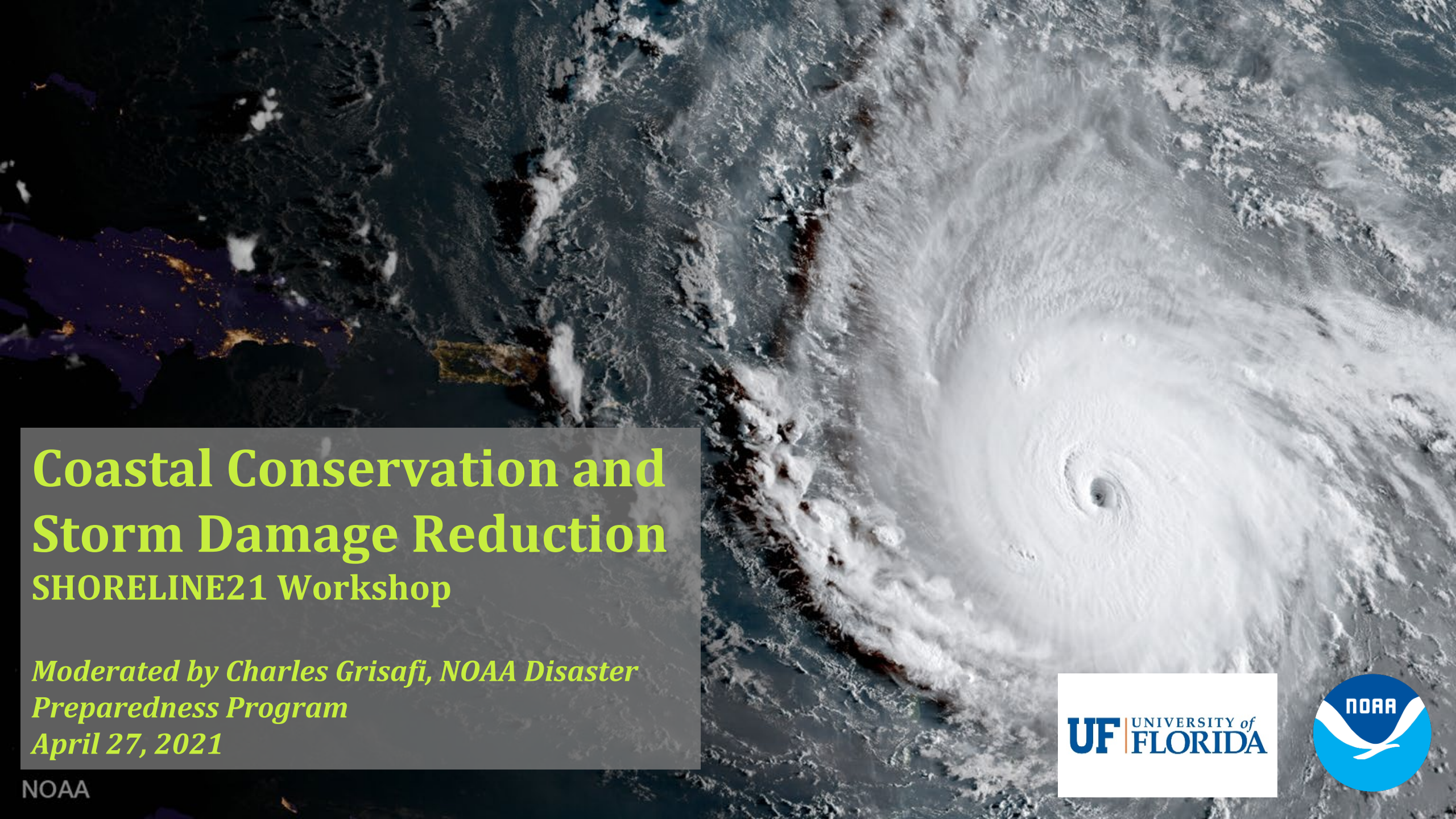


A satellite image of a hurricane, showing a well-defined eye and spiral cloud bands over a dark ocean surface. The hurricane is positioned on the right side of the frame, moving towards the left.

