

North Carolina Estuarine Shoreline Mapping Project

Municipality Statistics

June 2013

Prepared by: Kevin McVerry
North Carolina Division of Coastal Management
Department of Environment and Natural Resources

Outline

I. Project Background

Introduction.....	1
Methodology.....	1
Analysis.....	2

II. Analysis Results

Alliance.....	3
Atlantic Beach.....	4
Aurora.....	5
Bald Head Island.....	6
Bath.....	7
Bayboro.....	8
Beaufort.....	9
Belhaven.....	10
Belville.....	11
Bogue.....	12
Bridgeton.....	13
Calabash.....	14
Cape Carteret.....	15
Carolina Beach.....	16
Caswell Beach.....	17
Cedar Point.....	18
Columbia.....	19
Duck.....	20
Edenton.....	21
Elizabeth City.....	22
Emerald Isle.....	23
Gatesville.....	24
Havelock.....	25
Hertford.....	26
Holden Beach.....	27
Holly Ridge.....	28
Indian Beach.....	29
Jacksonville.....	30
Kill Devil Hills.....	31
Kitty Hawk.....	32
Kure Beach.....	33

Leland.....	34
Manteo.....	35
Mesic.....	36
Minnesott Beach.....	37
Morehead City.....	38
Murfreesboro.....	39
Nags Head.....	40
Navassa.....	41
New Bern.....	42
Newport.....	43
North Topsail Beach.....	44
Oak Island.....	45
Ocean Isle Beach.....	46
Oriental.....	47
Peletier.....	48
Pine Knoll Shores.....	49
Plymouth.....	50
River Bend.....	51
Saint James.....	52
Shalotte.....	53
Southern Shores.....	54
Southport.....	55
Stonewall.....	56
Sunset Beach.....	57
Surf City.....	58
Swansboro.....	59
Topsail Beach.....	60
Trent Woods.....	61
Vanceboro.....	62
Vandemere.....	63
Varnamtown.....	64
Washington Park.....	65
Washington.....	66
Wilmington.....	67
Windsor.....	68
Winfall.....	69
Winton.....	70
Wrightsville Beach.....	71
Summary.....	72

Introduction

The North Carolina Department of the Environment and Natural Resources (DENR) Division of Coastal Management (DCM) is charged with the management and conservation of the state's coastal resources. The ability of DCM and other stakeholders to manage coastal resources could be augmented through the enhancement of digital mapping products, specifically, the representation of the estuarine shorelines as well as modification of those shorelines.

Recognizing that the creation of a digital shoreline based in a spatial framework would facilitate the ability of DCM and other agencies to monitor future trends of shoreline change, the Division developed a methodology for mapping the state's estuarine shoreline. DCM completed the methodology in June 2008 and began the mapping process in-house and through a contract with East Carolina University's Department of Geological Sciences and the Institute for Coastal Science and Policy.

The goal of the project was to identify the shoreline types and associated structures along each portion of shoreline. This work is intended to provide data and support the development and implementation of a sustainable estuarine shoreline policy for North Carolina. The completed shoreline data is available on DCM's website for use by other DENR agencies, local governments, academic institutions and interested stakeholders. Its application will vary dependent on the agency using it, however agencies will be able to link their own unique attributes and/or data to the shoreline and use it to better understand the physical and biological processes associated with North Carolina's estuarine shoreline.

Methodology

The DCM developed a methodology for digitally mapping a contiguous estuarine shoreline for North Carolina's 20 coastal counties under the jurisdiction of the NC Coastal Area Management Act (CAMA). This mapping included:

1. Delineation of the estuarine shoreline (land-water interface) with it broken down into five distinct shoreline types (marsh, swamp forest, modified with an engineered structure, sediment bank, and miscellaneous);
2. Delineation of shoreline stabilization structures (bulkhead, boat ramp, riprap revetment breakwaters, sills, and groins)
3. Delineation of structures that are typically found over water (piers, floating docks, wharves, and bridges).

This methodology utilized heads-up digitizing in ArcGIS[®], as this approach is widely used, accurate and affordable. The shoreline was digitized from geo-referenced, county-level aerial orthophotographs in NAD 1983 state plane feet. Digitizing was done on a county-by-county basis and each county shoreline was digitized using the most recent aerial imagery available/accessible for that county. Digitizing is accomplished using visual cues, pre-established digitizing rules and DCM-generated vegetation land-cover polygons to assist in segmenting the shoreline into various shoreline types. The final estuarine shoreline delineation consists of three distinct files. The first file is a linear estuarine shoreline broken down into five shoreline types (marsh, swamp forest, sediment bank, modified with engineered structure, and miscellaneous). The second file includes linear shoreline stabilization structures that are both coincident with the shoreline (also mapped as the modified with engineered structure shoreline type) and those that are landward of and/or waterward of the shoreline (breakwater, bulkhead, boat ramp, sill, groin, and riprap revetment). The final file contains polygon

shaped structures that are typically over water (piers, floating docks, wharves, and bridges), but also includes parts of the structures mapped that are over land as well.

To review DCM's approach to digitizing the estuarine shoreline, please see *Charting the Estuarine Environment: A methodology for spatially delineating a contiguous, estuarine shoreline for North Carolina* (available at <http://dcm2.enr.state.nc.us/estuarineshoreline/Complete%20Methodology%20Report.pdf>).

Statistics

A need was identified to have project data and statistics available at a finer scale than by county-level. For the purpose of this report shoreline data was summarized by municipality. The digital GIS Municipal Boundaries layer created by the North Carolina Department of Transportation was used to extract shoreline and structure data. This GIS layer was updated in February of 2012 and contains boundaries for municipalities that participate in the Powell Bill in addition to some municipalities that don't participate in the Powell Bill¹. The data layer was overlaid on shoreline data to identify shoreline and structures within each municipality.

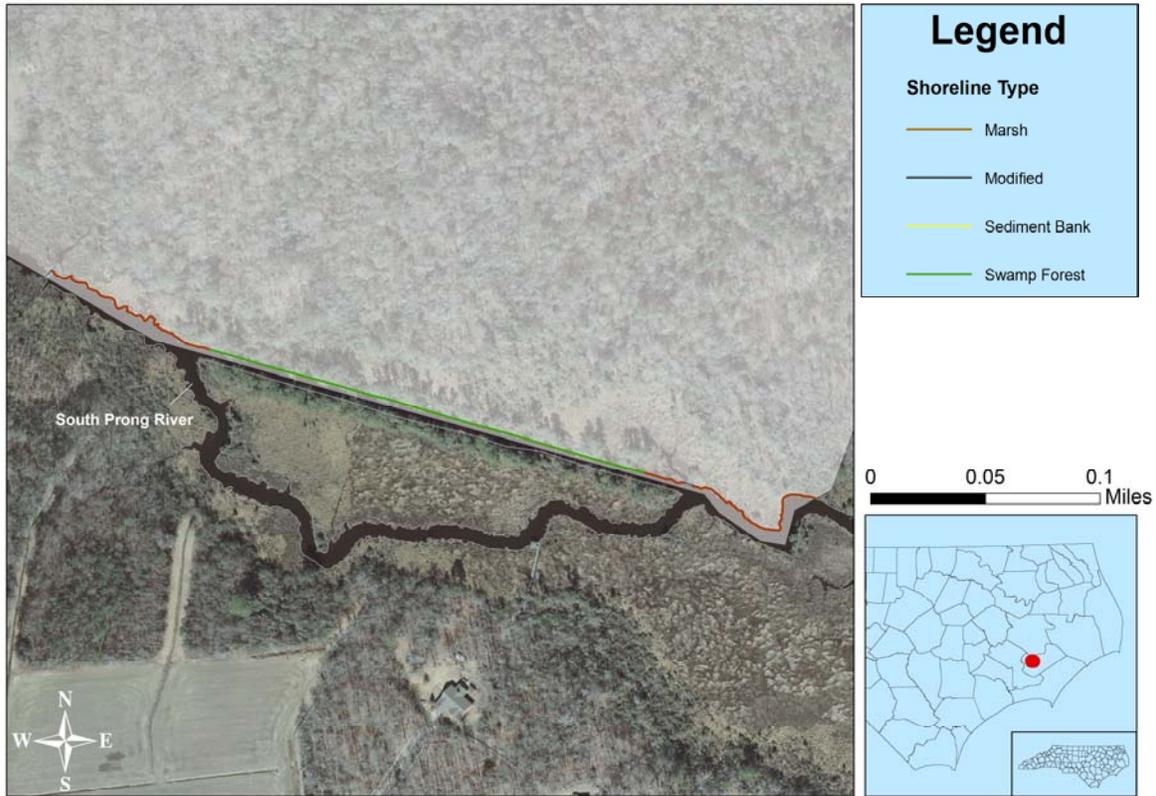
The shoreline itself is broken down into total length for each of the five shoreline types designated in DCM's estuarine shoreline delineation methodology. The statistics presented for modified with an engineered structure represent only a subset of the total structures present in the counties because only structures that are coincident with the estuarine shoreline (i.e. bulkheads) can be represented by the modified shoreline category. Additional structures, while important to understanding the overall modification and utilization of the estuarine shoreline and access to estuarine/public trust resources, are not included in the statistics for shoreline composition if they are not coincident with the shoreline. Therefore, when statistics are run for the overall length of erosion control/stabilization structures along the estuarine shoreline, this number will be greater than the correlating percentage in length that is represented by the modified shoreline category, as this category does not account for non-shoreline coincident structures.

The shoreline stabilization structure file was broken down into total length for each of the shoreline stabilization structures in miles. Again, these numbers do not add up to the same numbers presented in the modified shoreline structure breakdown because additional structures were mapped in this file.

Statistics generated for the polygon structures file (representing docks, piers, etc.) were broken down into total area in acres for each of the different structure types.

¹The Powell Bill or State Street-Aid Program provides funds for maintaining, repairing, constructing, reconstructing, or widening of local streets that are the responsibility of the municipalities or for planning, construction, and maintenance of bikeways or sideways along public streets and highways.
connect.ncdot.gov/municipalities/State-Street-Aid/Pages/default.aspx

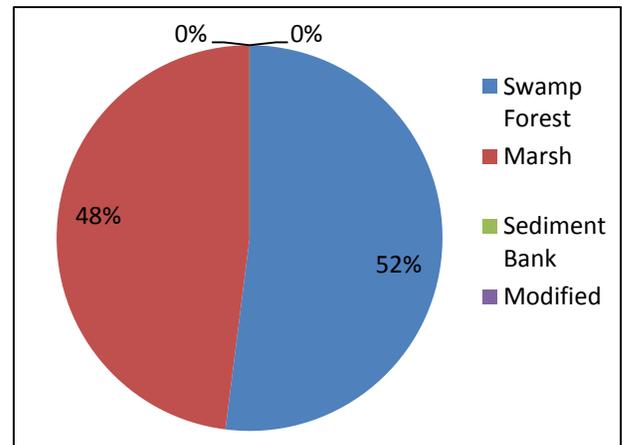
Alliance



Estuarine Shoreline

Total Mileage: .4

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	.2	52%
Marsh	.2	48%
Sediment Bank	0	0%
Modified	0	0%



Stabilization Structures

Total Mileage: 0

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	0	0	0
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	0	0	0
Bulkhead	0	0	0

Shoreline Access Structures

Total Acreage: 0

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	0	0

Atlantic Beach



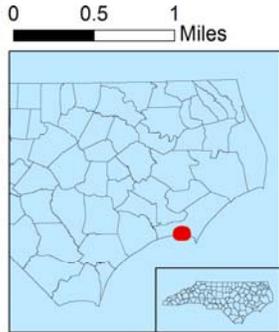
Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

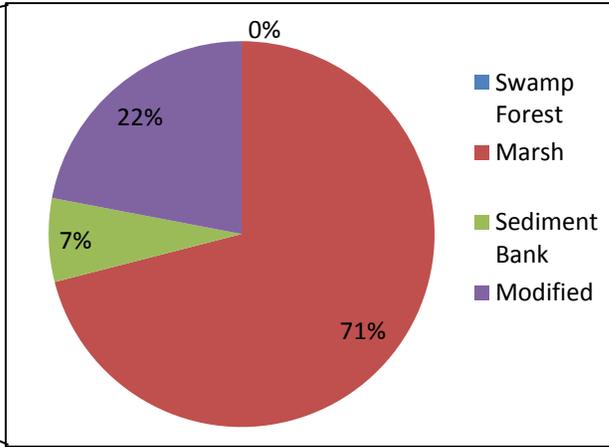
Other

- NC Shoreline
- Shoreline Access Structures



Estuarine Shoreline
Total Mileage: 43.4

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	30.9	71%
Sediment Bank	3.0	7%
Modified	9.5	22%



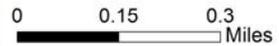
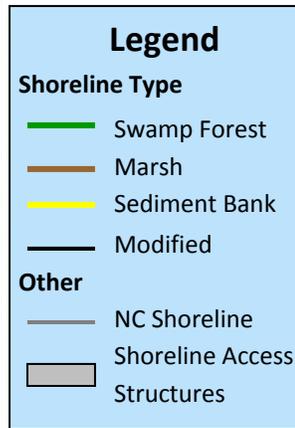
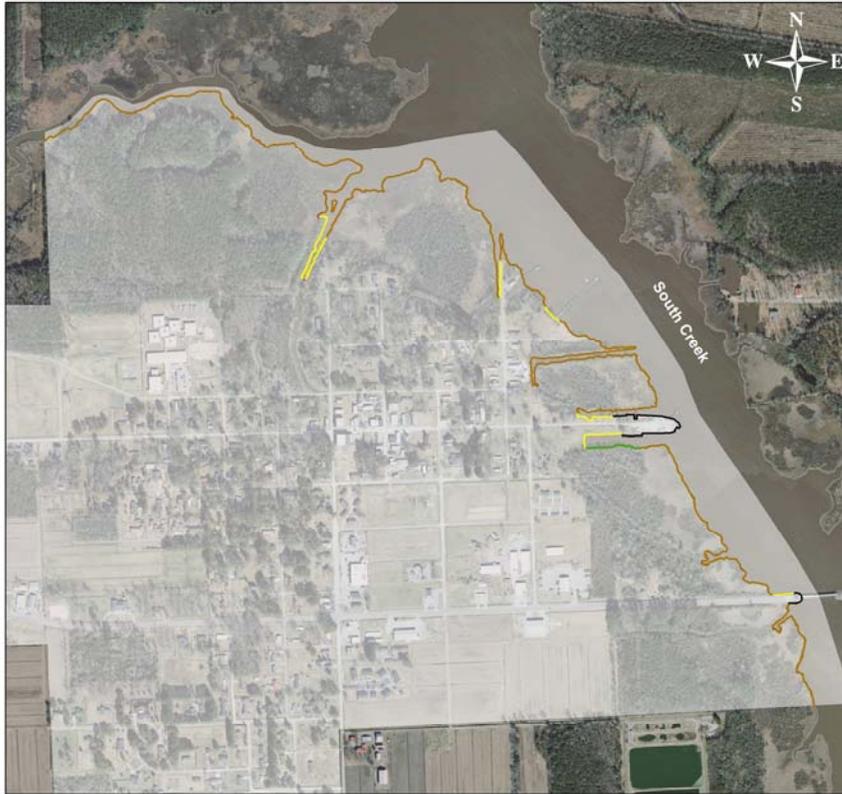
Stabilization Structures
Total Mileage: 12.5

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	572	.1	43
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	1,612	.3	10
Bulkhead	64,121	12.1	115

Shoreline Access Structures
Total Acreage: 11.8

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	11.8	989

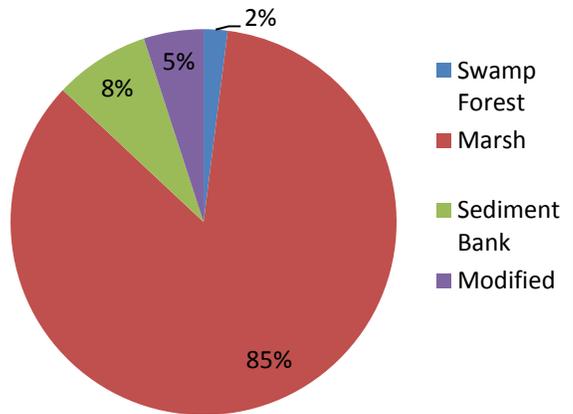
Aurora



Estuarine Shoreline

Total Mileage: 5.7

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	.1	2%
Marsh	4.8	85%
Sediment Bank	.5	8%
Modified	.3	5%



