

Gulf Coast Community Handbook

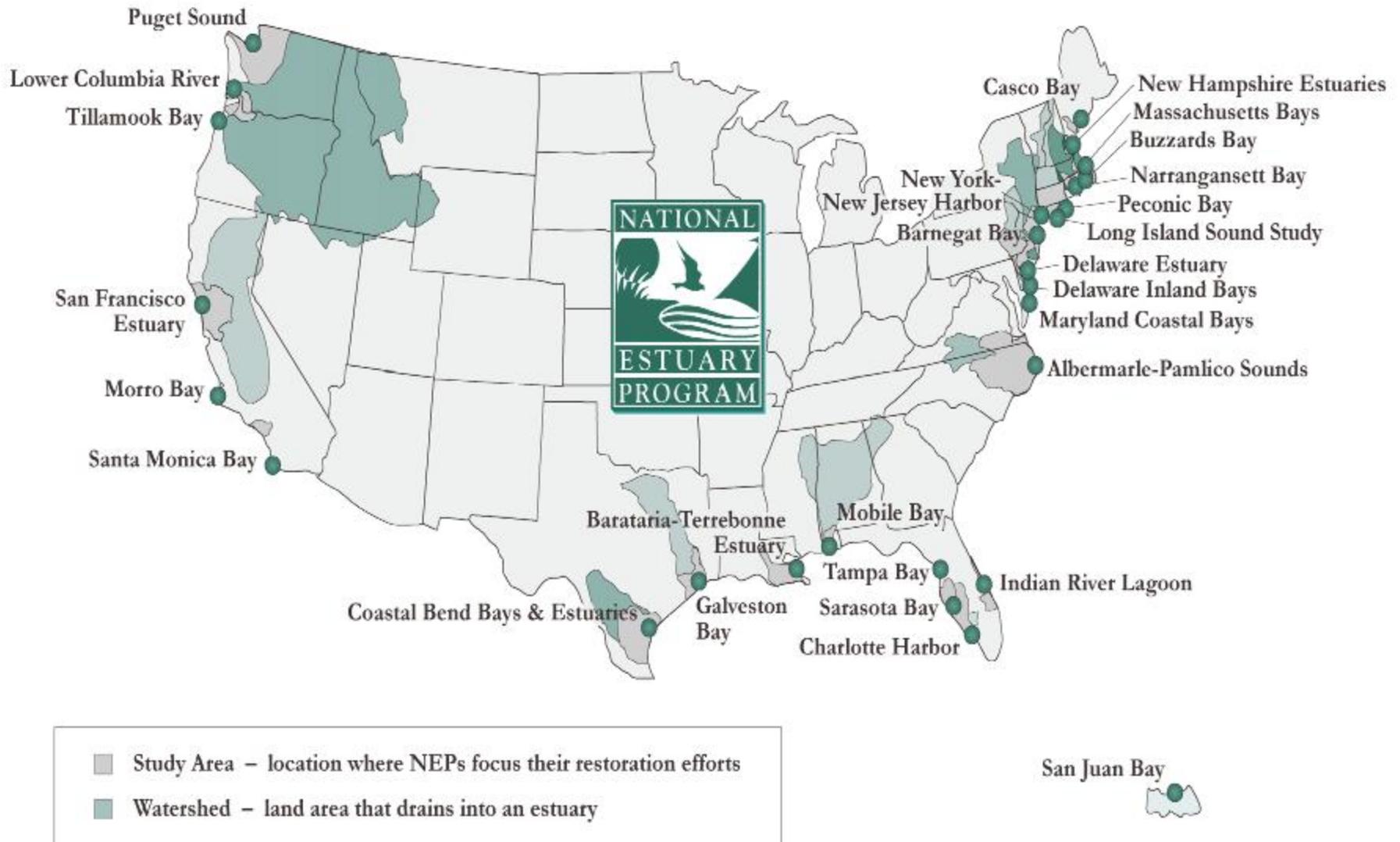


Lindsay M. Cross

Tampa Bay Estuary Program



National Estuary Program (NEP): Local watershed programs making a difference



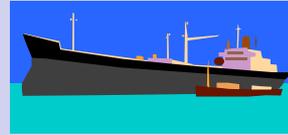
Partners vital to our success



Priority Issues in Tampa Bay



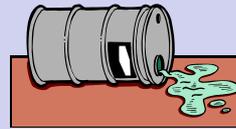
Water and Sediment
Quality



Dredged material
management



Bay Habitats



Spill Prevention and
Response



Fish and Wildlife



Public Access



Invasive Species



Education



Climate Change

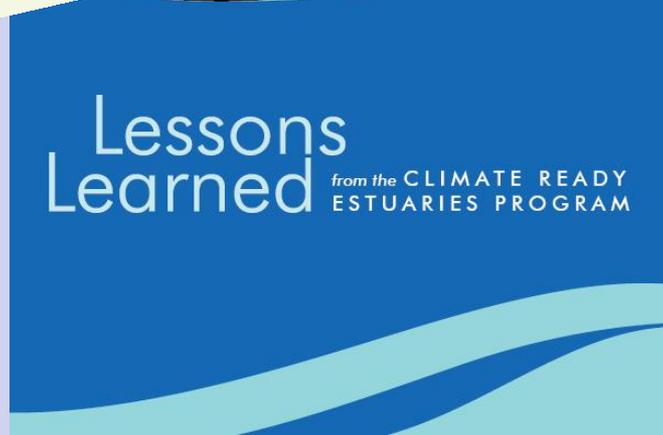
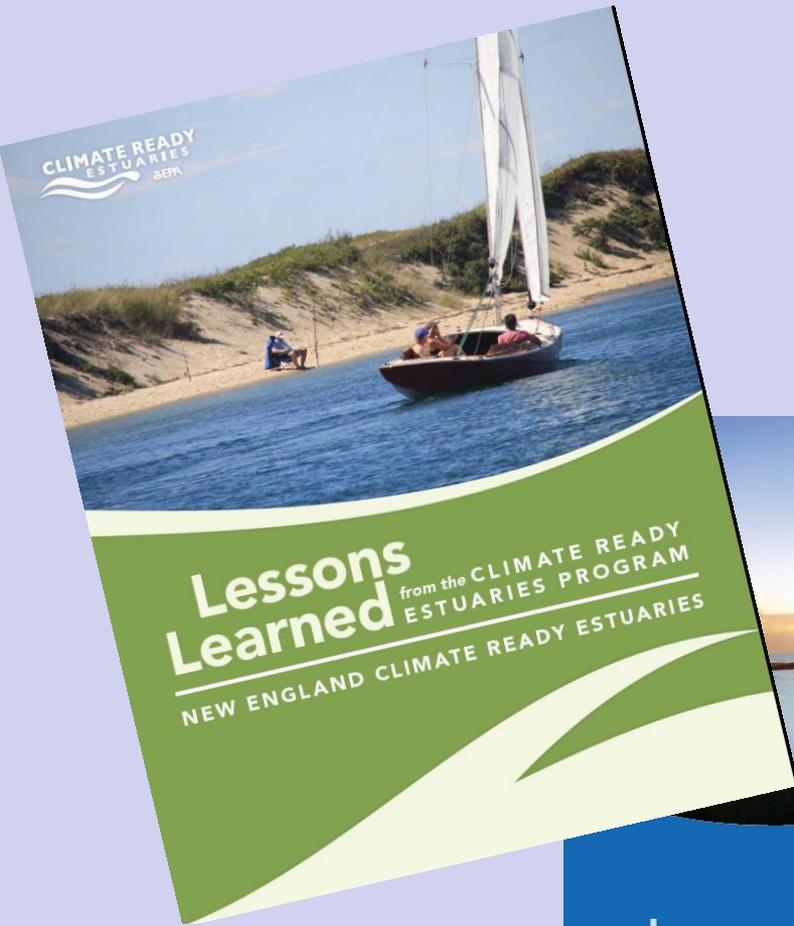
Climate Ready Estuaries



- Program through US Environmental Protection Agency to work with National Estuary Programs and coastal management community to:
 1. Assess climate change vulnerabilities
 2. Develop and implement adaptation strategies
 3. Engage and educate stakeholders



Publications



Gulf Coast Community Handbook

- Identify adaptation strategies that incorporate resiliency to climate change as a component of habitat restoration and protection plans
- Focus on specific case studies from the Gulf region
- Guidebook for other coastal communities that provides concrete examples of how to improve habitat resiliency along the Gulf coast

Handbook Contents

- Executive Summary
- Introduction
- Overview of Climate Change Science
 - Sea Level Rise
 - Storm Impacts and Extreme Weather
 - Changes in Precipitation and Temperature
 - Impacts to Flora and Fauna
 - Ocean Acidification
 - Gulf of Mexico Impacts
 - Storm Impacts
- Gulf of Mexico Case Studies
- Step-by-Step Recommendations
- Recommended Readings

