APNEP Education & Engagement Action Team

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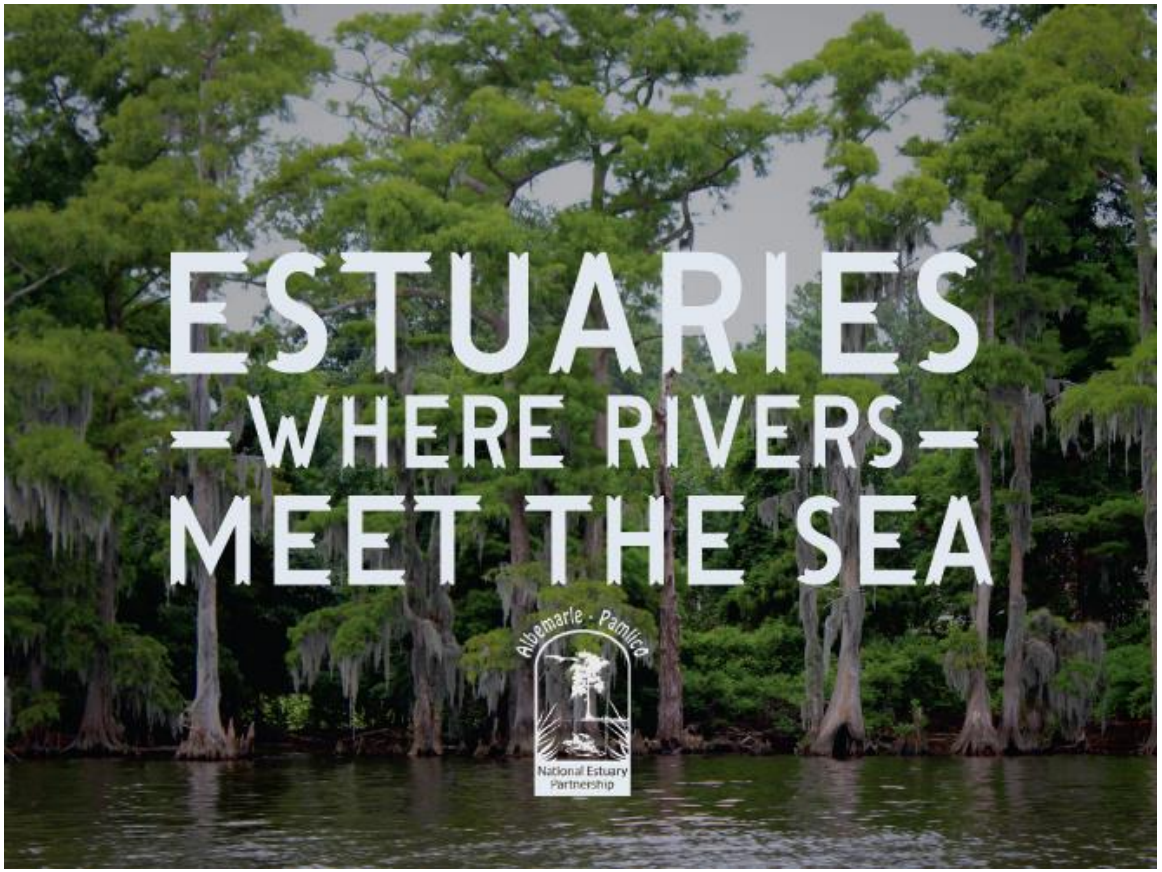
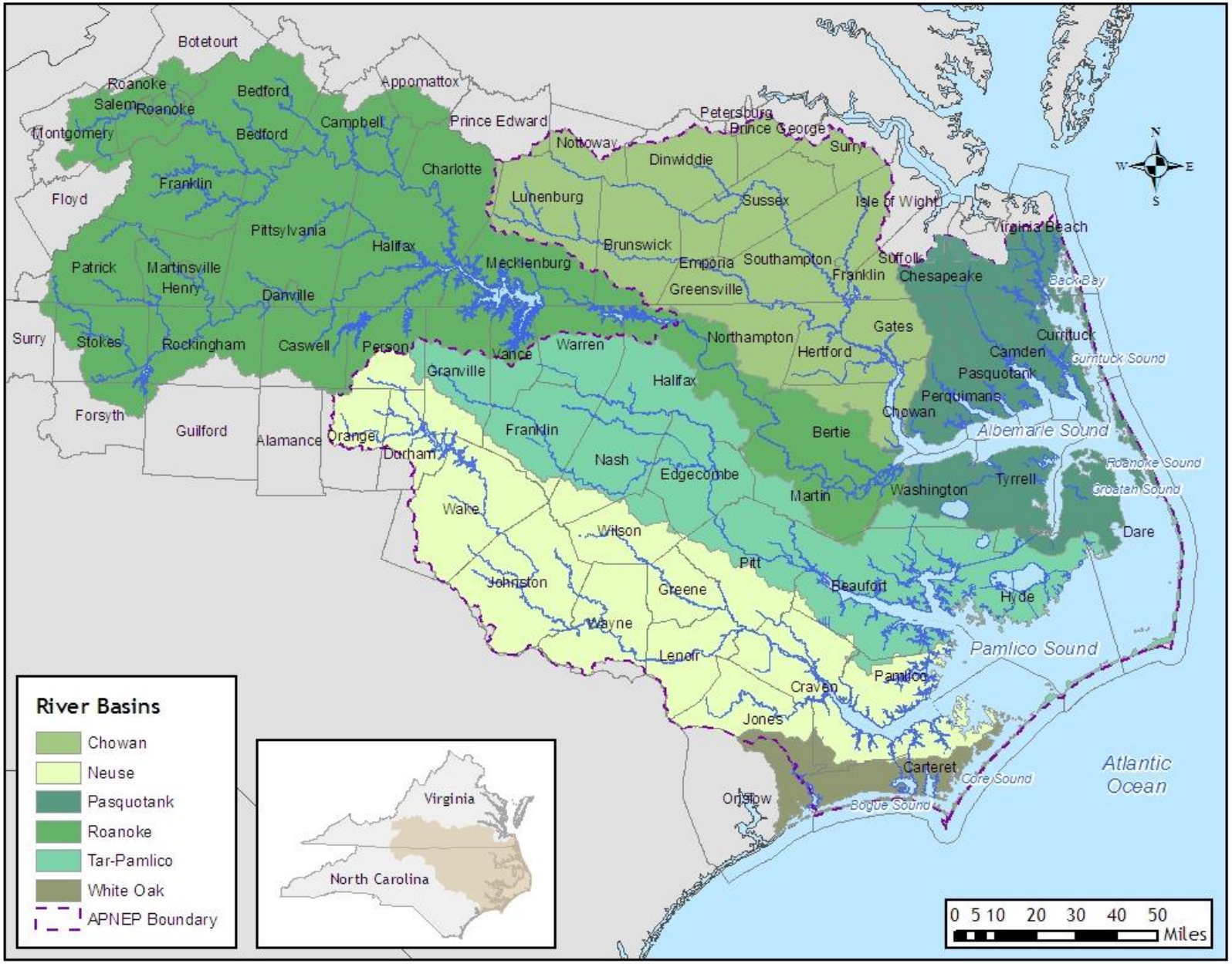
Policy and Engagement Manager
Albemarle-Pamlico National Estuary Partnership

November 8, 2016
Raleigh, NC
Webinar



APNEP's Mission

To identify, restore, and protect the significant resources of the Albemarle-Pamlico estuarine system.