Stabilization Structures

Total Mileage: .3

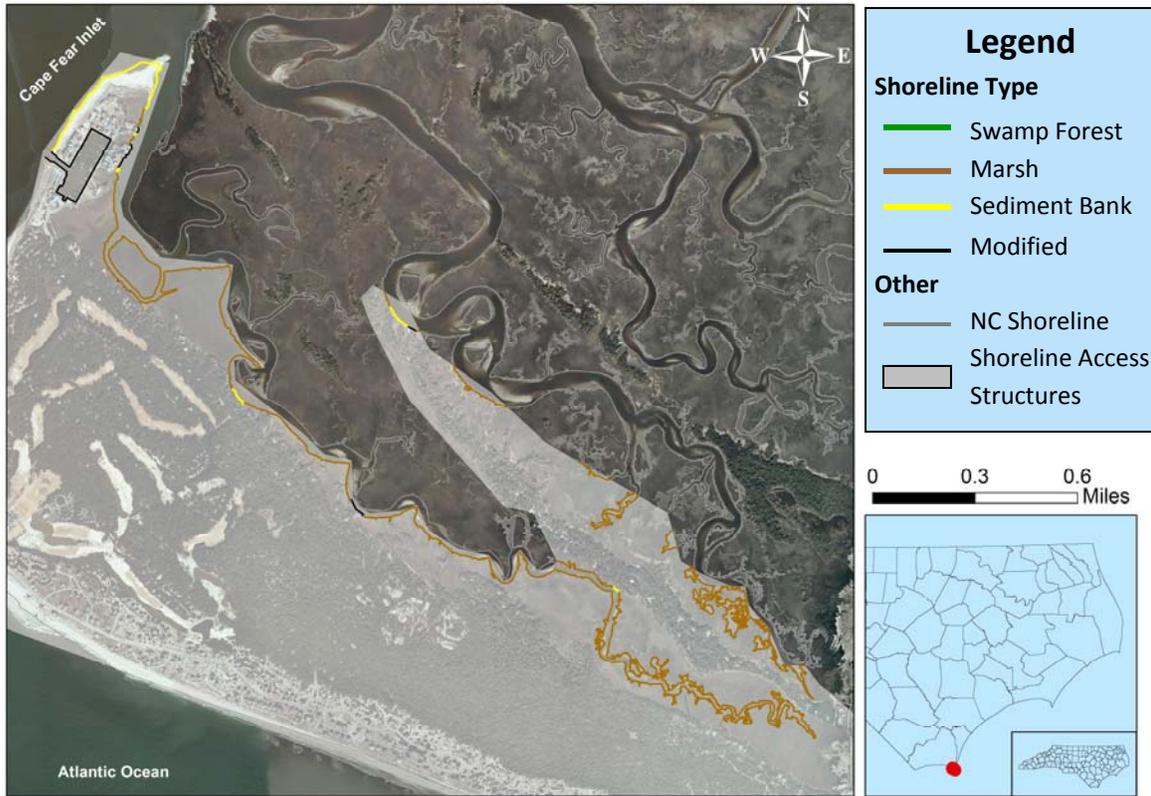
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	32	<.1	1
Breakwater	0	0	0
Groin/Jetty	107	<.1	2
Sill	0	0	0
Rip-Rap	321	.1	2
Bulkhead	1,047	.2	3

Shoreline Access Structures

Total Acreage: .15

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	.15	4

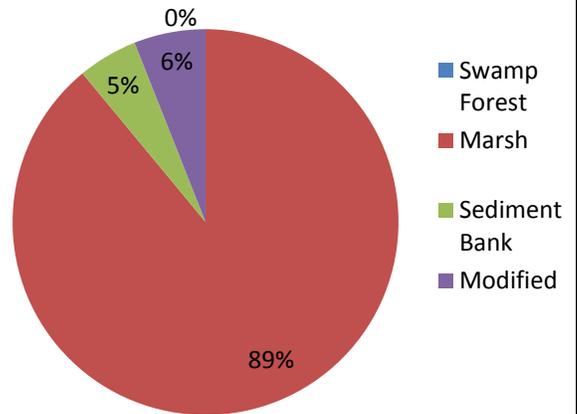
Bald Head Island



Estuarine Shoreline

Total Mileage: 15.2

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	13.5	89%
Sediment Bank	.8	5%
Modified	.9	6%



Stabilization Structures

Total Mileage: 1.1

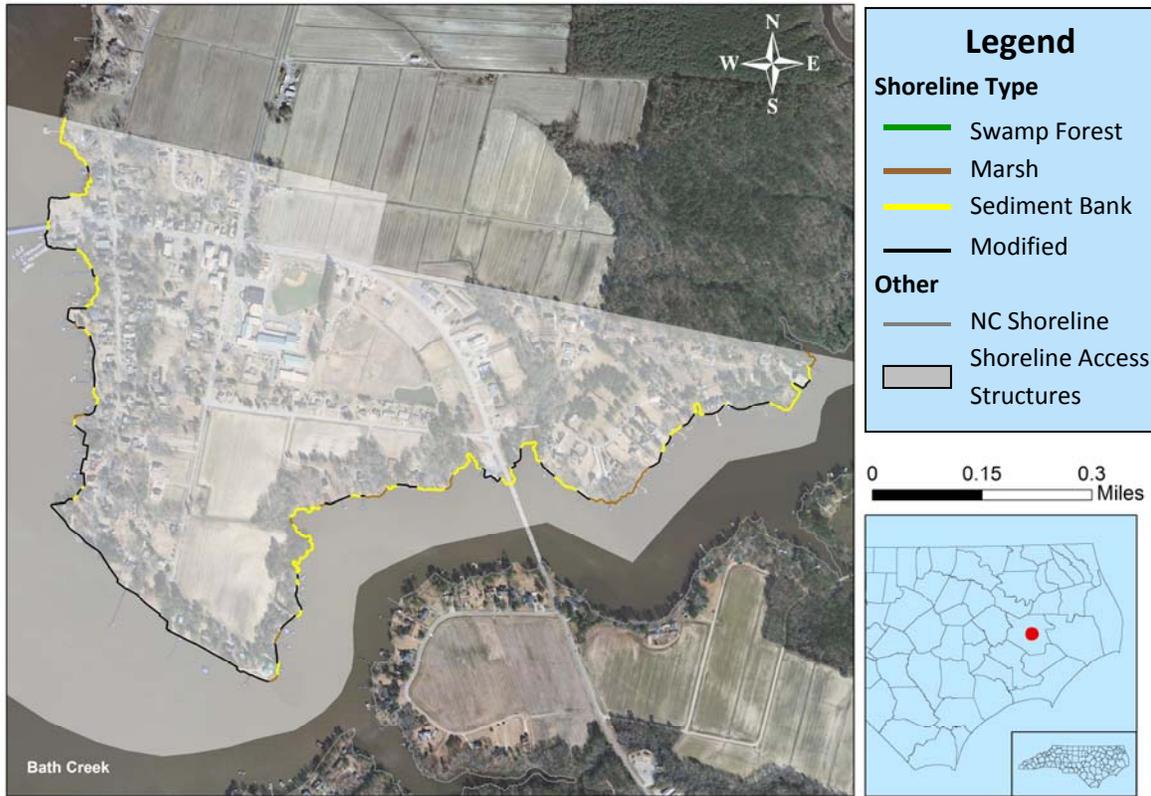
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	43	<.1	3
Breakwater	0	0	0
Groin/Jetty	450	.1	3
Sill	0	0	0
Rip-Rap	275	.1	3
Bulkhead	4,531	.9	7

Shoreline Access Structures

Total Acreage: 2.1

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	2.1	39

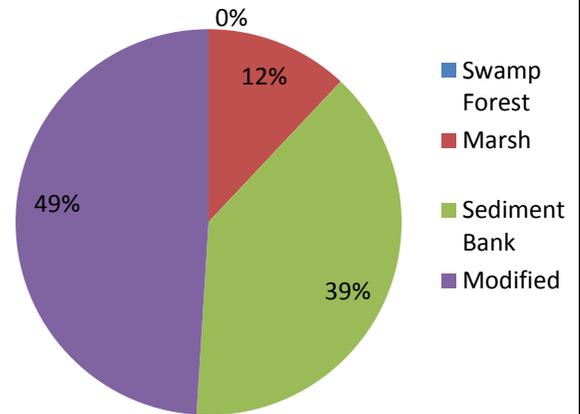
Bath



Estuarine Shoreline

Total Mileage: 2.8

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	.3	12%
Sediment Bank	1.1	39%
Modified	1.4	49%



Stabilization Structures

Total Mileage: 1.5

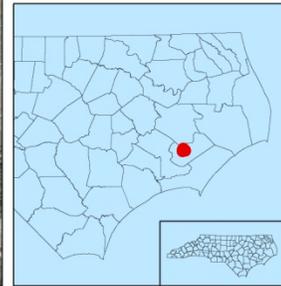
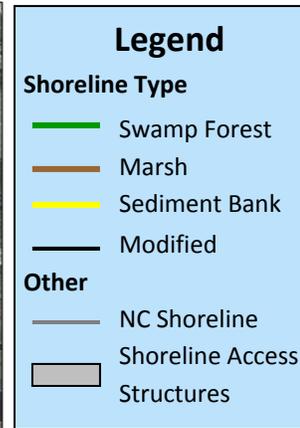
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	37	<.1	3
Breakwater	0	0	0
Groin/Jetty	136	<.1	1
Sill	0	0	0
Rip-Rap	863	.2	9
Bulkhead	6,788	1.3	40

Shoreline Access Structures

Total Acreage: 1.3

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.2	1
Pier/Float Dock/Wharf	1.1	71

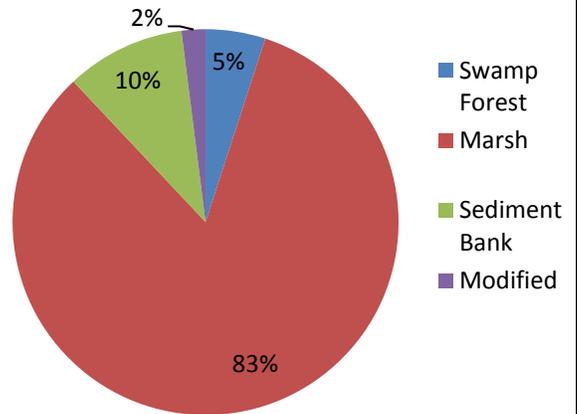
Bayboro



Estuarine Shoreline

Total Mileage: 6.6

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	.3	5%
Marsh	5.5	83%
Sediment Bank	.6	10%
Modified	.2	2%



Stabilization Structures

Total Mileage: .2

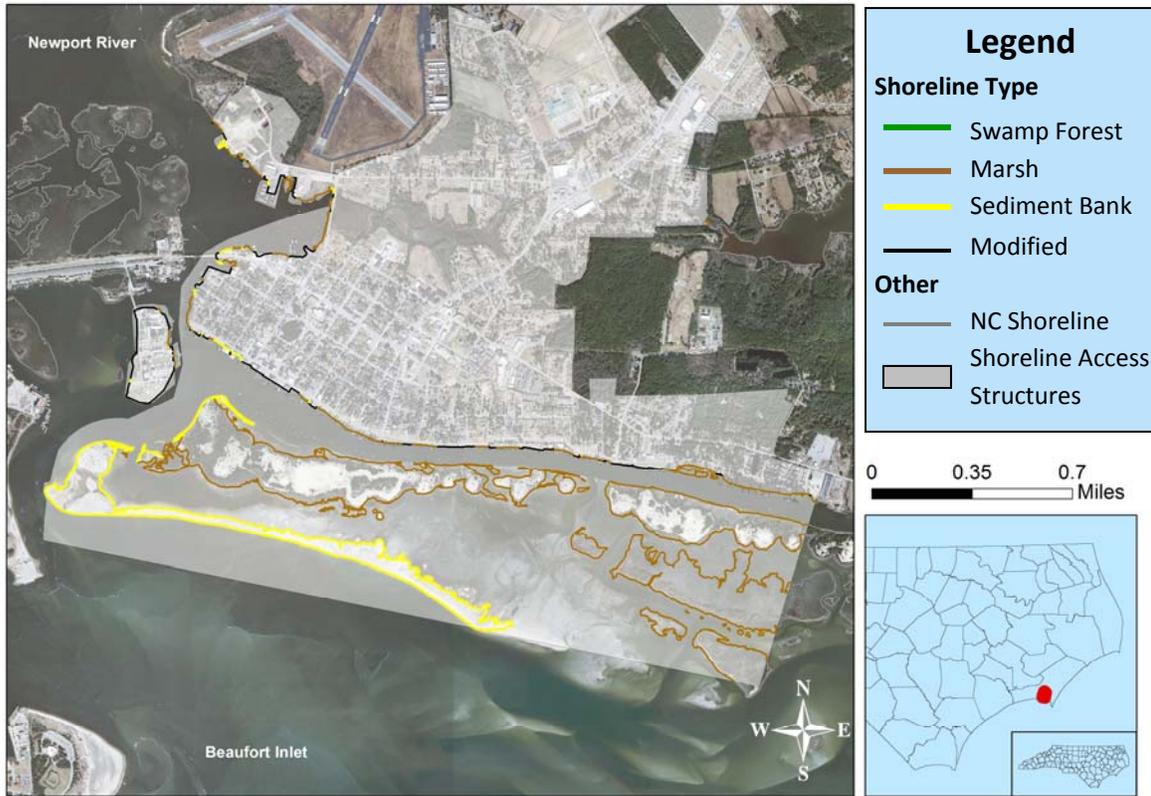
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	47	<.1	3
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	0	0	0
Bulkhead	967	.2	4

Shoreline Access Structures

Total Acreage: .21

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.11	2
Pier/Float Dock/Wharf	.20	13

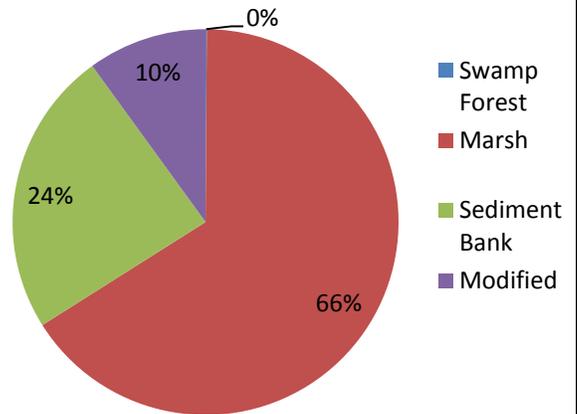
Beaufort



Estuarine Shoreline

Total Mileage: 25.7

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	<.1	<1%
Marsh	17.0	66%
Sediment Bank	6.1	24%
Modified	2.6	10%



Stabilization Structures

Total Mileage: 3.2

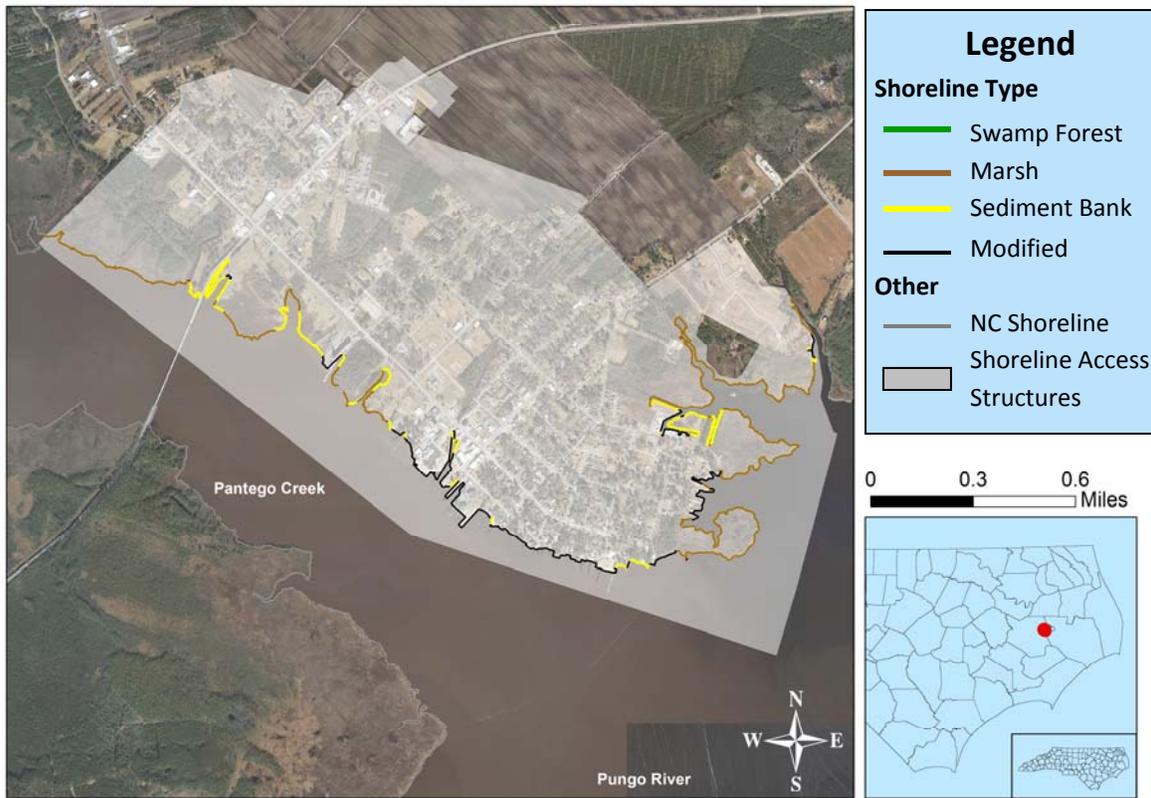
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	220	<.1	8
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	586	.1	5
Rip-Rap	4,740	.9	27
Bulkhead	11,749	2.2	48