Overview of Climate Science



Intergovernmental Panel on Climate Change

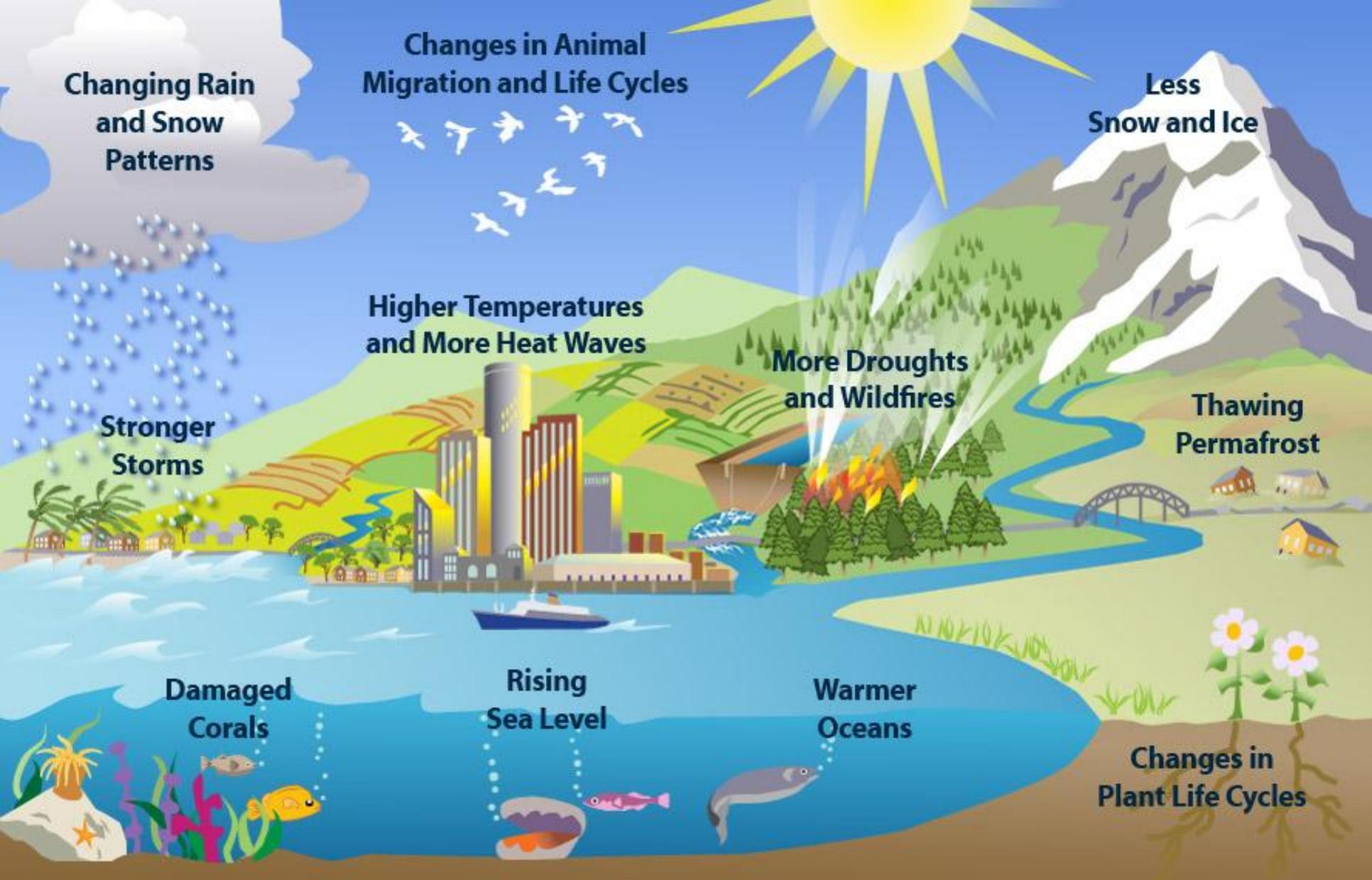


globalchange.gov
U.S. Global Change Research Program

National Climate Assessment



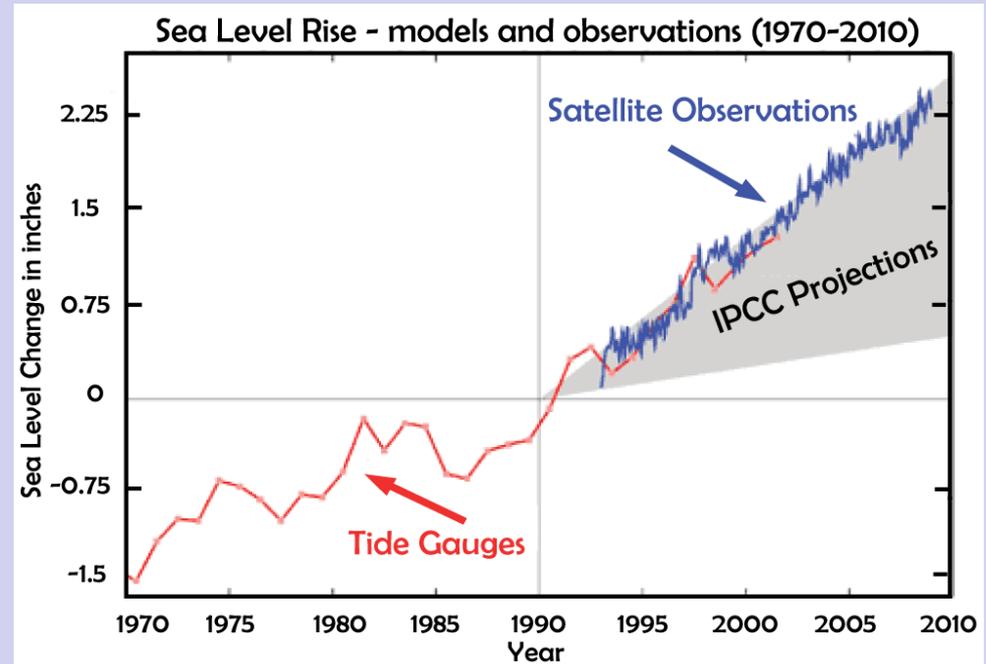
Restore America's Estuaries



Predicted impacts of climate change. Source: US Environmental Protection Agency

Sea Level Rise

- Local measurements (St. Pete Pier) document ~ 1 "/decade
- Rate expected to increase
- Communities can use scenarios based on the “tolerance of risk”



