



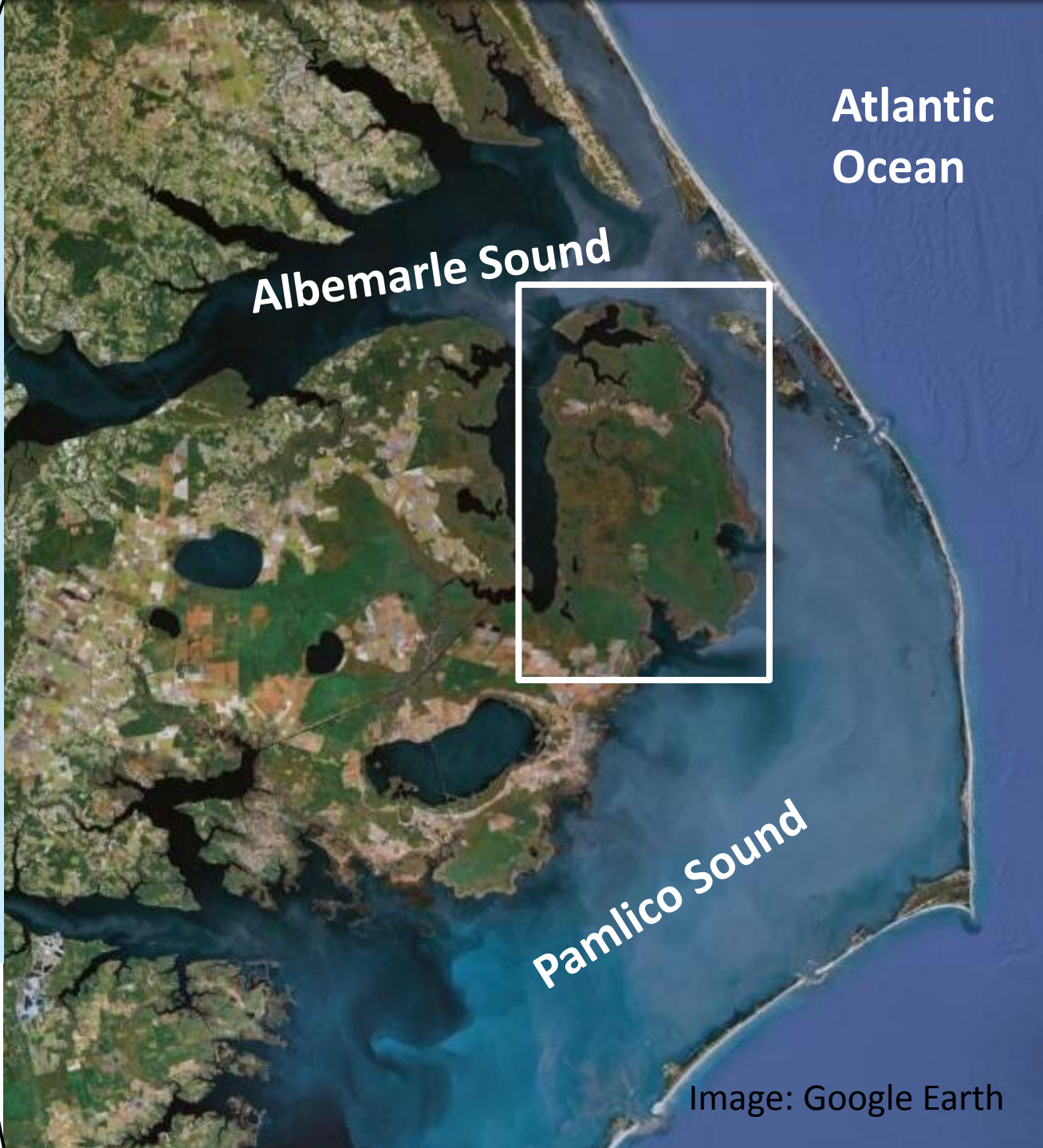
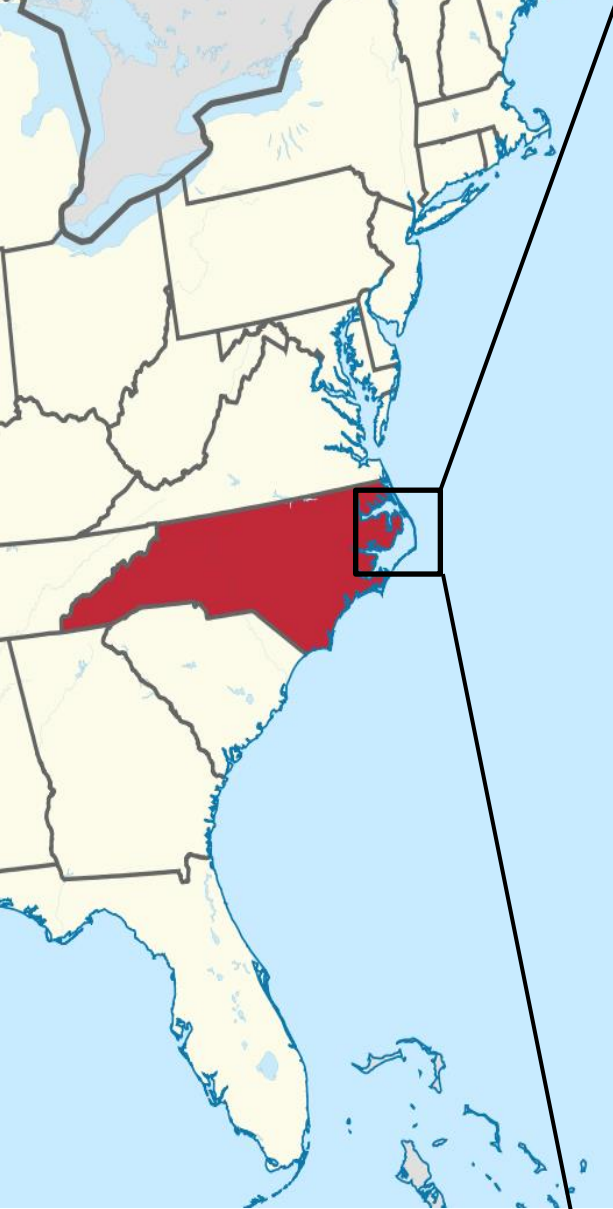
Building Resilience to Sea-level Rise on the Albemarle-Pamlico Peninsula

Dr. Christine Pickens, Coastal Restoration and Adaptation Specialist
The Nature Conservancy of North Carolina
April 29, 2014

What's Going On? Outline

- Overview of the Albemarle-Pamlico Peninsula, North Carolina
- Impacts of climate change
- Partnership to address challenges
 - The Nature Conservancy
 - US Fish and Wildlife Service
 - US Air Force
- Closer look at a restoration strategy
 - Water control structures





