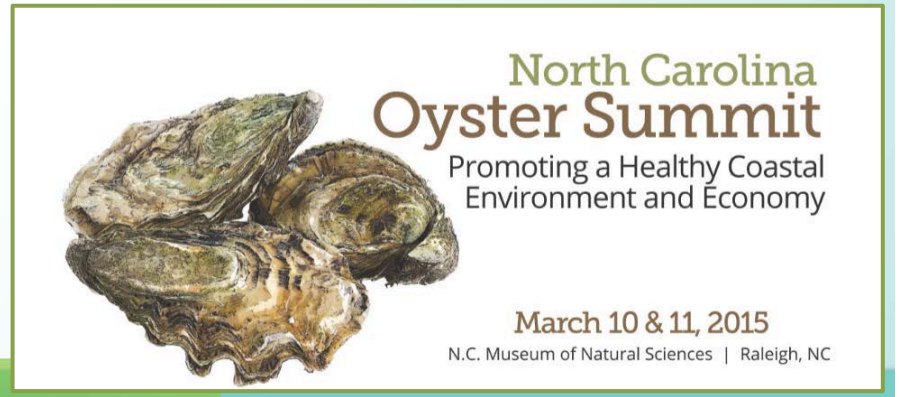
Watershed Management Priorities for the Next Five Years

Facilitator: Dr. Lexia Weaver, N.C. Coastal Federation

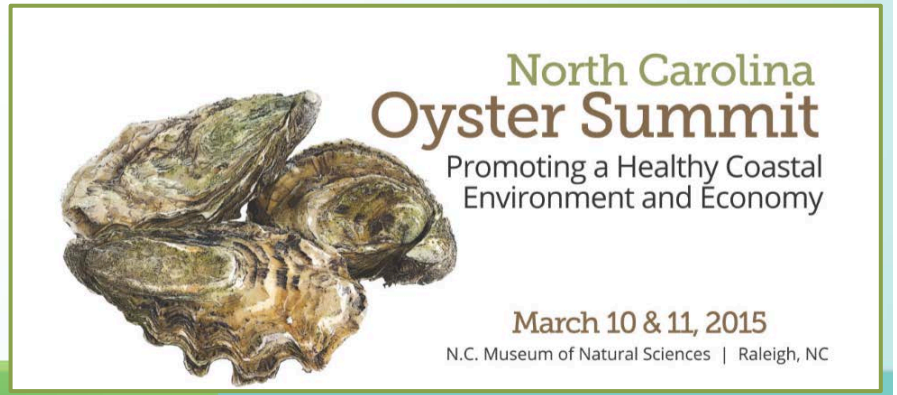
Panelists: Ted Wilgis, N.C. Coastal Federation
Dr. Mike Burchell, N.C. State University
Jamin Simmons, Mattamuskeet Management & Consulting
Hunter Freeman, Withers & Ravenel
Erin Carey, City of Wilmington
Steve Murphey, N.C. Division of Marine Fisheries, Shellfish Sanitation



Watershed Management Priorities for the Next Five Years

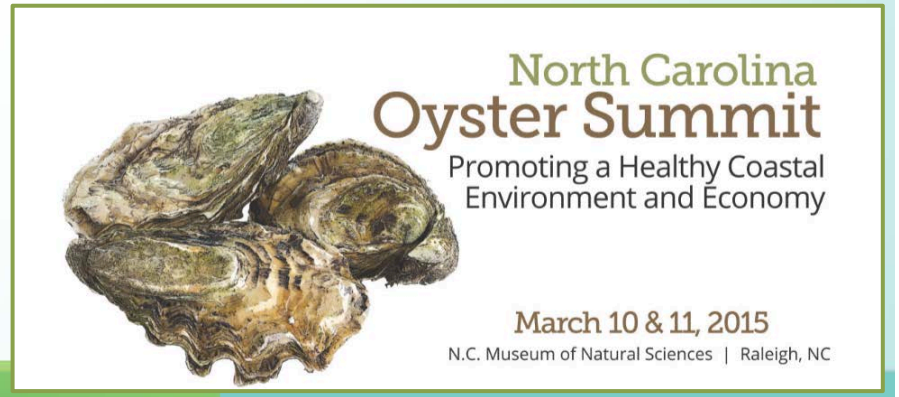
Goals of the Panel

- Link watershed restoration goals with water quality goals in shellfish growing areas.
- Provide an overview of previous and current watershed restoration strategies and efforts in agricultural and urban watersheds.
- Discuss water quality trends.
- Identify priorities and needs to expand watershed restoration efforts in order to maintain or restore water quality in priority areas and ensure the health of our oysters.



