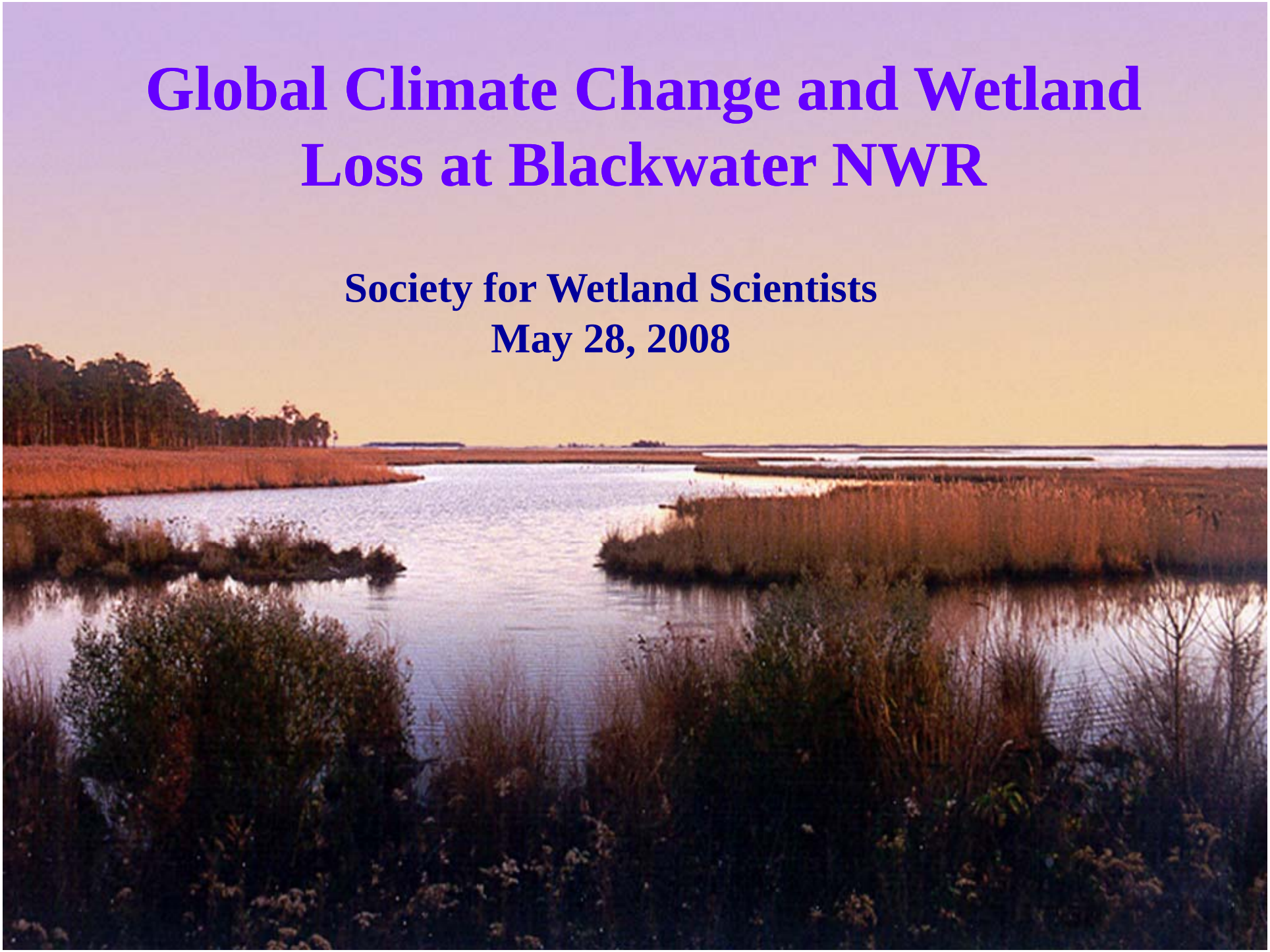
Global Climate Change and Wetland Loss at Blackwater NWR

Society for Wetland Scientists
May 28, 2008



Global Warming Increases Sea Level Rise and Wetland Loss

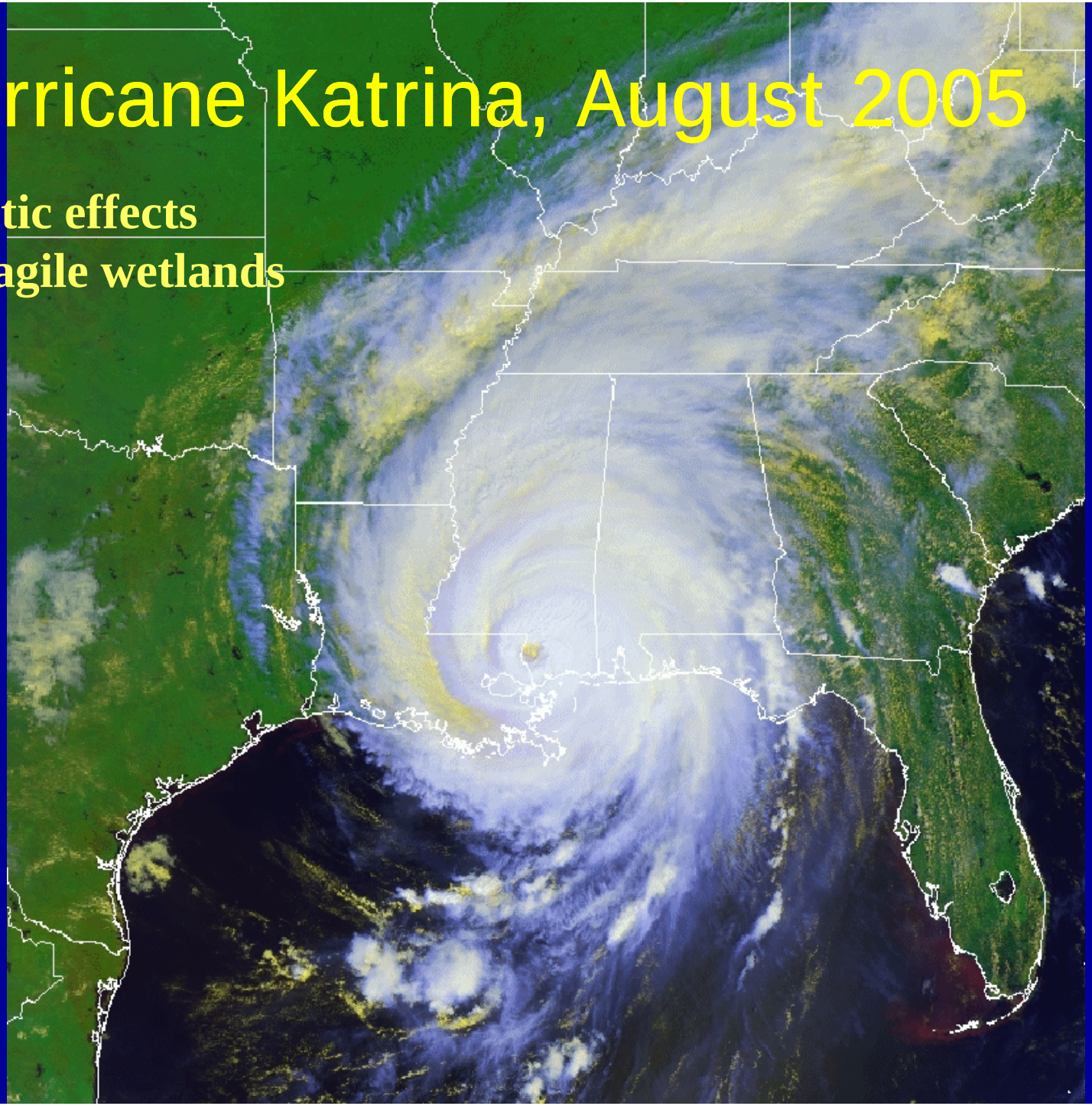
James Island, June 2007

Sea Level Rise will impact mid-Atlantic states harder than anywhere in U.S. (Uni of MD)