Coastal Conservation and Storm Damage Reduction SHORELINE21 Workshop

*Moderated by Charles Grisafi, NOAA Disaster
Preparedness Program
April 27, 2021*

NOAA

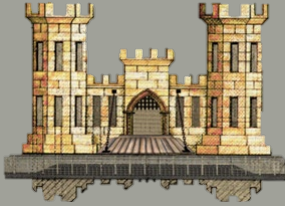
UF UNIVERSITY of
FLORIDA



**Jane McKee Smith, Ph.D.,
PE, D.CE, NAE**

U.S. Army Corps of Engineers,
US Engineer Research and Development
Center (ERDC), Coastal and Hydraulics
Laboratory





Coastal Flood Risk Management

Jane McKee Smith
US Army Engineer Research and Development Center

Coastal Flood Risk Management

- Field Measurements
- Basic Coastal Processes R&D
- Hazard Quantification

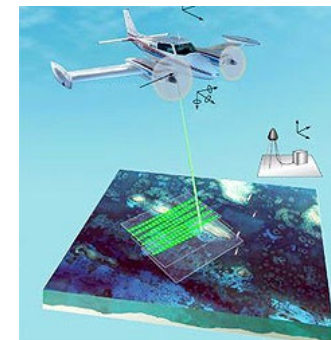
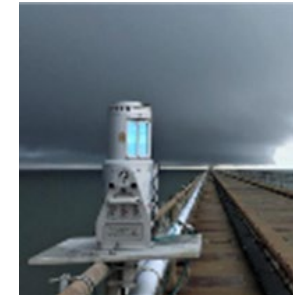
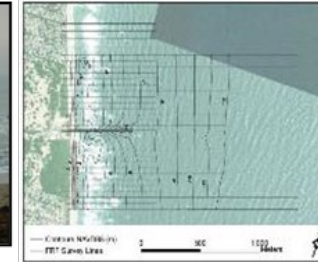
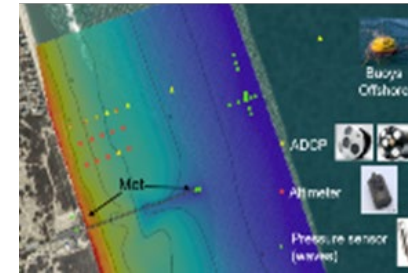


US Army Corps
of Engineers®

27 April 2021

Field Data Collection

- Field Research Facility, Duck, NC
 - 40-yr record: wind, waves, currents and topo-bathy
 - Technology development: surveying, remote sensing
 - Collaborative experiments (DUNEX, SandyDuck, DELILAH, SuperDuck)
- Climatological Measurements
 - Waves and Water Levels
 - Airborne LIDAR (JALBTCX) – National Coastal Mapping
- Project/Site-Specific Measurements
 - In-situ: waves, water levels, sediment
 - Remote: video ~ mini Argus, lidar, radar



Basic Coastal Processes R&D

- Natural and Nature-Based Features
 - Vegetated dune processes
 - Aeolian beach processes
 - Wave dissipation by vegetation
 - Sediment-vegetation interaction
 - Nearshore berms