Botetourt
Roanoke
Salem
Roanoke
Bedford
Bedford
Appomattox
Campbell
Prince Edward
Montgomery
Floyd
Franklin
Charlotte
Pittsylvania
Halifax
Patrick
Martinsville
Henry
Danville
Mecklenburg
Nottoway
Petersburg
Prince George
Surry
Dinwiddie
Lunenburg
Sussex
Isle of Wight
Virginia Beach
Brunswick
Emporia
Southampton
Suffolk
Franklin
Chesapeake
Back Bay
Greensville
Surry
Stokes
Rockingham
Caswell
Person
Vance
Warren
Granville
Northampton
Gates
Hertford
Currituck
Camden
Currituck Sound
Pasquotank
Halifax
Perquimans
Chowan
Albemarle Sound
Forsyth
Guilford
Alamance
Orange
Durham
Franklin
Bertie
Nash
Edgecombe
Martin
Washington
Tyrrell
Roanoke Sound
Croatan Sound
Wake
Wilson
Dare
Pitt
Johnston
Greene
Beaufort
Hyde
Wayne
Lenoir
Pamlico Sound
Craven
Pamlico
Jones
Carteret
Core Sound
Atlantic Ocean
Onslow
Bogue Sound
N
W
E
S
River Basins
Chowan
Neuse
Pasquotank
Roanoke
Tar-Pamlico
White Oak
APNEP Boundary
Virginia
North Carolina
0 5 10 20 30 40 50
Miles

APNEP Region

- It's BIG! 2nd largest estuarine complex in the lower 48 states
- Management region covers 28,000 square miles
- Albemarle-Pamlico estuarine system over 3,000 square miles
- Watershed Approach: Headwaters to the sounds
- 6 River Basins: Pasquotank, Roanoake, Chowan, Tar-Pamlico, Neuse, White Oak
- Water from 43 NC counties and 38 VA counties & cities drain into APNEP estuaries

Albemarle - Pamlico
National Estuary Partnership

National Estuary Program

- Designated as an estuary of national significance by Congress in 1987.
- One of 28 National Estuary Programs established under Section 320 of the Clean Water Act (CWA).
- Funded through an Environmental Protection Agency (EPA) grant to the NC Department of Environmental Quality.
- EPA requires that each program establish a Comprehensive Conservation and Management Plan (CCMP).
- The plan addresses water quality, habitat, and living resource challenges in each program's designated watershed.

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APNEP's Management Approach

- Watershed approach: headwaters to the sounds
- Ecosystem Based Management
- Partnerships
- Leverage resources
- Collaborative initiatives
- Applied science initiatives

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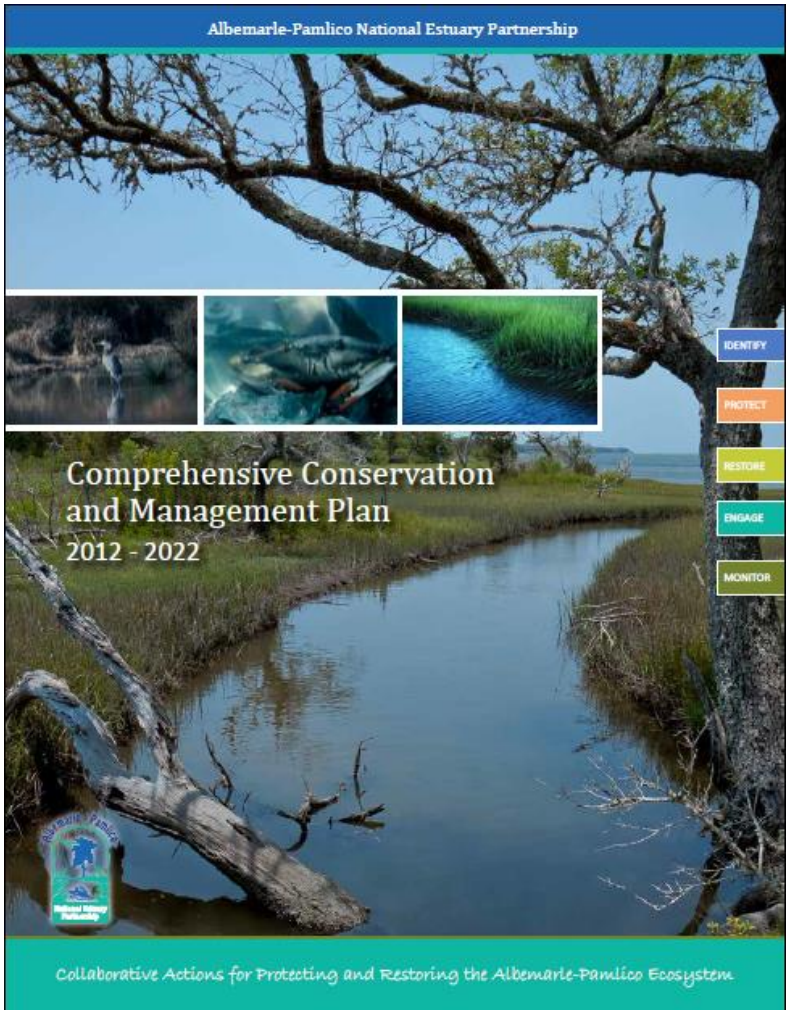
Implement CCMP

- Fourth CCMP question
- Ten-year horizon
- 58 CCMP actions
- Super-Aggregated into five components