Mid-Atlantic sea levels will rise by 20 inches by 2100

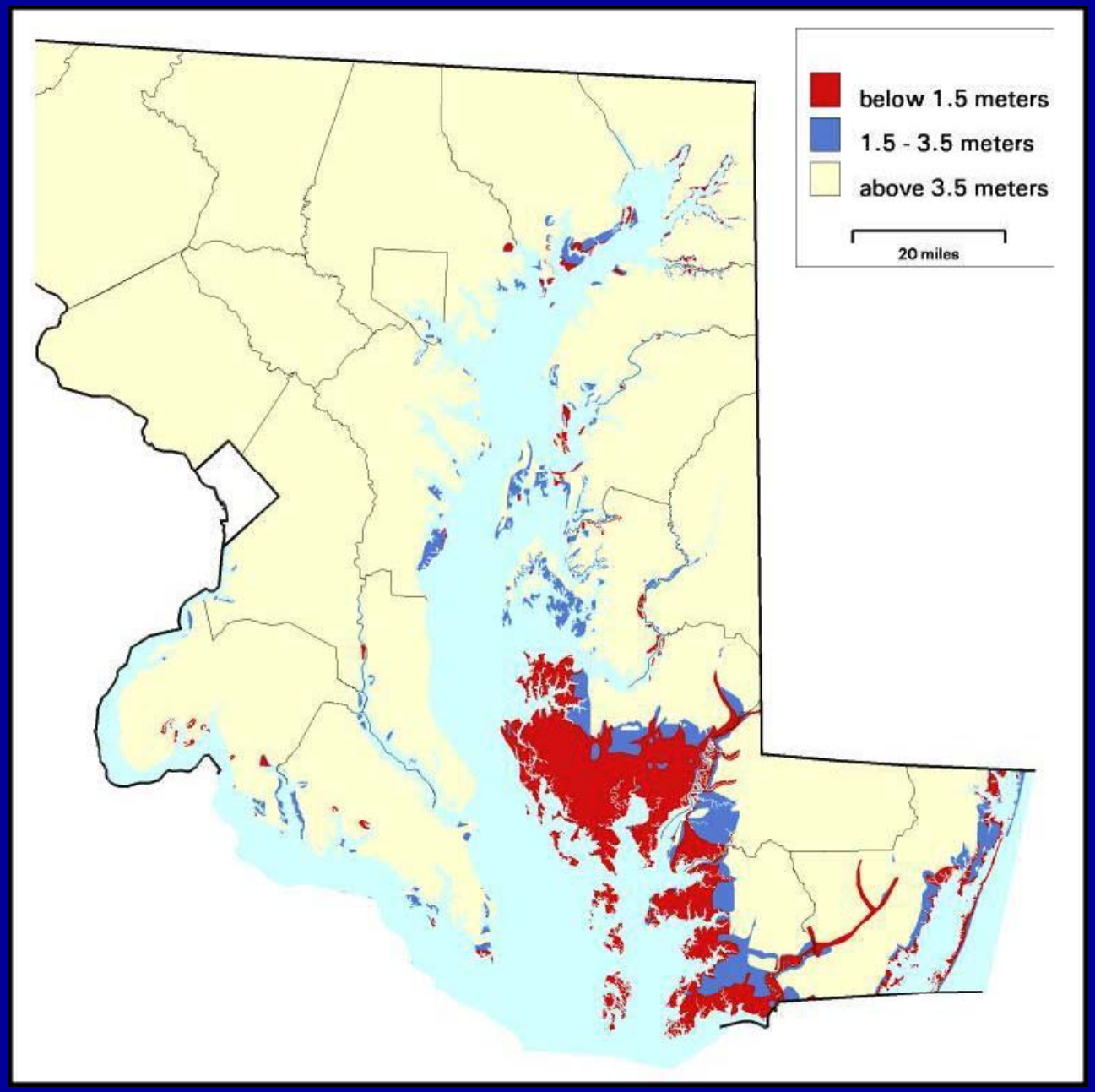
Hurricane Katrina, August 2005

Drastic effects
to fragile wetlands



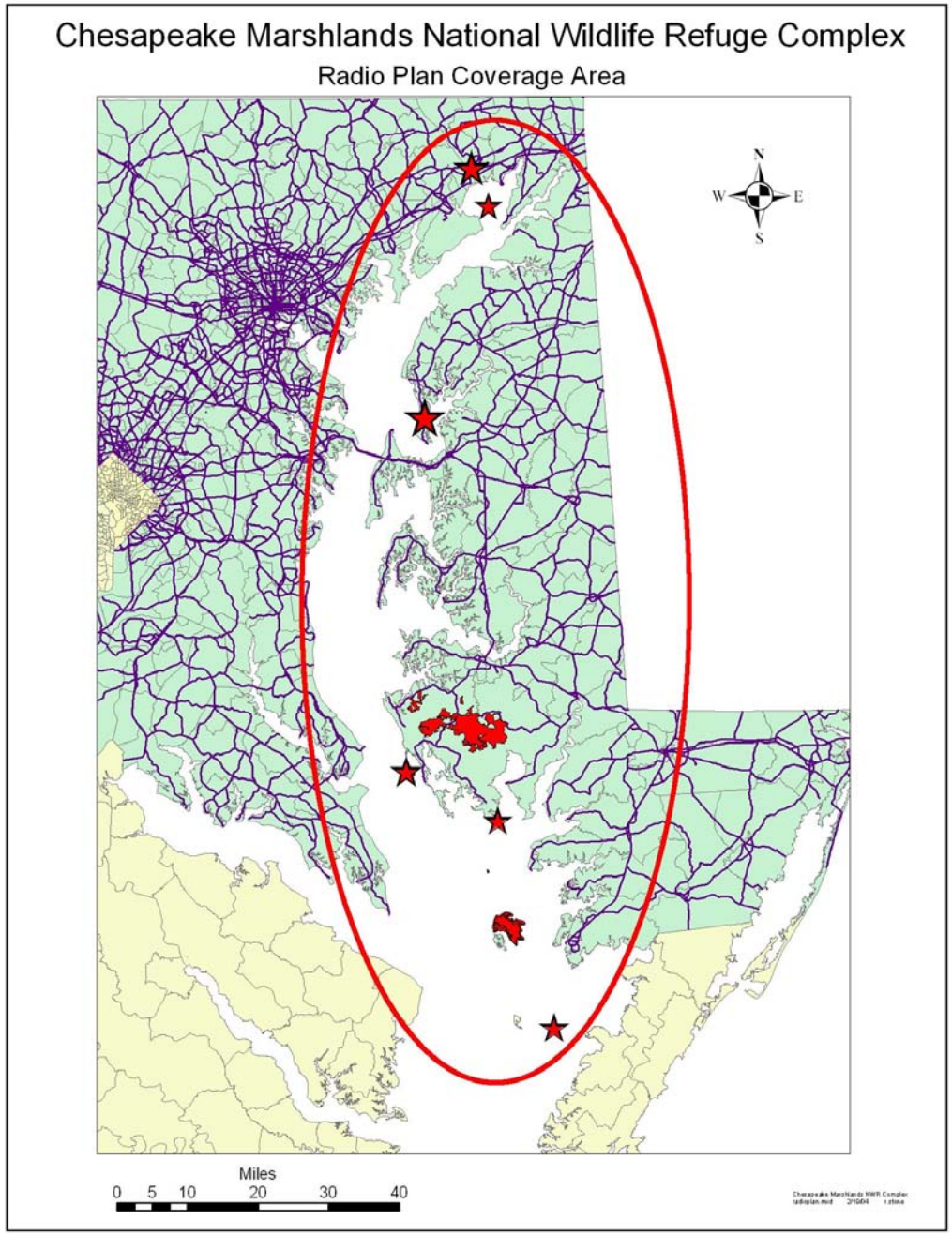
Hurricane Isabelle, Sept. 2003

Severe flooding
Dorchester County



Inundation Model: Towson State Uni. 2006

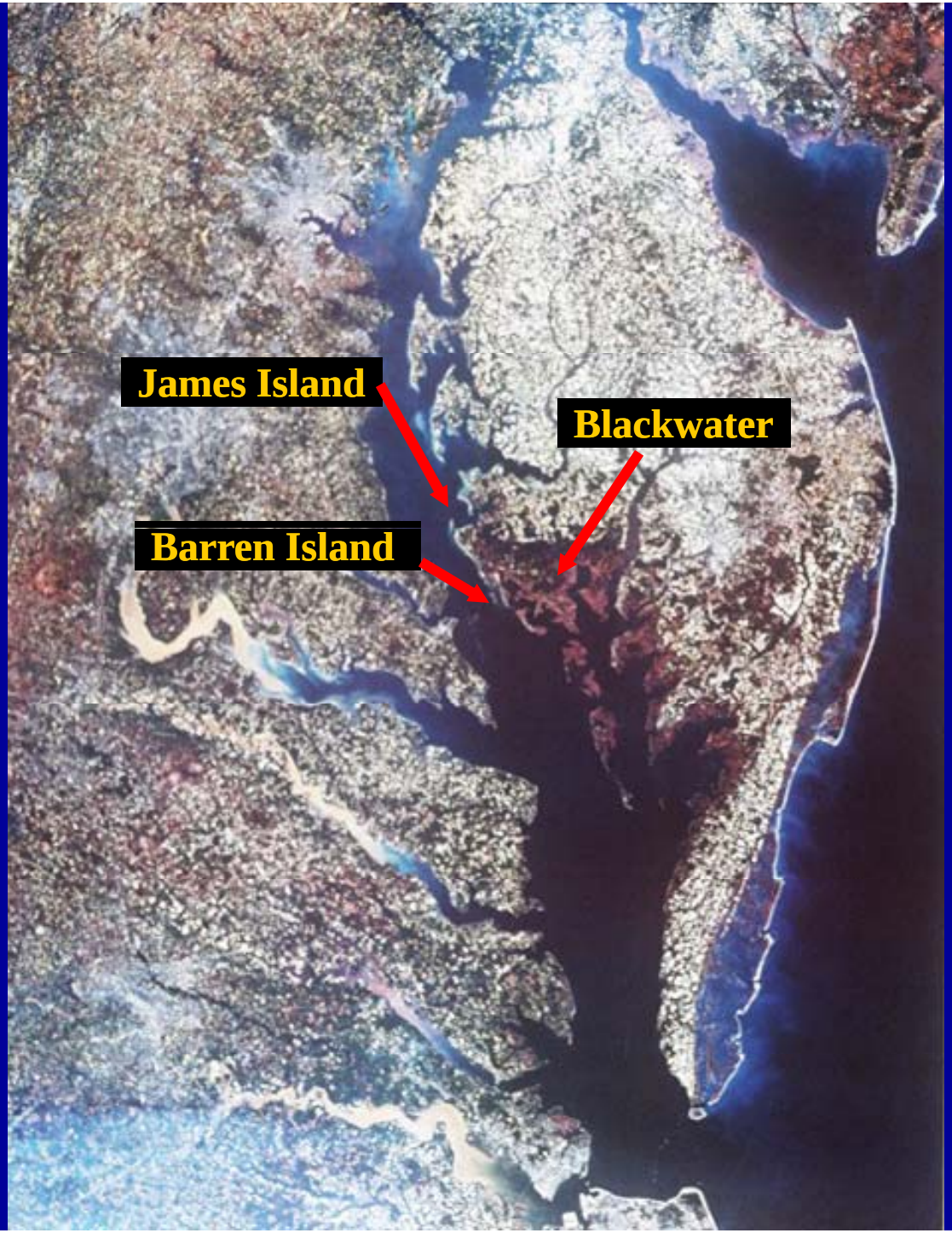
Dorchester County is at the greatest risk from rising sea levels



Blackwater NWR is part of the Chesapeake Marshlands National Wildlife Refuge Complex:

Blackwater NWR
Eastern Neck NWR
Martin NWR
Susquehanna NWR
Watts Island
Bishops Head Point
Spring Island
Barren Island

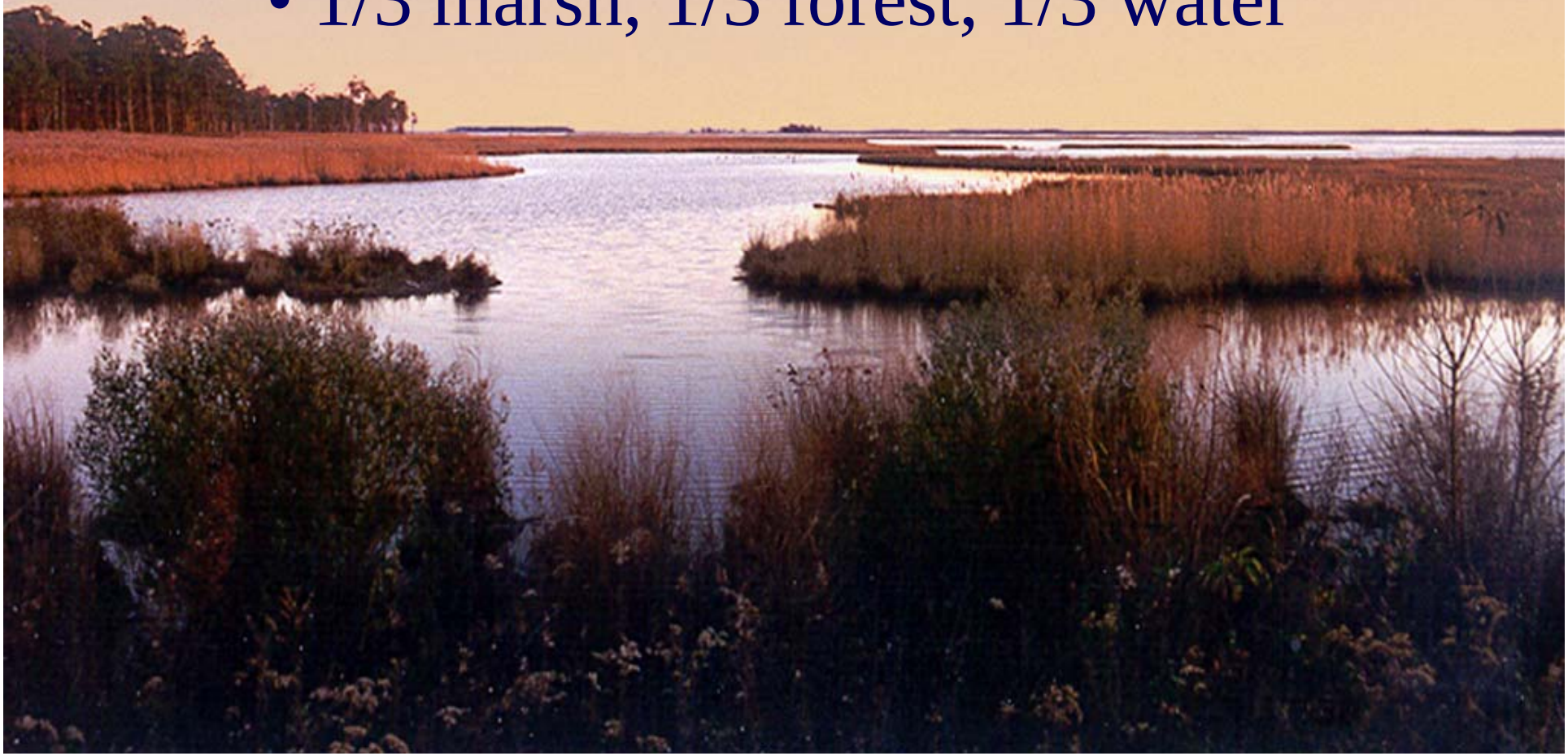
Remaining marsh shown in red



Chesapeake Bay

Blackwater National Wildlife Refuge

- Established 1933
- 28,000 acre complex
- 1/3 marsh, 1/3 forest, 1/3 water



Significance of Blackwater Wetlands

Wetlands of International Importance (Chesapeake Bay RAMSAR site)