Atlantic
Ocean

Albemarle Sound

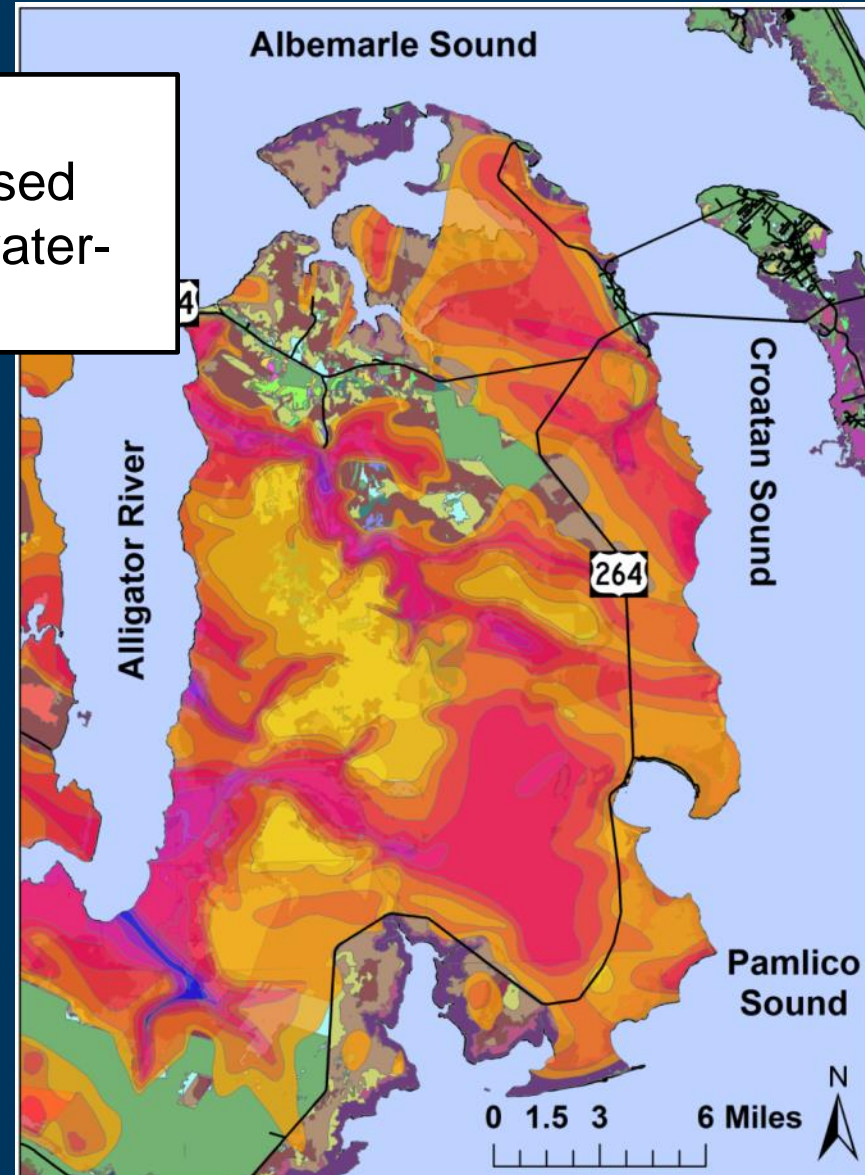
Pamlico Sound

Wetland Mosaic

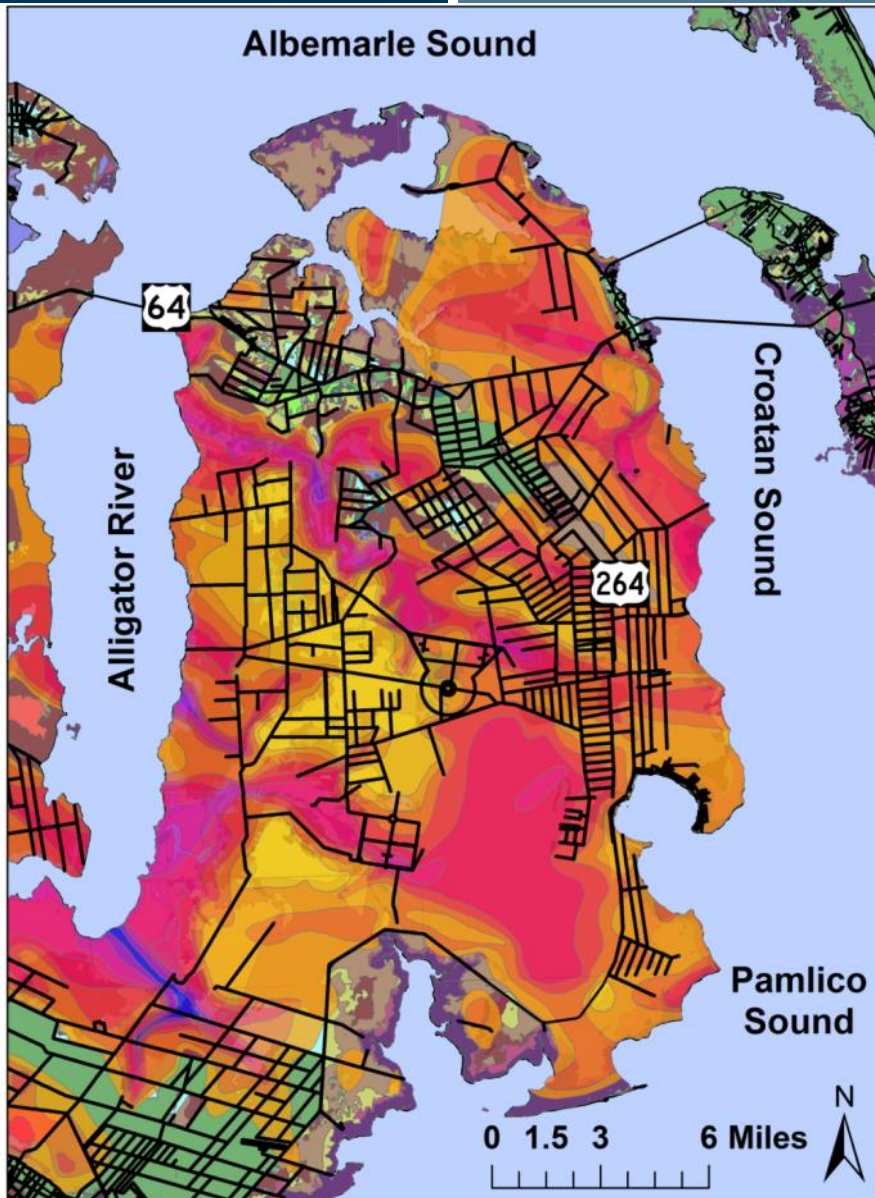


Peat = Build up of partially decomposed plant material in water-logged areas

Peat Depth (ft)



Ditching and Drainage



Ditches

- Dries out peat soil
- Subsidence
- Salt water moves in toward inner swamps (salt water intrusion)