Scenario	SLR by 2100
Highest	6.6 feet
Intermediate-High	3.9 feet
Intermediate-Low	1.6 feet

Source: thisnessofthat.blogspot.com; Allison et. Al., The Copenhagen Discussions, 2009; NOAA (2012)

Storm Impacts and Extreme Weather

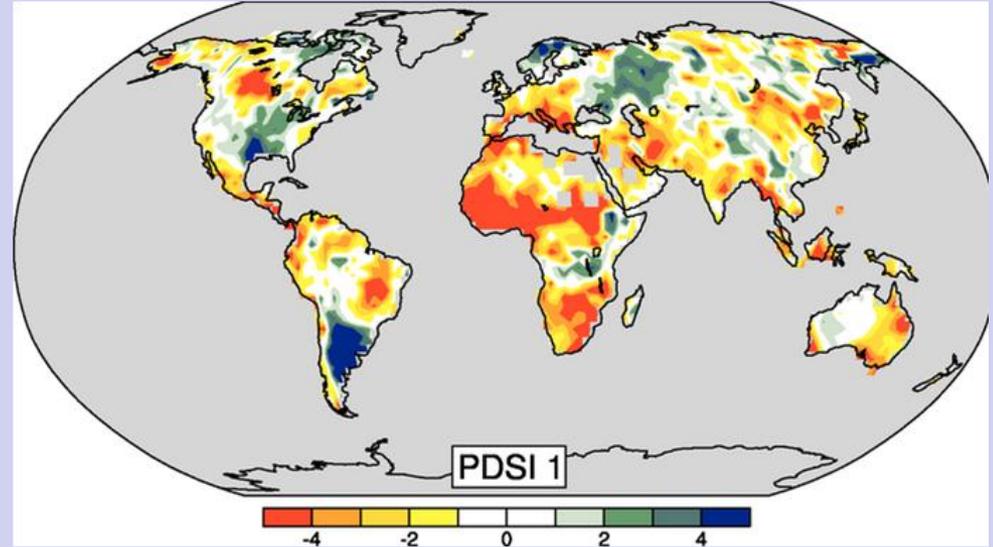
- Sea level rise may increase intensity of extreme weather events
- Major flooding more common
- Barrier islands vulnerable