1 of 6 priority wetland areas by North American Waterfowl Management Plan

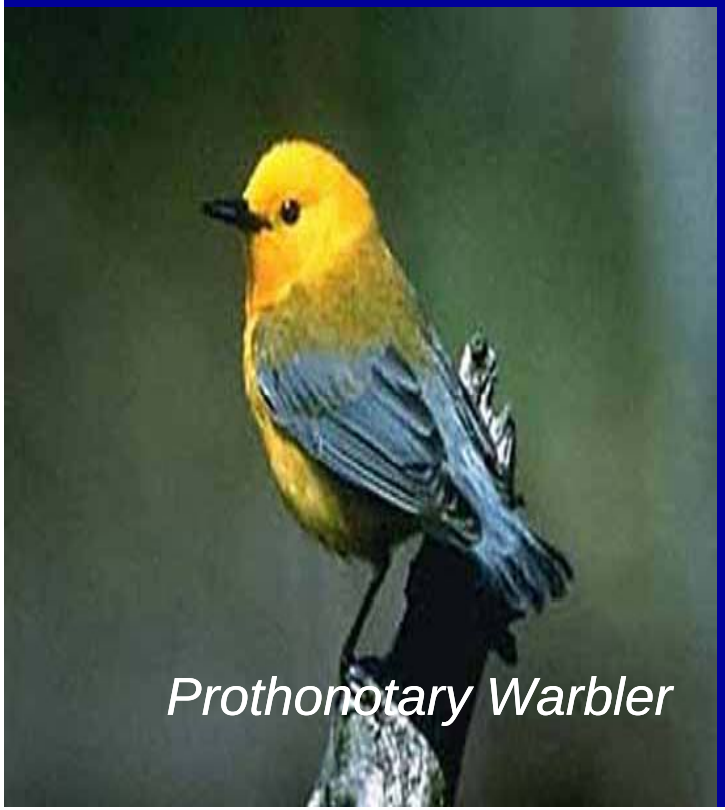
The Nature Conservancy: one of the “LAST GREAT PLACES”

Poster Child for Global Warming

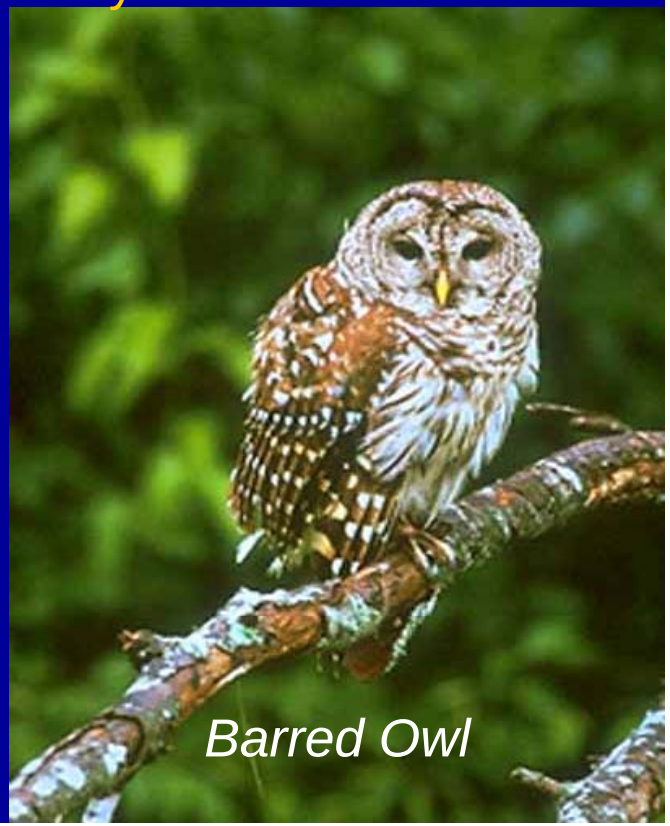
- Over 50 researchers: Uni of MD, USGS, NOAA, & partners
- Carbon Sequestration Potential
- Ability to leverage partnerships and science through grants

Internationally Important Bird Area: American Bird Conservancy

85 nesting songbird species
34 waterfowl species
52 shorebird species
30 marsh and wading birds
24 raptor species
Over 350 bird species annually