Roads

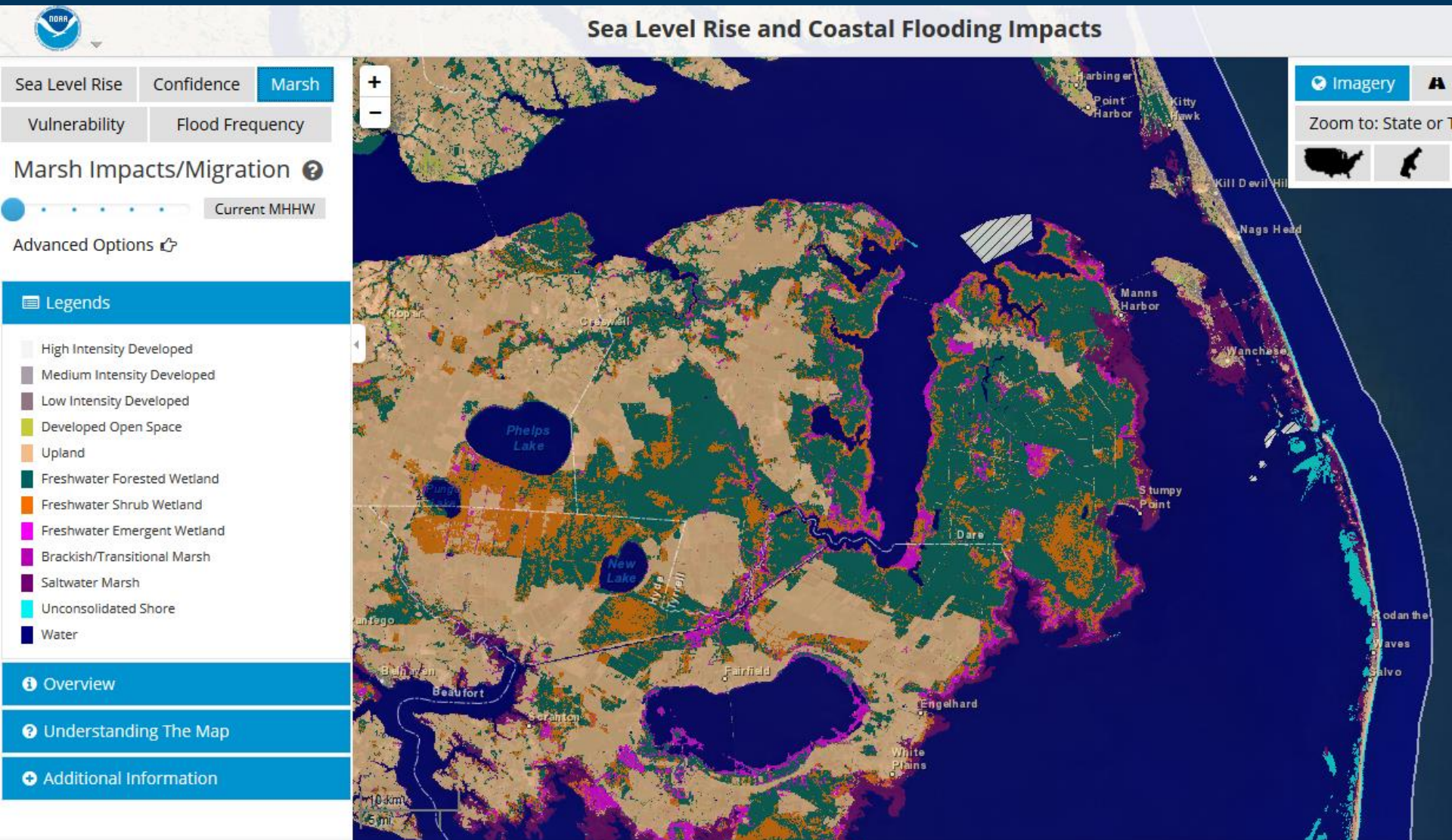
- Reduce water movement across the surface of the ground
- Can create ponding effect

Climate Change Impacts

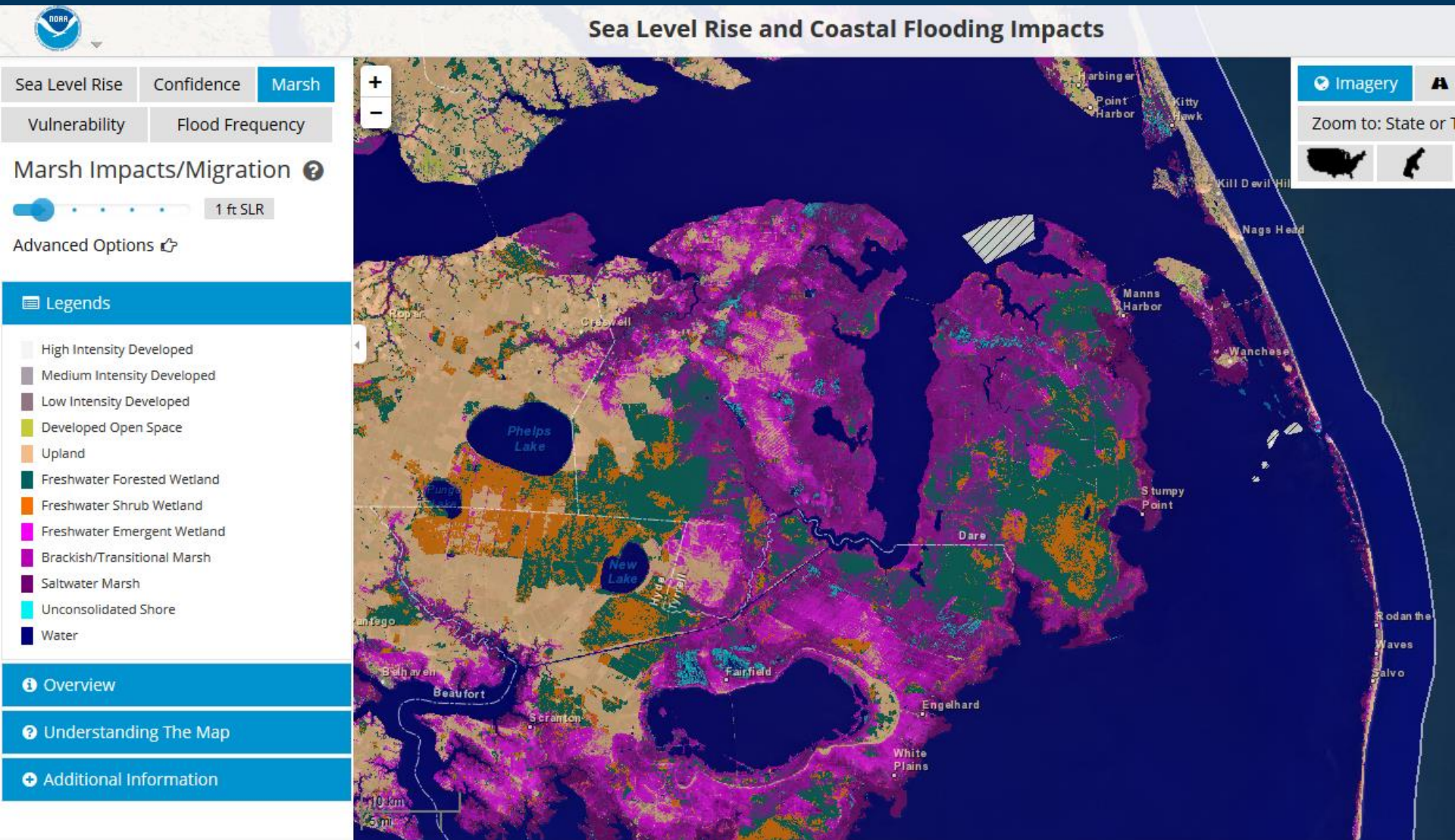
- Sea-level rise
- Salt water intrusion
- Increased storm severity/frequency