5 Components

IDENTIFY

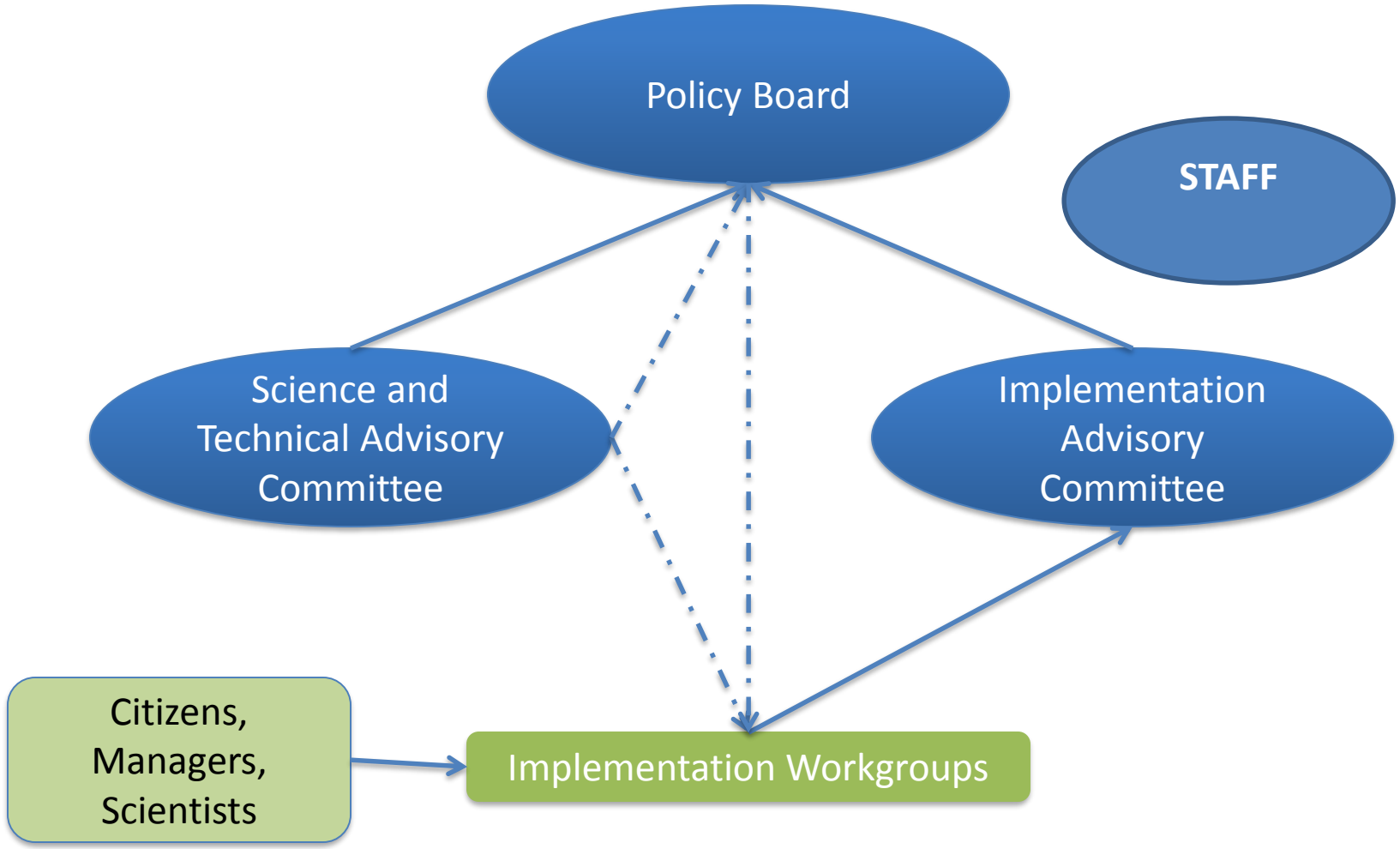
PROTECT

RESTORE

ENGAGE

MONITOR

Advisory Committee Structure



Action Teams

- Education & Engagement
- Contaminant Management
- Albemarle Nutrient Pilot Workgroup
- Freshwater Habitats and Fish Passage
- Ecological Flows
- Decision Support Tools
- Submerged Aquatic Vegetation
- Public Access
- Policy & Economics
- Restoration Strategies
- Water Quality Improvements
- Shorelines

- *External:*
  - Oysters
  - Invasives

APNEP CCMP Outcomes

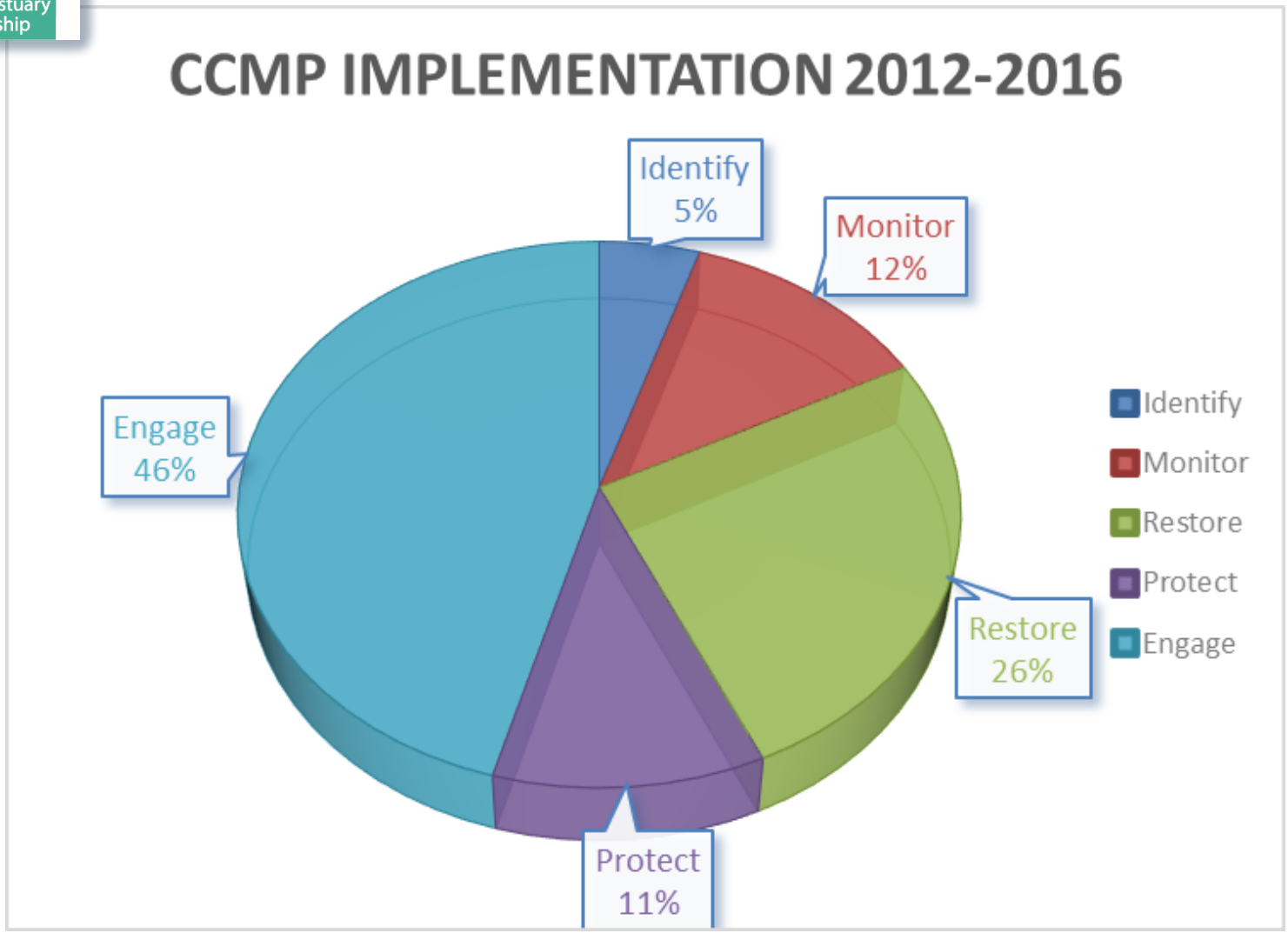
- Highlighting indicates actions and workgroups responsible for each outcome (p. 10-11 of CCMP)
- Actions are color-coded to indicate the responsible workgroups
- Education & Engagement example: Fish & game are safe for human consumption

Outcomes	Actions					Workgroups
1a	A1.1	B1.1	C1.1	D1.1	E1.1	Freshwater Habitats and Fish Passage
1b	A1.2	B1.2	C1.2	D1.2	E1.2	Policy & Economics
1c	A2.1	B1.3	C1.3	D1.3	E1.3	Decision Support Tools
1d	A2.2	B1.4	C1.4	D1.4	E2.1	Education & Engagement
1e	A2.3	B1.5	C1.5	D1.5	E2.2	Water Quality Imnprovements
2a	A2.4	B2.1	C2.1	D2.1		Shorelines
2b	A2.5	B2.2	C2.2	D2.2		Contaminant Management
2c	A3.1	B2.3	C2.3	D2.3		Invasives
3a	A3.2	B2.4	C3.1	D3.1		Restoration Strategies
3b	A3.3	B2.5	C3.2	D3.2		Monitoring Networks
3c		B2.6	C3.3	D3.3		Oysters
3d		B3.1	C4.1			SAV
		B3.2	C4.2			Flows
		B3.3	C4.3			Public Access
			C4.4			
			C5.1			
			C5.2			
			C5.3			

CCMP Implementation

			2016	2016	2016	2016	2016	2016	2016	2016	2016	2016
Staff Lead	Staff Support	Action Team	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Coley	Jimmy	Freshwater Habitats & Fish Passage										
Bill	Stacey	Policy & Economics										
Coley	Dean	Decision Support Tools										
Stacey	Jimmy	Education & Engage: Steward										
Coley	TBD	Education & Engage: Access										
Jimmy	TBD	WQ Improvements										
Jimmy	Stacey	Shorelines										
Jim	TBD	Nutrients										
Dean	TBD	Contaminants										
Dean	Bill	Invasives										
Stacey	TBD	Restoration Strategies										
Jimmy	Coley	Oysters										
Stacey	Dean	SAV										
Dean	Coley	Ecological Flows										