Prothonotary Warbler

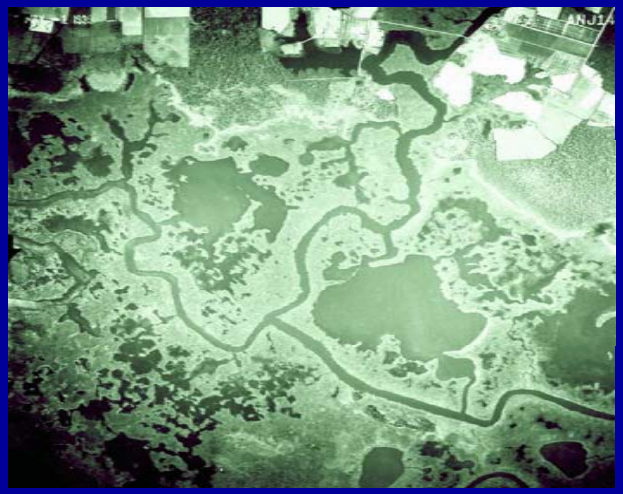


Barred Owl

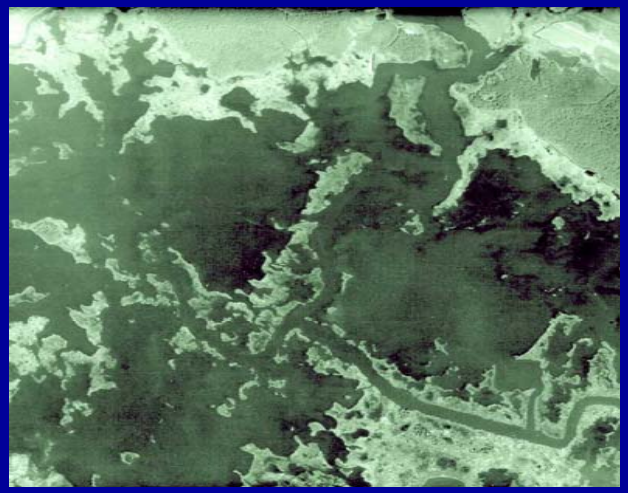
Biodiversity

Endangered Delmarva Fox Squirrel

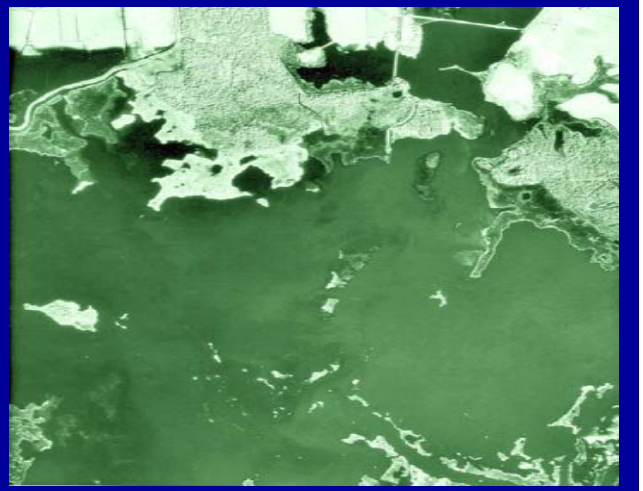
Blackwater's Disappearing Wetlands



1938



1974

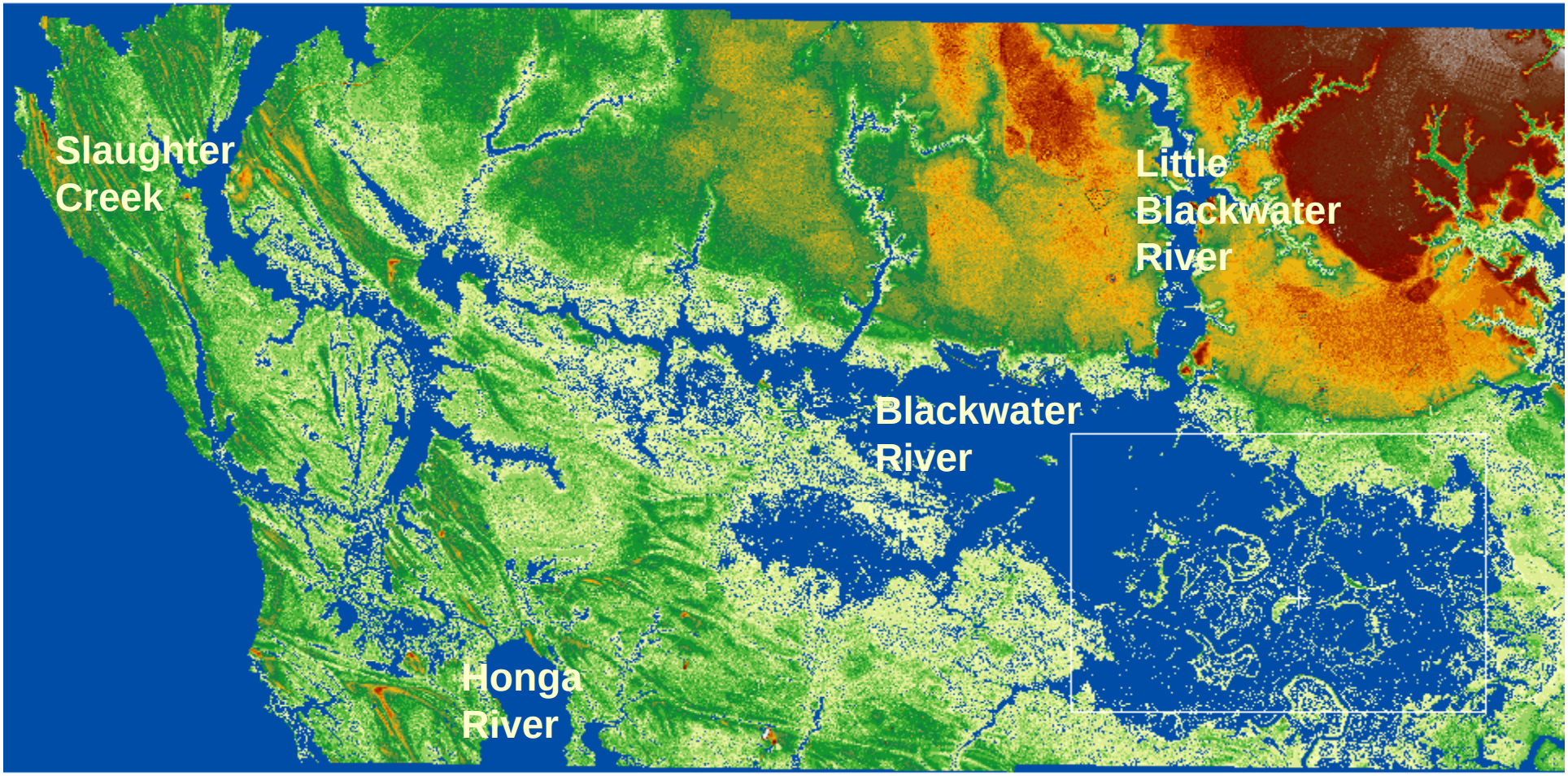


1989

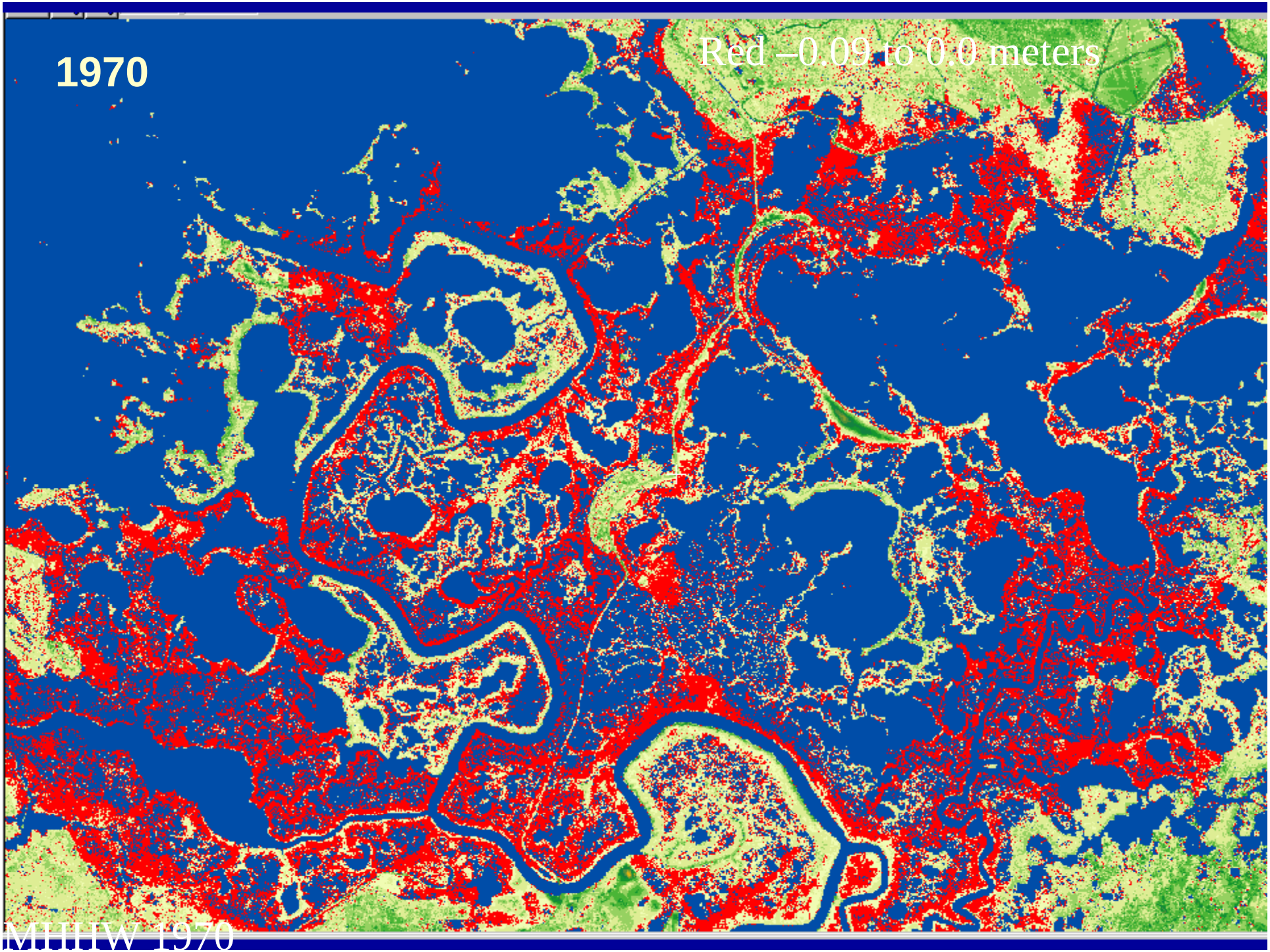
2008: “Lake Blackwater”

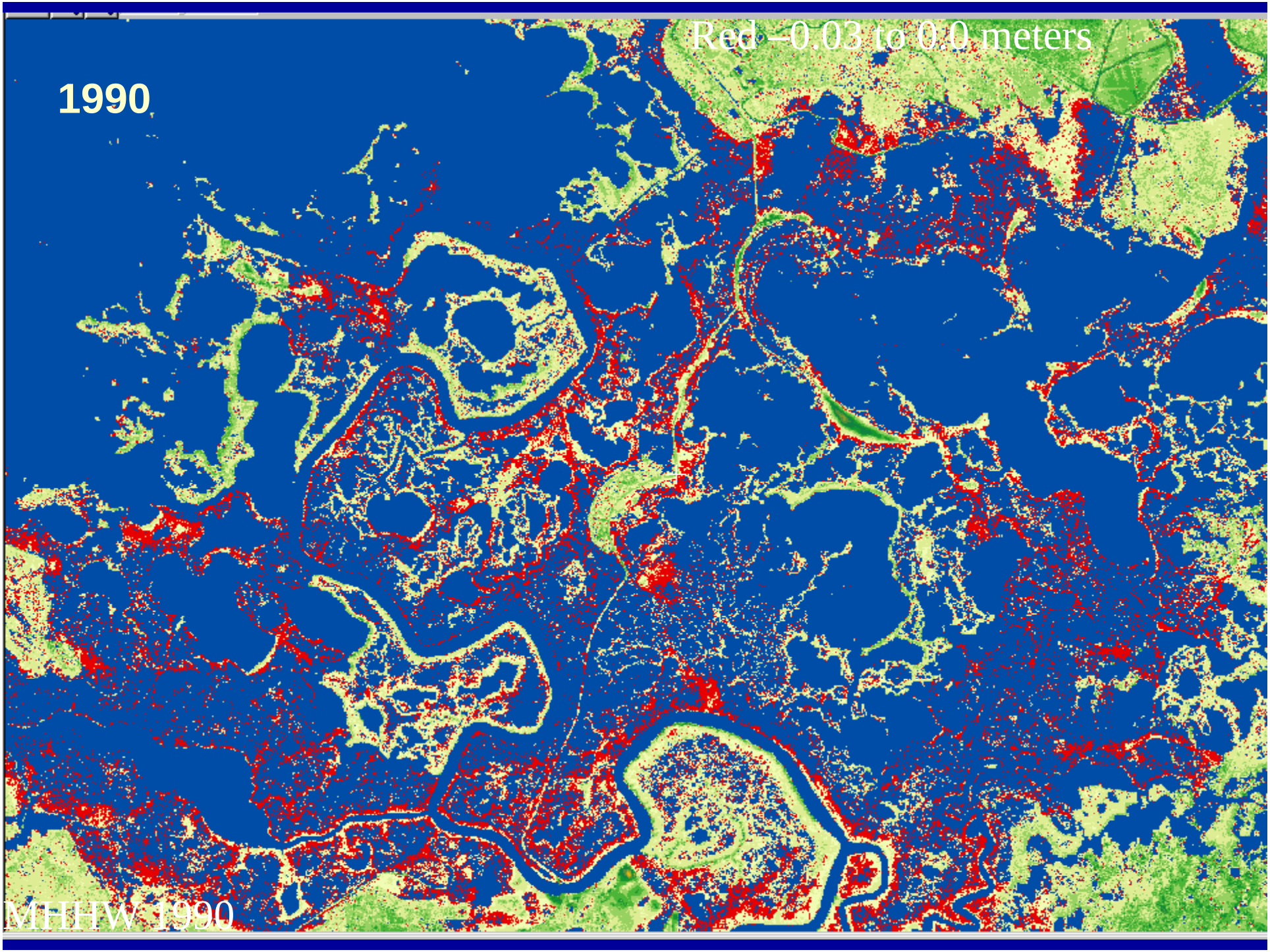
Blackwater Lake:
Historic River Channels
Under water

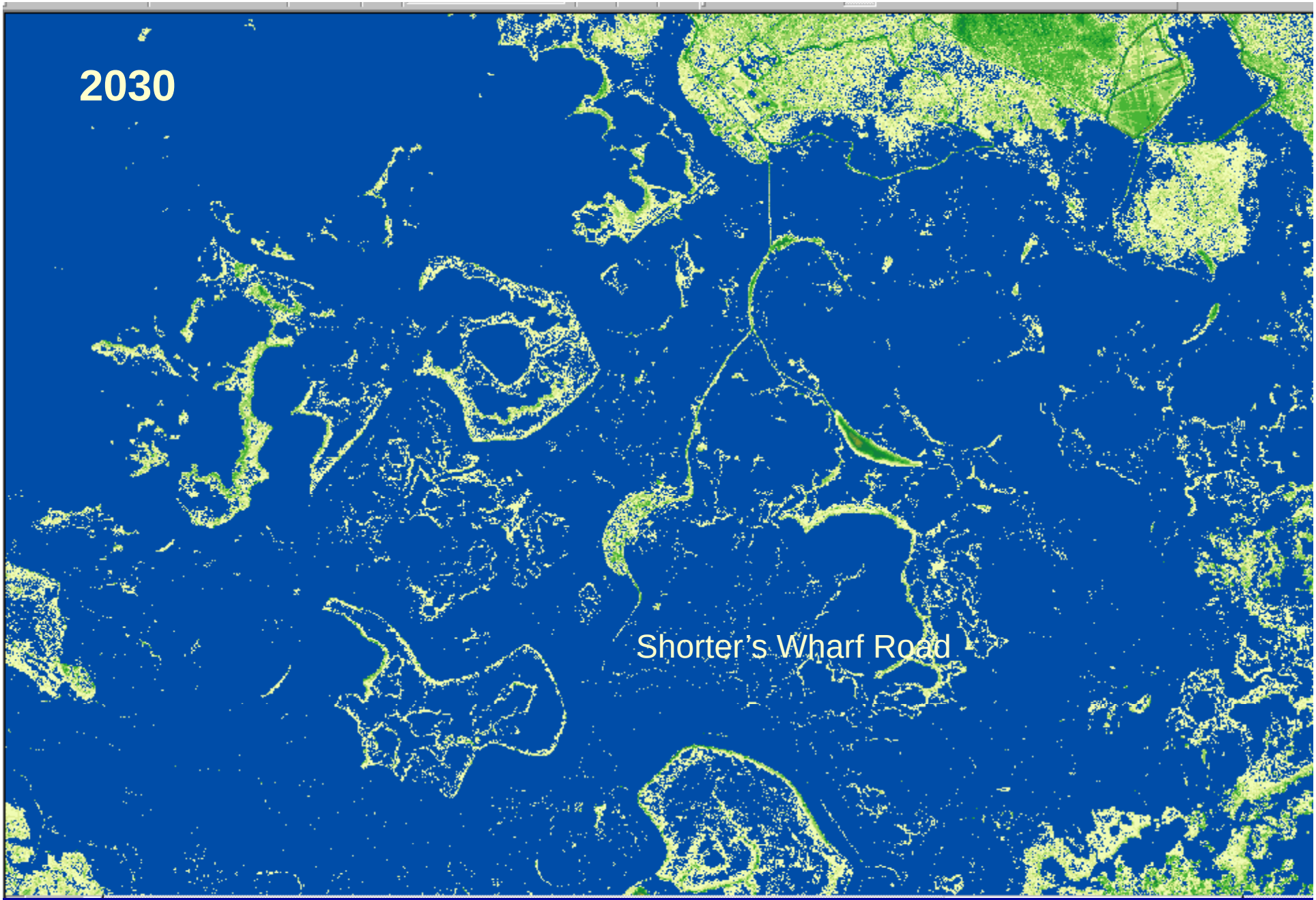
Curt Larsen (USGS) Model of Sea Level Rise over next 50 years