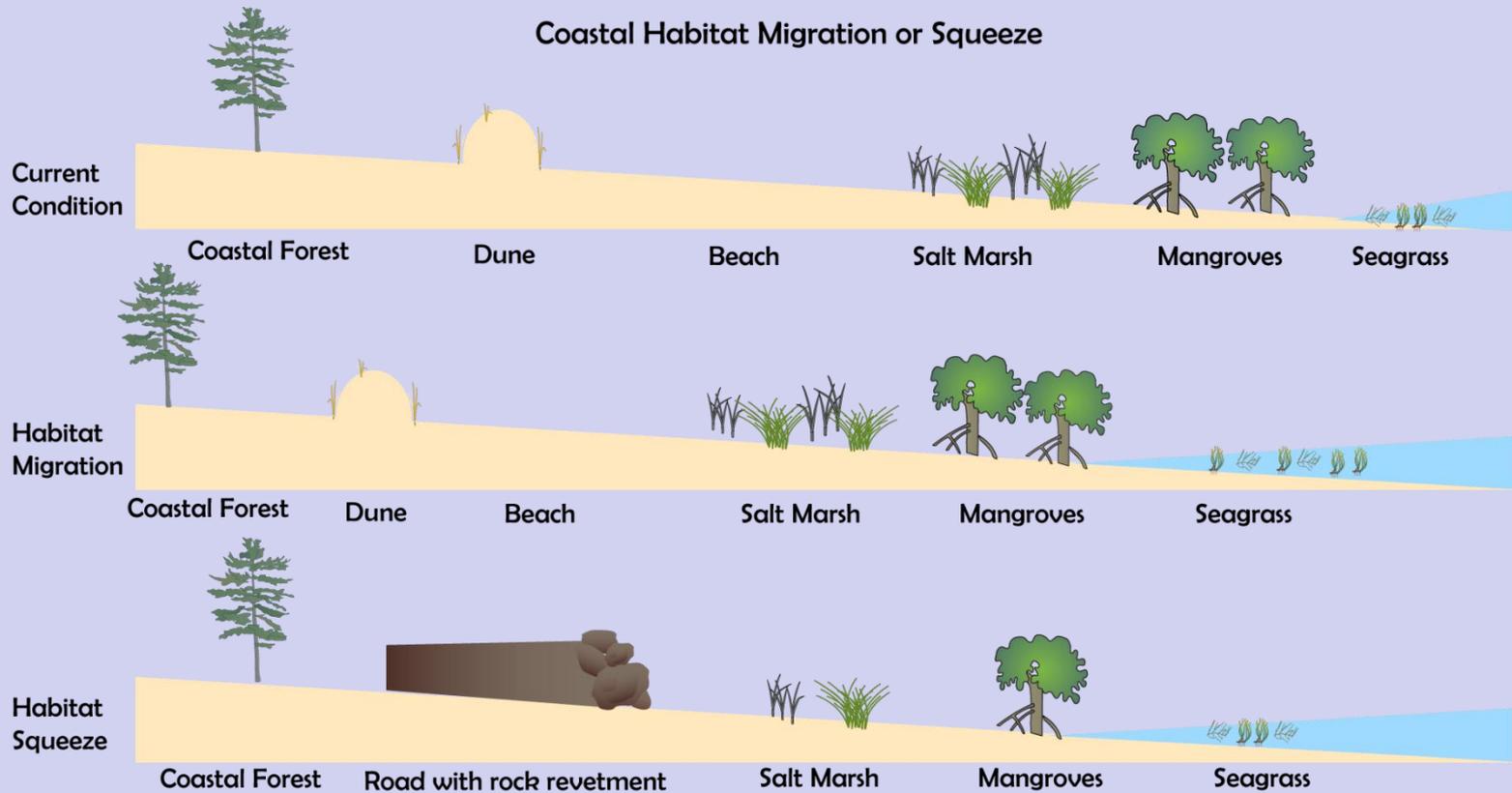
Source: Tom McKenzie, unknown

Changes in precipitation and temperature

- Warmer air temperatures will impact precipitation patterns and intensity
- Greater variability predicted



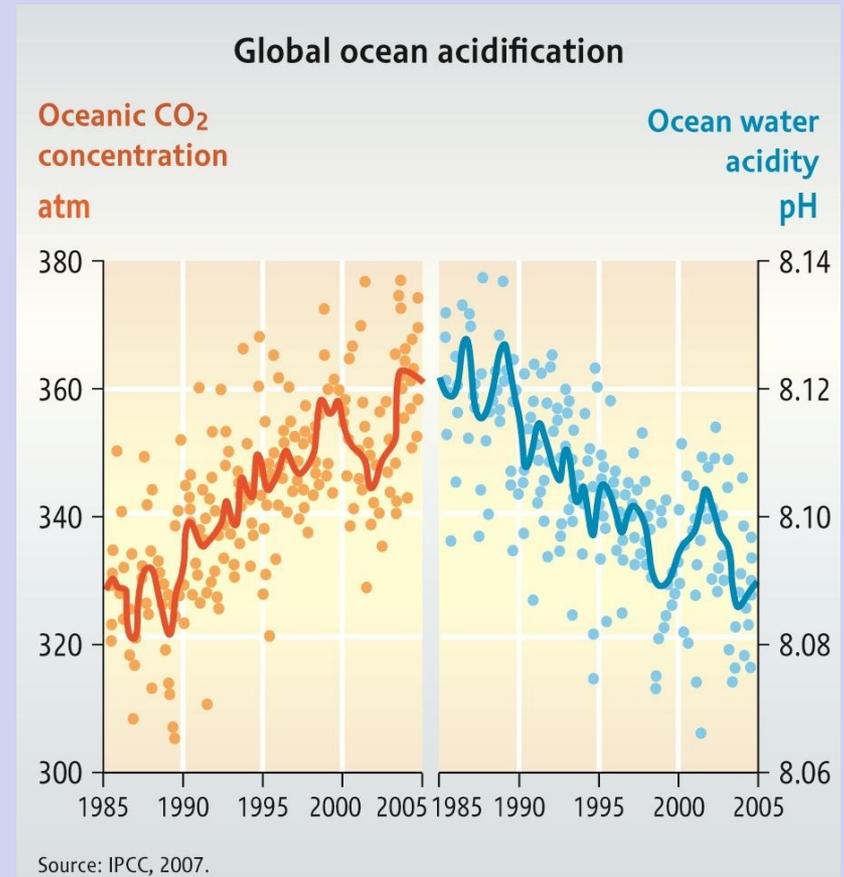
Impacts to Flora and Fauna



- Examples of habitat migration or squeeze
- Changes in habitat ranges

Ocean Acidification

- pH decrease of 0.1 = 25% increase in acidity
- Threatens marine creatures
 - Coral reefs
 - Shellfish
 - Algae



Source: University of Queensland, IPCC 2007

Additional Gulf of Mexico Impacts

- Land subsidence could exacerbate sea level rise
 - Oil and gas extraction
 - Pumping of groundwater
- Significant wetland losses
 - Louisiana loses a football field-sized wetland every hour