Overall CCMP Implementation



2015 E&E Action team Grants

- Seeds of Inspiration: Mano al Hermano & NCCF
- Sea Wolves: CMAST
- Sound Choices in EE: EENC conference
- Secrets of the Swamp: Museum of Natural Sciences
- We Are Nature Heroes: NC Aquarium-Roanoke Island
- Cistern and Wildflower Meadow: NC Aquarium—Roanoke Island

Measuring outcomes & impacts of environmental education

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Shad in the Classroom / Roanoke River Days

National Estuary Partnership

NORTH CAROLINA Museum of Natural Sciences

U.S. FISH & WILDLIFE SERVICE

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UNC At Water's Edge Teacher Institute, Project WET Facilitator Workshops

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UNC INSTITUTE FOR THE ENVIRONMENT

Recent APNEP Outreach

- SciRen Triangle, September 2016
- Kids River Fest: Sound Rivers, May 2016
- Let's G.O. Williamston, May 2016
- NC Coastal Envirothon, March 2016

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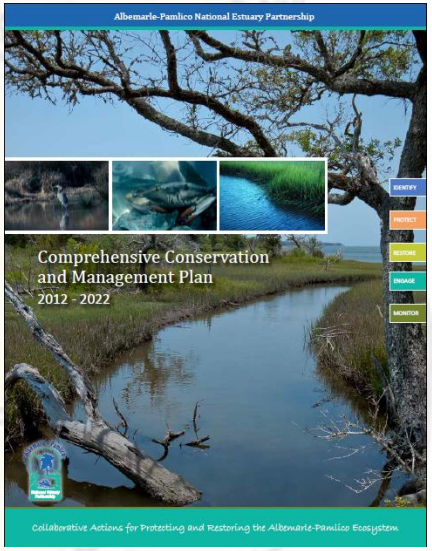
Education and Engagement CCMP Goals

- Primary: D1.1, D2.2, D2.3
- Secondary: D1.3, D1.4, D3.1; E2.2
- Access Primary: D1.5, D2.1



Education and Engagement Primary CCMP Goals

- D1.1: Communicate the importance of stewardship and offer opportunities for volunteerism to further APNEP's mission.
- D2.2: Provide environmental education training opportunities for educators in the region.
- D2.3: Increase public understanding of the relationship between ecosystem health and human health advisories relating to water, fish, and game.

Education and Engagement
Public Access Subgroup Goals

- D1.5: Increase opportunities for public access to waterways, public lands, and trails.

- D2.1: Provide & promote opportunities for outdoor experiences that connect individuals with the A-P ecosystem.

Education and Engagement Secondary CCMP Goals

- D1.3: Coordinate outreach and engagement efforts regarding the impact of invasive species.
- D1.4: Coordinate outreach efforts regarding the proper application of fertilizers to reduce nutrient runoff.
- D3.1: Develop and implement a strategy to improve decision-maker's understanding of the costs and benefits of environmental protection, restoration, planning, and monitoring.
- E2.2: Develop and maintain an online resource that clearly conveys regional information in support of ecosystem-based management.

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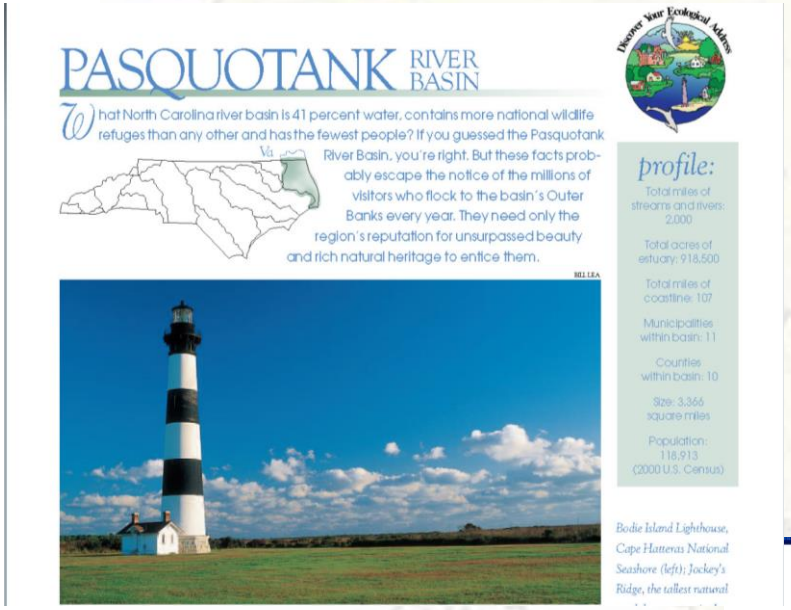
D1:1 Outputs: Education & Engagement Materials



PASQUOTANK RIVER BASIN

What North Carolina river basin is 41 percent water, contains more national wildlife refuges than any other and has the fewest people? If you guessed the Pasquotank River Basin, you're right. But these facts probably escape the notice of the millions of visitors who flock to the basin's Outer Banks every year. They need only the region's reputation for unsurpassed beauty and rich natural heritage to entice them.

Discover Your Ecological Address

profile:

Total miles of streams and rivers: 2,000

Total acres of estuary: 918,500

Total miles of coastline: 107

Municipalities within basin: 11

Counties within basin: 10

Size: 3,366 square miles

Population: 118,913 (2000 U.S. Census)

Bodie Island Lighthouse, Cape Hatteras National Seashore (left); Jockey's Ridge, the tallest natural

NC CATCH

REAL LOCAL SEAFOOD

NC Catch wants to ensure seafood from our coast is a priority on your table.

We believe that by sustaining the rich culture, variety of resources, health benefits and incredible tastes from our shores, we can help maintain thriving coastal fishing communities and build a stronger appreciation of North Carolina's local seafood for generations to come.

Our non-profit is comprised of local Catch groups focused on connecting consumers and businesses with year-round access to high-quality seafood.

FOR MORE INFORMATION PLEASE VISIT US ONLINE AT

WWW.NCCATCH.ORG

Brunswick Catch · Outer Banks Catch · CarteretCatch · Ocracoke Fresh

Fresh, from local fishermen to you · Local fisheries approved · Select N.C. seafood from the fisheries of Carteret County · Caught today the traditional way

DID YOU KNOW THAT?

*About 30 types of seafood caught by commercial fishermen live in NC estuaries, including oysters, clams, blue crabs, shrimp, spotted sea trout, red drum, and flounder.

*The peak months in NC for blue crab landings are May through October.

*The blue crab fishery is the most valuable in NC in terms of landings and dollars.

*The crab pot was developed in the Chesapeake Bay in 1928 and first used in NC in 1953.

*Oysters filter impurities out of water as they eat. One oyster can filter 25 gallons of water per day.

*Croakers are named for the croaking sound produced by the vibration of their swim bladder and muscles.

*Southern flounder are lefteye flounders and have both of their eyes on the left side of their body.

Do you love great seafood? You're in luck! North Carolina offers a variety of local seafood par excellence!

Our coastal waters supply shrimp, blue crabs, oysters, clams, scallops and many types of fish for your dining pleasure. Some of our seafood comes from our broad expanse of estuaries and some from the Atlantic Ocean.

Whether you enjoy seafood prepared at your favorite restaurant, purchased at your local market, or like to catch your own, opportunities abound to celebrate the seasonal variety of North Carolina seafood.