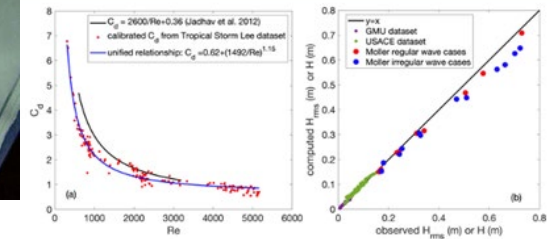
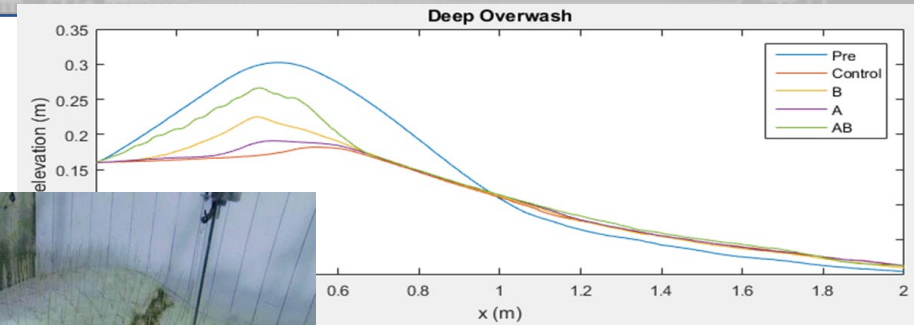
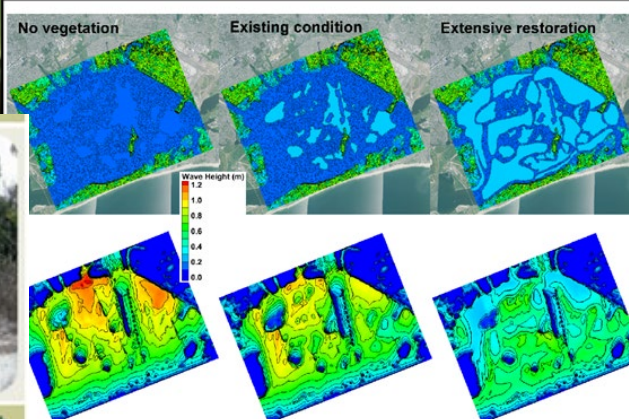
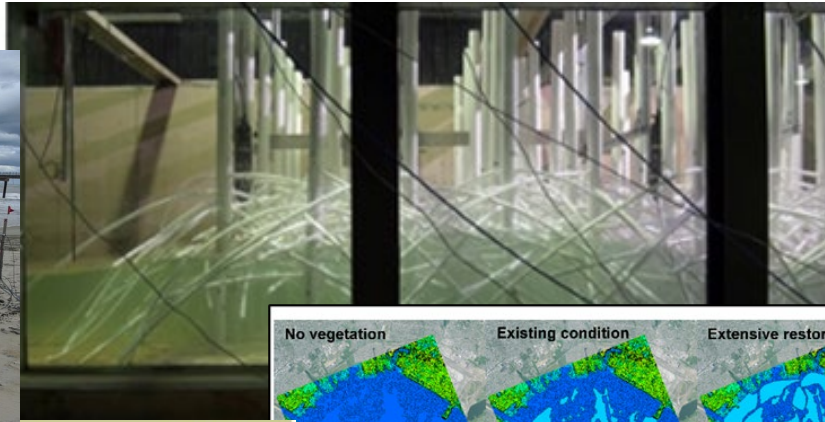
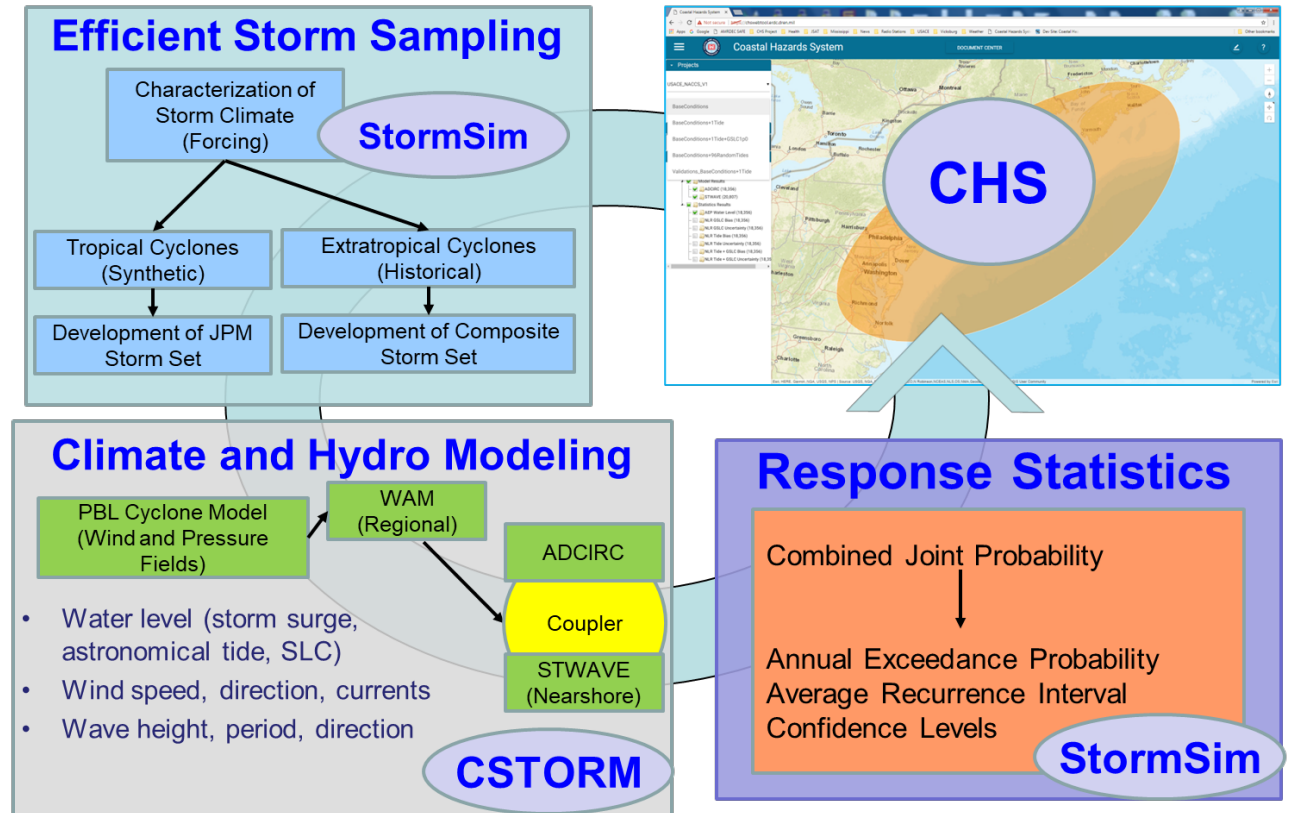
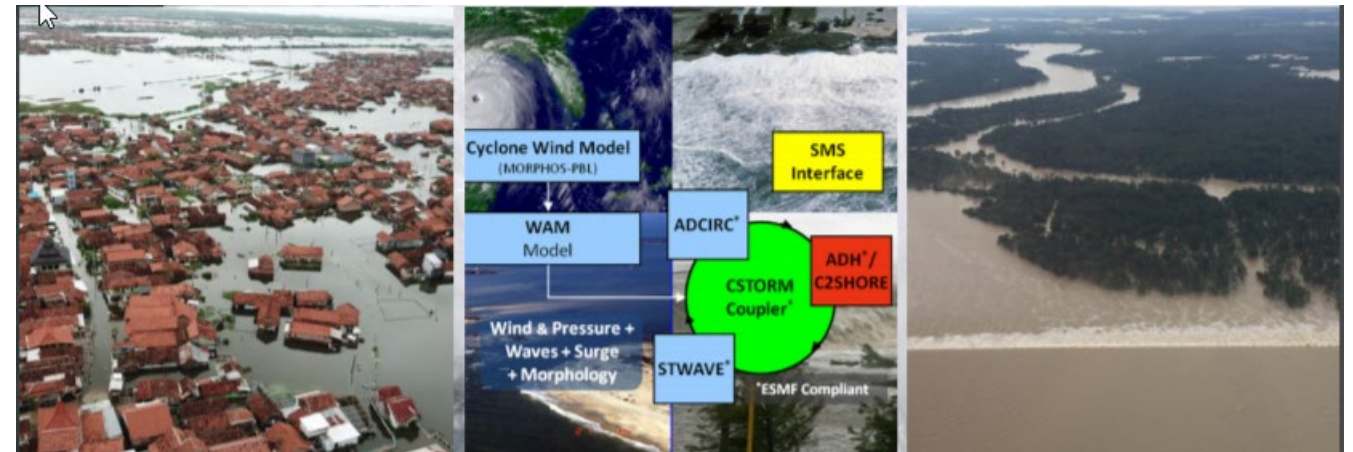