NOAA Sea-level Rise Viewer: Current Wetlands



NOAA Sea-level Rise Viewer: 1ft SLR Wetlands



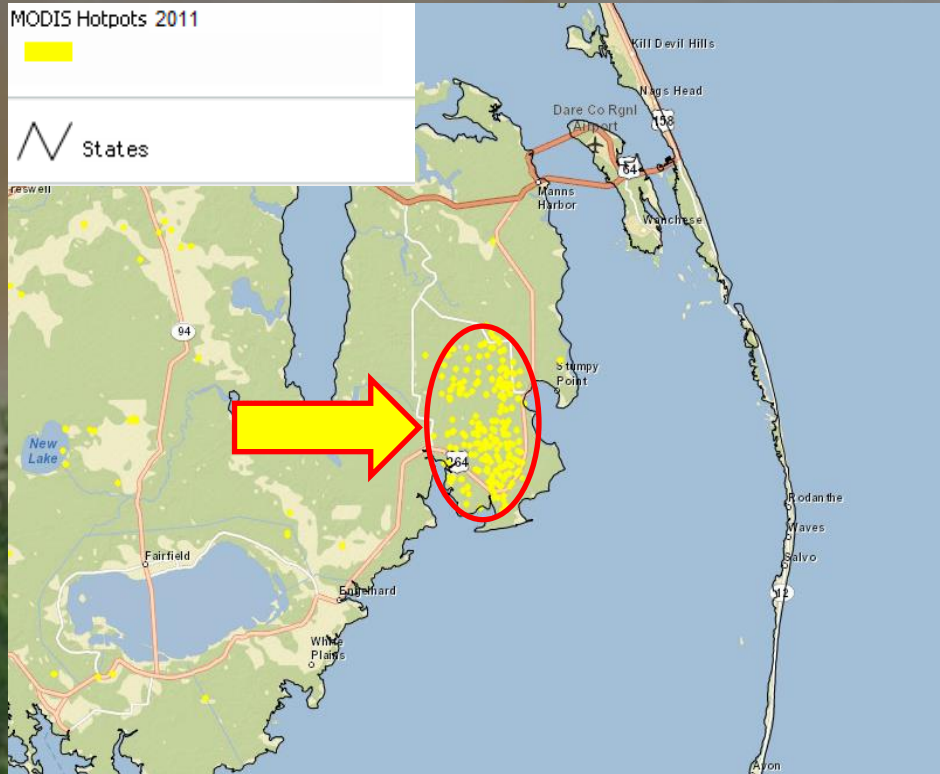
Climate Change Impacts

- Sea-level rise
- Salt water intrusion
- Increased storm severity/frequency
- Extreme rain events and warmer temperatures
- More wildfires?



Pains Bay Fire (2011)

USDA Forest Service FORWARN Model

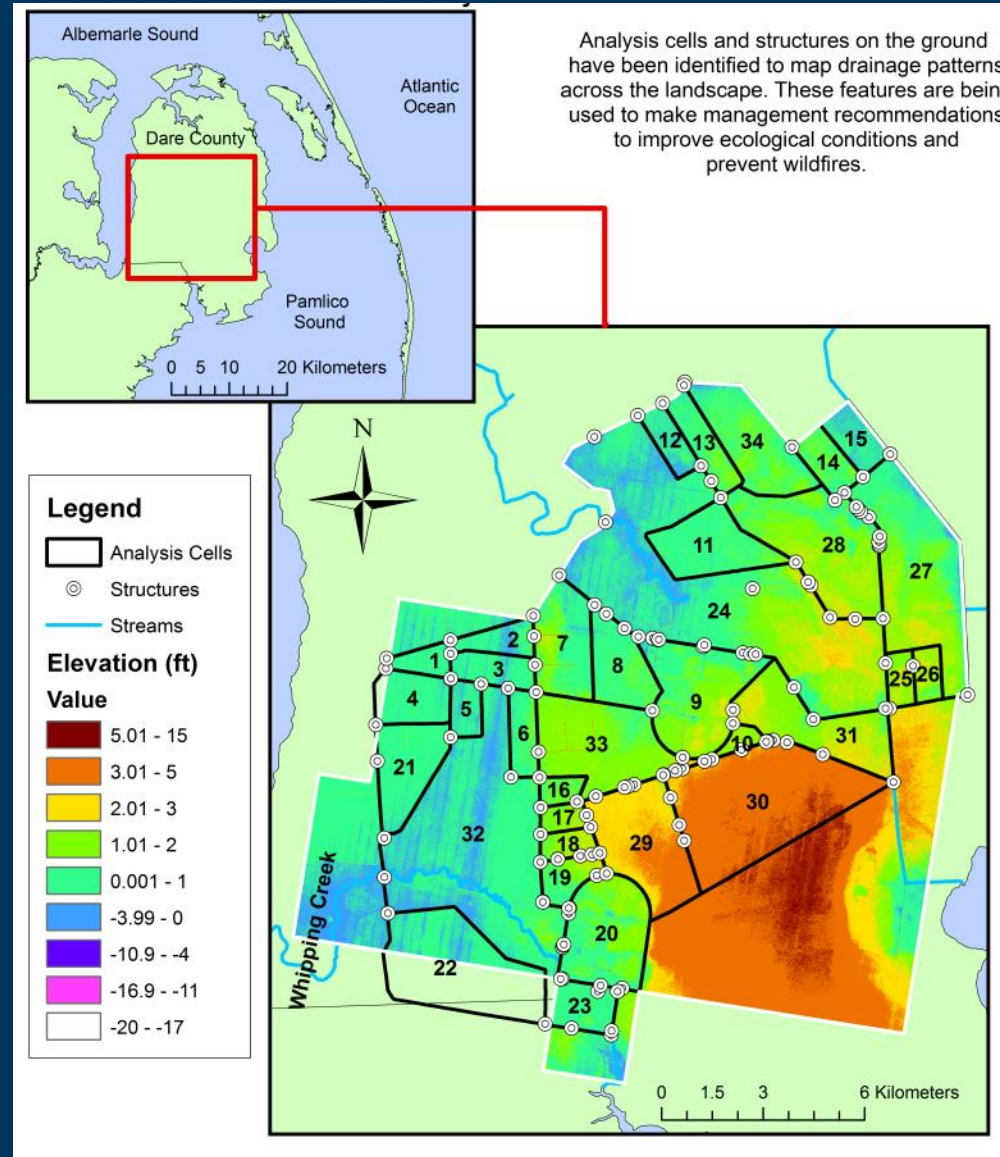


- 45,294 acres
- Lasted 120 days
- Cost \$14,000,000
- **Millions of tons of carbon** lost to the atmosphere (Mickler)