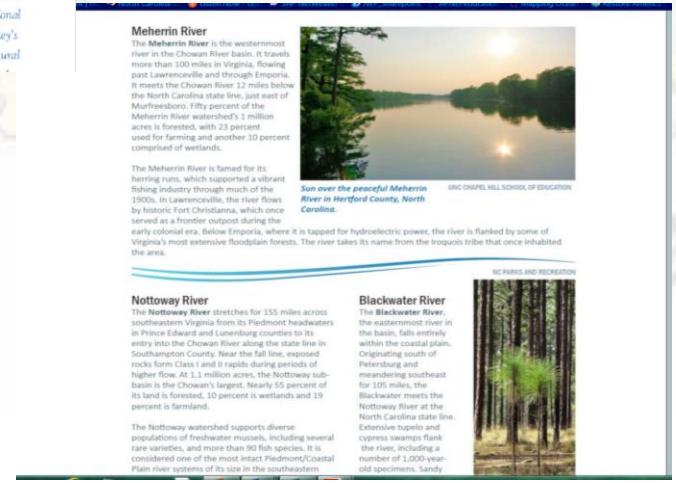
FOR MORE INFORMATION REGARDING NORTH CAROLINA ESTUARIES, PLEASE VISIT: WWW.APNEP.ORG

Where It All Begins: The Estuary

Estuaries are partially enclosed coastal water bodies where freshwater from inland rivers mix with saltwater from the ocean. North Carolina's estuary system consists of about 3,000 square miles of surface water area.

Estuaries are shallow, so sunlight penetrates the water, allowing plants to grow. The rivers flowing into the estuaries carry sediments rich in nutrients that settle onto the estuary floor. These conditions create unique habitat for marine species to hatch and to grow. Some of these species migrate to the ocean.

More than 150 species of fish and invertebrates live in North Carolina estuaries.



Meherrin River

The Meherrin River is the westernmost river in the Chowan River basin. It travels more than 100 miles in Virginia, flowing past Lawrenceville and through Emporia. It meets the Chowan River 12 miles below the North Carolina state line, just east of Murfreesboro. Fifty percent of the Meherrin River watershed's 1 million acres is forested, with 23 percent used for farming and another 10 percent comprised of wetlands.

The Meherrin River is famed for its herring runs, which supported a vibrant fishing industry through much of the 1900s. In Lawrenceville, the river flows by historic Fort Christianna, which once served as a frontier outpost during the early colonial era. Below Emporia, where it is tapped for hydroelectric power, the river is flanked by some of Virginia's most extensive floodplain forests. The river takes its name from the Iroquois tribe that once inhabited the area.

Sun over the peaceful Meherrin River in Hertford County, North Carolina.

UNC CHAPEL HILL SCHOOL OF EDUCATION

Nottoway River

The Nottoway River stretches for 155 miles across southeastern Virginia from its Piedmont headwaters in Prince Edward and Lunenburg counties to its entry into the Chowan River along the state line in Southampton County. Near the fall line, exposed rocks form Class I and II rapids during periods of higher flow. At 1.1 million acres, the Nottoway subbasin is the Chowan's largest. Nearly 55 percent of its land is forested, 10 percent is wetlands and 19 percent is farmland.

The Nottoway watershed supports diverse populations of freshwater mussels, including several rare varieties, and more than 90 fish species. It is considered one of the most intact Piedmont/Coastal Plain river systems of its size in the southeastern

Blackwater River

The Blackwater River, the easternmost river in the basin, falls entirely within the coastal plain. Originating south of Petersburg and meandering southeast for 105 miles, the Blackwater meets the Nottoway River at the North Carolina state line. Extensive tupelo and cypress swamps flank the river, including a number of 1,000-year-old specimens. Sandy

NC PARKS AND RECREATION

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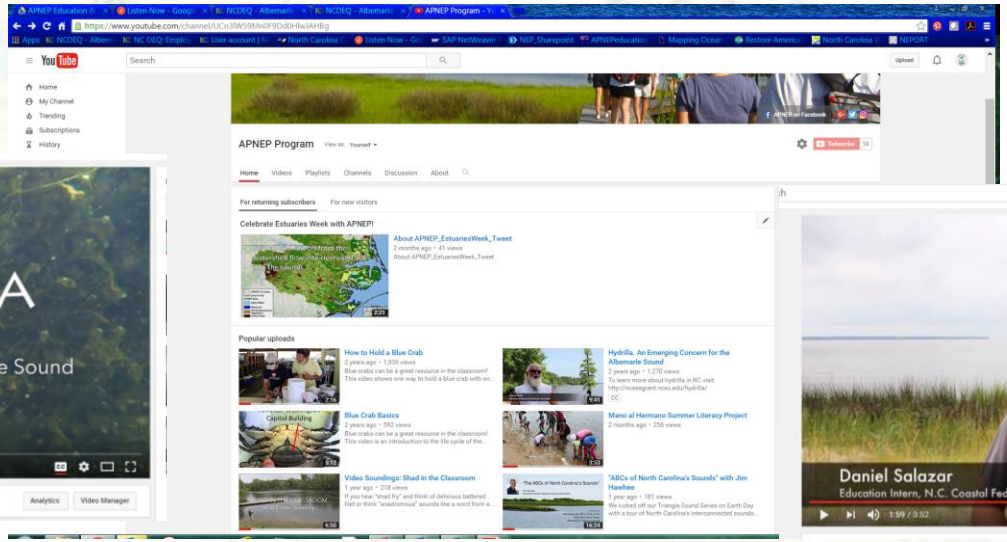
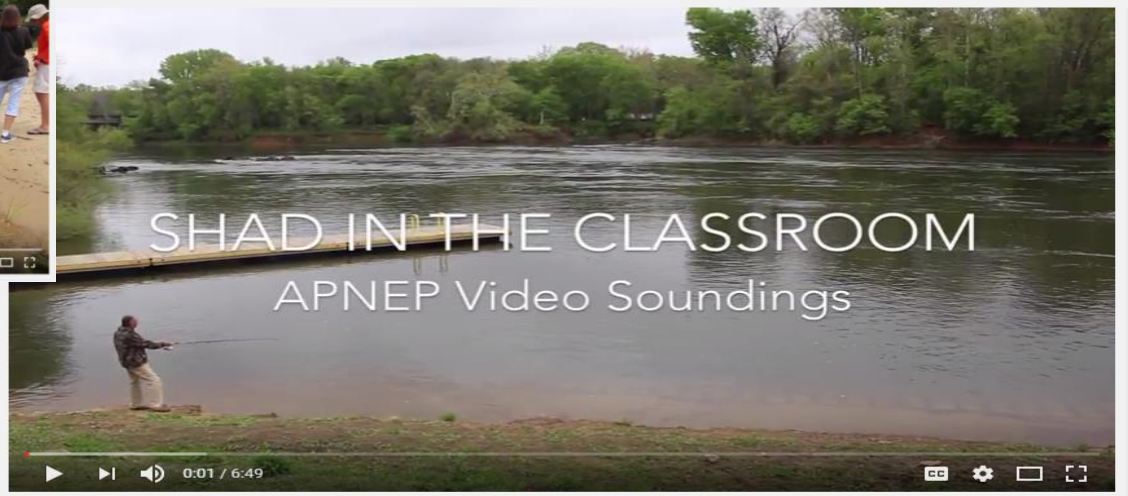
D1.1 Outputs: Video Production





D1.1 Outputs: Engagement Opportunities

THE POCOSIN PROJECT
"Swamp on a Hill"

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D2.2 Outputs: Teacher Workshops

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North Carolina Coastal Federation

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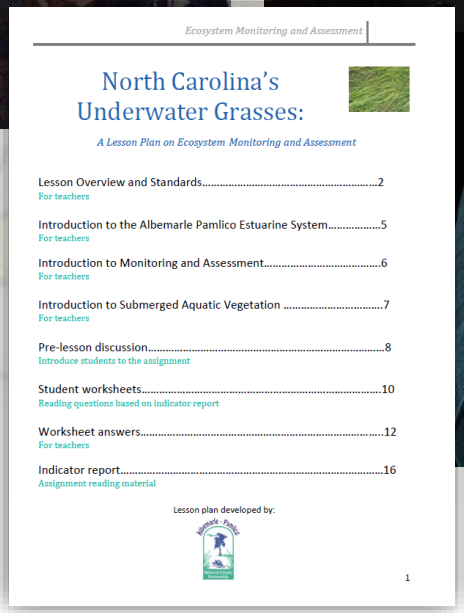
D2.2 Outputs: Educator Resources