Shoreline Access Structures

Total Acreage: 5.3

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	5.3	171

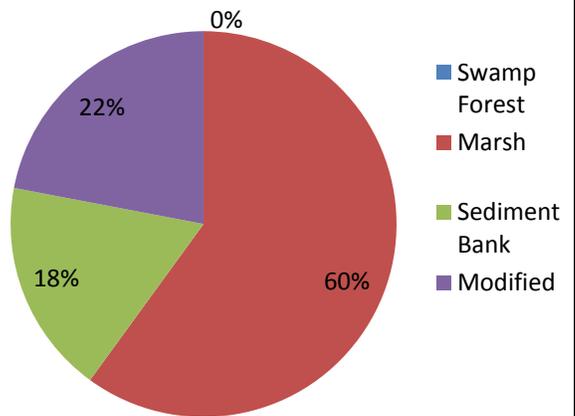
Belhaven



Estuarine Shoreline

Total Mileage: 12.4

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	7.4	60%
Sediment Bank	2.3	18%
Modified	2.7	22%



Stabilization Structures

Total Mileage: 2.9

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	183	<.1	8
Breakwater	0	0	0
Groin/Jetty	642	.1	12
Sill	0	0	0
Rip-Rap	4,540	.9	17
Bulkhead	9,855	1.9	41

Shoreline Access Structures

Total Acreage: 1.0

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	1.0	54

Belville



Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

Other

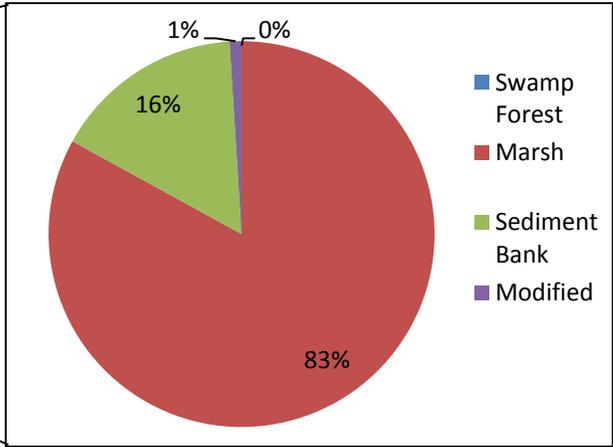
- NC Shoreline
- Shoreline Access Structures

0 0.25 0.5 Miles



Estuarine Shoreline
Total Mileage: 3.4

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	2.9	83%
Sediment Bank	.5	16%
Modified	<.1	1%



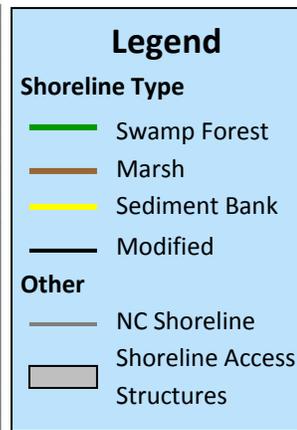
Stabilization Structures
Total Mileage: .04

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	60	.01	2
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	0	0	0
Bulkhead	161	.03	1

Shoreline Access Structures
Total Acreage: 1.0

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	1.0	14

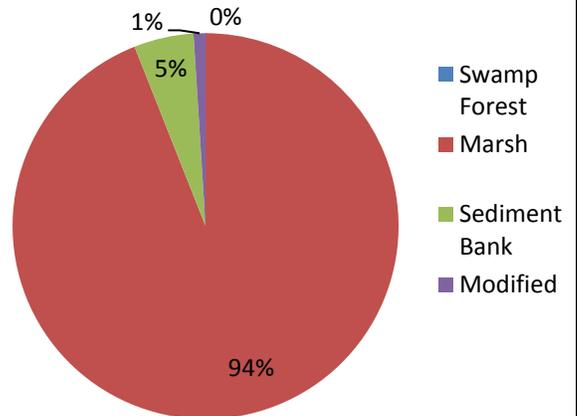
Bogue



Estuarine Shoreline

Total Mileage: 6.0

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	5.7	94%
Sediment Bank	.3	5%
Modified	<.1	1%



Stabilization Structures

Total Mileage: .03

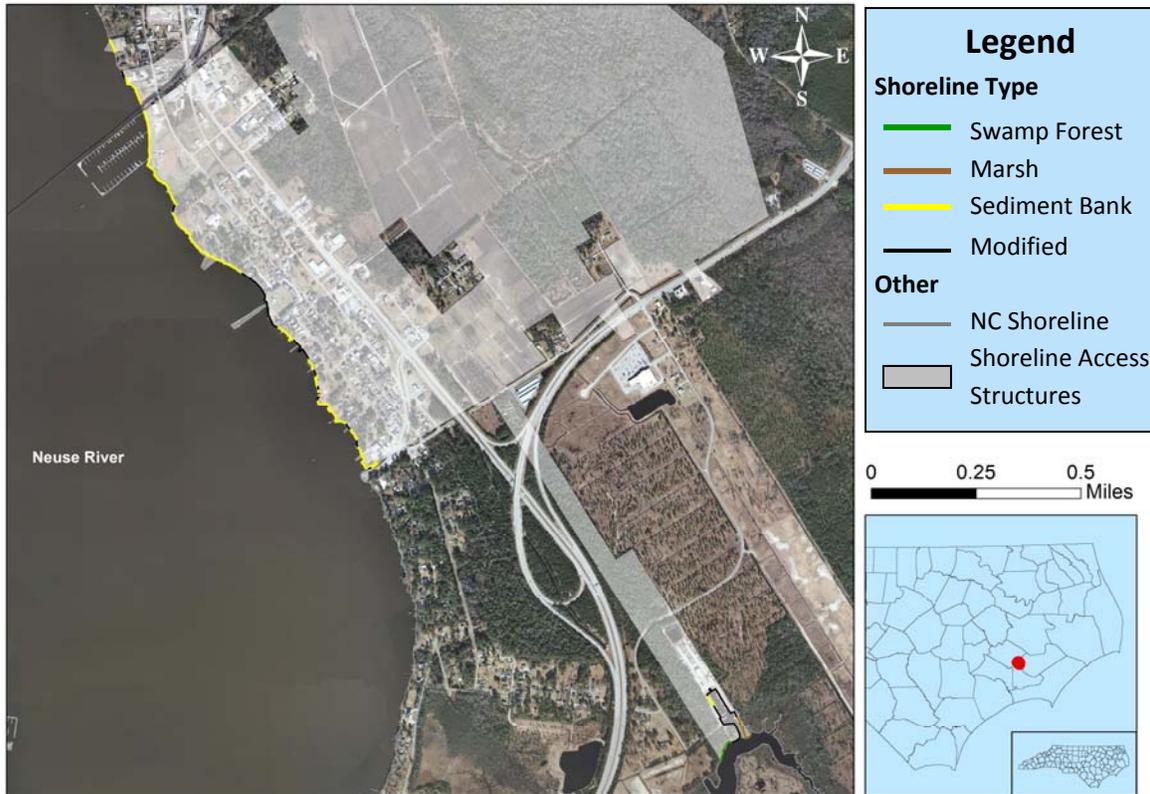
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	17	<.01	1
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	0	0	0
Bulkhead	156	.03	2

Shoreline Access Structures

Total Acreage: .26

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	.26	15

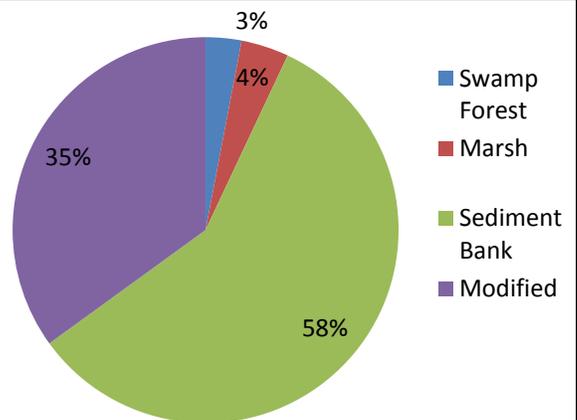
Bridgeton



Estuarine Shoreline

Total Mileage: 1.8

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	.1	3%
Marsh	.1	4%
Sediment Bank	1.0	58%
Modified	.6	35%



Stabilization Structures

Total Mileage: .7

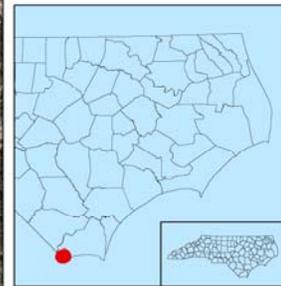
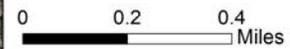
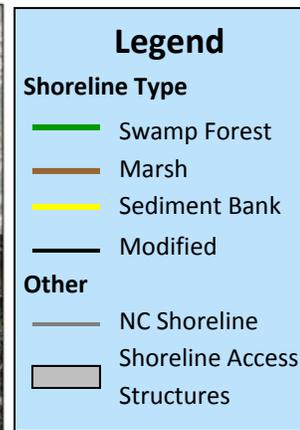
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	0	0	0
Breakwater	0	0	0
Groin/Jetty	27	<.1	1
Sill	0	0	0
Rip-Rap	1,594	.3	5
Bulkhead	2,073	.4	12

Shoreline Access Structures

Total Acreage: .37

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	.37	35

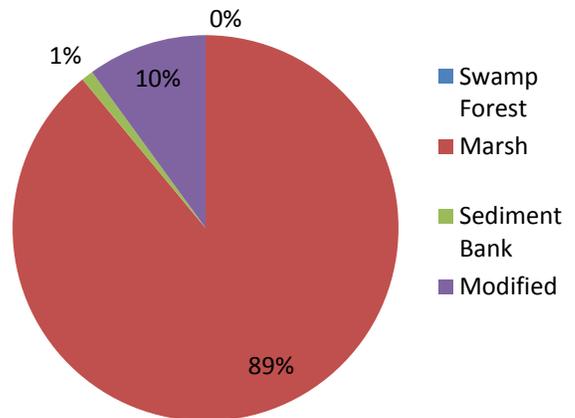
Calabash



Estuarine Shoreline

Total Mileage: 7.7

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	6.9	89%
Sediment Bank	<.1	1%
Modified	.8	10%



Stabilization Structures

Total Mileage: 1.0

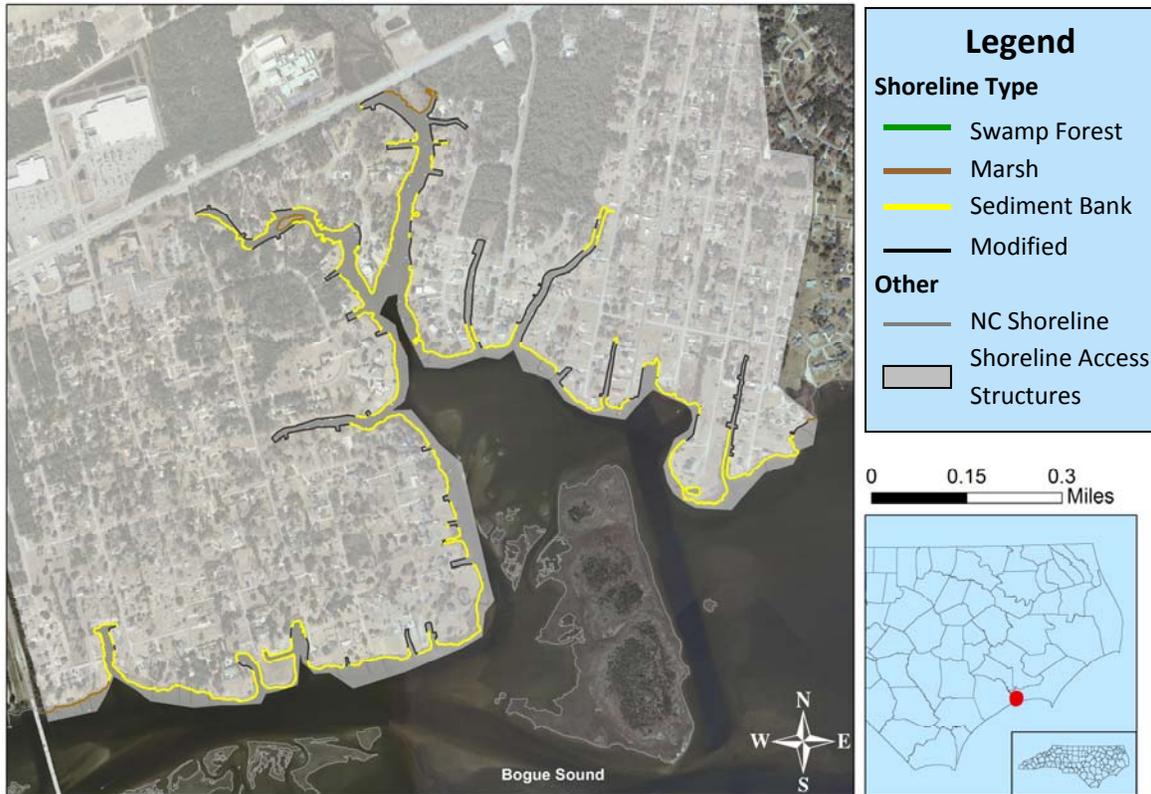
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	29	<.1	2
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	2,028	.4	5
Bulkhead	3,032	.6	4

Shoreline Access Structures

Total Acreage: 1.5

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	1.5	33

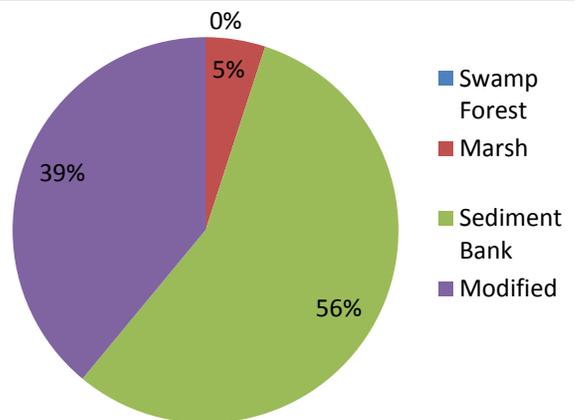
Cape Carteret



Estuarine Shoreline

Total Mileage: 8.5

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	.4	5%
Sediment Bank	4.8	56%
Modified	3.3	39%



Stabilization Structures

Total Mileage: 3.9

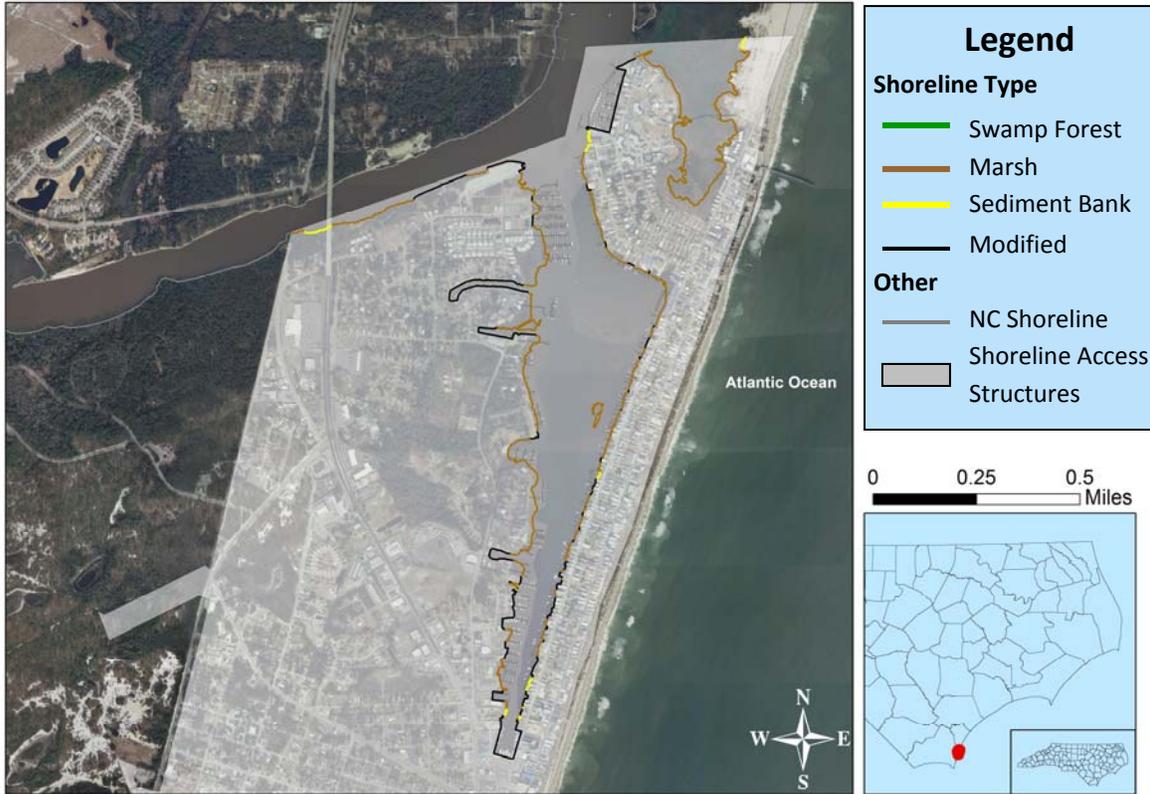
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	90	<.1	8
Breakwater	274	.1	1
Groin/Jetty	199	<.1	2
Sill	0	0	0
Rip-Rap	225	<.1	1
Bulkhead	20,262	3.8	62