Blackwater National Wildlife Refuge LIDAR NAVD88 @ 0.0ft

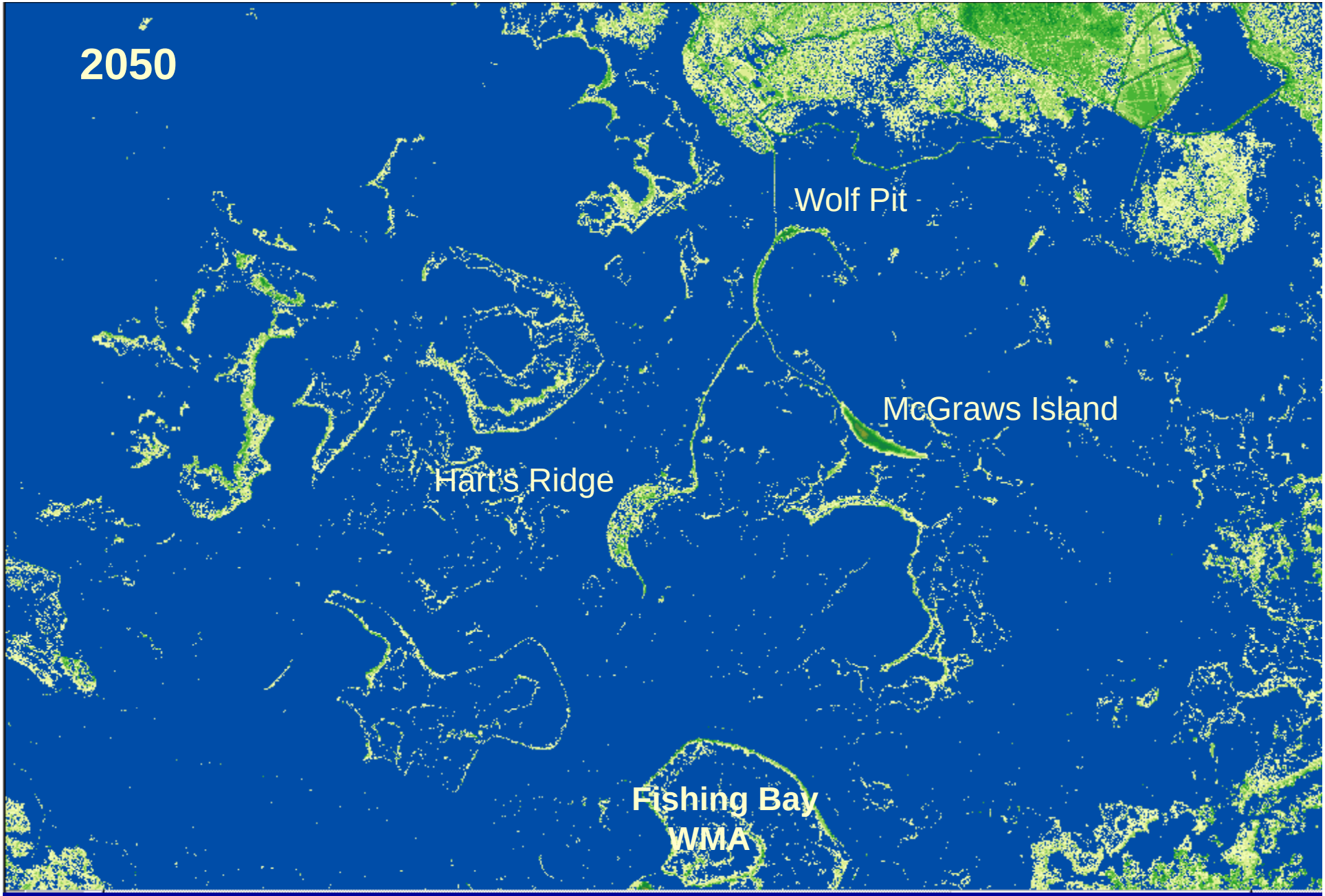

1970
Red –0.09 to 0.0 meters
MHHW 1970


Red –0.03 to 0.0 meters
1990
MHHW 1990



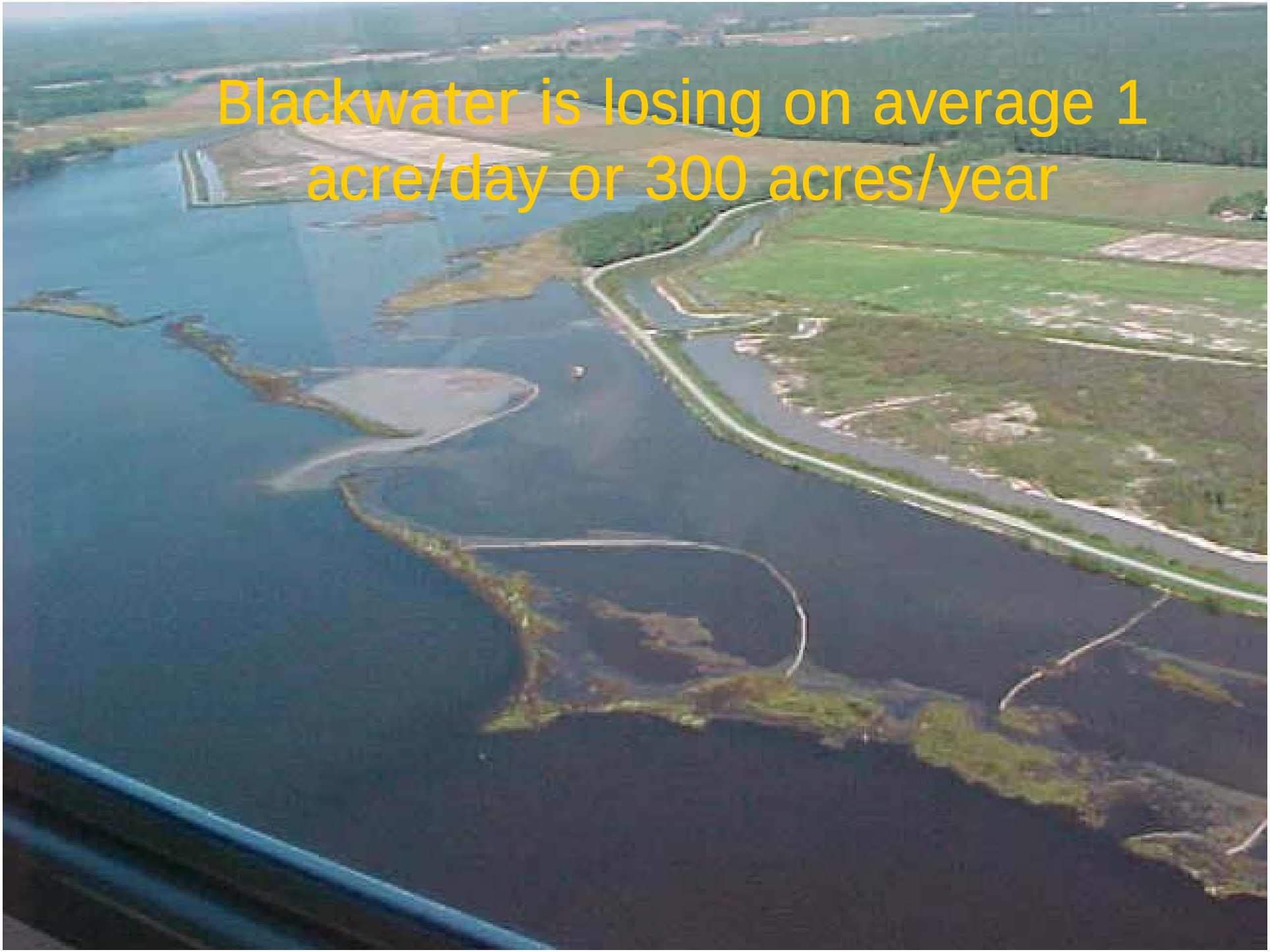
MHHW + 30 years

Blue is 0.09 meters



MHHW + 50 years

Blue is 0.15 meters


Blackwater is losing on average 1 acre/day or 300 acres/year

MARSH LOSS AT BLACKWATER

Efforts to Restore Blackwater Wetlands

- Reduce salt water intrusion
- Extirpate nutria
- Reduce resident Canada geese
- 1980s Wetland Restoration of 12 acres
- 2003 Wetland Restoration of 8 acres