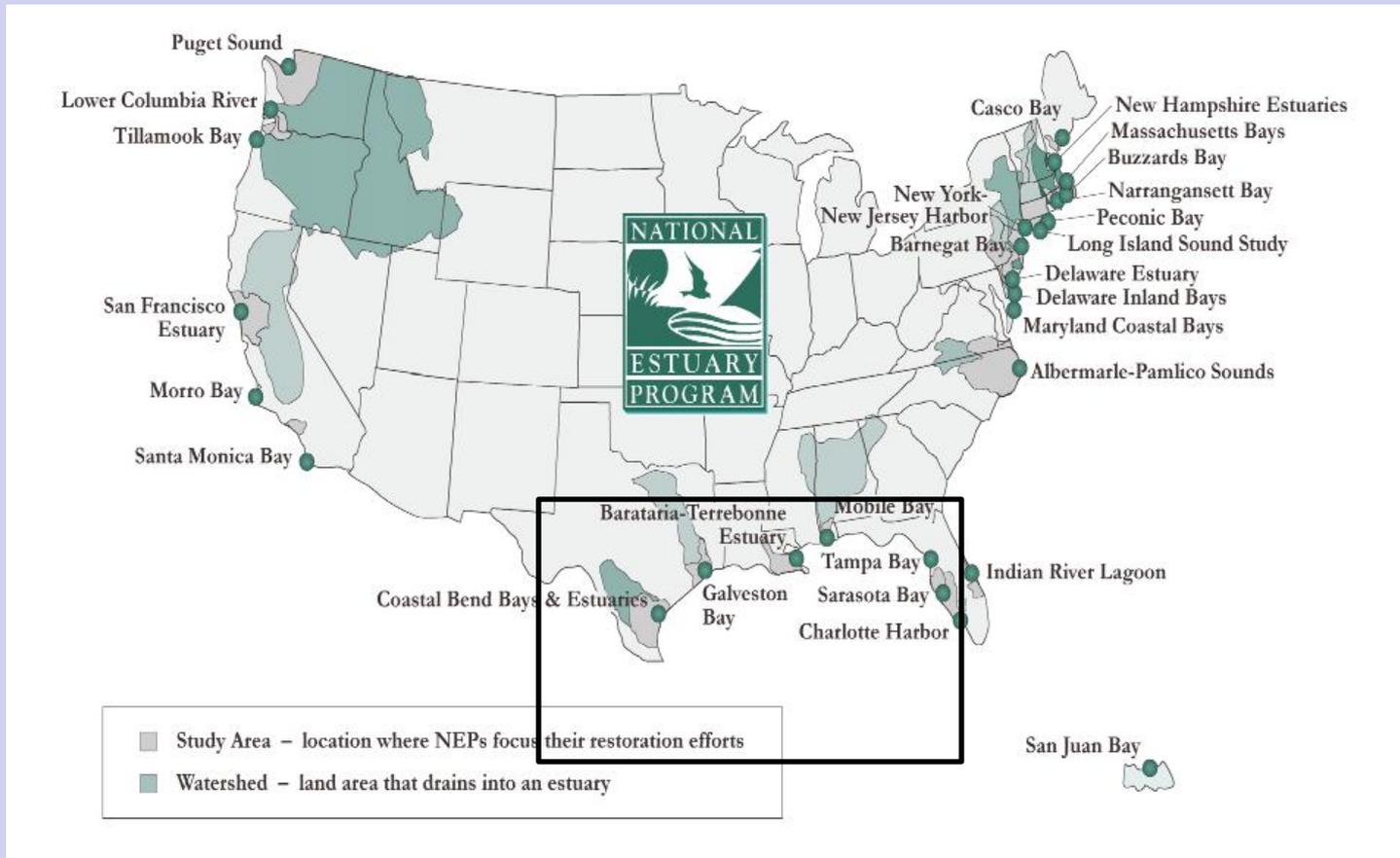


Case Studies

- Highlight activities at Gulf Coast NEPs and NERRs
- Examples of collaborative projects as well as individual initiatives



National Estuary Programs



Coastal Bend Bays & Estuaries, TX
Galveston Bay, TX
Barataria-Terrebonne Estuary, LS
Mobile Bay, AL