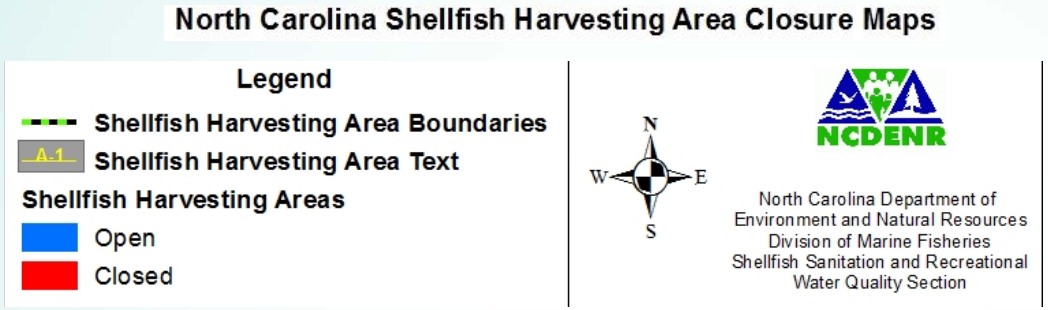
Meet Our Panelists

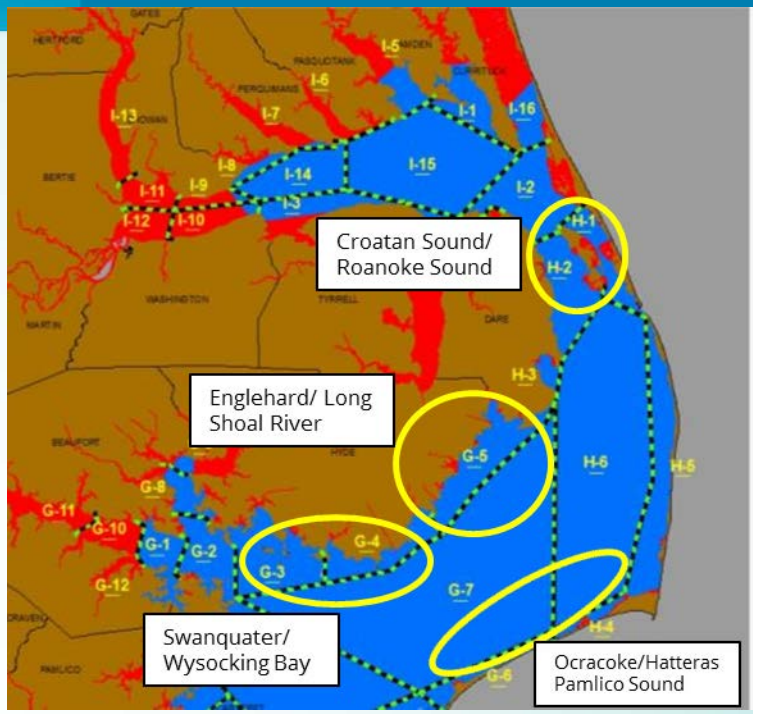
- **Ted Wilgis** – Coastal Education Coordinator, N.C. Coastal Federation
- **Michael R. Burchell II, Ph.D.** - Associate Professor and Extension Leader, Dept. of Biological and Agricultural Engineering, N.C. State University
- **Jamin Simmons** – President, Mattamuskeet Management & Consulting
- **Hunter C. Freeman, PE, LEED AP** – Withers & Ravenel
- **Erin Carey** - Watershed Coordinator, City of Wilmington Stormwater Services
- **Steve Murphey** - Asst. Section Chief, Shellfish Sanitation & Recreational Water Quality