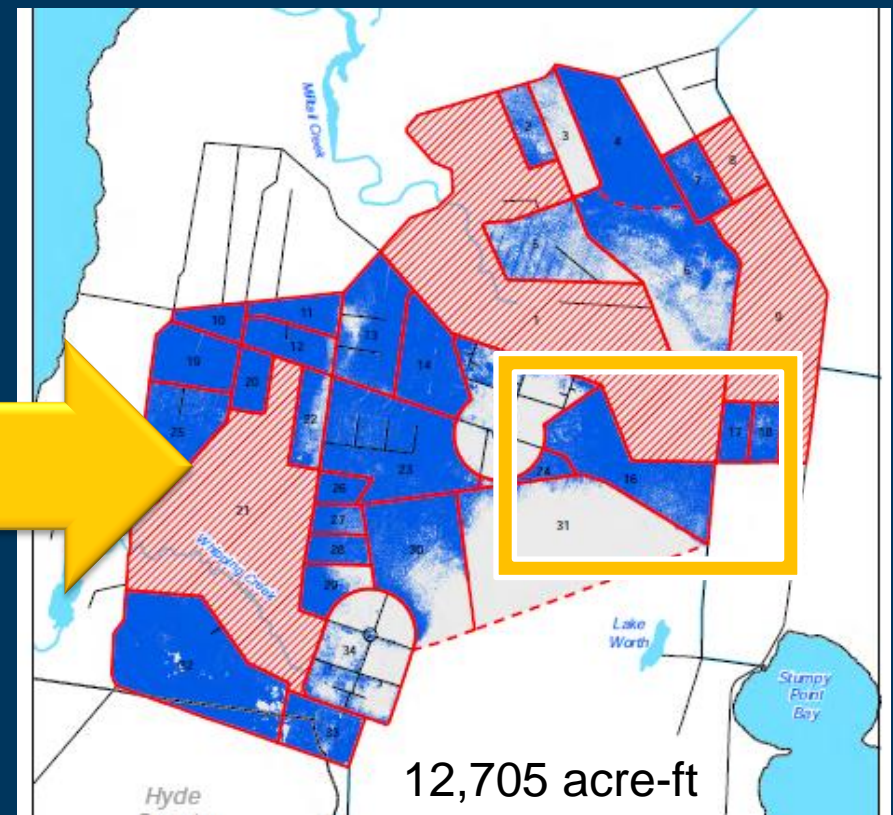
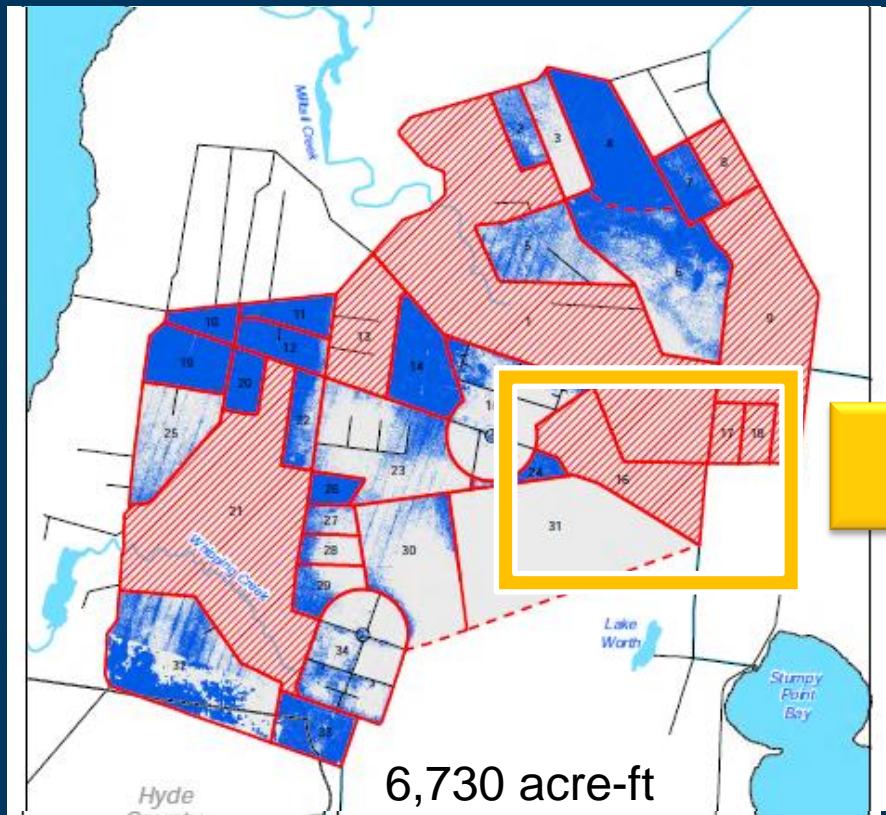


Alligator River NWR & Dare Co. Bombing Range Water Management Plan

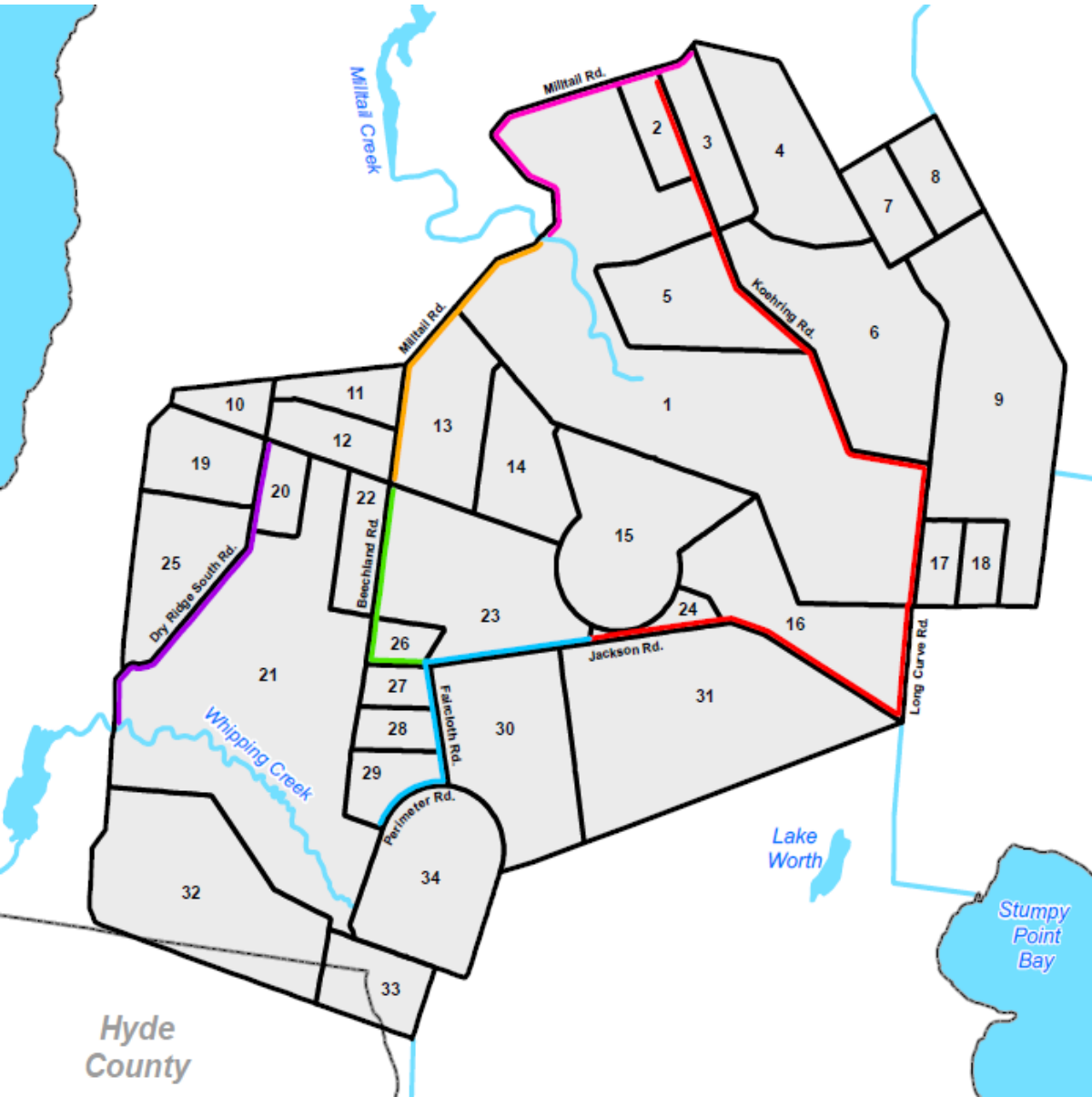
- ✓ Field Surveys
- ✓ LiDAR
- ✓ Drainage Study
- ✓ Draft Water Management Plan
- ✓ Recommended Actions
- ✓ Review and Prioritize
- ✓ Final Water Management Plan
- ✓ Installation of Structures