Tampa Bay, FL
Sarasota Bay, FL
Charlotte Harbor, FL

National Estuarine Research Reserves



Mission-Aransas, TX
Grand Bay, MS
Weeks Bay, AL

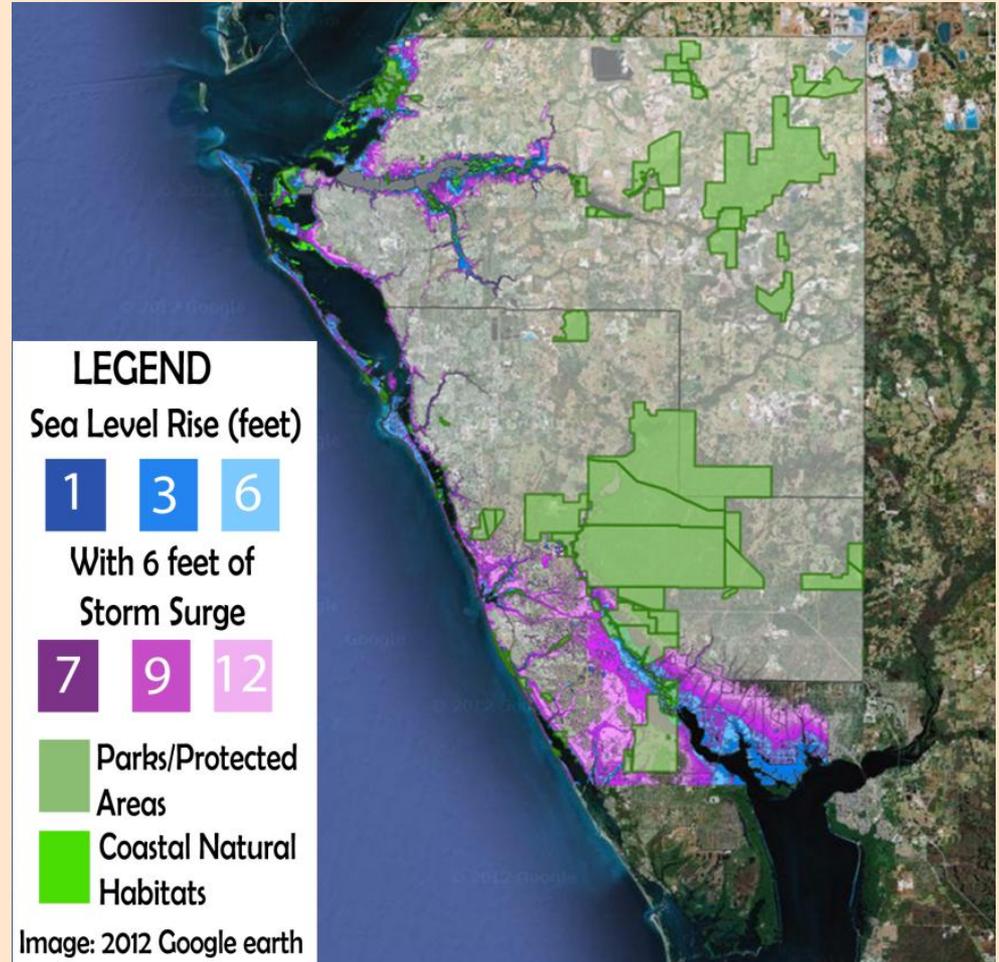
Apalachicola, FL
Rookery Bay, FL

Visualizing Sea level rise in Sarasota Bay: Sarasota Bay Estuary Program



SARASOTA BAY
ESTUARY PROGRAM
Restoring Our Bays

- Web-based sea level rise visualization tool
- 3 sea level rise and 3 (additive) storm height scenarios
- Overlays for conservation areas and drainages



Source: SBEP

Habitat creation at North Lido Park, FL: Sarasota Bay Estuary Program



- Mosaic of wetland habitats, including a new tidal channel with connection to Sarasota Bay
- Fill material used to create rolling dunes
- Restoration tested during tropical storm Debby

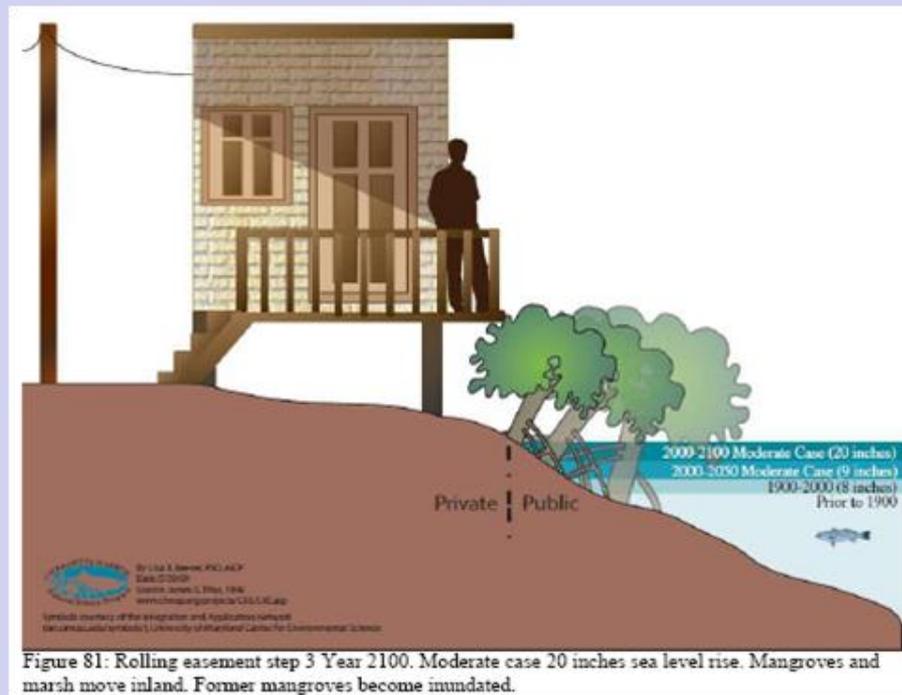


Source: Jay Leverone, Sara Kane

Adaptation plan for Punta Gorda, FL: Charlotte Harbor NEP



- Extensive community-based effort
- Vulnerability, Adaptation and Acceptability Games
- Suite of strategies for adaptation, protection, planned relocation and accommodation through 2200



Effects of Everglades restoration on sharks in Rookery Bay, FL: Rookery Bay NERR



- Restoration in Everglades will improve distribution of freshwater
- Sharks indicate healthy salinity regimes