Installation of Weir: Stewart's Canal

Control Resident Canada Geese

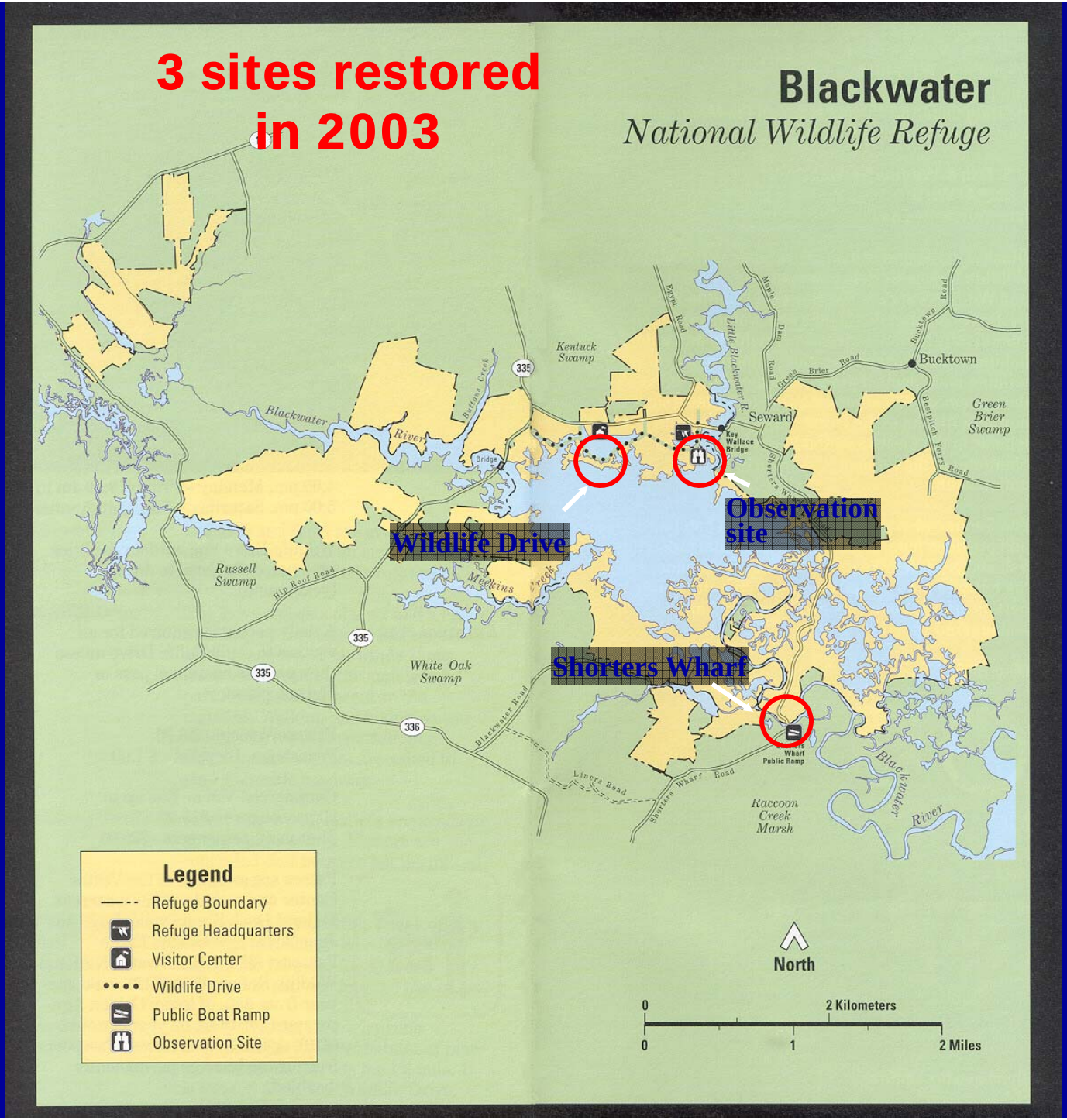
Eliminate Nutria

Three-square transplanted in 1982 restoration project

1982 Restoration Site in 2005

2003 Wetland Restoration

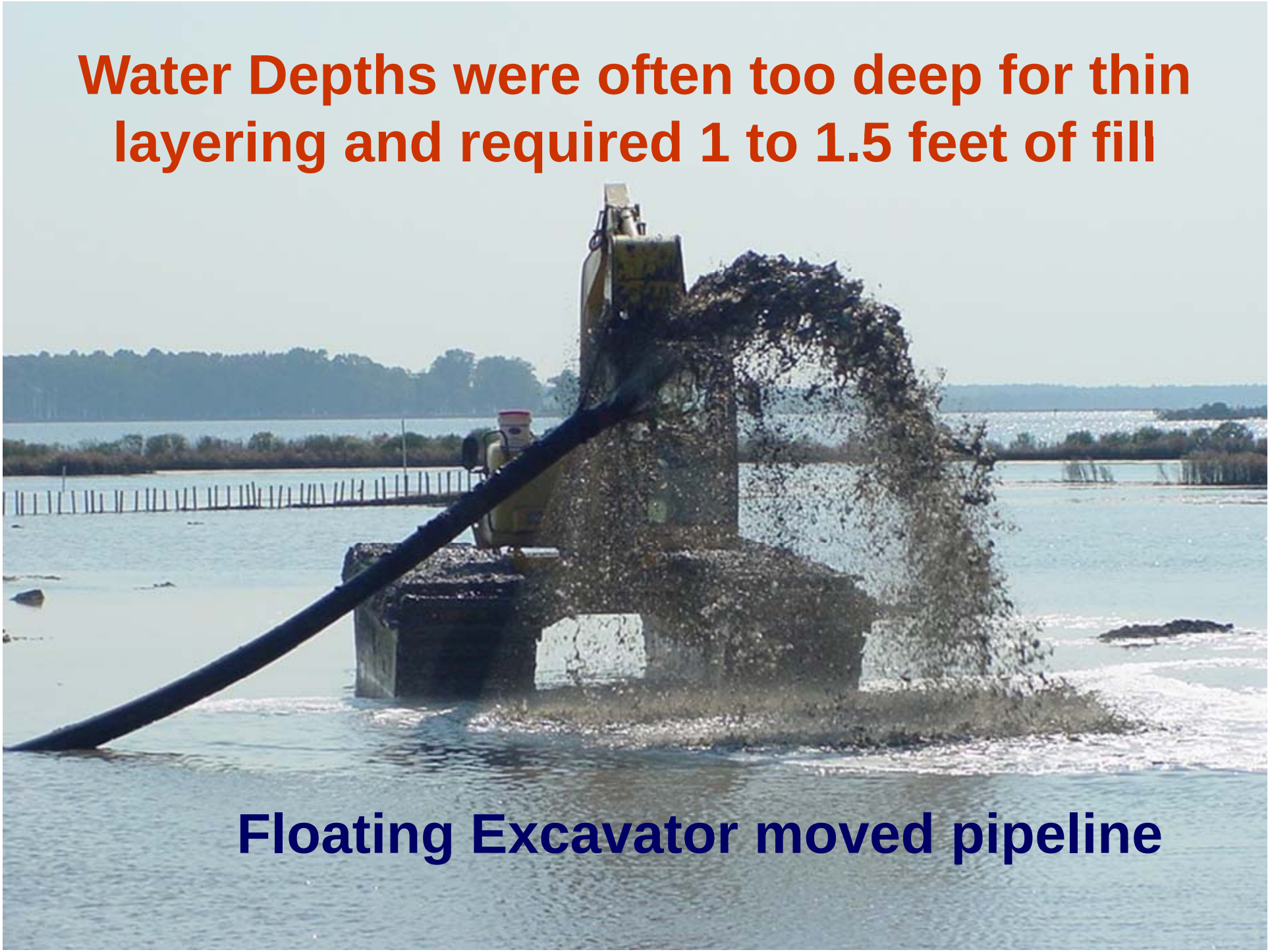
- Restore 8 acres of tidal wetlands at 3 sites
- Plant 70,000 marsh grass units
- Monitor plant success
- Sediment containability


3 sites restored in 2003
Blackwater
National Wildlife Refuge
Wildlife Drive
Observation site
Shorters Wharf
Bucktown
Seward
Kentuck Swamp
Green Brier Swamp
Russell Swamp
White Oak Swamp
Raccoon Creek Marsh
Blackwater River
Little Blackwater R.
Meekins Neck Creek
Key Wallace Bridge
Shorters Wharf Public Ramp
Legend
Refuge Boundary
Refuge Headquarters
Visitor Center
Wildlife Drive
Public Boat Ramp
Observation Site
North
0
2 Kilometers
0
1
2 Miles

Initial Containment

Installation of Straw Bales and Wooden Stakes

Water Depths were often too deep for thin layering and required 1 to 1.5 feet of fill