Shoreline Access Structures

Total Acreage: 1.4

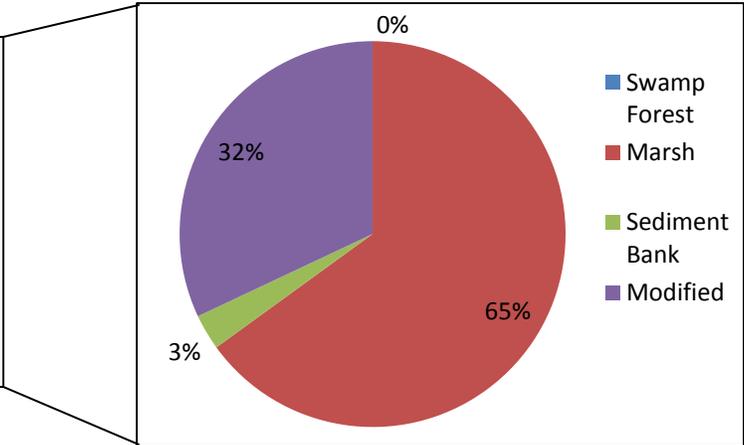
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	1.4	147

Carolina Beach



Estuarine Shoreline
Total Mileage: 8.0

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	5.1	65%
Sediment Bank	.3	3%
Modified	2.6	32%



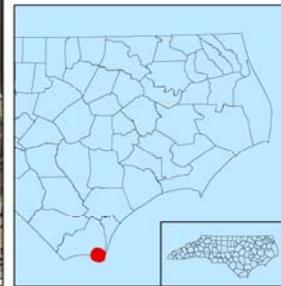
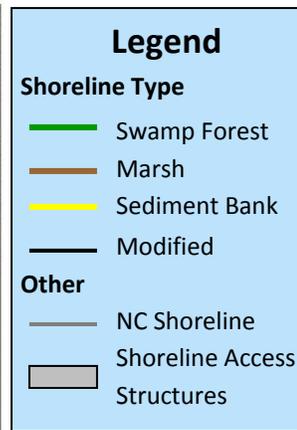
Stabilization Structures
Total Mileage: 4.0

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	114	<.1	5
Breakwater	956	.2	3
Groin/Jetty	192	<.1	5
Sill	0	0	0
Rip-Rap	757	.1	1
Bulkhead	19,428	3.7	32

Shoreline Access Structures
Total Acreage: 7.7

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	7.7	231

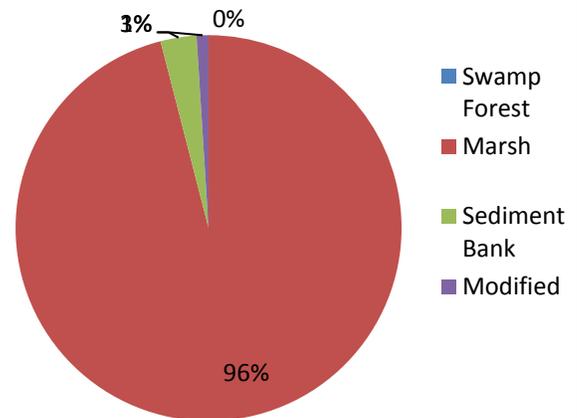
Caswell Beach



Estuarine Shoreline

Total Mileage: 36.1

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	34.7	96%
Sediment Bank	1.2	3%
Modified	.2	1%



Stabilization Structures

Total Mileage: .2

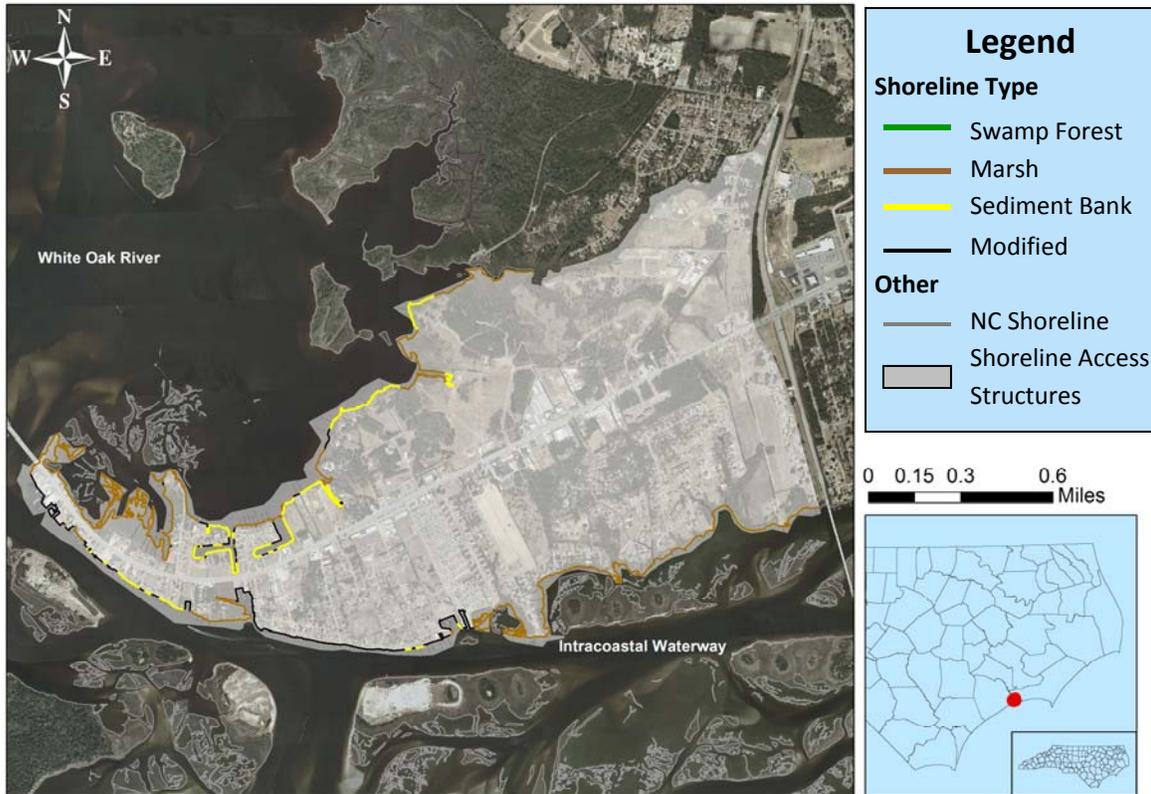
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	0	0	0
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	1,247	.2	1
Bulkhead	0	0	0

Shoreline Access Structures

Total Acreage: .91

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	.91	2

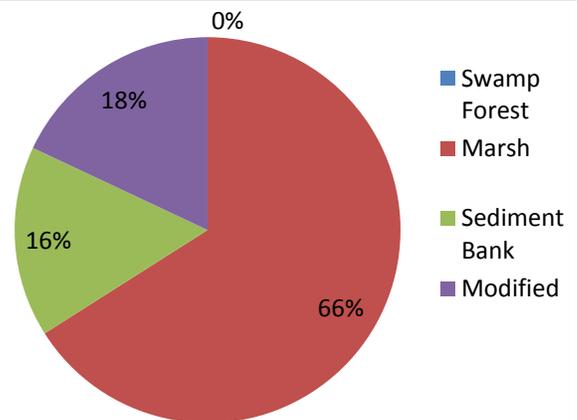
Cedar Point



Estuarine Shoreline

Total Mileage: 13.6

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	9.0	66%
Sediment Bank	2.1	16%
Modified	2.5	18%



Stabilization Structures

Total Mileage: 2.9

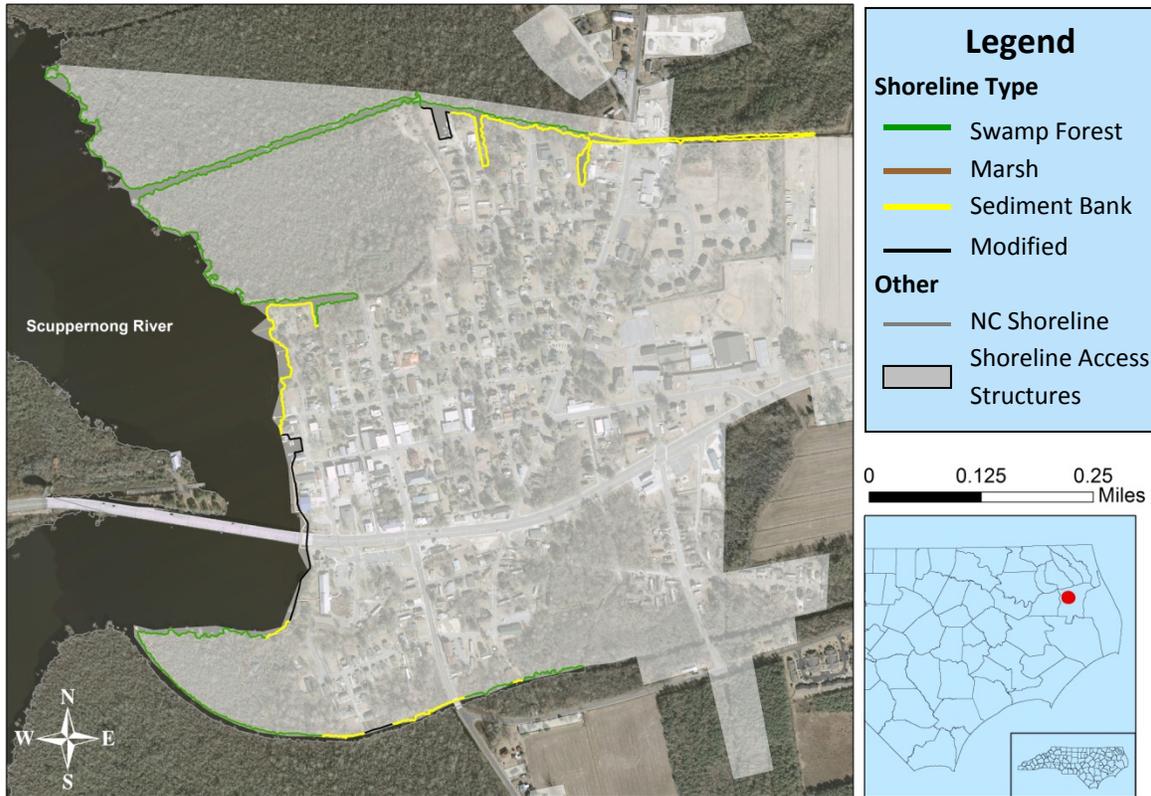
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	312	.1	24
Breakwater	0	0	0
Groin/Jetty	42	<.1	2
Sill	0	0	0
Rip-Rap	3,377	.6	17
Bulkhead	11,745	2.2	68

Shoreline Access Structures

Total Acreage: 3.6

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	3.6	253

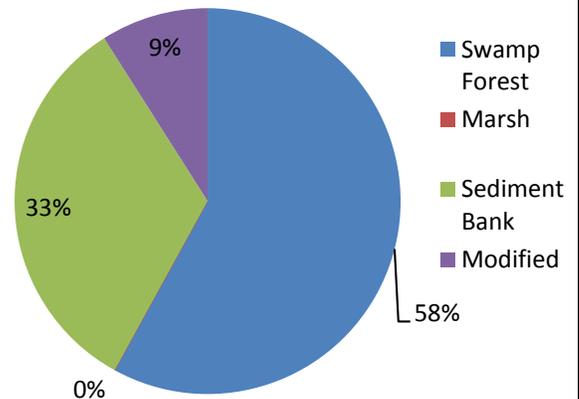
Columbia



Estuarine Shoreline

Total Mileage: 4.2

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	2.4	58%
Marsh	0	0%
Sediment Bank	1.4	33%
Modified	.4	9%



Stabilization Structures

Total Mileage: .3

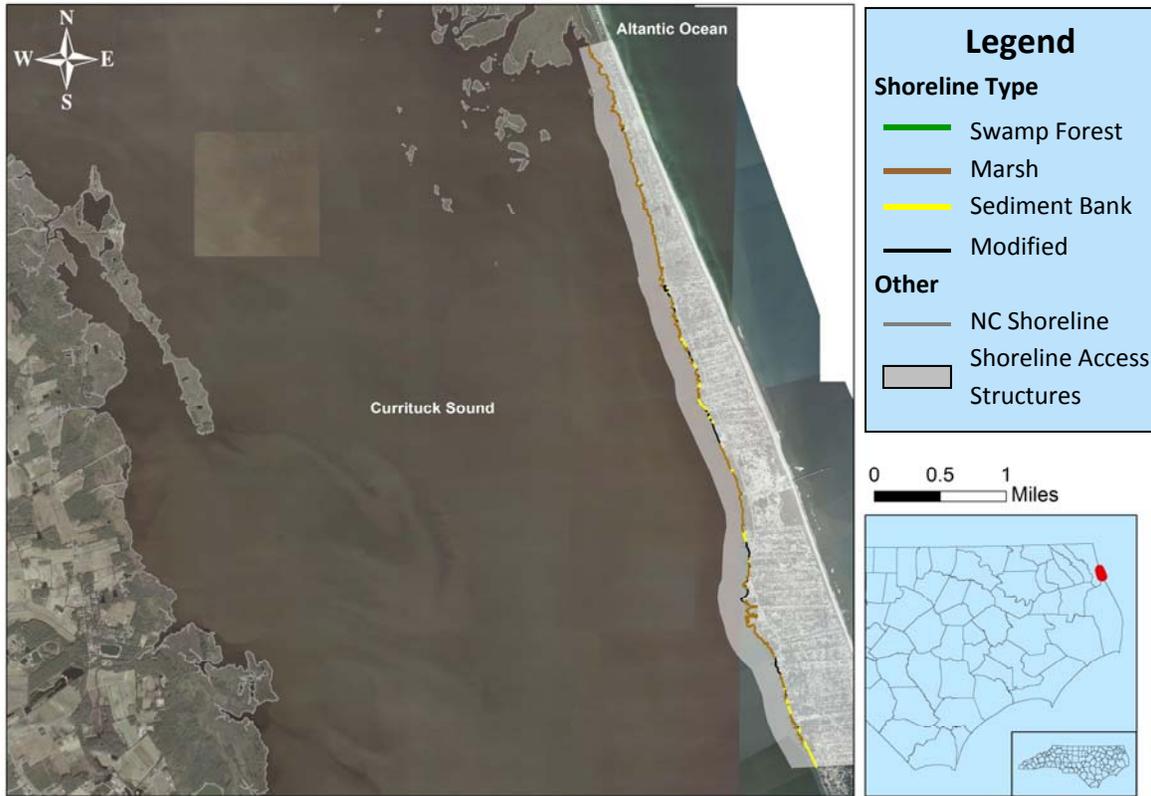
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	25	<.1	1
Breakwater	0	0	0
Groin/Jetty	23	<.1	1
Sill	0	0	0
Rip-Rap	1,312	.2	1
Bulkhead	668	.1	3

Shoreline Access Structures

Total Acreage: .72

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	.72	8

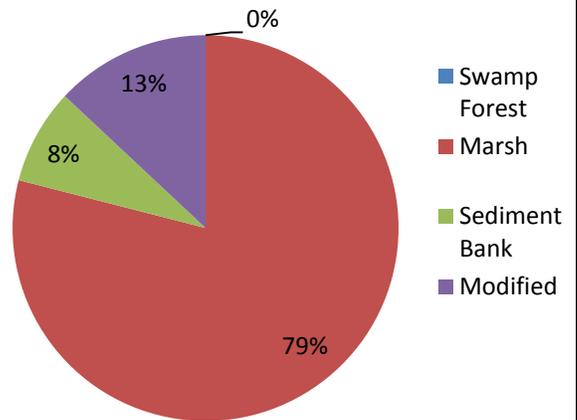
Duck



Estuarine Shoreline

Total Mileage: 10.1

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	8.0	79%
Sediment Bank	.8	8%
Modified	1.3	13%