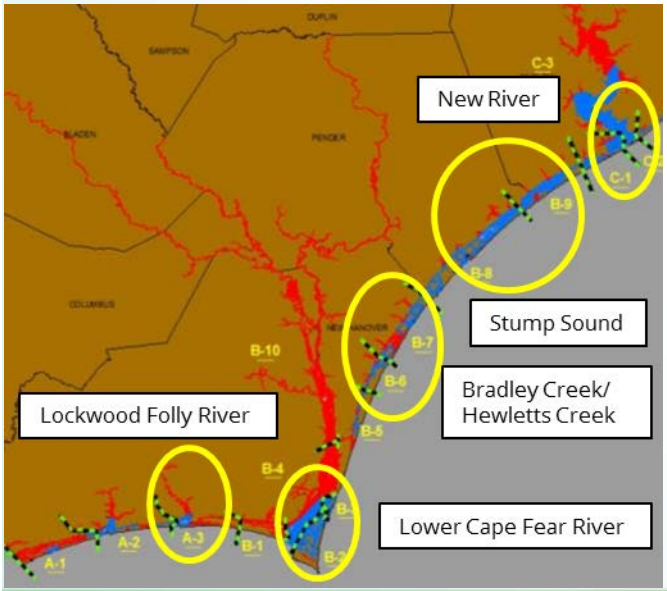


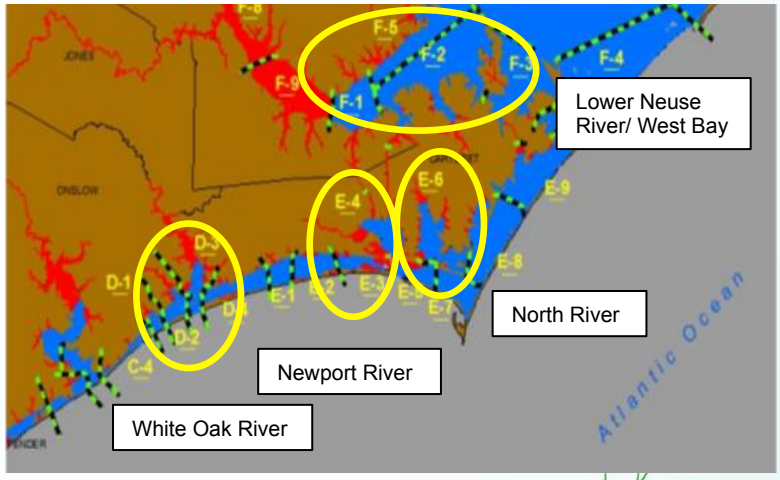
Ted Wilgis

Focused Efforts
Regional Priority Areas







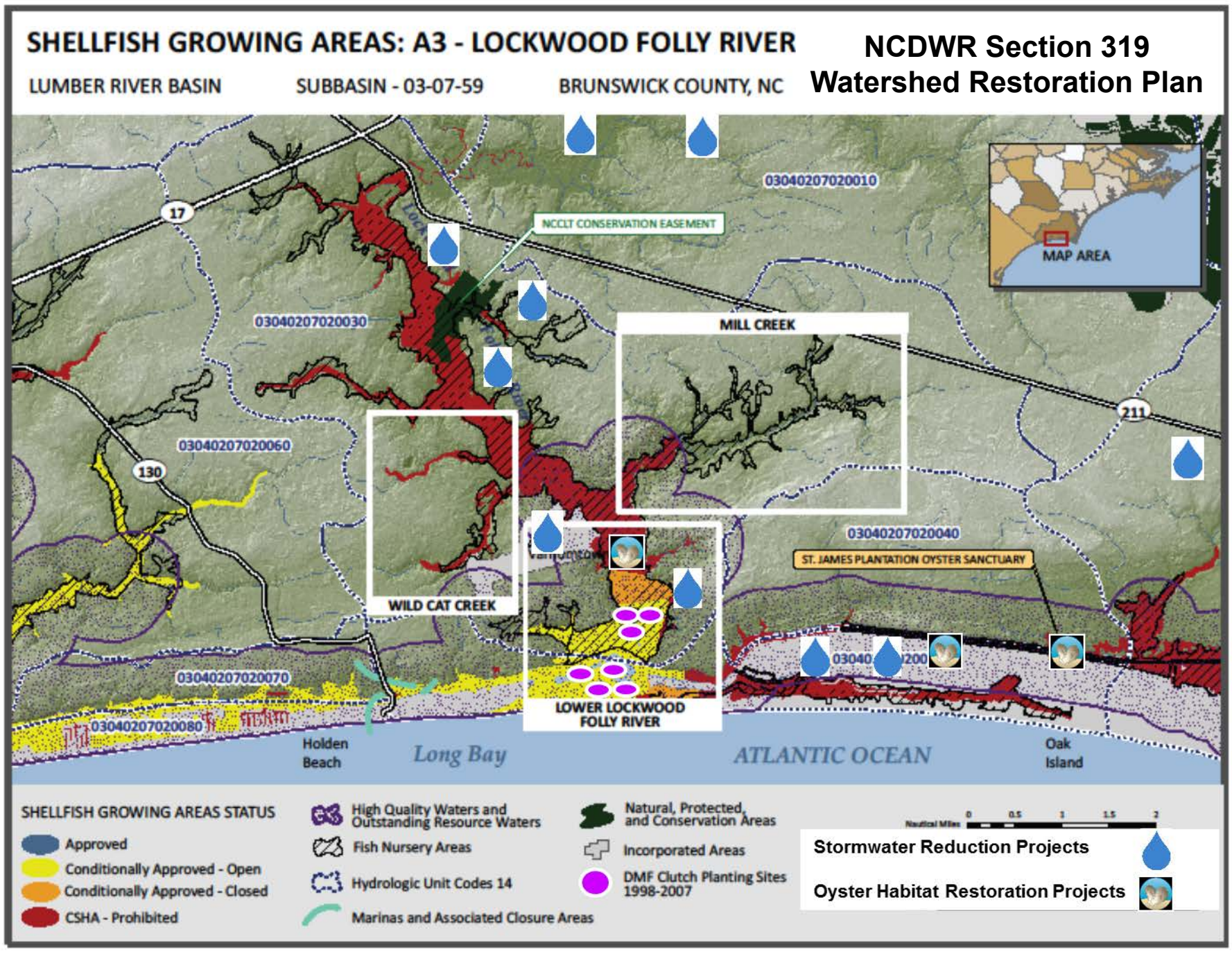


North Carolina Coastal Federation