Floating Excavator moved pipeline

2003: 8 acres restored using on-site material

May 2003

June 2003

August 2003

August 2004

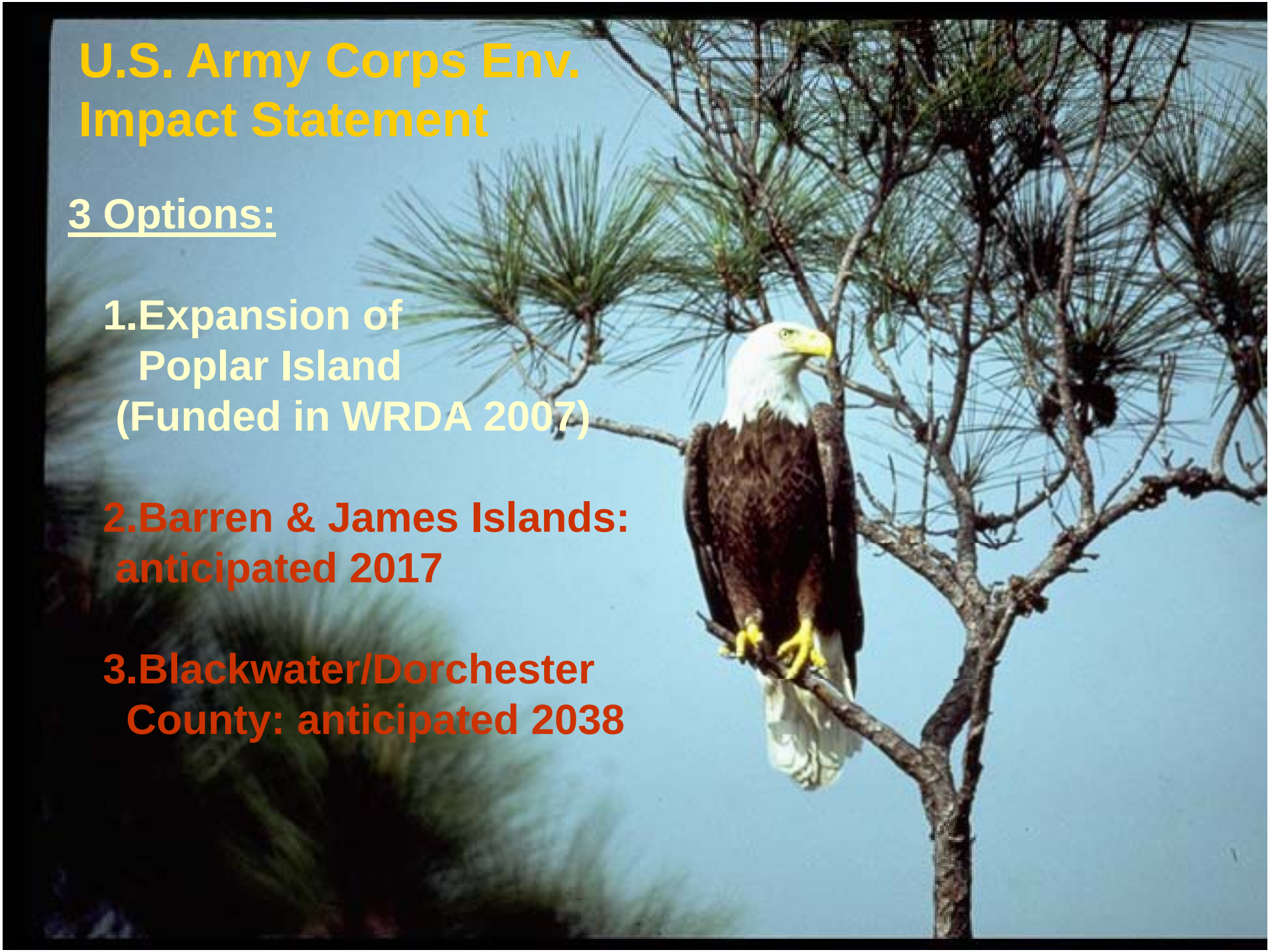
August 2006

MD Port Administration: Channel Dredging to maintain access to Port of Baltimore

- Maintenance dredging of 3.5 to 4 million cubic yards per year

Chesapeake Channel Sediments Used To Restore Wetlands: Poplar Island

www.nab.usace.army.mil/projects/Maryland/Poplar Island



U.S. Army Corps Env. Impact Statement

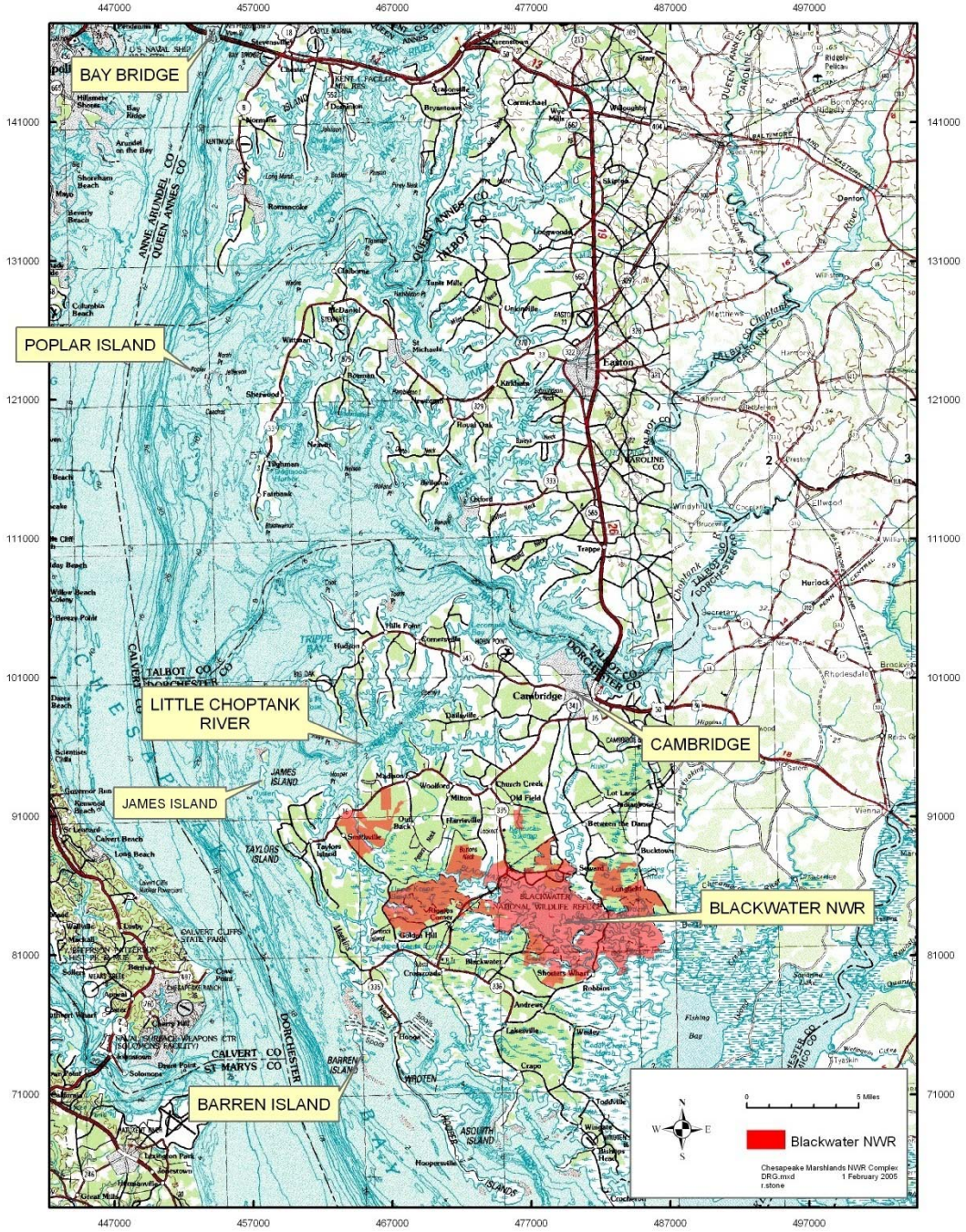
3 Options:

1. Expansion of Poplar Island (Funded in WRDA 2007)

2. Barren & James Islands: anticipated 2017

3. Blackwater/Dorchester County: anticipated 2038

$197,999 Appropriation for Army Corps to Study Blackwater in FY 2008



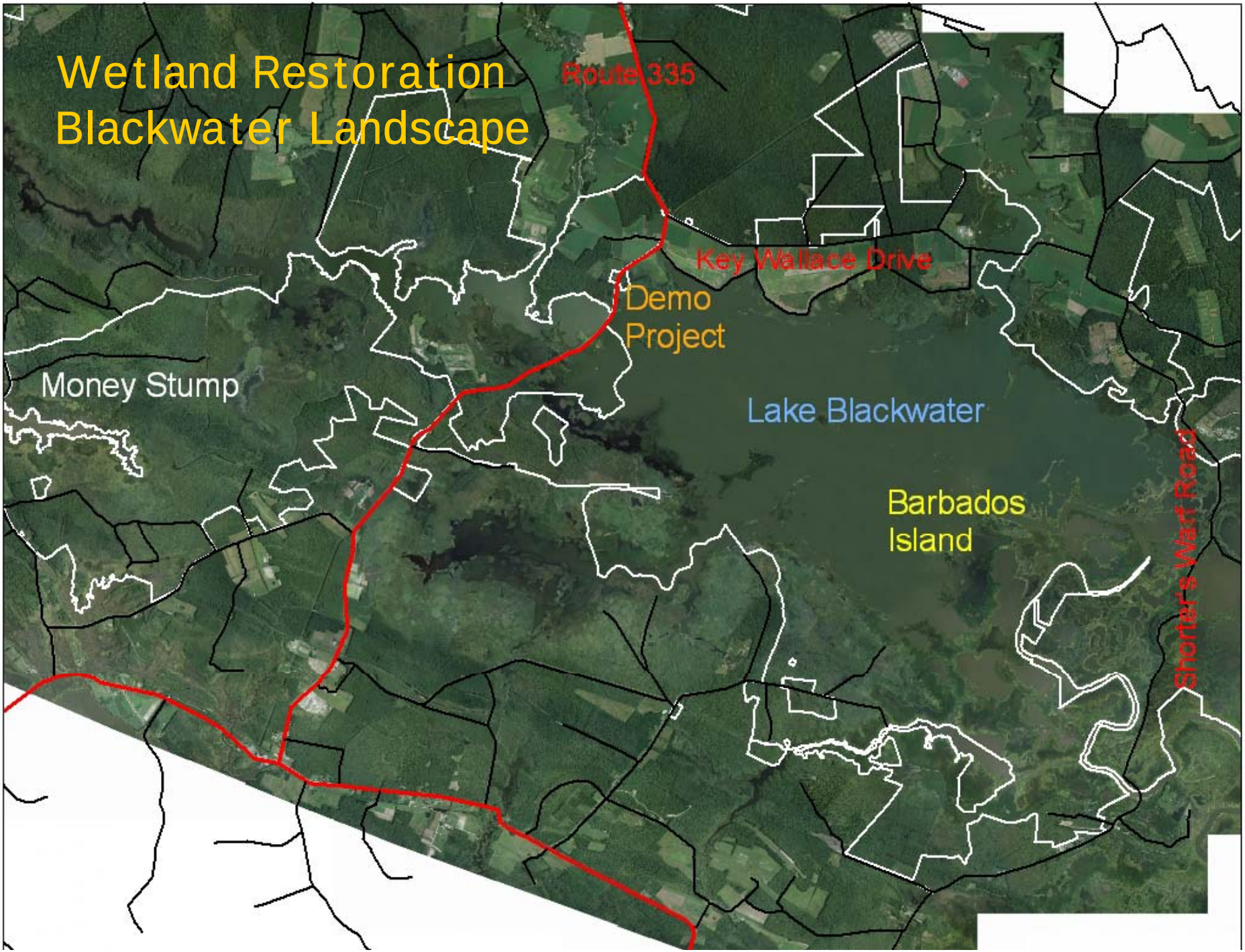
Roughly 60 miles from the Bay Bridge by land

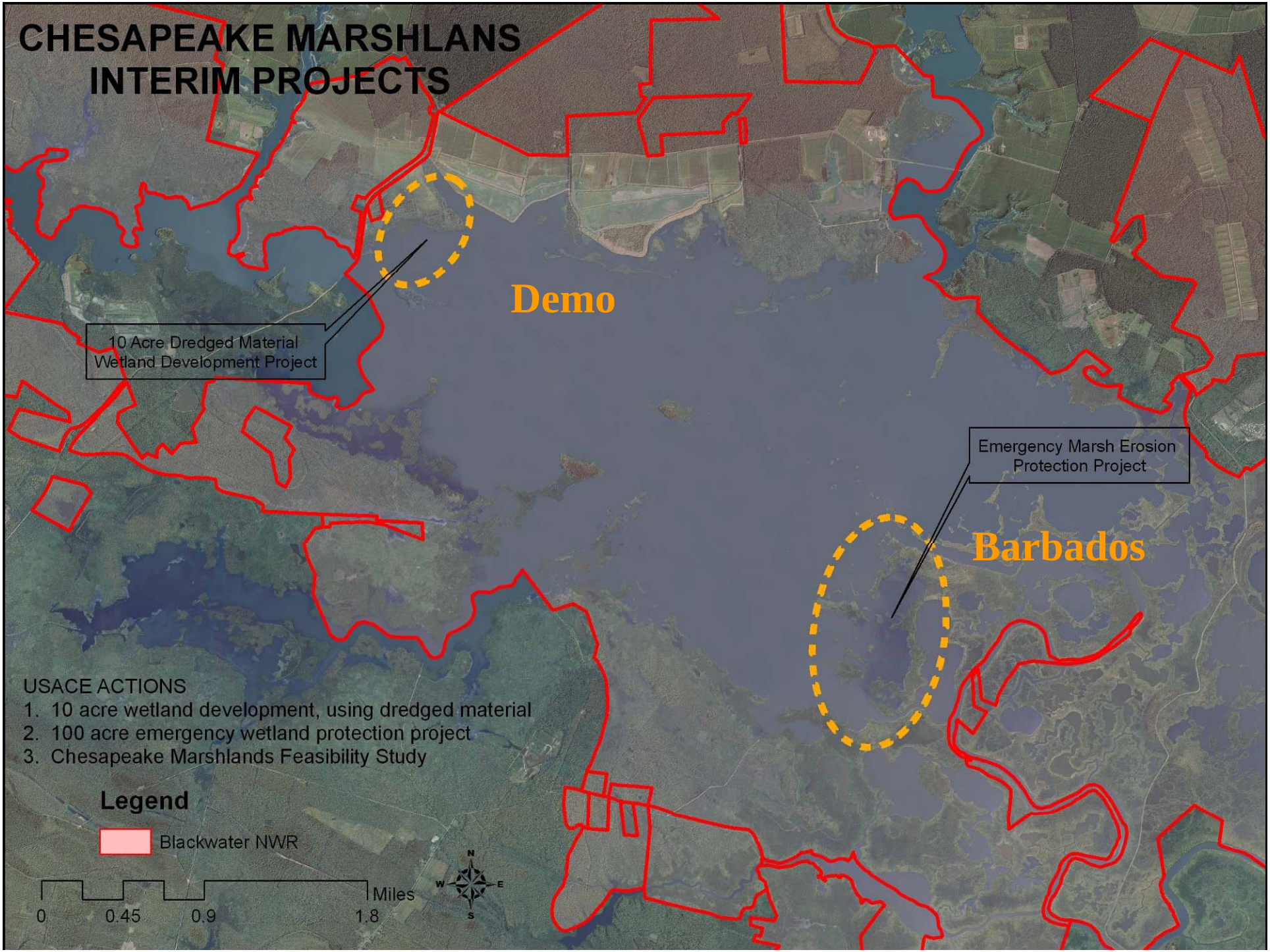
Blackwater is 31 miles from Poplar Island and 5 Miles from James Island by water