Stabilization Structures

Total Mileage: 2.7

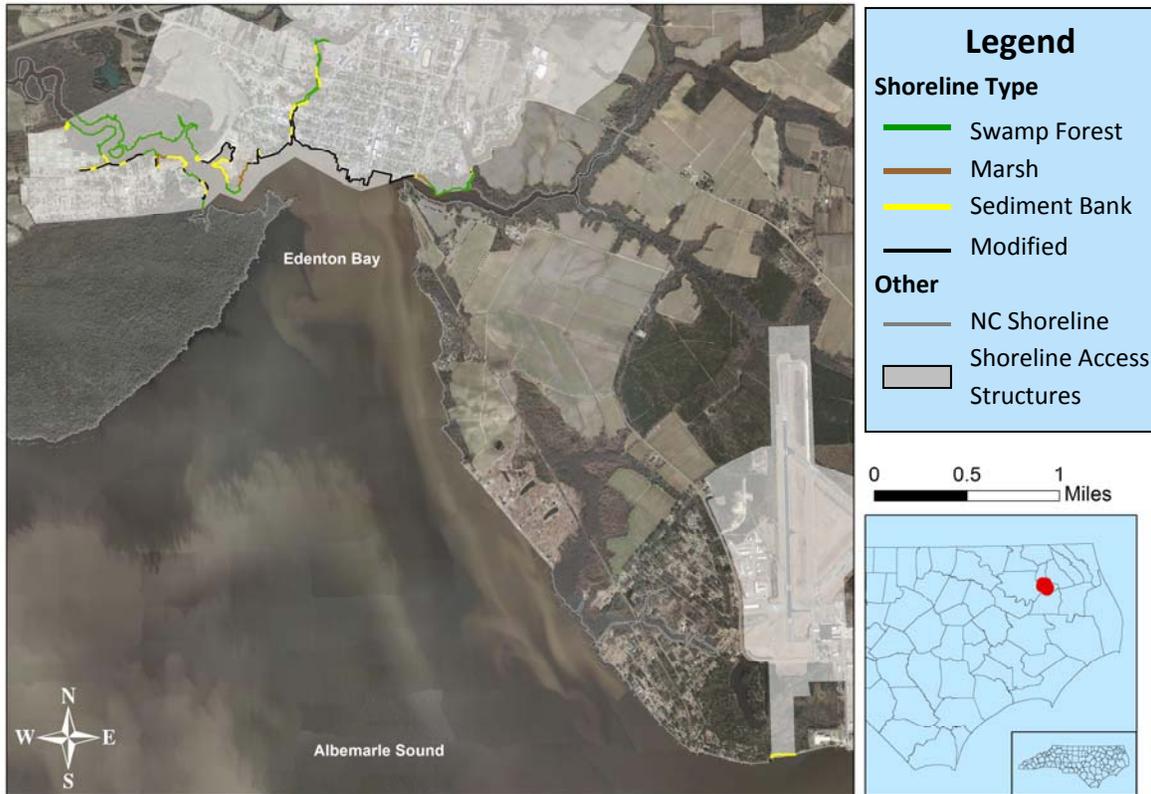
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	127	<.1	9
Breakwater	284	.1	2
Groin/Jetty	1,400	.3	17
Sill	0	0	0
Rip-Rap	1,028	.2	10
Bulkhead	11,302	2.1	36

Shoreline Access Structures

Total Acreage: 2.7

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	2.7	119

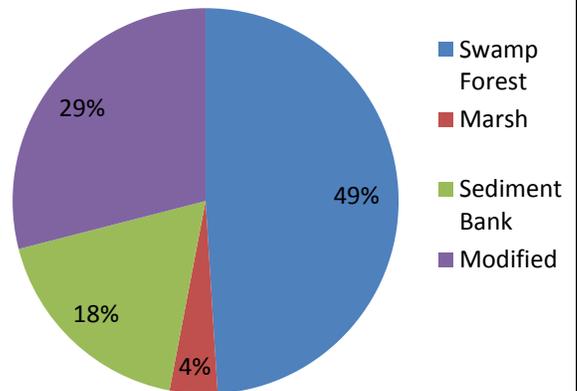
Edenton



Estuarine Shoreline

Total Mileage: 9.0

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	4.4	49%
Marsh	.4	4%
Sediment Bank	1.6	18%
Modified	2.6	29%



Stabilization Structures

Total Mileage: 2.8

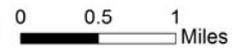
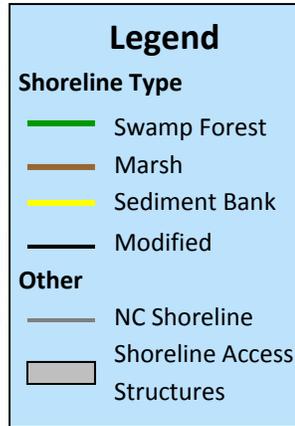
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	56	<.1	2
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	1,427	.3	8
Bulkhead	13,149	2.5	26

Shoreline Access Structures

Total Acreage: 1.4

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.3	3
Pier/Float Dock/Wharf	1.1	86

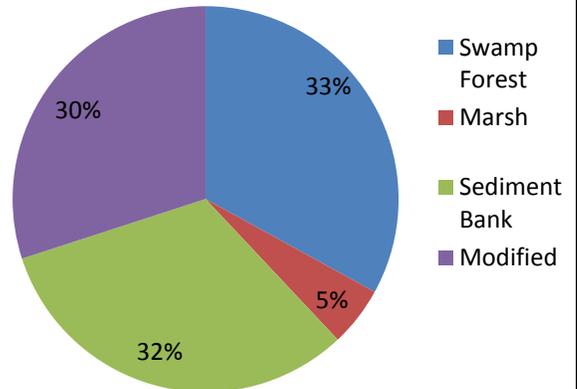
Elizabeth City



Estuarine Shoreline

Total Mileage: 25.2

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	8.4	33%
Marsh	1.2	5%
Sediment Bank	8.1	32%
Modified	7.5	30%



Stabilization Structures

Total Mileage: 7.6

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	139	<.1	10
Breakwater	0	0	0
Groin/Jetty	247	<.1	5
Sill	0	0	0
Rip-Rap	3,225	.6	21
Bulkhead	36,996	7.0	73

Shoreline Access Structures

Total Acreage: 5.6

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	1.5	11
Pier/Float Dock/Wharf	4.1	152

Emerald Isle



Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

Other

- NC Shoreline
- Shoreline Access Structures

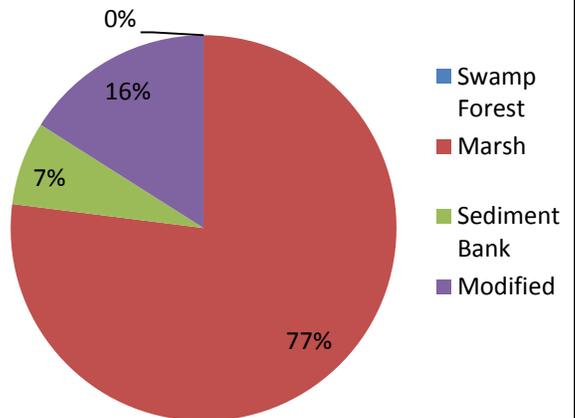
0 1.5 3 Miles



Estuarine Shoreline

Total Mileage: 100.0

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	76.9	77%
Sediment Bank	6.7	7%
Modified	16.4	16%



Stabilization Structures

Total Mileage: 6.2

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	220	<.1	16
Breakwater	0	0	0
Groin/Jetty	76	<.1	1
Sill	0	0	0
Rip-Rap	4,214	.8	14
Bulkhead	28,299	5.4	96

Shoreline Access Structures

Total Acreage: 15.0

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	15.0	600

Gatesville



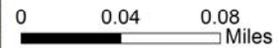
Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

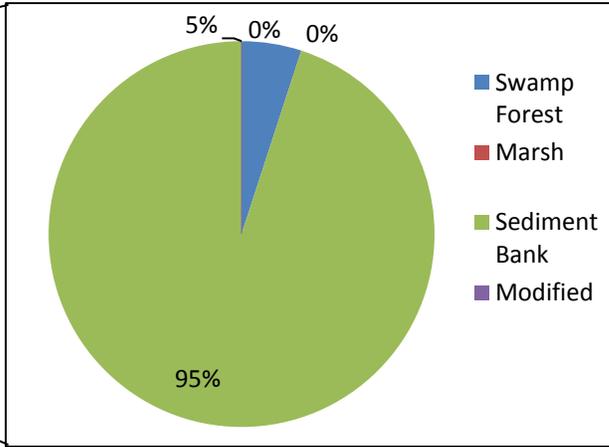
Other

- NC Shoreline
- Shoreline Access Structures



Estuarine Shoreline
Total Mileage: .1

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	<.1	5%
Marsh	0	0%
Sediment Bank	.1	95%
Modified	0	0%



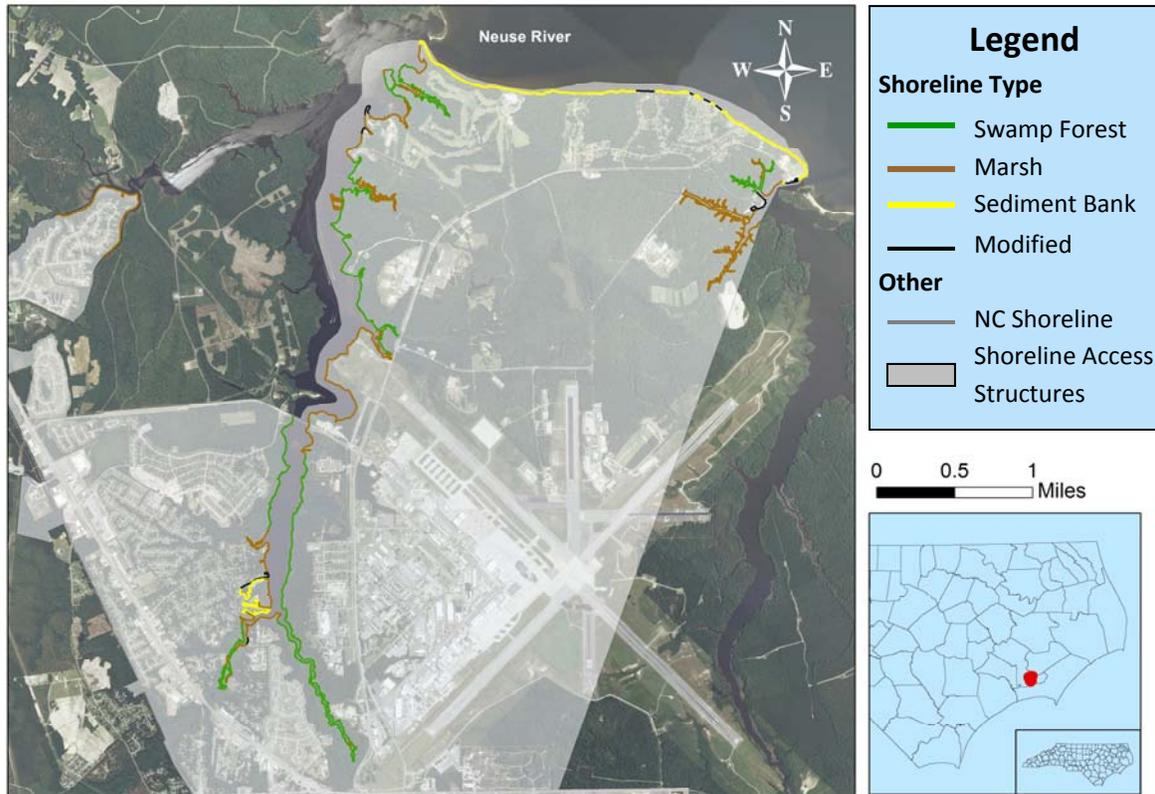
Stabilization Structures
Total Mileage: 0

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	0	0	0
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	0	0	0
Bulkhead	0	0	0

Shoreline Access Structures
Total Acreage: <.1

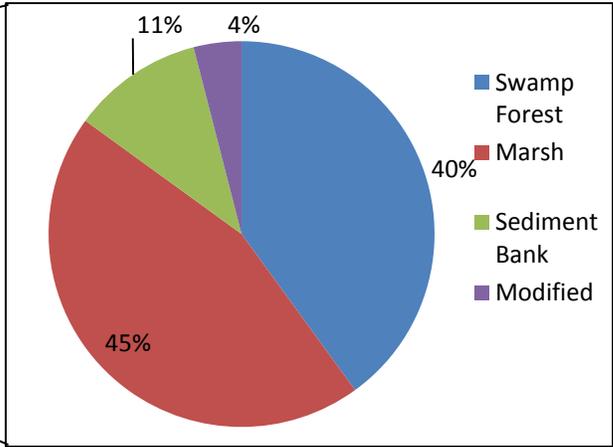
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	<.1	2

Havelock



Estuarine Shoreline
Total Mileage: 33.7

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	13.4	40%
Marsh	15.2	45%
Sediment Bank	3.7	11%
Modified	1.3	4%



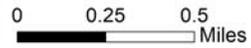
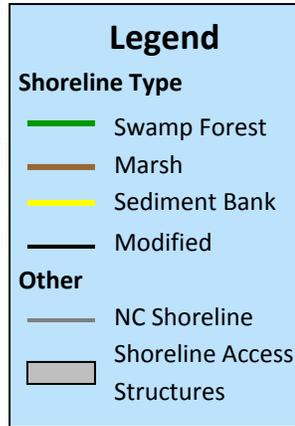
Stabilization Structures
Total Mileage: 1.3

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	36.4	<.1	2
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	308	.1	2
Bulkhead	6,599	1.2	15

Shoreline Access Structures
Total Acreage: 1.3

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.68	3
Pier/Float Dock/Wharf	.67	28

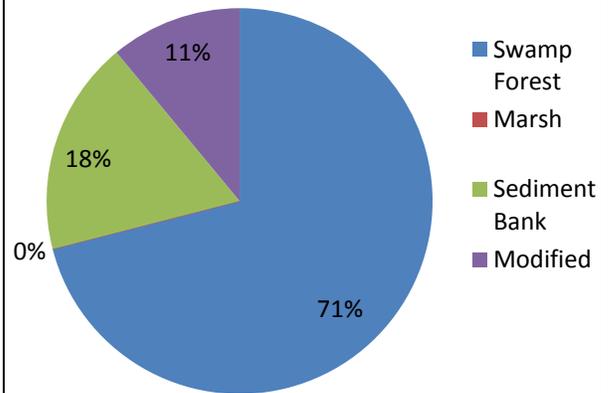
Hertford



Estuarine Shoreline

Total Mileage: 12.4

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	8.8	71%
Marsh	0	0%
Sediment Bank	2.2	18%
Modified	1.4	11%



Stabilization Structures

Total Mileage: 1.4

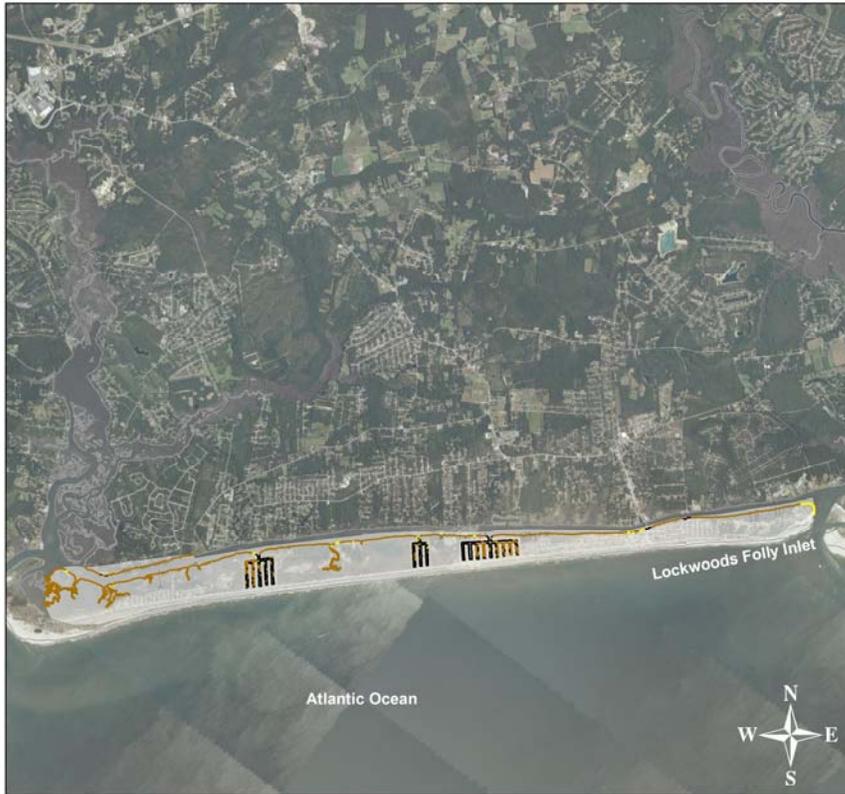
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	89	<.1	3
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	2,716	.5	10
Bulkhead	4,680	.9	10

Shoreline Access Structures

Total Acreage: 1.3

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.8	4
Pier/Float Dock/Wharf	.5	29

