Regional Climate Change Compact

- Collaborate on joint policy positions urging Congress to recognize vulnerabilities of South Florida to Climate Change & enhance federal participation in regional adaptation strategies
- Develop joint position statements on proposed State legislation and energy/climate policies
- Develop baseline greenhouse gas emissions for South Florida and coordinate emissions reductions strategies
- Unify sea level rise projections
NPS Efforts

• Reduce Fuel Use and GHG Emissions from Transportation Sources
• Reduce GHGs Through Buildings and Facilities Management
• Increase Climate Change Outreach and Education
• NPS 2\textsuperscript{nd} Century Call to Action – 21 & 23
USACE Efforts

• June 2011 Climate Change Adaptation Policy Statement released

• Feb 2013 Adaptation Plan & Report

• [http://corpsclimate.us/](http://corpsclimate.us/)
C-111: A Case Study
Barriers and Opportunities

• Time consumptive to model for a large range of impacts.
• Climate deniers remain amongst decision makers needed for authorization & funding.
• Inflexibility of federal process.
• Long term benefits exceed term limits.
• Broaden & diversify funding sources.
Policy Challenges

- USACE 2011 guidance does not apply to regulatory activities.
- Limitations of adaptive management to address climate adaptation.
- Calculating long term benefits for climate mitigation and adaptation.
- Skyrocketing project costs.
Lessons Learned

• Everglades Restoration will help delay climate change impacts in natural and developed areas…IF it happens fast enough.

• Additional water storage is the critical element to deal with uncertainties.

• More work needed to assess impact of sea level rise and climate change on the restoration effort.

• CERP PIRs must address adaptation strategies for enhanced long term sustainability.
Questions?