Figure 2. (a) Unified C_d - Re relationship inferred from Tropical Storm Lee dataset using improved CSHORE with effective vegetation height. (b) Wave height comparison for three independent dataset using C_d from the unified C_d - Re relationship.



Hazard Quantification

- High-Fidelity Modeling
 - Coastal Storm Modeling System
 - Compound flooding ~ coupling models and enhanced statistics
 - Testbed for validation
- Coastal Hazards System
 - Climatological storm simulation
 - Coastal storm database
 - Website and tools to support
- Life-Cycle Probabilistic Analysis Methods
 - Including NNBF & community infrastructure





Heidi Stiller

NOAA National Ocean Service
Office for Coastal Management



Coastal Conservation and Storm Damage Reduction

NOAA Office for Coastal Management



Programs and Partnerships

Primary Programs

National Coastal Zone Management Program

National Estuarine Research Reserves

Digital Coast

Coral Reef Conservation Program



National Coastal Resilience Fund (\$34M in FY21)

Funding available for coastal resilience projects that

- Provide communities with enhanced protection and buffering from impacts of sea level rise, changing flood patterns, coastal erosion, and increased frequency and intensity of storms;

AND

- Protect and restore habitat for fish and wildlife.

[*nfwf.org/coastalresilience*](https://nfwf.org/coastalresilience)



Rebecca Beavers, Ph.D.

Department of Interior, National Park Service
Climate Change Response Program



Sandy Rice



Climate Adaptation and Resilience through Effective Disaster Response and Recovery



April 27, 2021



Rebecca Beavers, Ph.D.

Research Permit and Reporting



- Nearly three decades ago, the NPS developed an incident management strategy to provide for visitor and employee safety and protect agency resources and property
- NPS Research Permit and Reporting System
[Research Permit and Reporting System \(nps.gov\)](https://www.nps.gov/research-permit-and-reporting-system)

*Climate Adaptation and Resilience are
facilitated through effective Disaster Response and Recovery*



Cape Lookout National Seashore (NC)

Portsmouth Village



Landscape changes

- increased tidal flooding
- salt marsh plants in the lawn



Historic Structures and Cultural Landscapes

NPS Arrowhead Hotshots
Hurricane Dorian

Resilient Projects: Coastal Hazards



Disasters can be **opportunities** to rebuild adaptively and become **resilient**



Work with the dynamic coastal environment:

- Raise buildings
- Redesign features
- Create mobile structures
- Alternative transport
- Relocate
- Abandon

Concept design for cottages at Everglades National Park

- Elevated structure
- Weather resistant





Susan N. White, Ph.D.

North Carolina Sea Grant