Holden Beach



Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

Other

- NC Shoreline
- Shoreline Access Structures

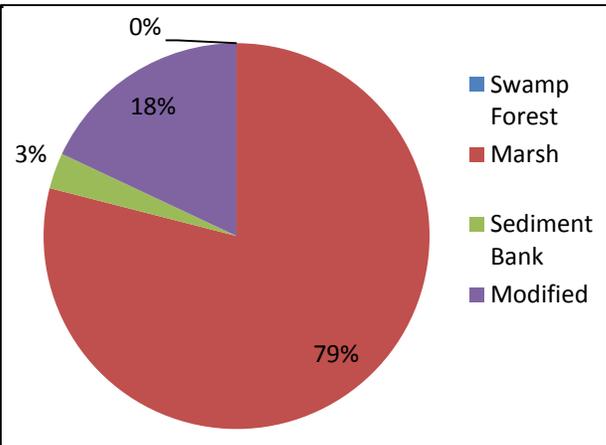
0 1 2 Miles



Estuarine Shoreline

Total Mileage: 27.8

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	22.0	79%
Sediment Bank	.7	3%
Modified	5.1	18%



Stabilization Structures

Total Mileage: 9.0

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	104	<.1	8
Breakwater	0	0	0
Groin/Jetty	134	<.1	3
Sill	0	0	0
Rip-Rap	81	<.1	1
Bulkhead	47,550	9.0	29

Shoreline Access Structures

Total Acreage: 11.2

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	11.2	794

Holly Ridge



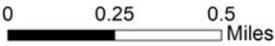
Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

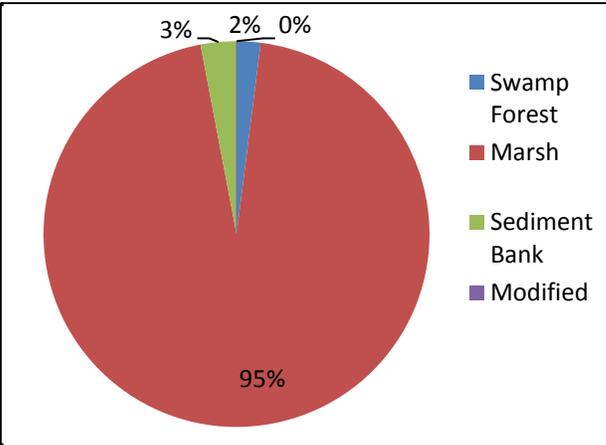
Other

- NC Shoreline
- Shoreline Access Structures



Estuarine Shoreline
Total Mileage: 1.8

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	<.1	2%
Marsh	1.8	95%
Sediment Bank	<.1	3%
Modified	0	0%



Stabilization Structures
Total Mileage: 0

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	0	0	0
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	0	0	0
Bulkhead	0	0	0

Shoreline Access Structures
Total Acreage: .05

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	.05	4

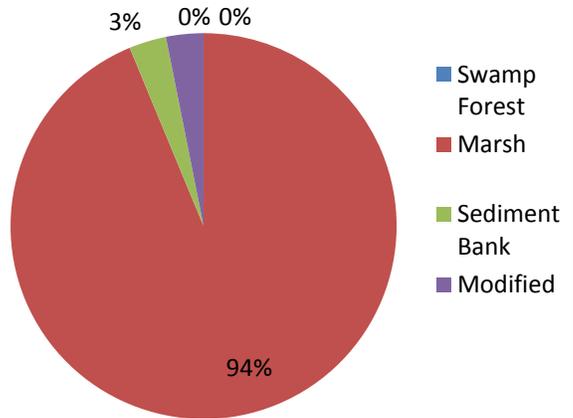
Indian Beach



Estuarine Shoreline

Total Mileage: 1.7

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	1.6	90%
Sediment Bank	.1	7%
Modified	<.1	3%



Stabilization Structures

Total Mileage: .1

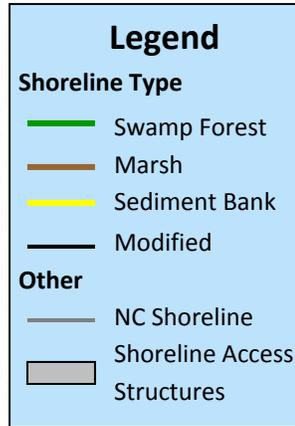
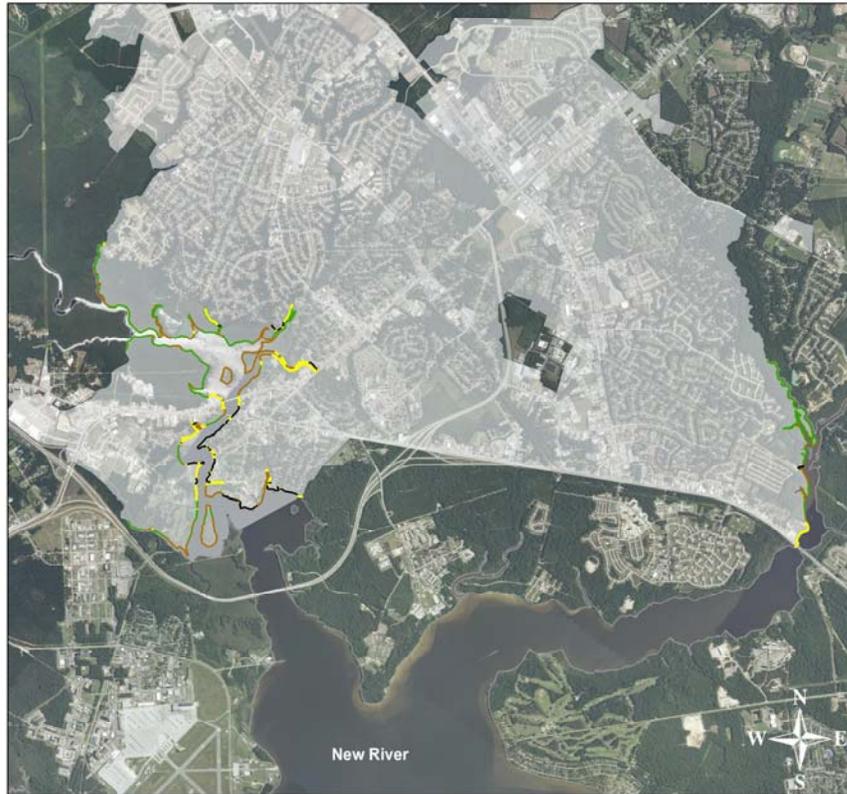
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	0	0	0
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	0	0	0
Bulkhead	706	.1	4

Shoreline Access Structures

Total Acreage: .80

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	.80	11

Jacksonville



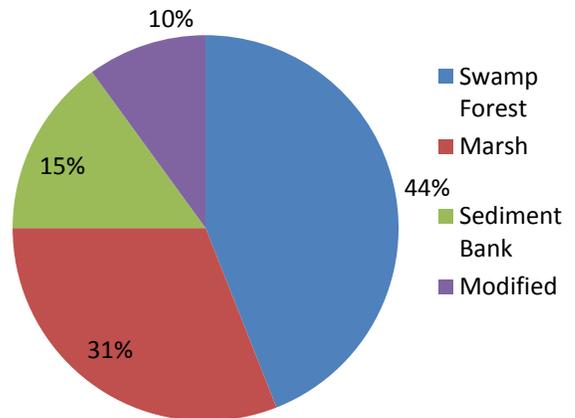
0 0.5 1 Miles



Estuarine Shoreline

Total Mileage: 22.3

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	9.9	44%
Marsh	6.9	31%
Sediment Bank	3.3	15%
Modified	2.2	10%



Stabilization Structures

Total Mileage: 2.5

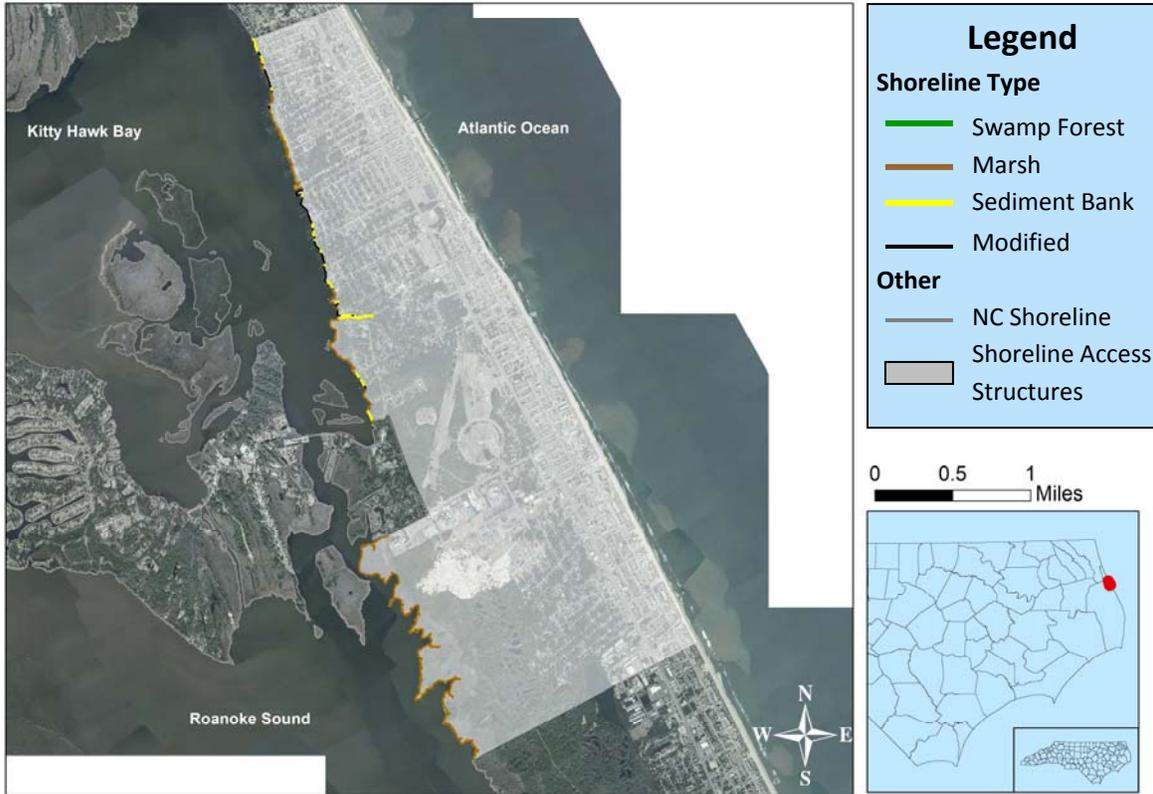
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	150	<.1	9
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	1,668	.3	7
Bulkhead	11,487	2.2	34

Shoreline Access Structures

Total Acreage: 4.8

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	1.9	5
Pier/Float Dock/Wharf	2.9	100

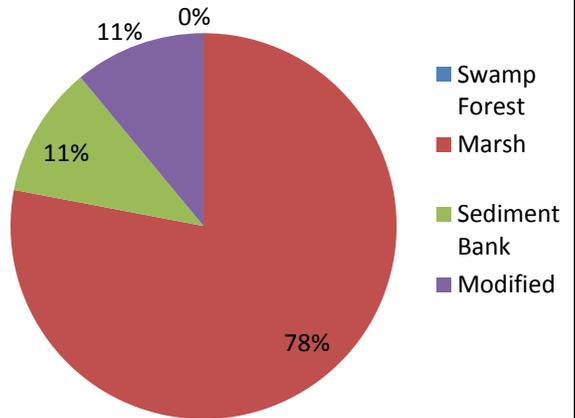
Kill Devil Hills



Estuarine Shoreline

Total Mileage: 10.0

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	7.8	78%
Sediment Bank	1.1	11%
Modified	1.1	11%



Stabilization Structures

Total Mileage: 1.6

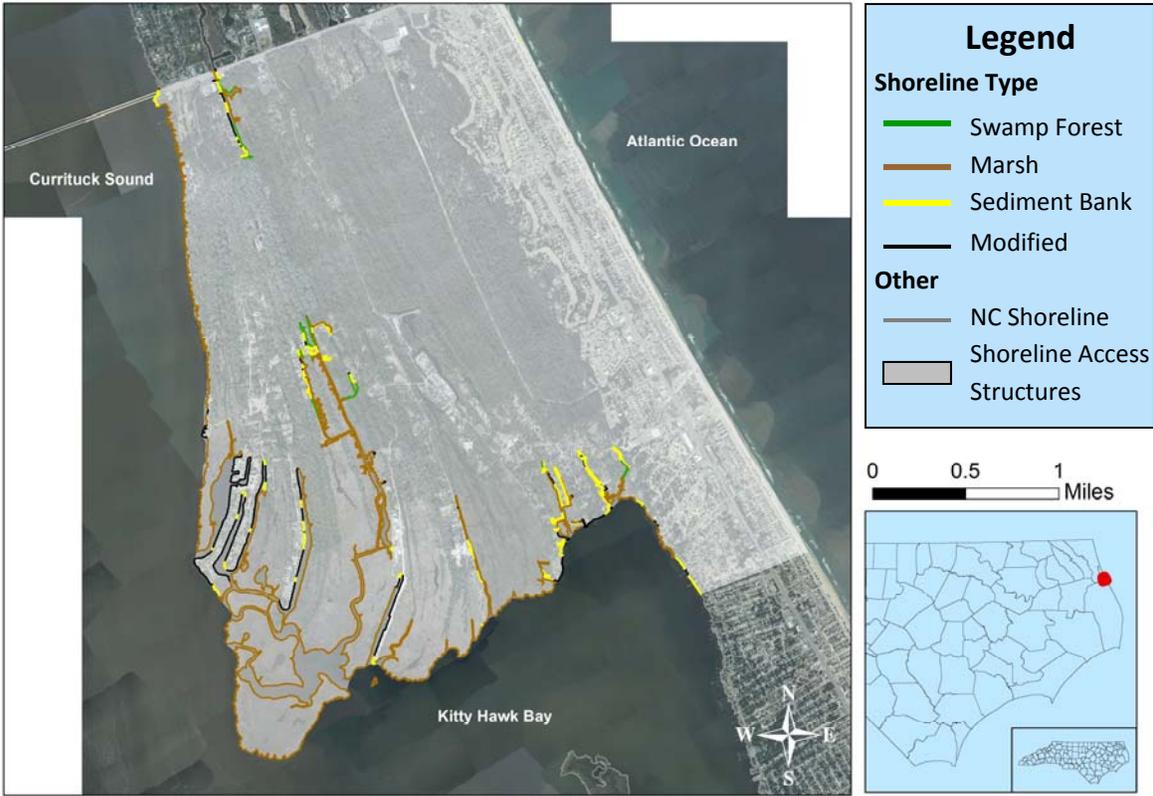
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	86	<.1	3
Breakwater	45	<.1	1
Groin/Jetty	385	.1	3
Sill	0	0	0
Rip-Rap	448	.1	4
Bulkhead	7,399	1.4	24

Shoreline Access Structures

Total Acreage: 2.5

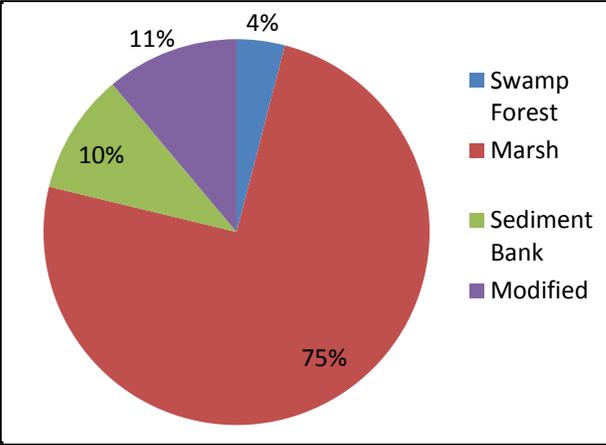
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	2.5	82

Kitty Hawk



Estuarine Shoreline
Total Mileage: 50.2

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	2.1	4%
Marsh	37.0	74%
Sediment Bank	5.2	10%
Modified	5.9	12%