Working Together for a Healthy Coast

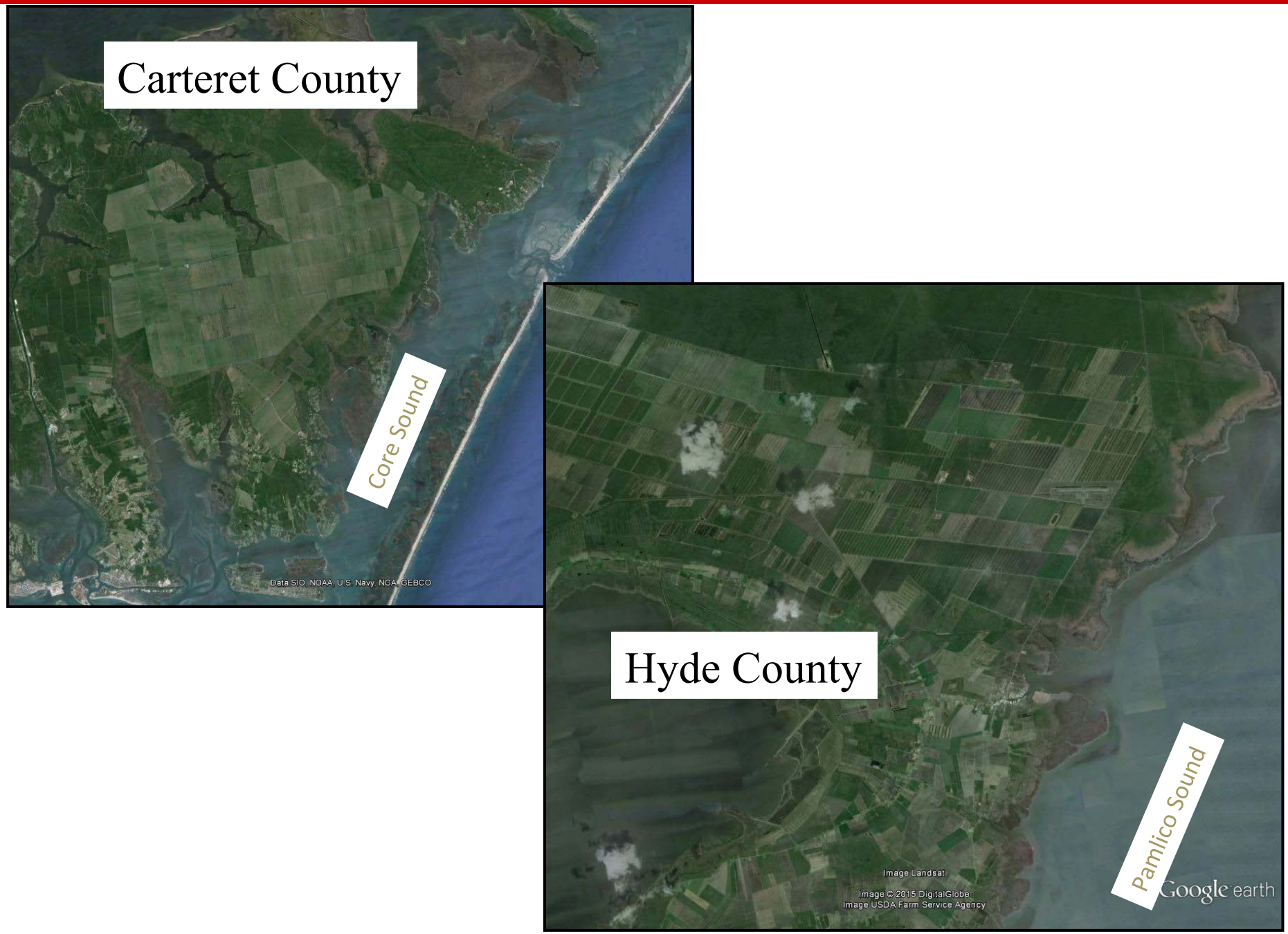
Watersheds to Reefs

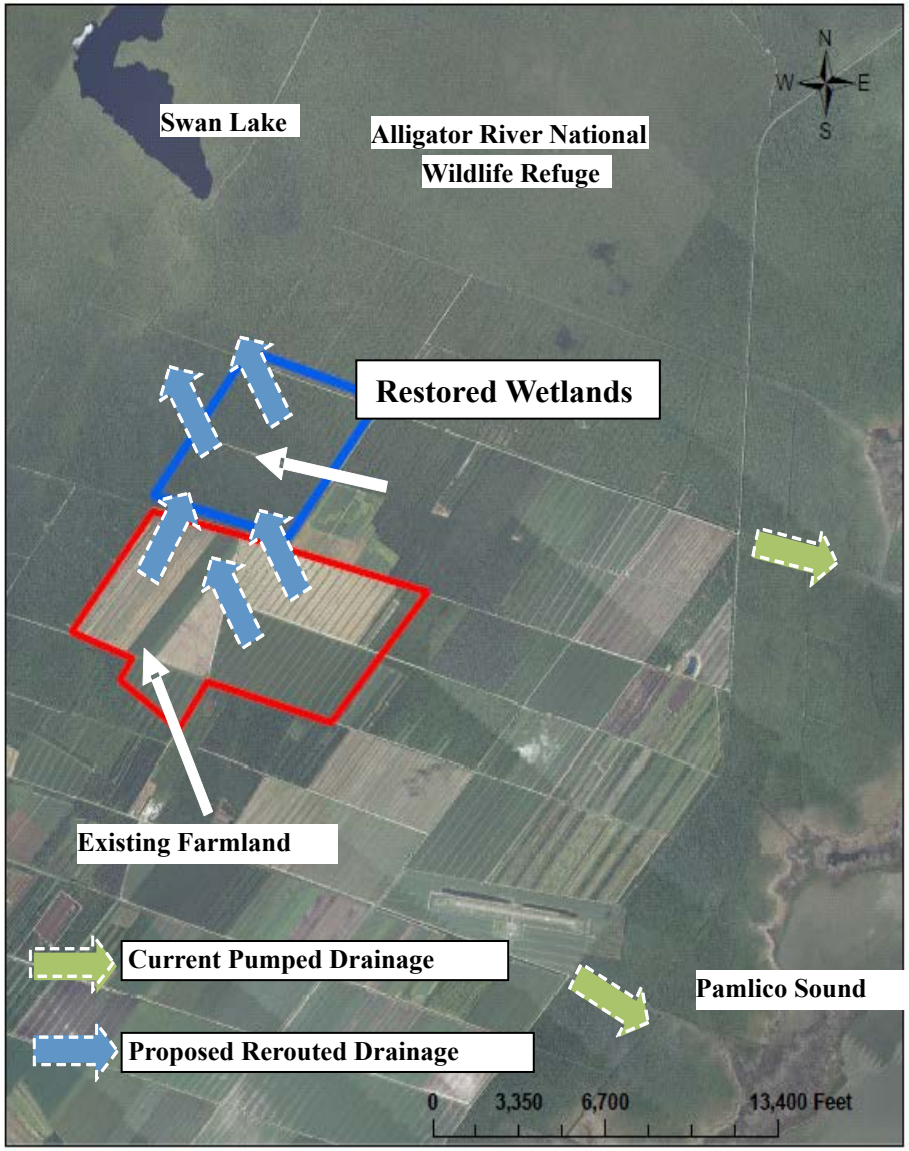
Linking Watershed Restoration Plans & Oyster Restoration in Priority Areas