Ecosystem Monitoring and Assessment

North Carolina's Underwater Grasses:

A Lesson Plan on Ecosystem Monitoring and Assessment

Lesson Overview and Standards....2
For teachers

Introduction to the Albemarle Pamlico Estuarine System....5
For teachers

Introduction to Monitoring and Assessment....6
For teachers

Introduction to Submerged Aquatic Vegetation....7
For teachers

Pre-lesson discussion....8
Introduce students to the assignment

Student worksheets....10
Reading questions based on indicator report

Worksheet answers....12
For teachers

Indicator report....16
Assignment reading material

Lesson plan developed by:

1

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SCIREN

DWR Division of Water Resources

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D2.3: Public Understanding SAV Boat Signs

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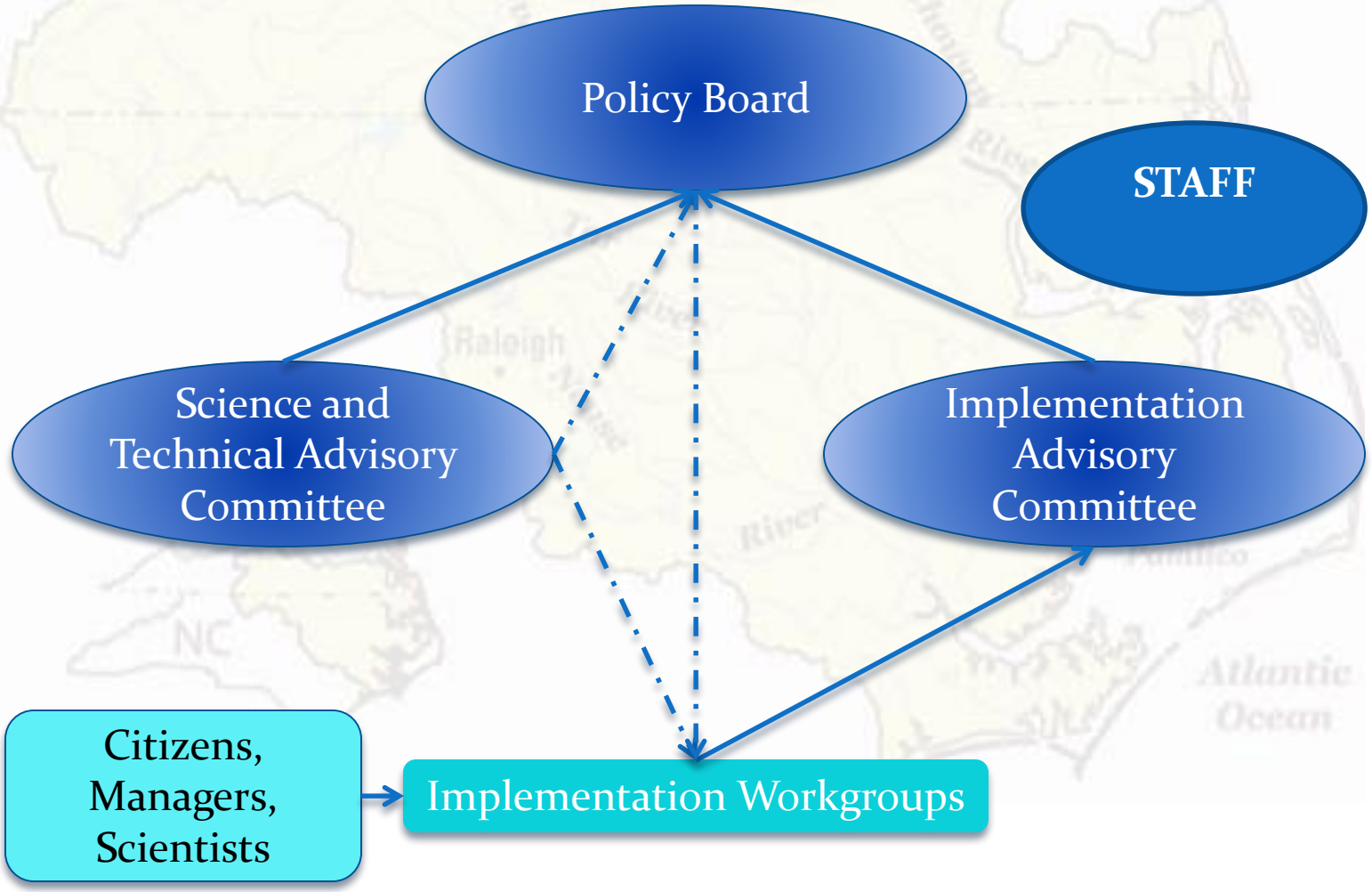
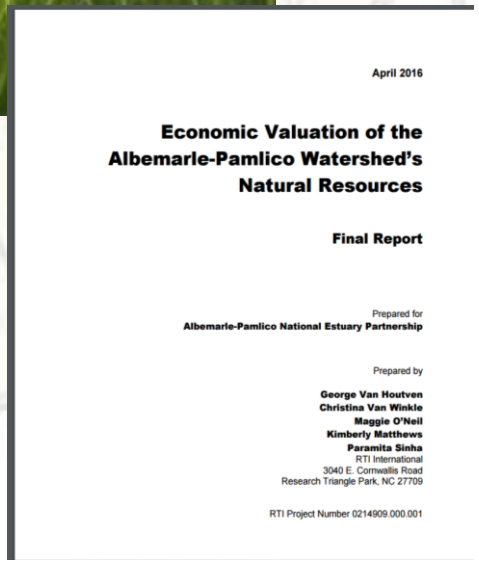
Advisory Committee Structure



Opportunities for Integration with Other Action Teams

- Nutrients
- Contaminants
- Submerged Aquatic Vegetation
- Policy & Economics



April 2016

Economic Valuation of the Albemarle-Pamlico Watershed's Natural Resources

Final Report

Prepared for
Albemarle-Pamlico National Estuary Partnership

Prepared by

George Van Houtven
Christina Van Winkle
Maggie O'Neil
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3040 E. Cornwallis Road
Research Triangle Park, NC 27709

RTI Project Number 0214909.000.001

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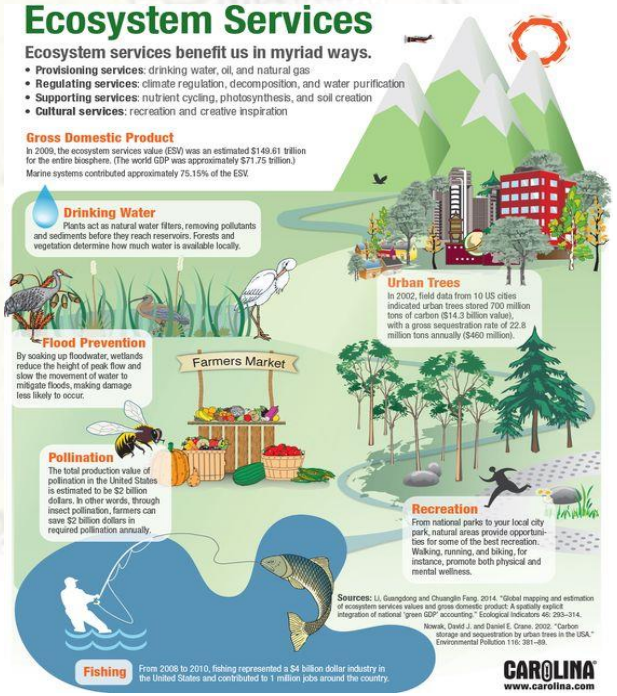
Opportunities for Integration with Other Partners

- Integration with planned initiatives
- What are the needs? Fill gaps.
- New Campaign for A-P system?