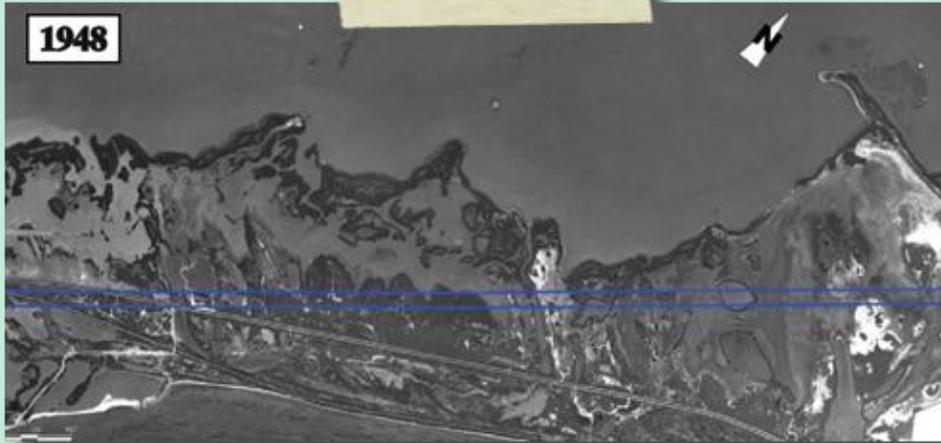


Source: RBNERR, US Army Corps of Engineers

Making marshes in Nueces Bay, TX: Coastal Bend Bays & Estuaries NEP



- 160-acre intertidal marsh restoration
- Marsh terraces and berms created at higher elevation
- Will combat erosion and subsidence



This 1948 aerial photo captures the area before construction of the current causeway wiped out about 180 acres of marsh.



Source: HDR, Lammon Aerial Photography

Coastal habitat mosaics, Schultz Preserve, FL: Tampa Bay Estuary Program



- Upland, spoil-created peninsula restored to braided tidal creek system
- 120 acres of subtidal, marsh and coastal uplands
- Tidal emergent wetlands can migrate upslope



Impact on critical coastal habitats; Tampa Bay

Tampa Bay Estuary Program



- Modeling of 40 cm (~1.3') to 2 meters (~6.6') SLR
- Impact to coastal habitats under 2 scenarios:
 - Allow Habitat migration
 - Protect dry land

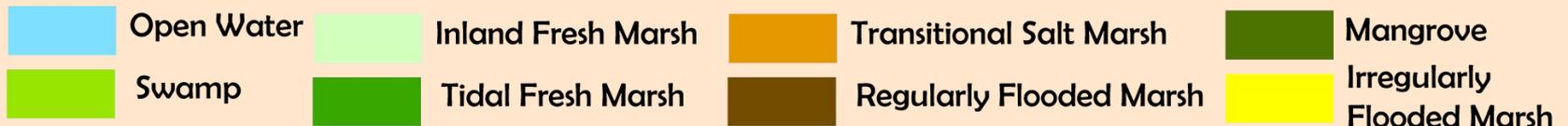
Current Condition
St. Petersburg, FL



2 meter SLR
Habitat Migration



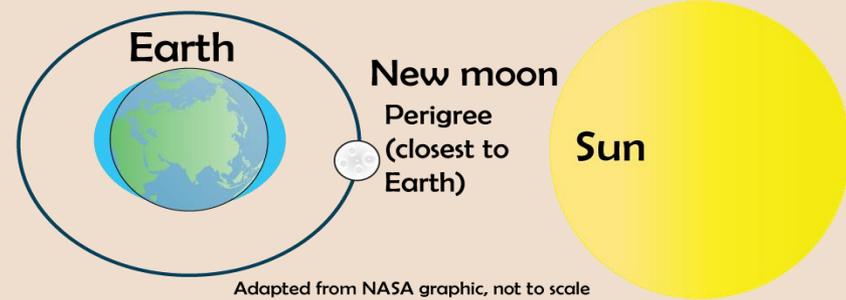
2 meter SLR
Dry Land Protected



King Tide Photo Initiative: Sarasota Bay and Tampa Bay Estuary Programs



- Summer 2012: >150 photos documenting extremely high tide
- Winners judged by community members



SARASOTA BAY
ESTUARY PROGRAM
Restoring Our Bays



Source: NASA,
Larry Stults

Step-by-Step Recommendations

- Assess current vulnerabilities
- Map areas that may become inundated
- Identify habitats for protection and preservation
- Prioritize strategies that incorporate environmental benefits
- Engage business community
- Develop post-disaster recovery plans



Source: Tracy Skrabal, rosiemade.com

Gulf Coast Community Handbook

Case Studies from Gulf of Mexico Communities for Incorporating Climate Change Resiliency into Habitat Planning and Protection

A report to the US Environmental Protection Agency,
Climate Ready Estuaries Program



Developed by Lindsay M. Cross,
Tampa Bay Estuary Program



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Electronic and hard copies available

www.tbep.tech.org/DATA/cre/gulfcoasthandbook.pdf

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