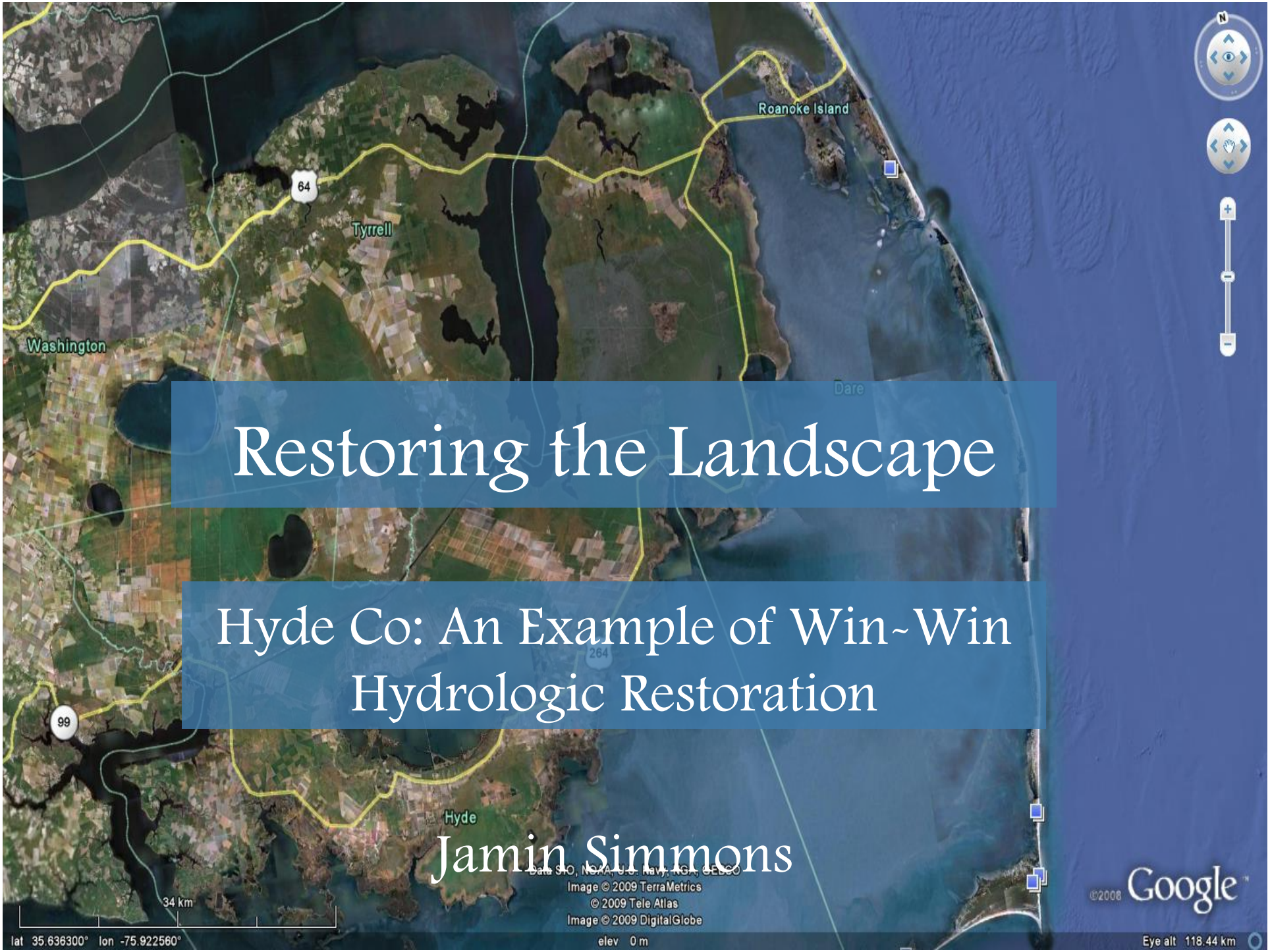
Healthy Coast =
Productive Reefs =
Eco(*nomic* & *logical*)
Benefits


SHELLFISH GROWING AREAS: A3 - LOCKWOOD FOLLY RIVER
LUMBER RIVER BASIN
SUBBASIN - 03-07-59
BRUNSWICK COUNTY, NC
NCDWR Section 319
Watershed Restoration Plan
03040207020010
NCCLT CONSERVATION EASEMENT
MAP AREA
17
03040207020030
MILL CREEK
211
03040207020060
130
WILD CAT CREEK
03040207020040
ST. JAMES PLANTATION OYSTER SANCTUARY
LOWER LOCKWOOD
FOLLY RIVER
03040207020070
03040207020080
Holden
Beach
Long Bay
ATLANTIC OCEAN
Oak
Island
SHELLFISH GROWING AREAS STATUS
Approved
Conditionally Approved - Open
Conditionally Approved - Closed
CSHA - Prohibited
High Quality Waters and
Outstanding Resource Waters
Fish Nursery Areas
Hydrologic Unit Codes 14
Marinas and Associated Closure Areas
Natural, Protected,
and Conservation Areas
Incorporated Areas
DMF Clutch Planting Sites
1998-2007
Nautical Miles
0
0.5
1
1.5
2
Stormwater Reduction Projects
Oyster Habitat Restoration Projects

Dr. Mike Burchell




Swan Lake
Alligator River National Wildlife Refuge
N
W
E
S
Restored Wetlands
Existing Farmland
Current Pumped Drainage
Proposed Rerouted Drainage
Pamlico Sound
0
3,350
6,700
13,400 Feet