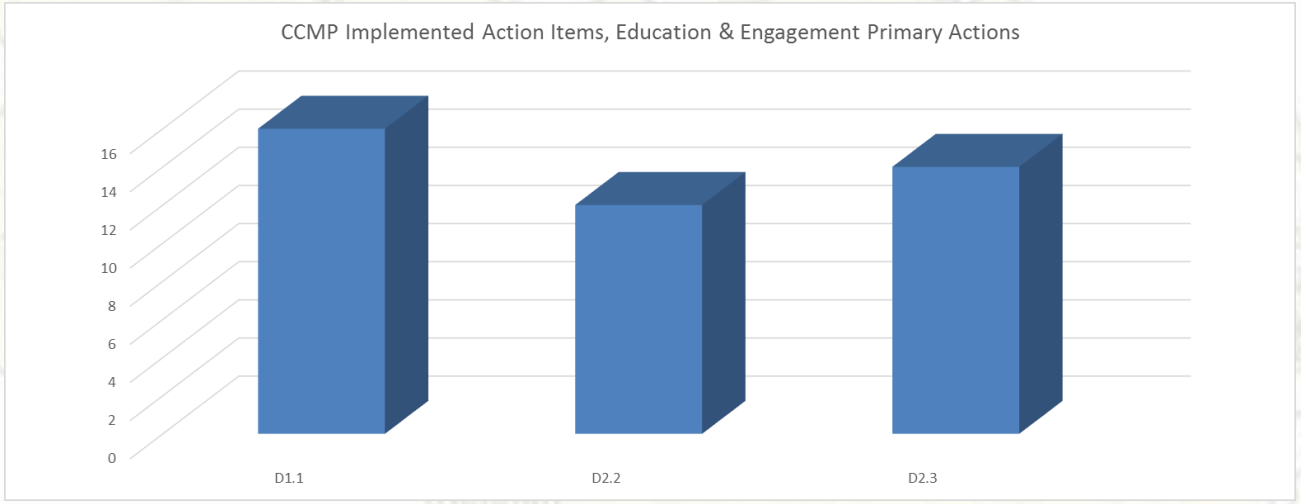


Imagine a Day Without Water

Action Team Set Up

- Members—who is missing?
- Subcommittees?
- Develop an action plan
- Select team chair(s)

Education and Engagement Implementation



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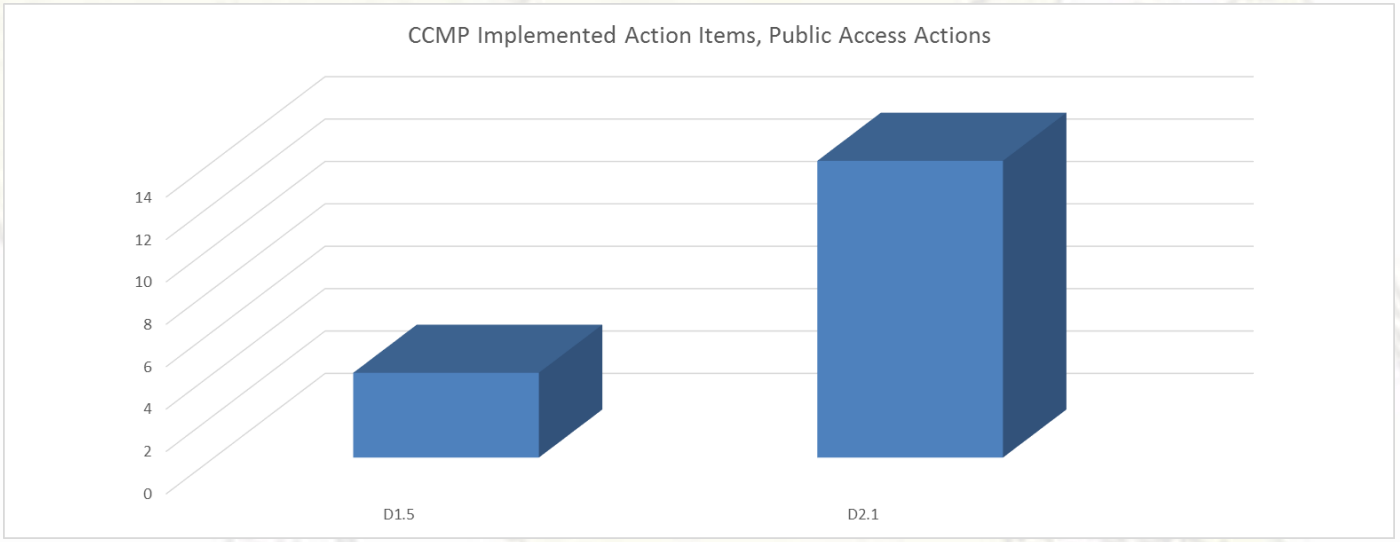
Education and Engagement Access Subgroup Goals



- D1.5: Increase opportunities for public access to waterways, public lands, and trails.
- D2.1: Provide & promote opportunities for outdoor experiences that connect individuals with the A-P ecosystem.

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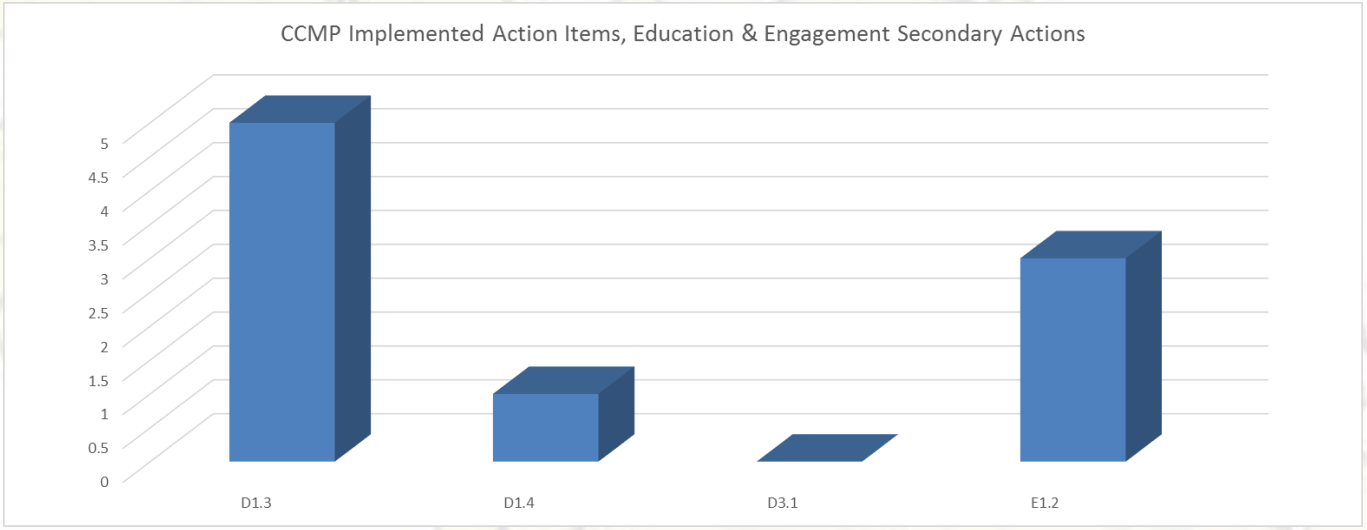
E&E Secondary Actions Implementation