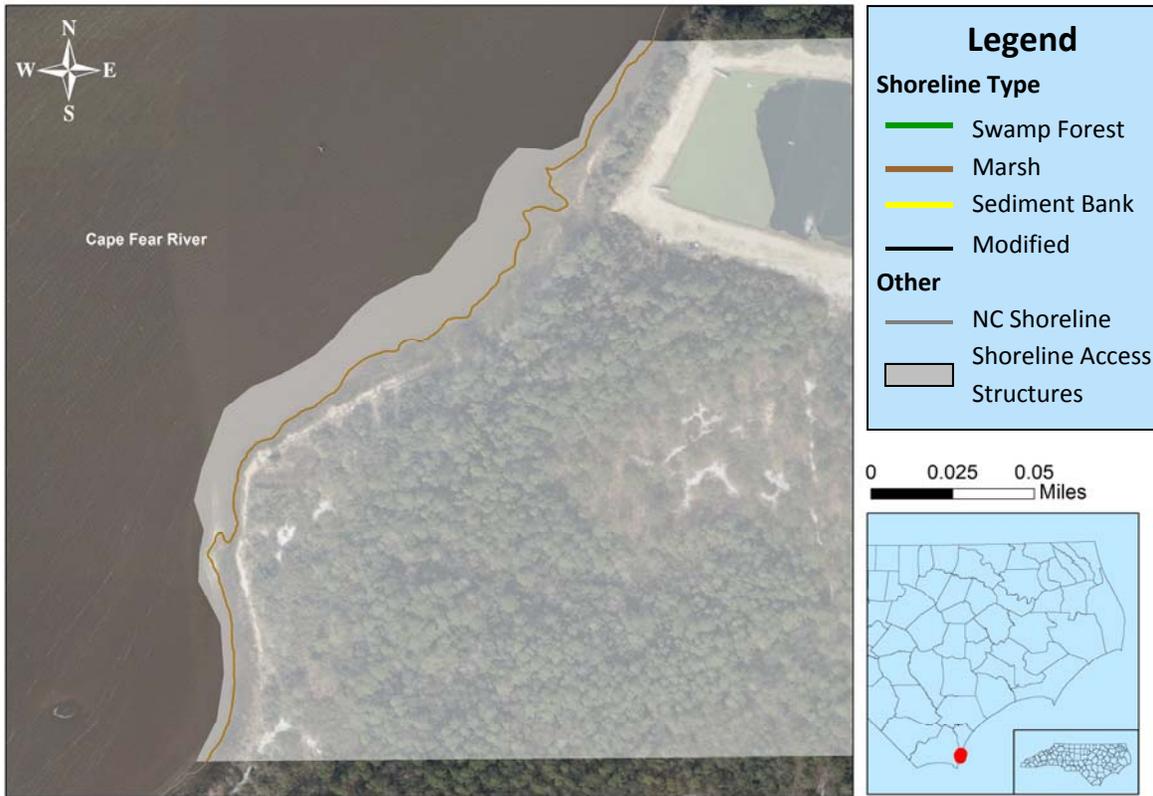
Stabilization Structures
Total Mileage: 6.4

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	100	<.1	5
Breakwater	0	0	0
Groin/Jetty	628	.1	3
Sill	0	0	0
Rip-Rap	3,344	.6	14
Bulkhead	29,987	5.7	60

Shoreline Access Structures
Total Acreage: 6.8

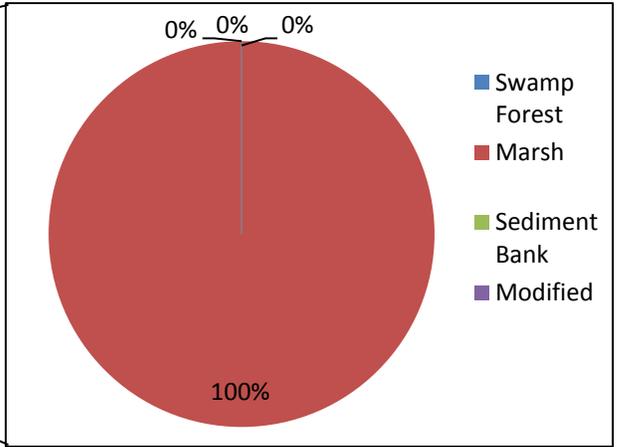
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	4.6	10
Pier/Float Dock/Wharf	2.2	211

Kure Beach



Estuarine Shoreline
Total Mileage: .3

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	.3	100%
Sediment Bank	0	0%
Modified	0	0%



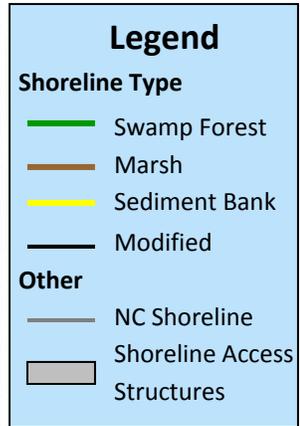
Stabilization Structures
Total Mileage: 0

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	0	0	0
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	0	0	0
Bulkhead	0	0	0

Shoreline Access Structures
Total Acreage: 0

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	0	0

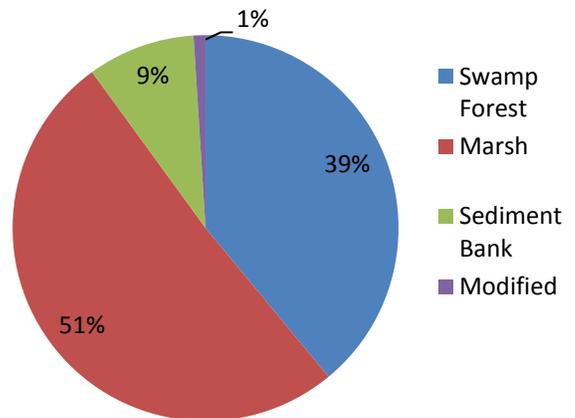
Leland



Estuarine Shoreline

Total Mileage: 15.4

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	6.0	39%
Marsh	7.9	51%
Sediment Bank	1.4	9%
Modified	.1	1%



Stabilization Structures

Total Mileage: .1

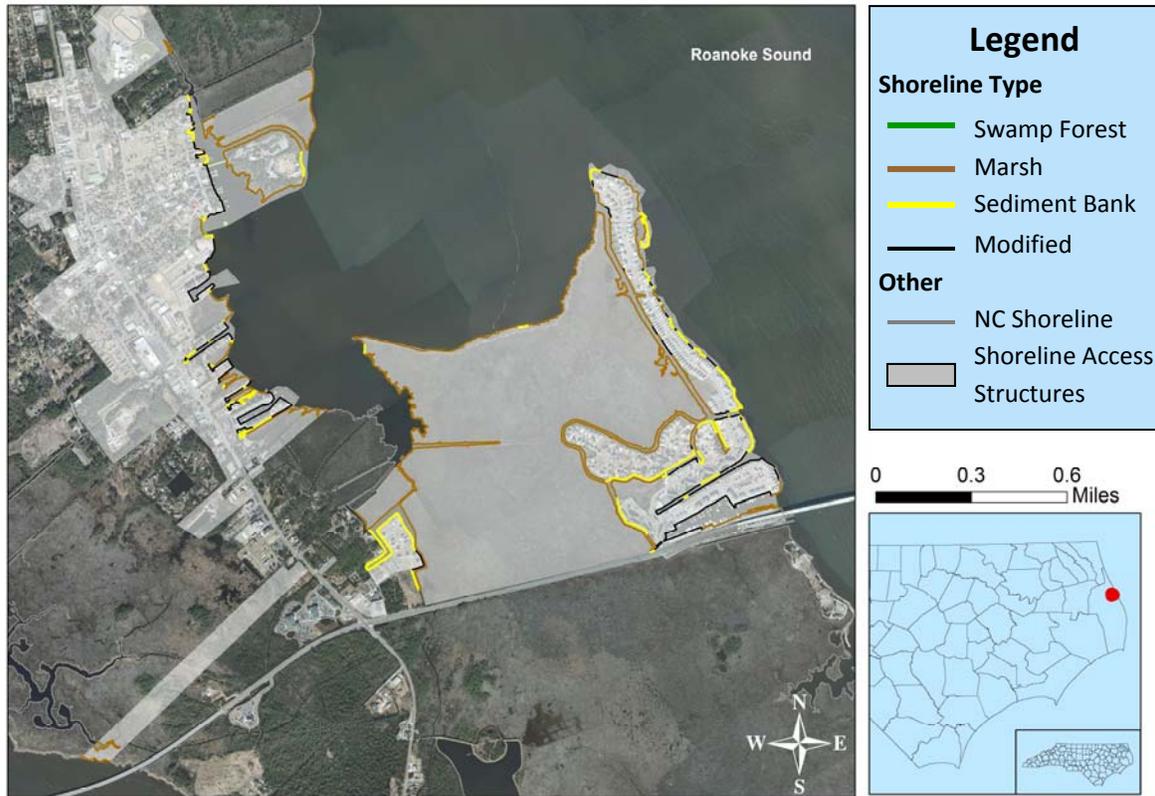
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	81	<.1	5
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	296	.1	2
Bulkhead	56	<.1	2

Shoreline Access Structures

Total Acreage: .81

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.50	3
Pier/Float Dock/Wharf	.31	18

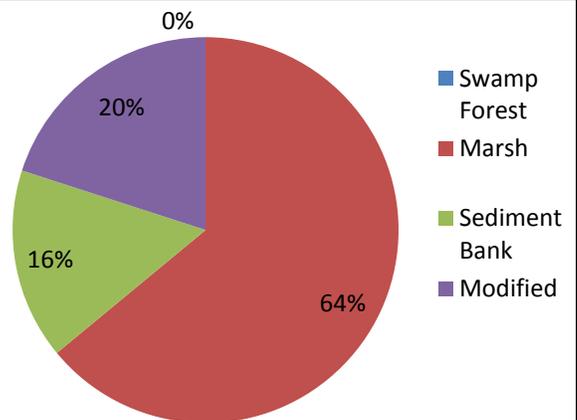
Manteo



Estuarine Shoreline

Total Mileage: 21.4

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	13.7	64%
Sediment Bank	3.5	16%
Modified	4.2	20%



Stabilization Structures

Total Mileage: 7.1

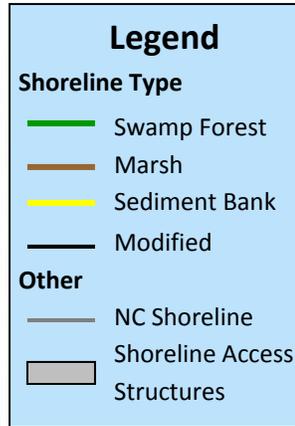
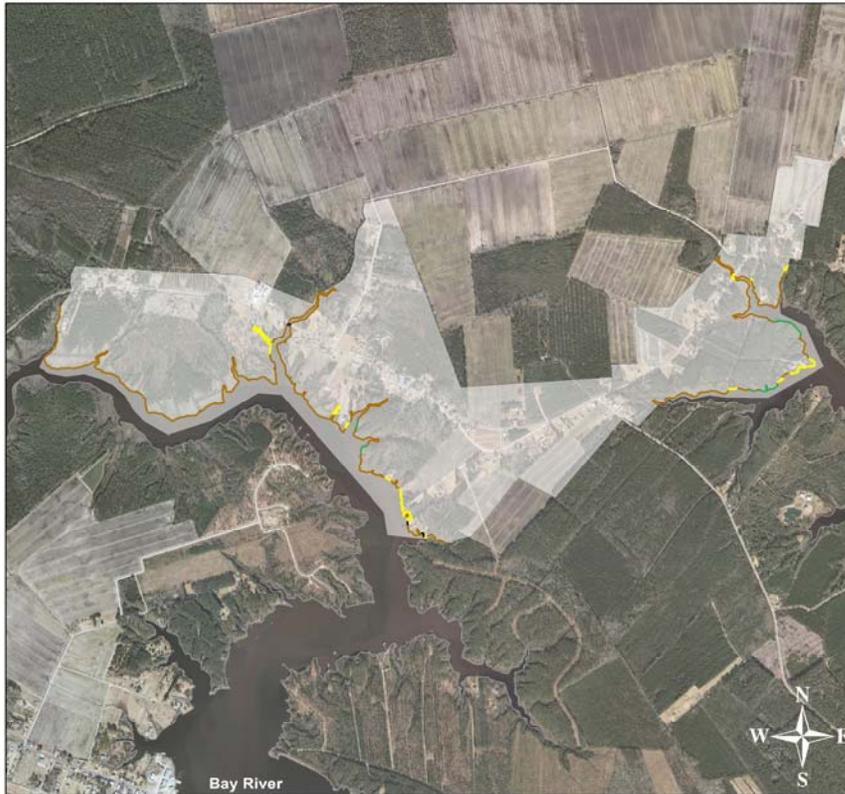
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	28	<.1	2
Breakwater	1,827	.3	6
Groin/Jetty	278	.1	15
Sill	4,371	.8	13
Rip-Rap	1,682	.3	13
Bulkhead	29,322	5.6	62

Shoreline Access Structures

Total Acreage: 7.4

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.5	4
Pier/Float Dock/Wharf	6.9	177

Mesic



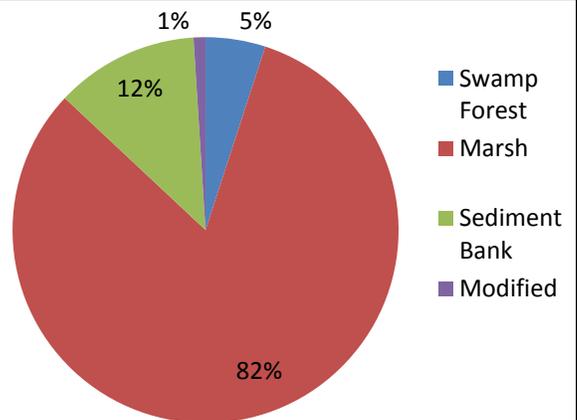
0 0.35 0.7 Miles



Estuarine Shoreline

Total Mileage: 6.5

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	.3	5%
Marsh	5.3	82%
Sediment Bank	.8	12%
Modified	.1	1%



Stabilization Structures

Total Mileage: .1

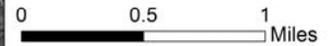
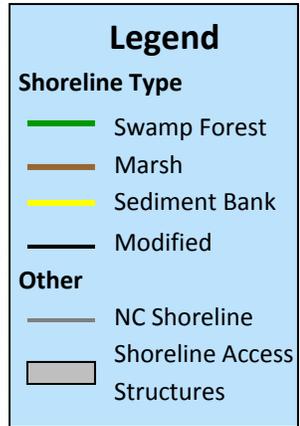
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	0	0	0
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	108	<.1	2
Bulkhead	190	<.1	2

Shoreline Access Structures

Total Acreage: .16

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.05	2
Pier/Float Dock/Wharf	.11	9

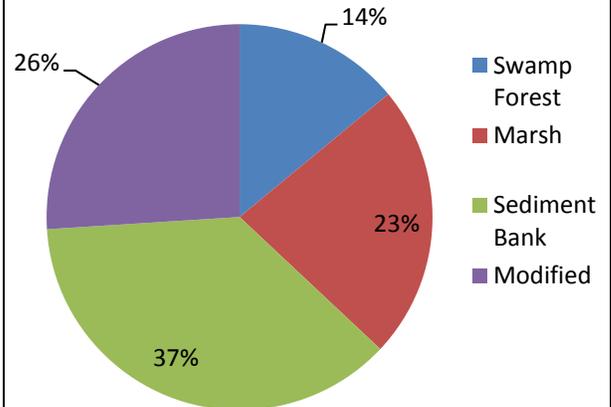
Minnesott Beach



Estuarine Shoreline

Total Mileage: 6.7

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	.9	14%
Marsh	1.6	23%
Sediment Bank	2.5	37%
Modified	1.7	26%



Stabilization Structures

Total Mileage: 2.7

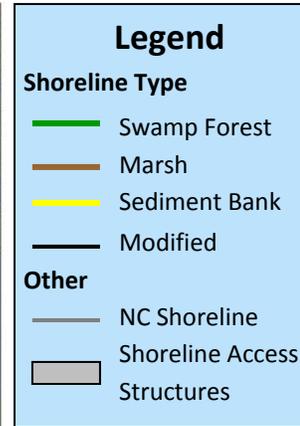
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	44	<.1	4
Breakwater	0	0	0
Groin/Jetty	2,325	.4	35
Sill	0	0	0
Rip-Rap	6,004	1.1	23
Bulkhead	6,584	1.2	24

Shoreline Access Structures

Total Acreage: 1.3

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	1.3	45

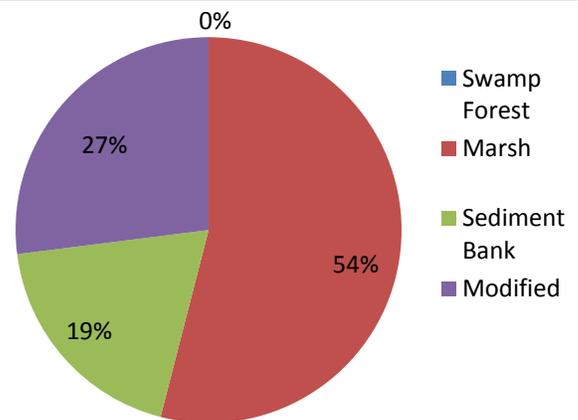
Morehead City



Estuarine Shoreline

Total Mileage: 35.0

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	18.9	54%
Sediment Bank	6.8	19%
Modified	9.3	27%



Stabilization Structures

Total Mileage: 10.0

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	258	<.1	15
Breakwater	398	.1	3
Groin/Jetty	705	.1	14
Sill	386	.1	2
Rip-Rap	11,307	2.1	47
Bulkhead	39,918	7.6	74