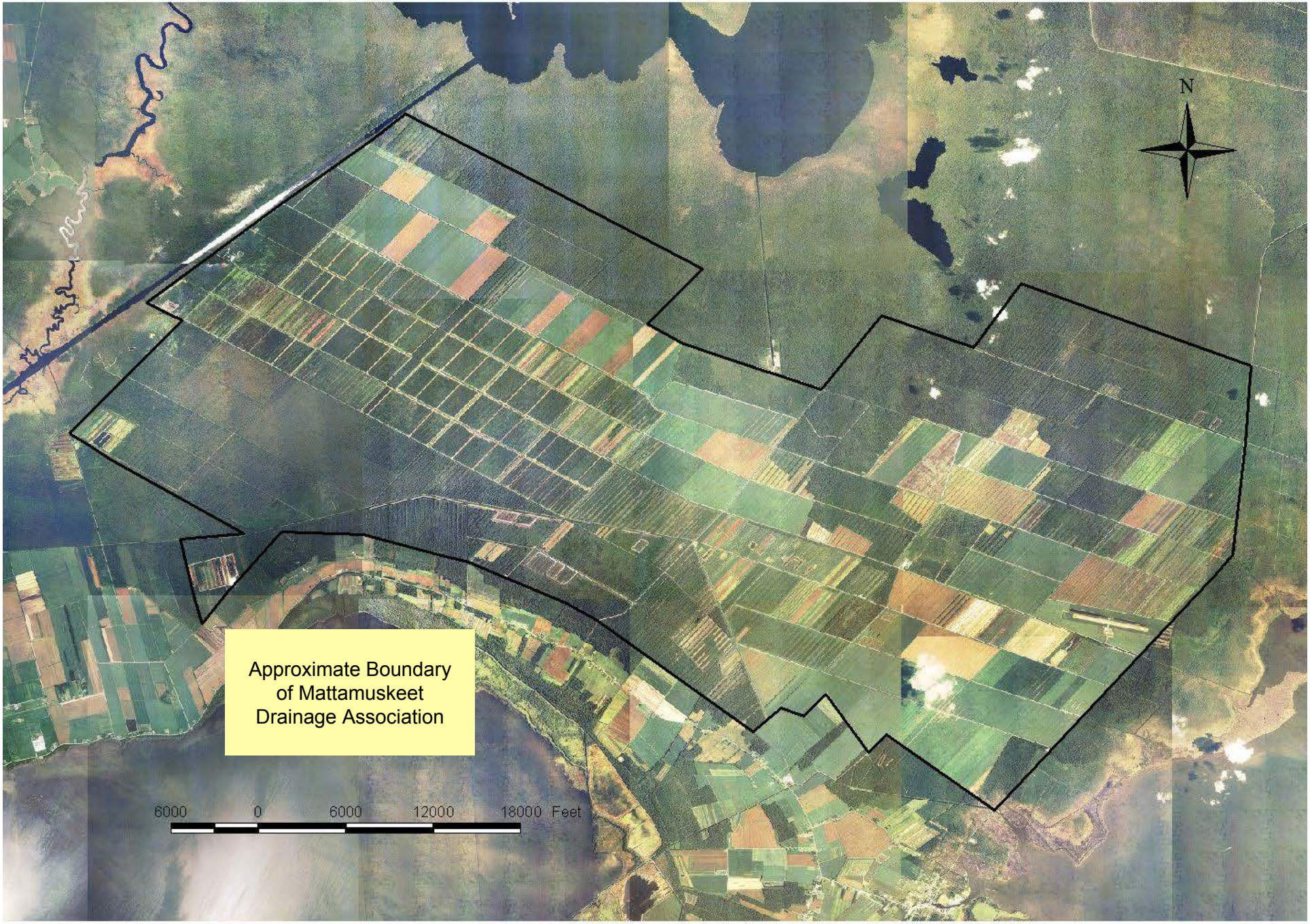


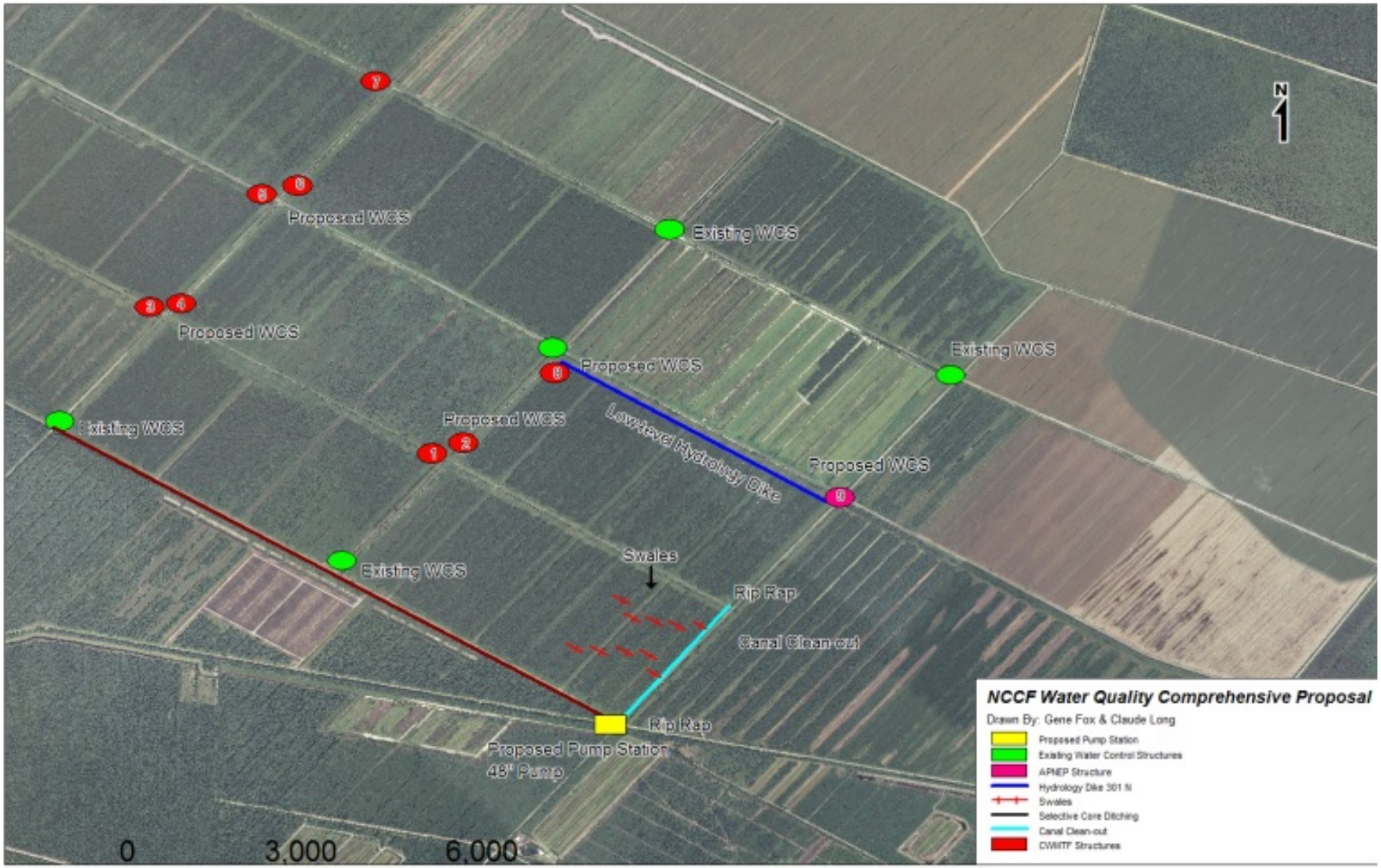
Restoring the Landscape

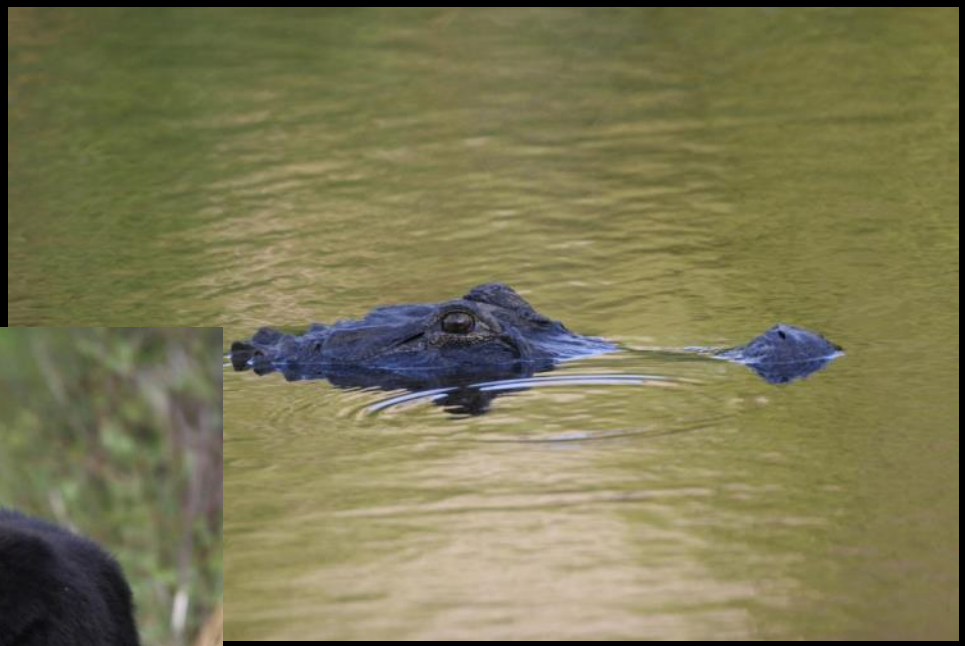
Hyde Co: An Example of Win-Win Hydrologic Restoration

Jamin Simmons

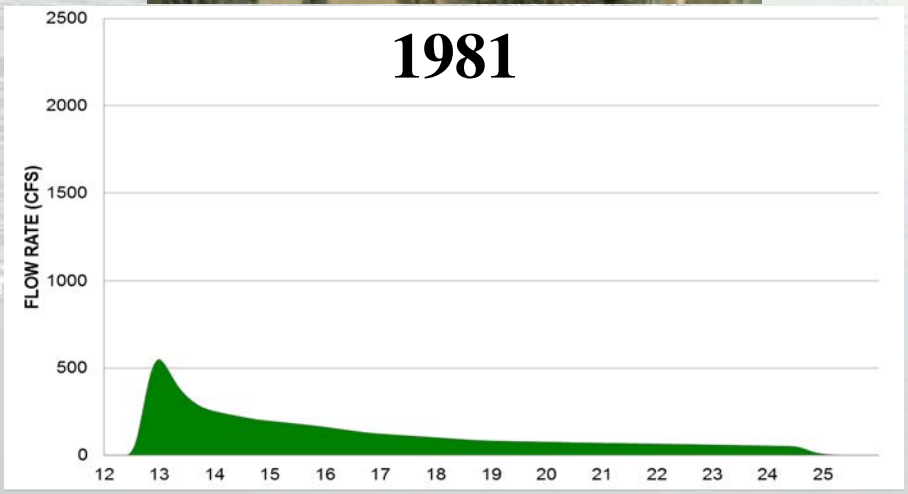
Hydrologic Restoration

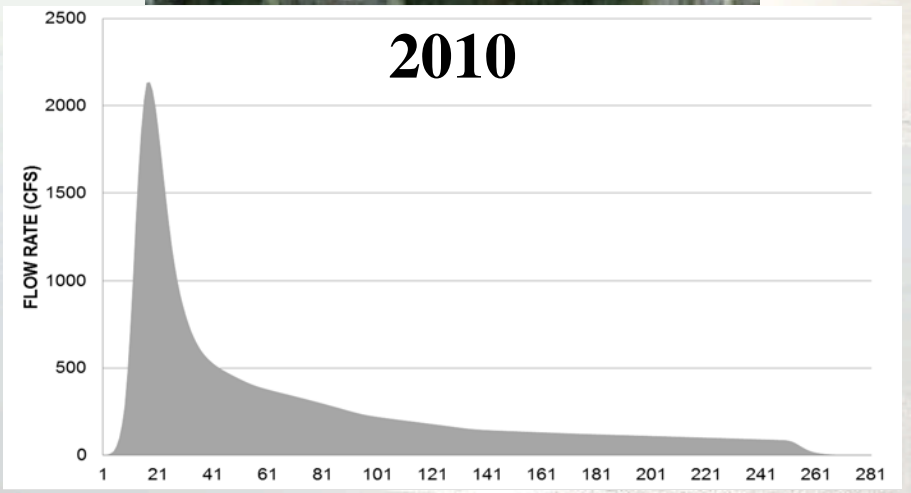

N
Approximate Boundary
of Mattamuskeet
Drainage Association
6000
0
6000
12000
18000 Feet


7
6
8
Proposed WCS
Existing WCS
3
4
Proposed WCS
Proposed WCS
Existing WCS
Existing WCS
Proposed WCS
1
2
Low-Level Hydrology Dike
Proposed WCS
9
Existing WCS
Swales
Rip Rap
Canal Clean-out
Rip Rap
Proposed Pump Station
45" Pump
0
3,000
6,000
N
NCCF Water Quality Comprehensive Proposal
Drawn By: Gene Fox & Claude Long
Proposed Pump Station
Existing Water Control Structures
APNEP Structure
Hydrology Dike 301 N
Swales
Selective Core Ditching
Canal Clean-out
CWMTF Structures