Improving Water Holding Capacity



Important Water Reaches

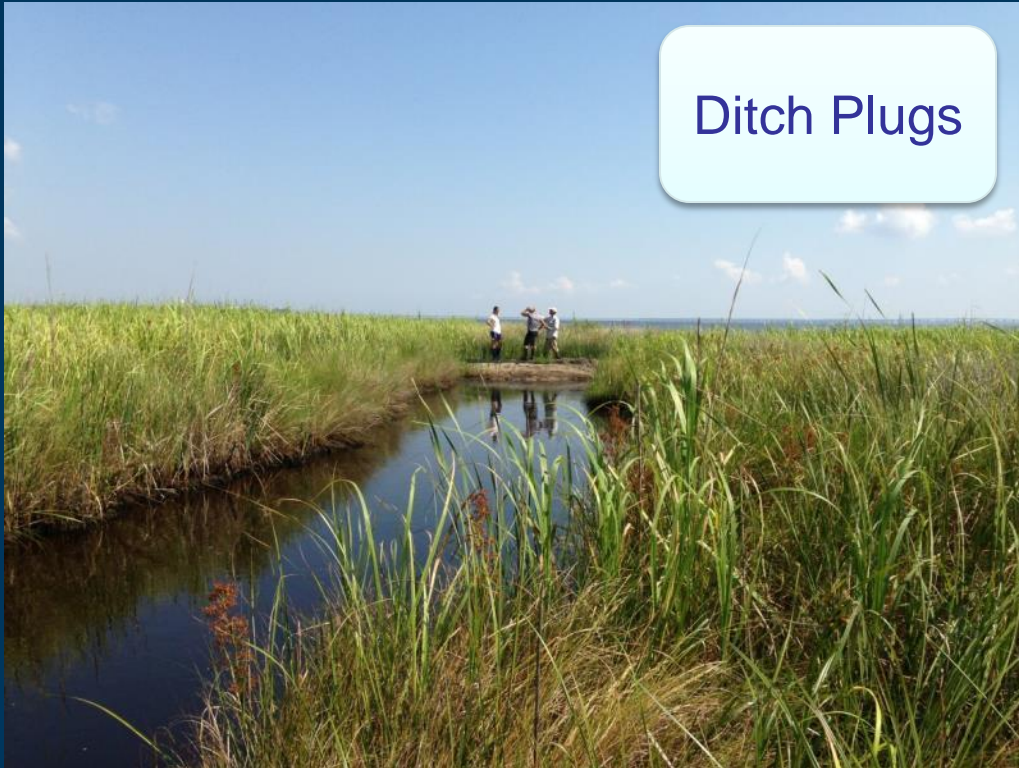


- 6 Major Reaches that allow water to flow through the area
- Important for fire management

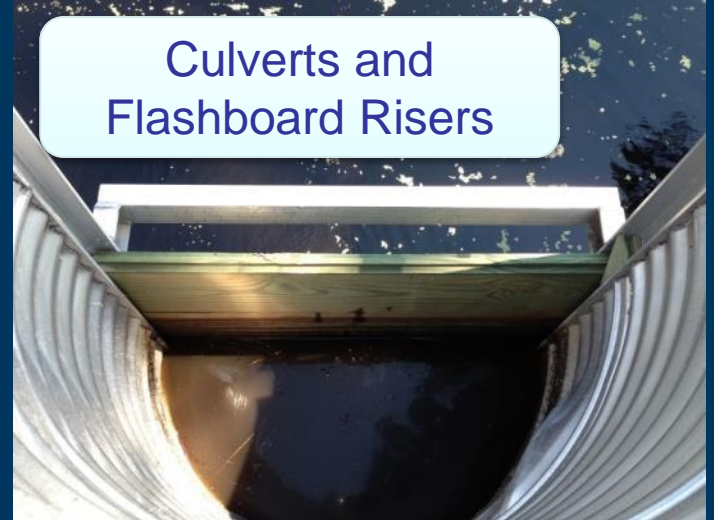
Strategies for Restoring More Natural Water Patterns

We are reducing salt water intrusion, improving water quality in the Sound and reducing vulnerability to wildfires.