- D1.3: Coordinate outreach and engagement efforts regarding the impact of invasive species.
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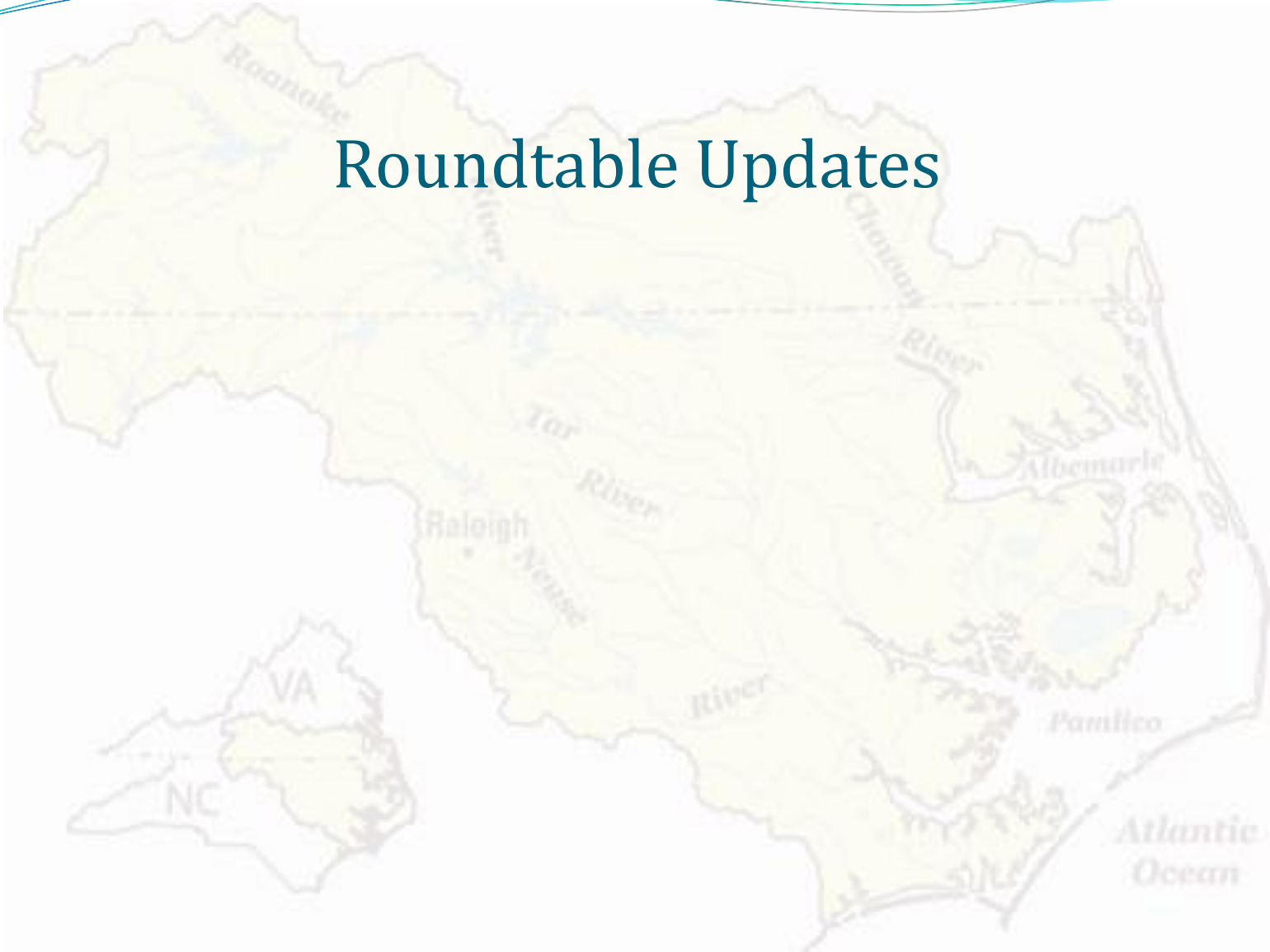
Measuring outcomes & impacts of environmental education

- Develop metrics for APNEP sponsored projects
- Tie back to CCMP Outcomes
- Currently developing surveys & follow up materials for workshops, teacher institutes,& related initiatives

Roundtable Updates



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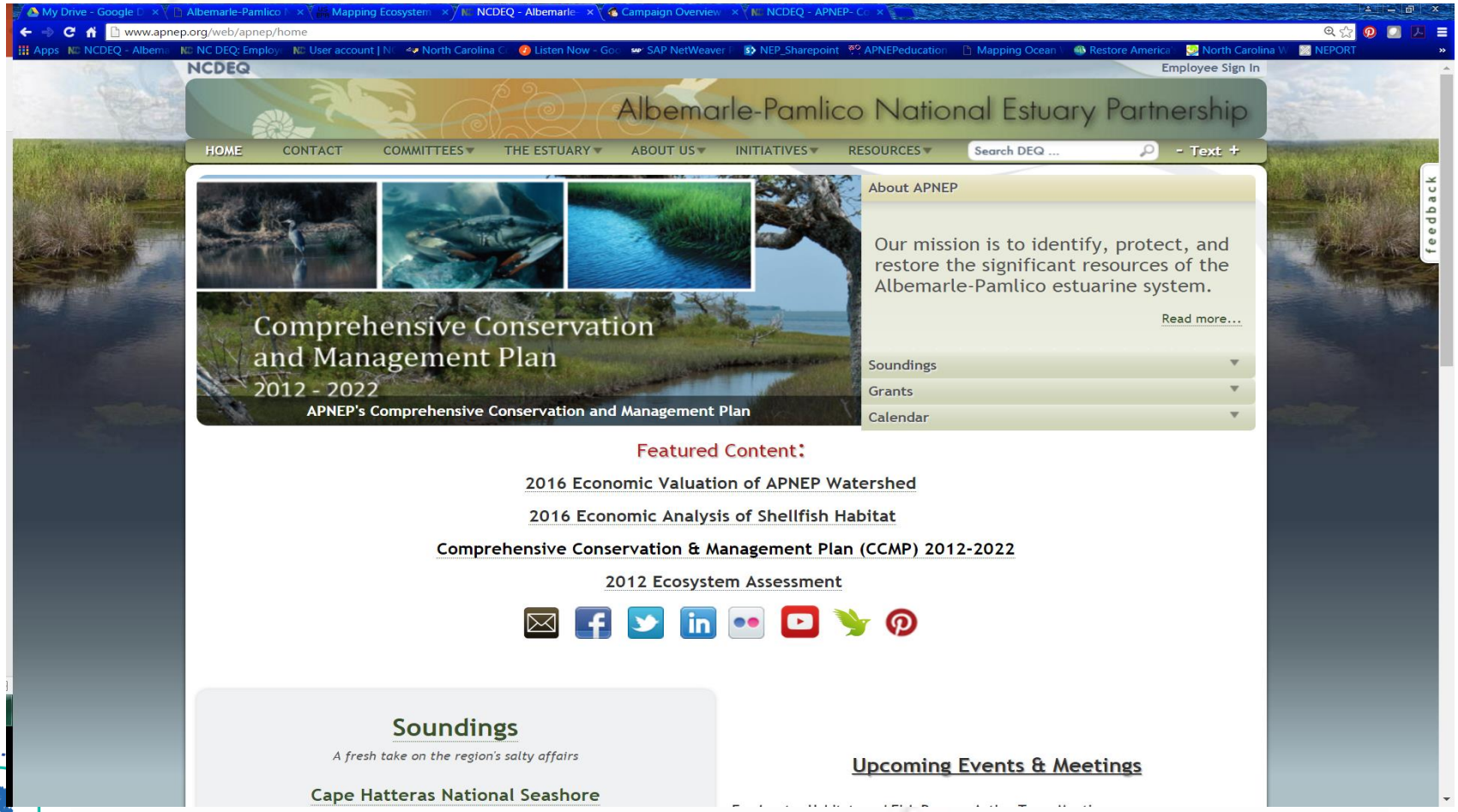
Upcoming Events

- **SciREN Greenville Educator Open House**

November 15, Go Science

- **APNEP / NEP 30th Anniversary 2017**

APNEP Communications



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