CHANGE IN LAND USE
1981 - 2010





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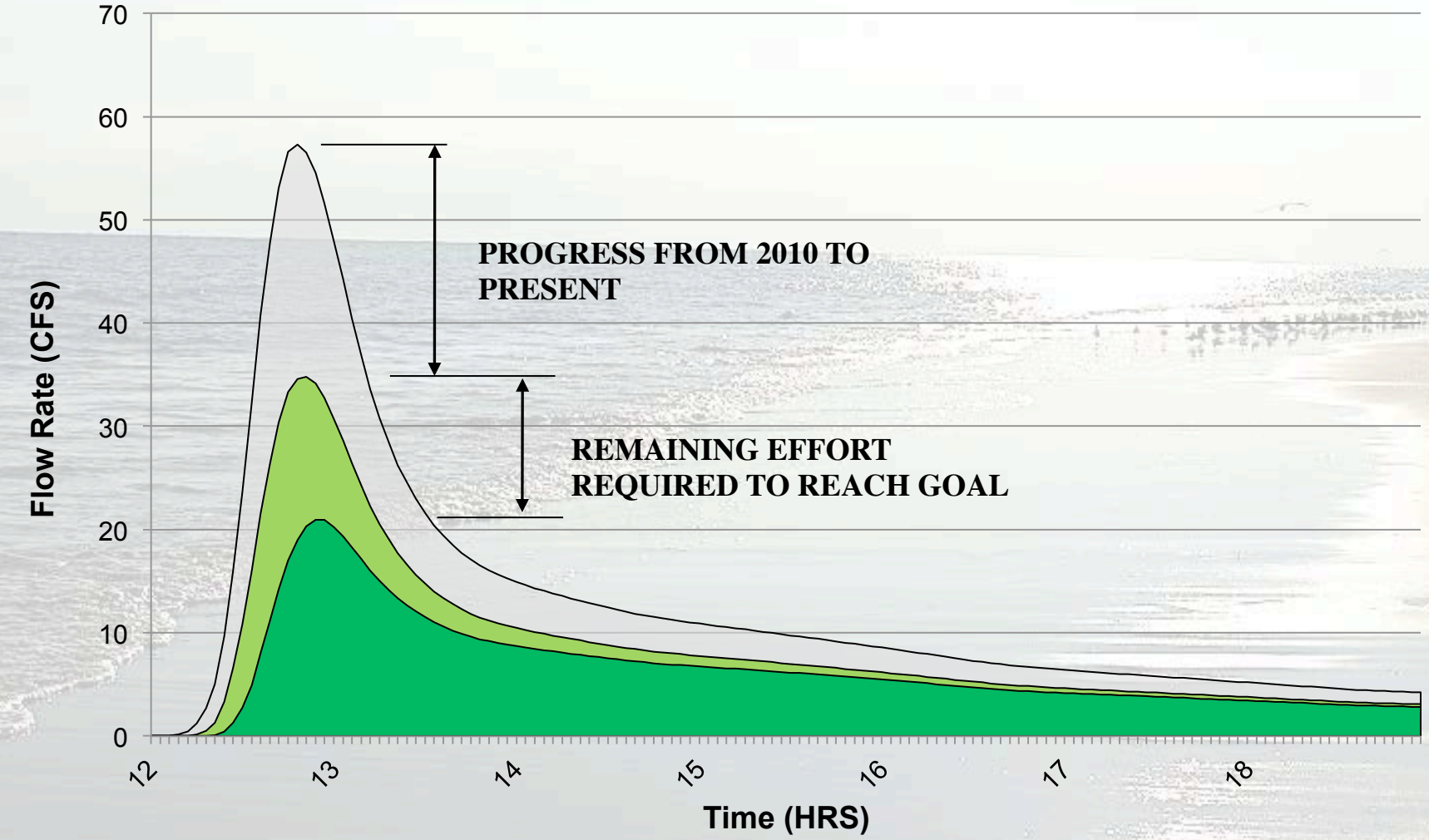
Volume Reduction BMPs

Volume Reduction BMPs



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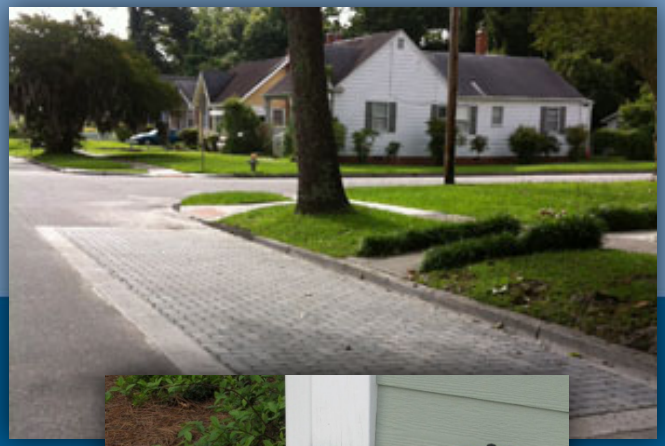
Erin Carey, City of Wilmington

The Restoration Plan

- Promote SCM Installations
  - Best Management Practices
  - Public, Private
    - Commercial, Residential
- Voluntary
- Reduce Hydrographs To Historical Levels



Tidal Creek Project Before **4/23/2014**

Site Prepared **5/1/2014**

Tidal Creek
Sod and Plants put in on
May 2, 2014

Steve Murphey

Shellfish Water Quality

- Shellfish waters have an extremely high standard (14 MPN)
- Relatively small loading events can result in temporary closures (1-1.5 inch rainfall/24 hr)
- Undeveloped areas sometimes have significant closures due to wildlife, water flow, etc.
- Developed areas where runoff is significant rapidly degrade shellfish water quality although the resource itself is often unaffected.
- Restoration, while not a cure-all can mitigate loss of use by slowing or maintaining water quality due to reduced and slower discharge of runoff.

Shellfish Water Quality

- Rainfall amounts and especially heavy rainfall events are the primary driver for water quality declines in a given year, even in restored areas.
- Warming waters may increase environmental pathogens such as Vibrios. As a result there may be a greater risk of illness from consumption of shellfish
- Vibrios are more prevalent during warmer months
- Illness typically increase with increased consumption of raw or undercooked shellfish