Ditch Plugs



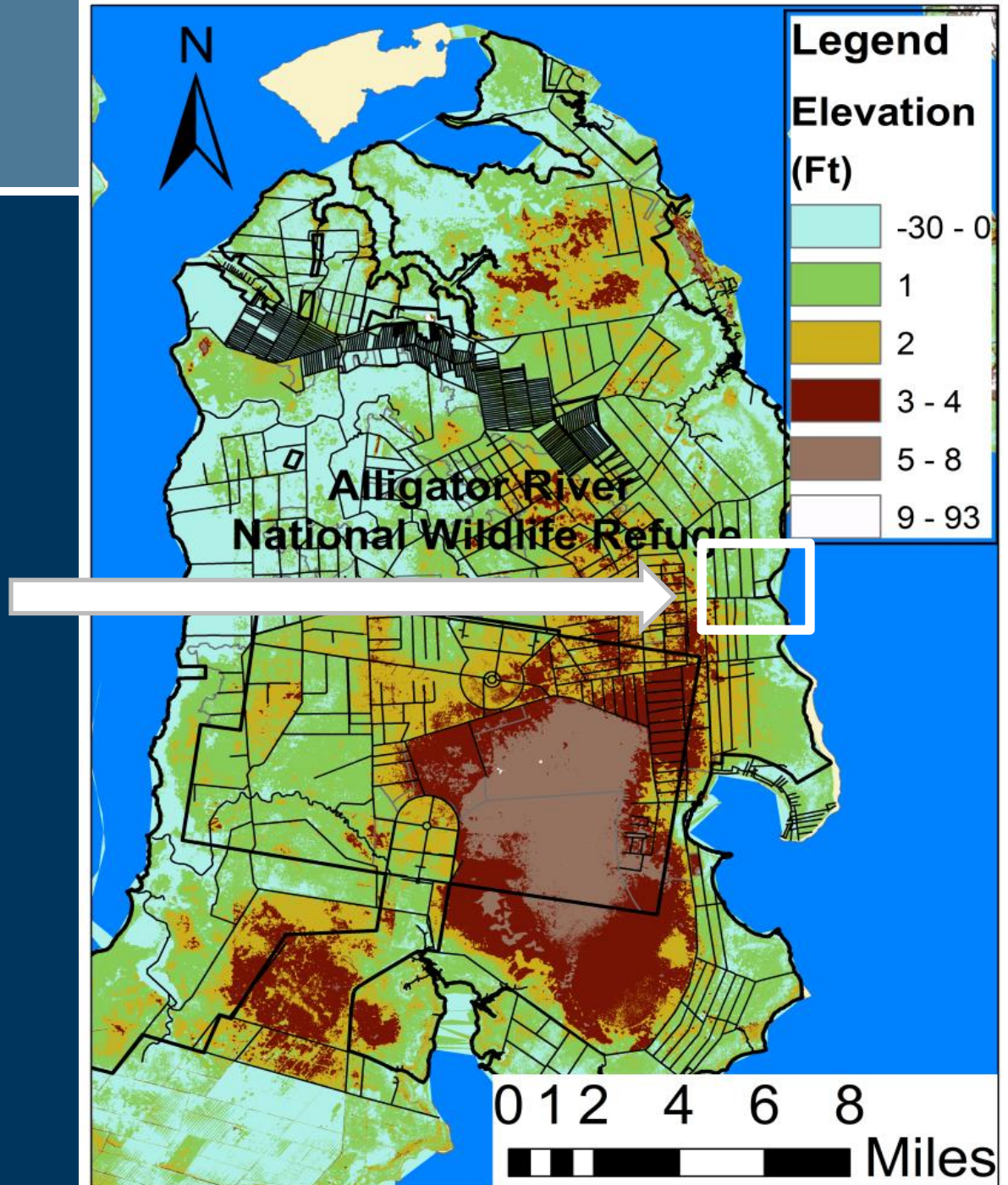
Culverts and
Flashboard Risers



Check Valves



Point Peter Road Water Control Structure



Point Peter Road Water Control Structure

Upstream
Measurement

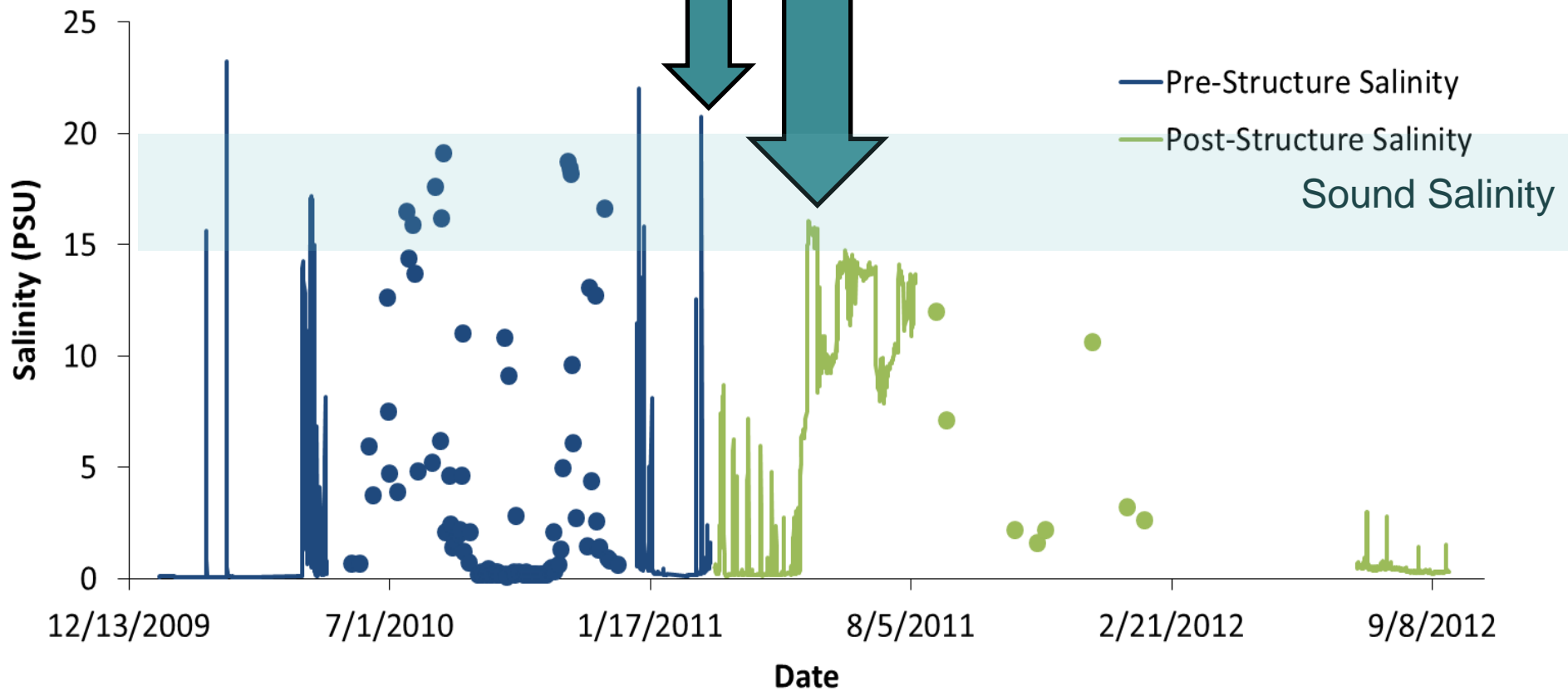
Structure



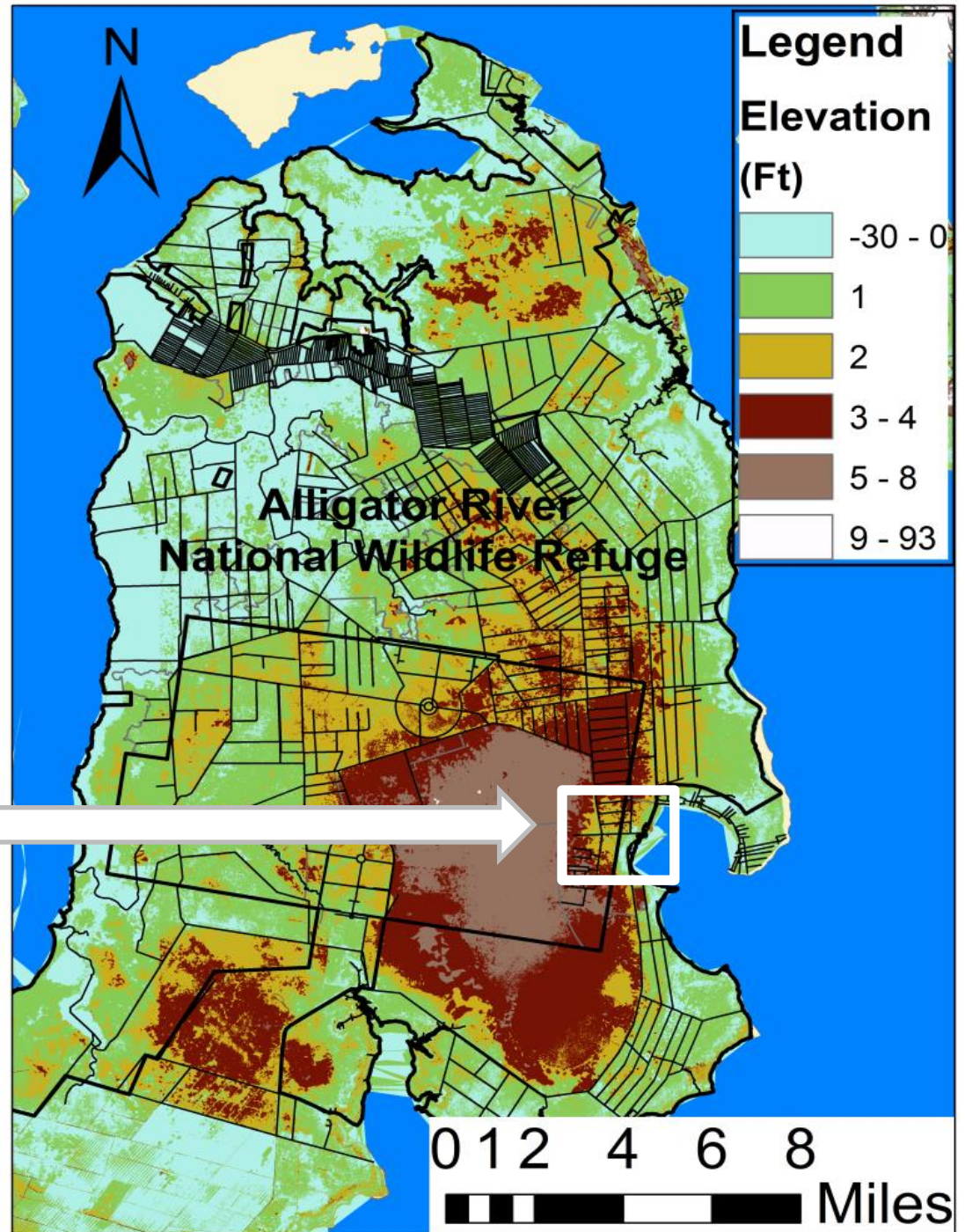
Water Control Structure Effectiveness

Structure
Installed

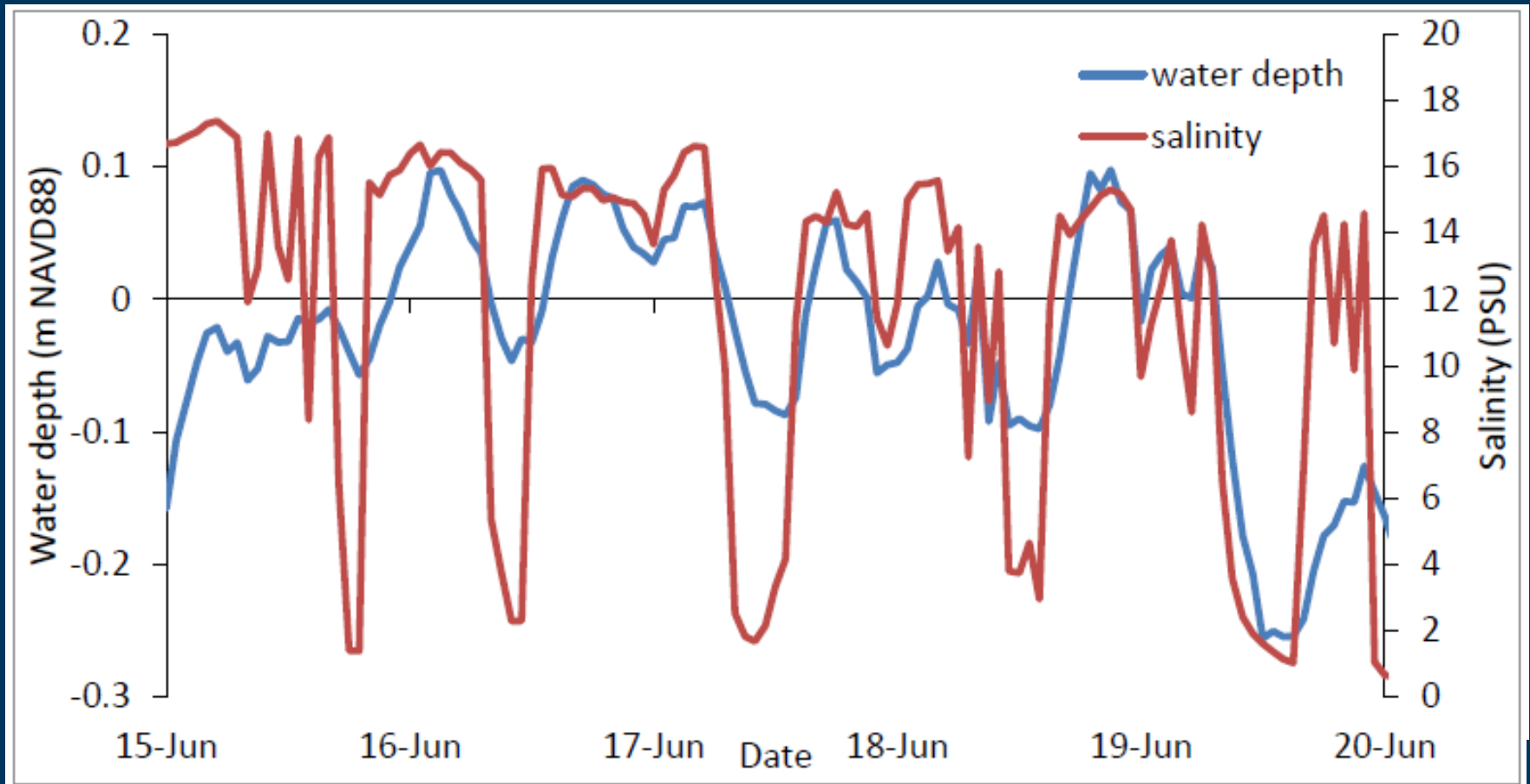
Pains Bay Fire &
Hurricane Irene



Lake Worth Road Water Control Structure



Water Level and Salinity: Point Peter Rd vs. Lake Worth Rd.



What's Going On? Summary