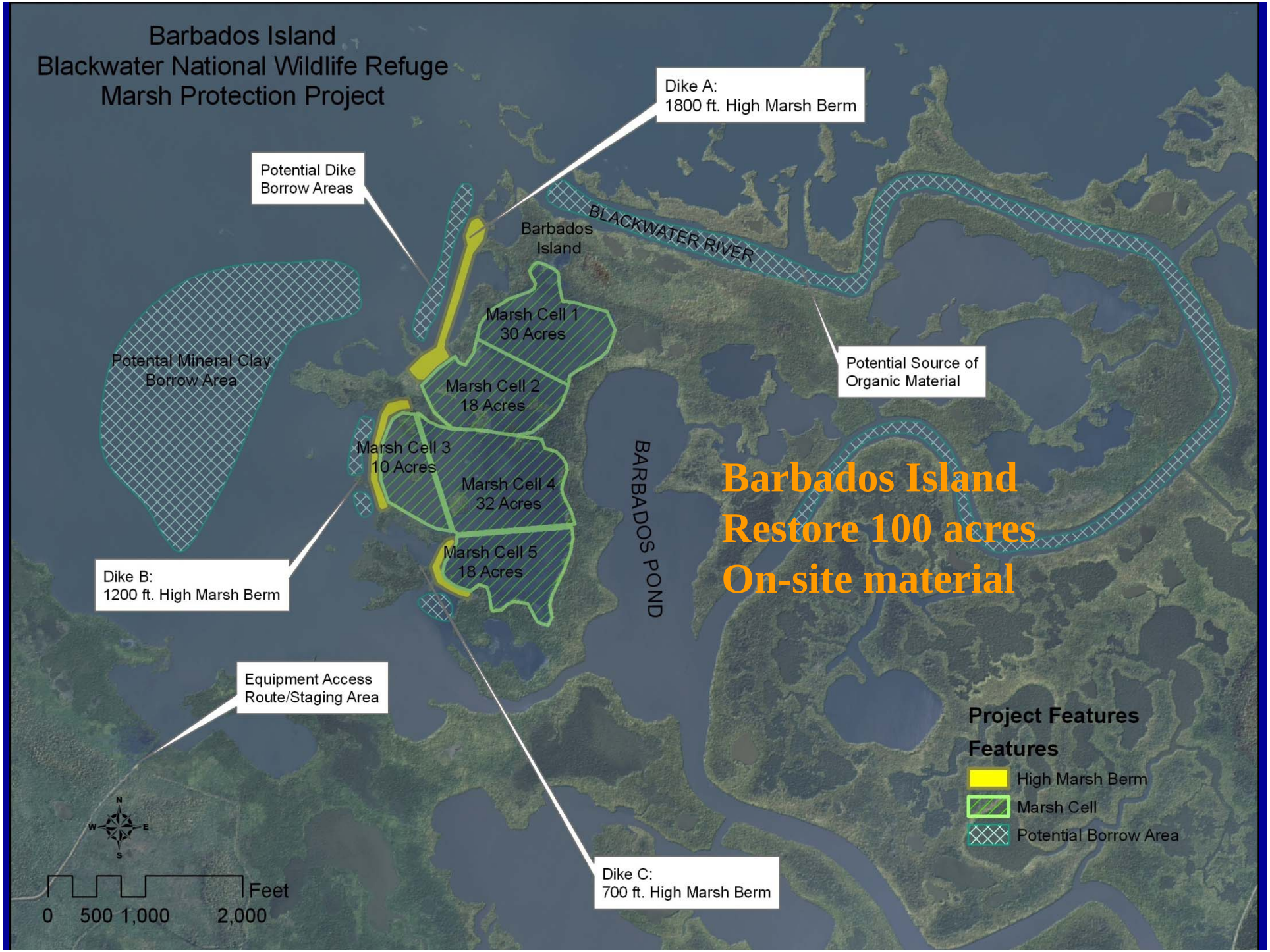
Dorchester Restoration:
placement areas
for dredged material
for 50 to 100 years

Critical Need to Restore Wetlands

1. Watershed: 20,000 acres
2. Barbados Island: 100 acres
3. Demonstration: 10 acres
4. MoneyStump: 750 acres


Wetland Restoration
Blackwater Landscape
Route 335
Key Wallace Drive
Demo
Project
Money Stump
Lake Blackwater
Barbados
Island
Shorter's Wharf Road


CHESAPEAKE MARSHLANS
INTERIM PROJECTS
Demo
10 Acre Dredged Material
Wetland Development Project
Emergency Marsh Erosion
Protection Project
Barbados
USACE ACTIONS
1. 10 acre wetland development, using dredged material
2. 100 acre emergency wetland protection project
3. Chesapeake Marshlands Feasibility Study
Legend
Blackwater NWR
Miles
0
0.45
0.9
1.8
N
W
E
S

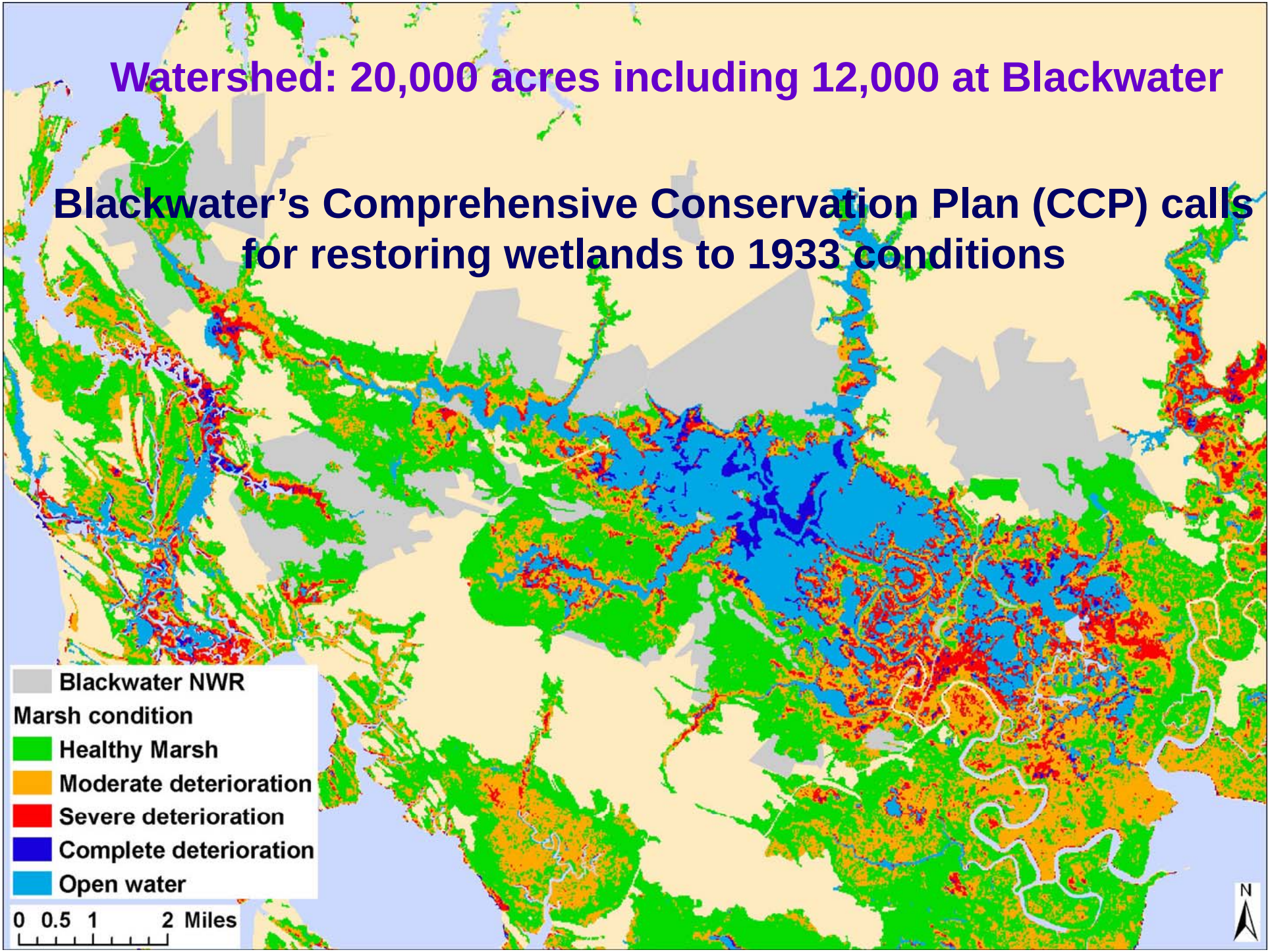

Barbados Island
Blackwater National Wildlife Refuge
Marsh Protection Project
Dike A:
1800 ft. High Marsh Berm
Potential Dike
Borrow Areas
Barbados
Island
BLACKWATER RIVER
Marsh Cell 1
30 Acres
Potental Mineral Clay
Borrow Area
Marsh Cell 2
18 Acres
Potential Source of
Organic Material
Marsh Cell 3
10 Acres
Marsh Cell 4
32 Acres
BARBADOS POND
Barbados Island
Restore 100 acres
On-site material
Marsh Cell 5
18 Acres
Dike B:
1200 ft. High Marsh Berm
Equipment Access
Route/Staging Area
Project Features
Features
High Marsh Berm
Marsh Cell
Potential Borrow Area
Dike C:
700 ft. High Marsh Berm
N
W
E
S
Feet
0 500 1,000 2,000

Demonstration Site
Mimic Watershed Restoration

Purpose of Demo

- **Mimic the large-scale project:**
  - **Wave and Wind Energy**
  - **Water Depths**
  - **Bottom Foundation**
  - **Similar Habitats**
  - **Public Education**

Transportation Routes for Demonstration Project


Watershed: 20,000 acres including 12,000 at Blackwater
Blackwater's Comprehensive Conservation Plan (CCP) calls for restoring wetlands to 1933 conditions
Blackwater NWR
Marsh condition
Healthy Marsh
Moderate deterioration
Severe deterioration
Complete deterioration
Open water
0 0.5 1 2 Miles
N

Moneystump: Smithville Road

Saltwater Intrusion: Pine Trees killed

Plug this Old
Agricultural
Ditch

Looking towards Smithville Road

POTENTIAL COSTS

1. **Demonstration: $0.5 to $3.2 million**
2. **Barbados Island Marsh Erosion Project**
   - Estimate: $3,600,000 for 100 acres
3. **Chesapeake Marshlands Feasibility Study**
   - Estimate: $10.5 Million for 4 year study
4. Money Stump: unknown

Timing is Critical for Blackwater

Wetland Loss is the Biggest Threat

Contact: Dixie Birch
410-228-2692, ext. 118
Email: dixie_birch@fws.gov