- We identified effective strategies to restore more natural water patterns
- Lessons from working with multiple partners:
 - Different missions and approaches
 - Establish a core group that stays connected and involved
 - Which issue is most pressing?
- Bring it to scale: Working directly with two more National Wildlife Refuges using related techniques

Acknowledgments

TNC

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North Carolina Forest Service

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Thank You!

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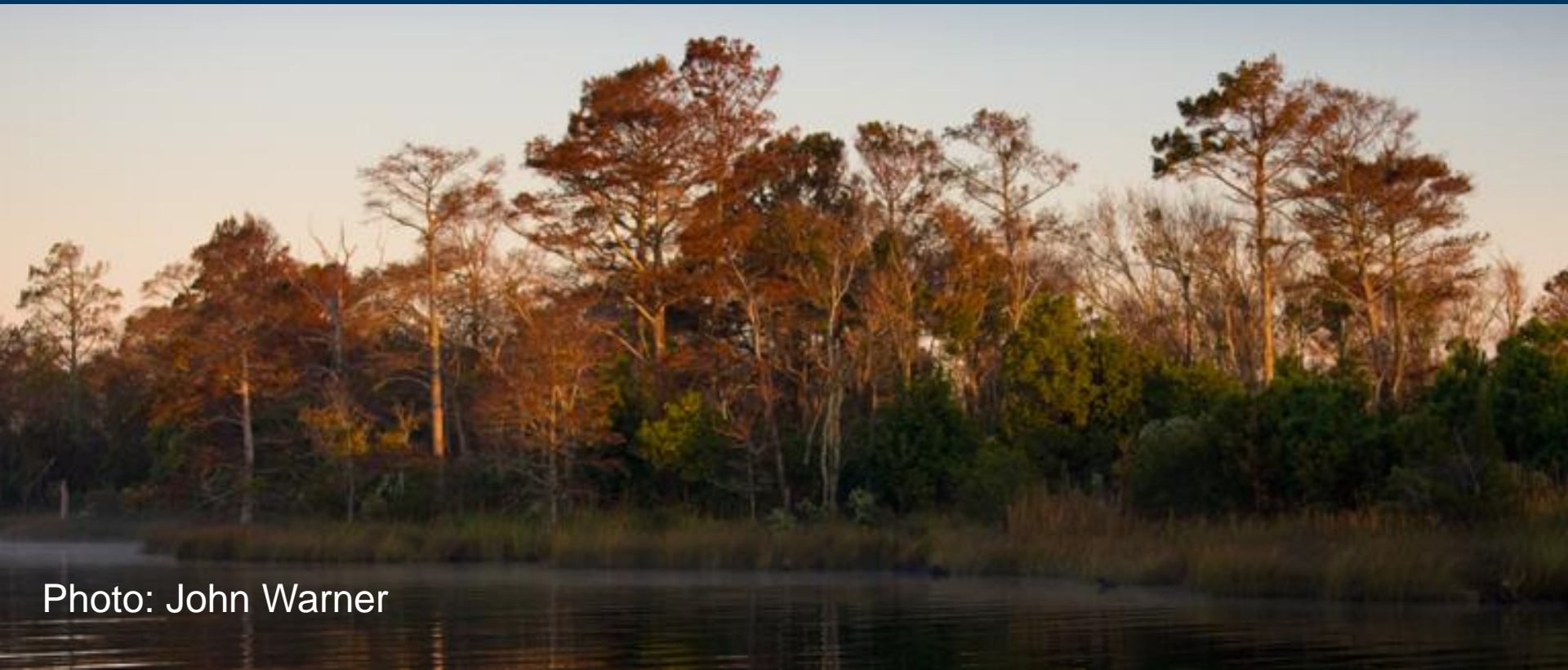


Photo: John Warner