Shoreline Access Structures

Total Acreage: 16.5

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	3.4	6
Pier/Float Dock/Wharf	13.1	536

Murfreesboro



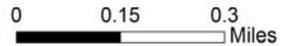
Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

Other

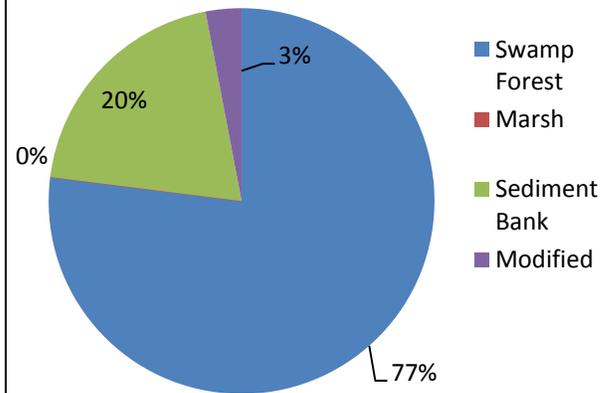
- NC Shoreline
- Shoreline Access Structures



Estuarine Shoreline

Total Mileage: 2.2

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	1.7	77%
Marsh	0	0%
Sediment Bank	.4	20%
Modified	.1	3%



Stabilization Structures

Total Mileage: .1

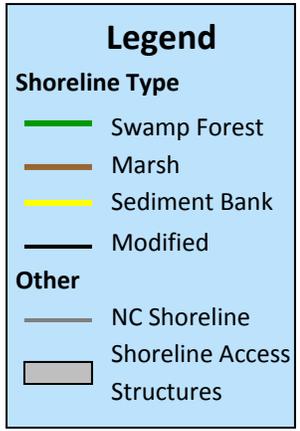
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	29	<.1	2
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	156	<.1	3
Bulkhead	207	<.1	4

Shoreline Access Structures

Total Acreage: .02

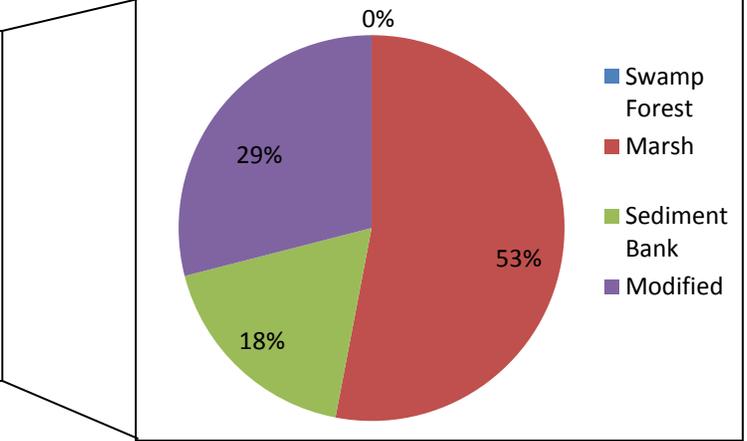
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	.02	2

Nags Head



Estuarine Shoreline
Total Mileage: 24.0

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	12.7	53%
Sediment Bank	4.4	18%
Modified	6.9	29%



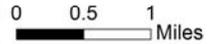
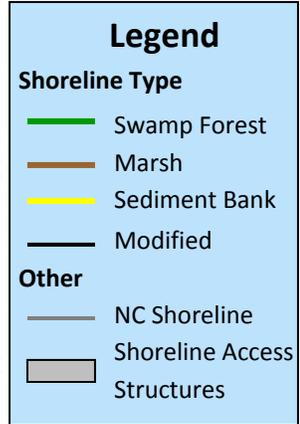
Stabilization Structures
Total Mileage: 8.5

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	150	<.1	11
Breakwater	605	.1	8
Groin/Jetty	1,401	.3	40
Sill	907	.2	7
Rip-Rap	9,564	1.8	41
Bulkhead	32,443	6.1	71

Shoreline Access Structures
Total Acreage: 4.9

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	1.0	2
Pier/Float Dock/Wharf	3.9	233

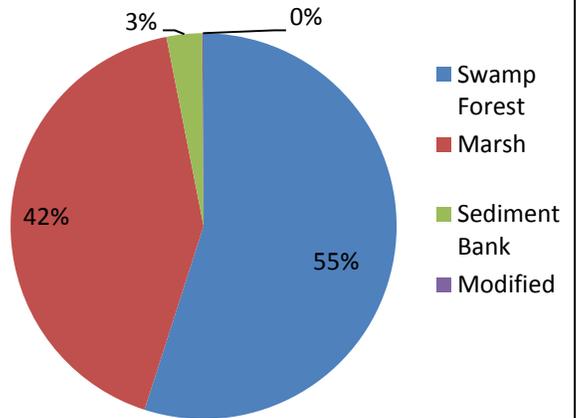
Navassa



Estuarine Shoreline

Total Mileage: 28.0

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	15.4	55%
Marsh	11.9	42%
Sediment Bank	.7	3%
Modified	<.1	<1%



Stabilization Structures

Total Mileage: .03

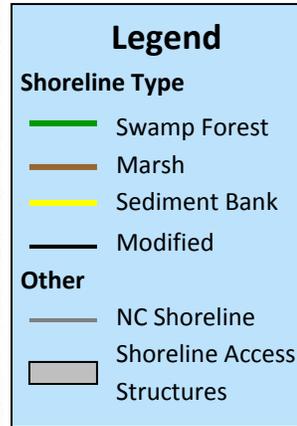
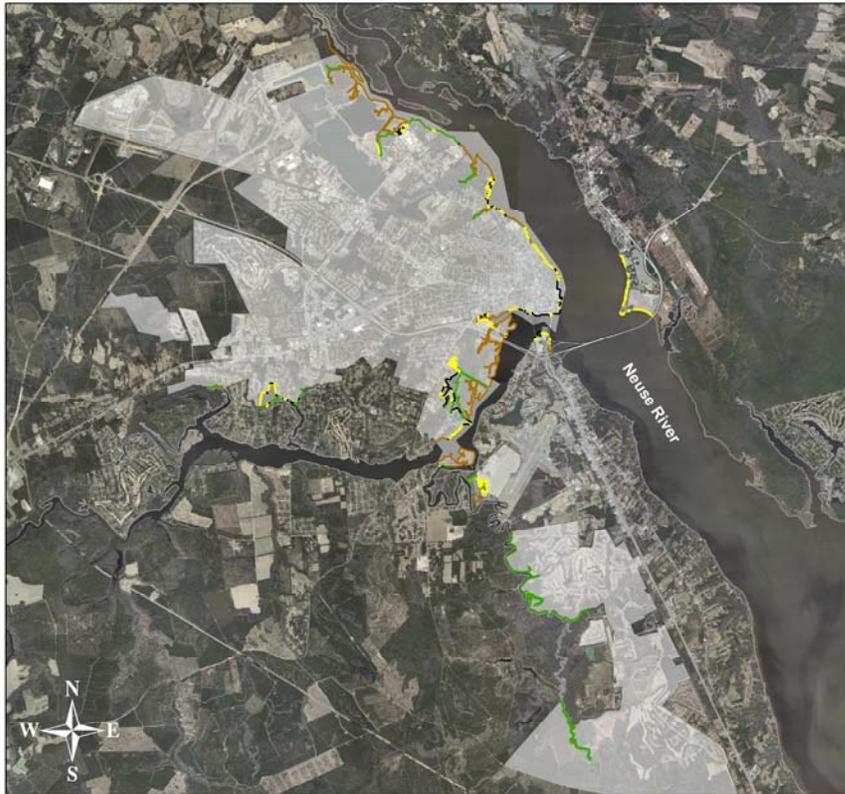
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	38	<.1	2
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	45	<.1	1
Bulkhead	88	<.1	2

Shoreline Access Structures

Total Acreage: .57

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.15	2
Pier/Float Dock/Wharf	.42	10

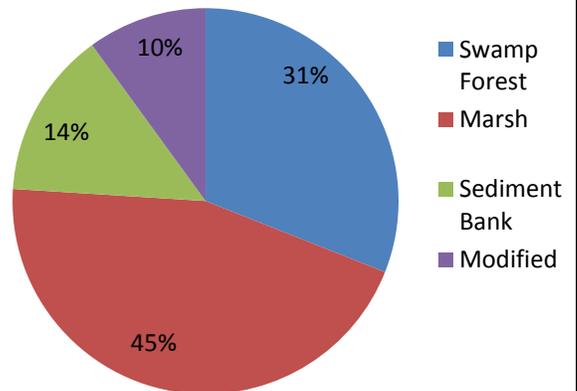
New Bern



Estuarine Shoreline

Total Mileage: 50.1

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	15.6	31%
Marsh	22.2	45%
Sediment Bank	7.2	14%
Modified	5.1	10%



Stabilization Structures

Total Mileage: 5.8

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	193	<.1	12
Breakwater	0	0	0
Groin/Jetty	183	<.1	4
Sill	0	0	0
Rip-Rap	4,610	.9	28
Bulkhead	25,785	4.9	73

Shoreline Access Structures

Total Acreage: 5.6

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.8	4
Pier/Float Dock/Wharf	4.8	180

Newport



Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

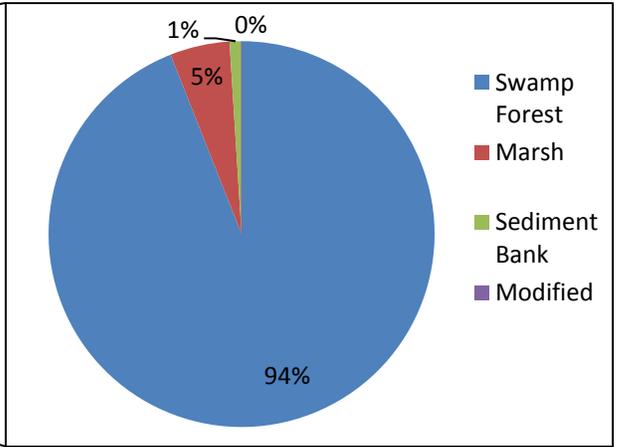
Other

- NC Shoreline
- Shoreline Access Structures



Estuarine Shoreline
Total Mileage: 1.8

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	1.7	94%
Marsh	.1	5%
Sediment Bank	<.1	1%
Modified	0	0%



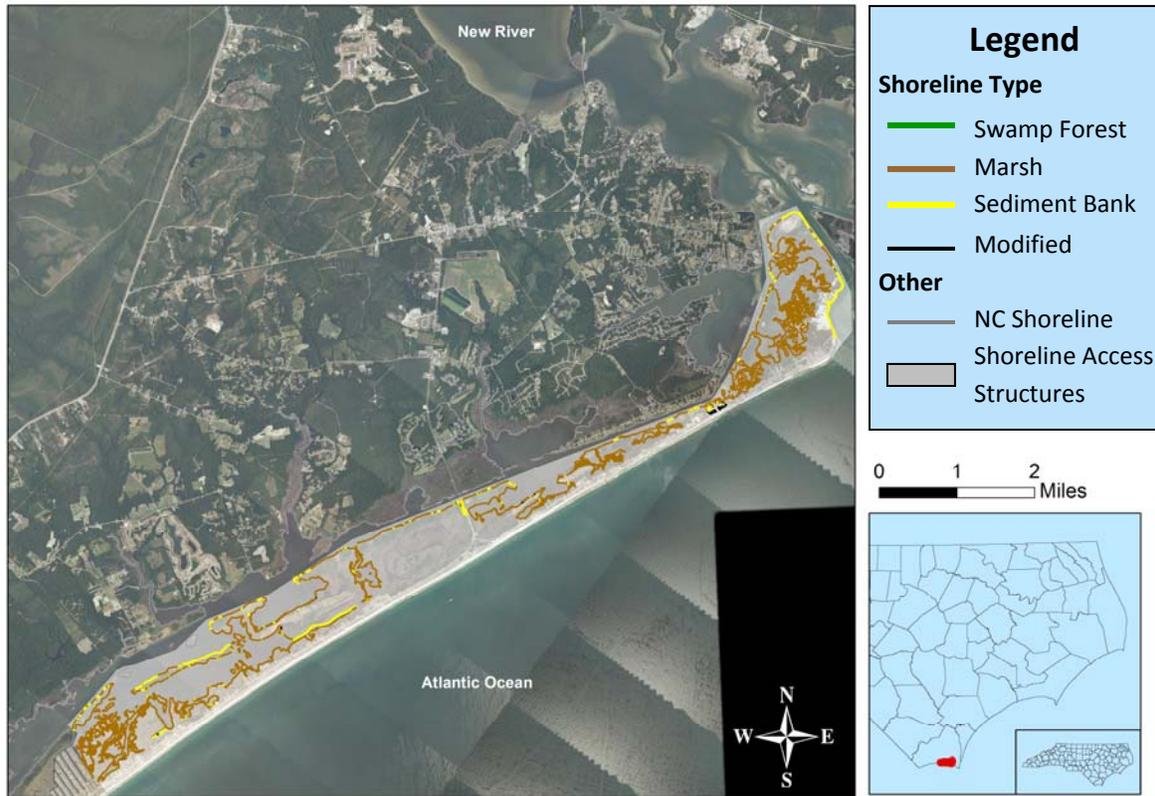
Stabilization Structures
Total Mileage: 0

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	0	0	0
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	0	0	0
Bulkhead	0	0	0

Shoreline Access Structures
Total Acreage: 0

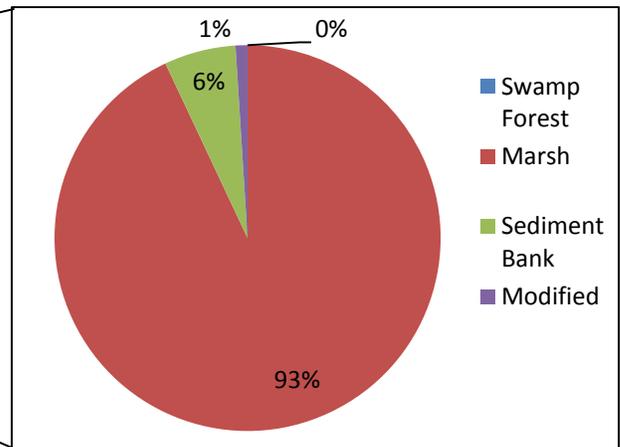
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	0	0

North Topsail Beach



Estuarine Shoreline
Total Mileage: 121.0

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	113.3	93%
Sediment Bank	6.9	6%
Modified	.8	1%



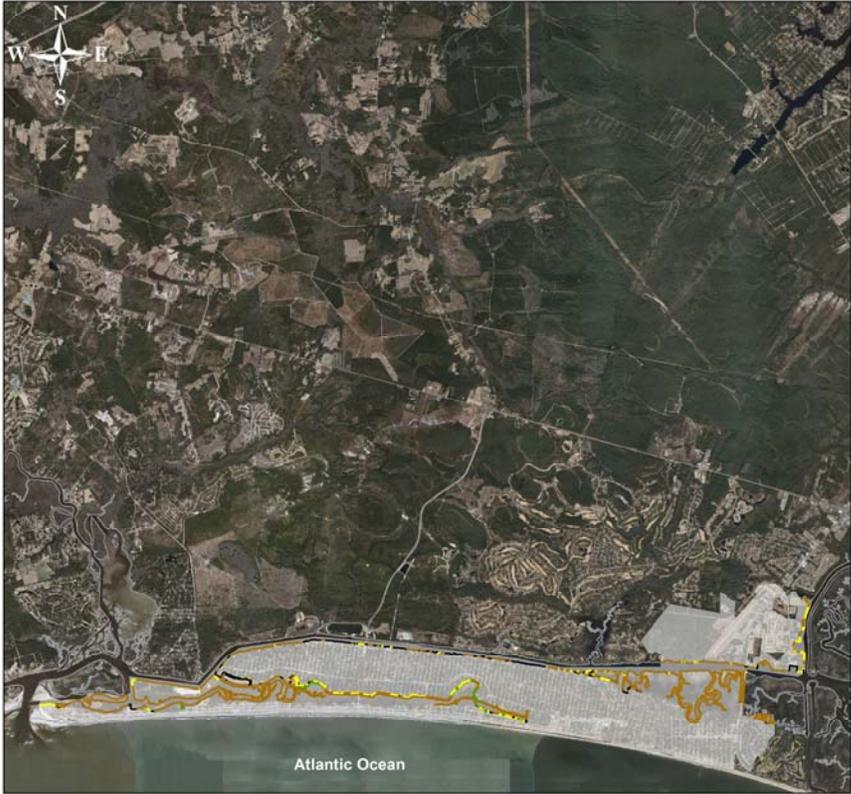
Stabilization Structures
Total Mileage: 1.2

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	325	.1	23
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	146	<.1	1
Rip-Rap	195	<.1	3
Bulkhead	5,593	1.1	29

Shoreline Access Structures
Total Acreage: 1.1

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	<.01	1
Pier/Float Dock/Wharf	1.1	160

Oak Island



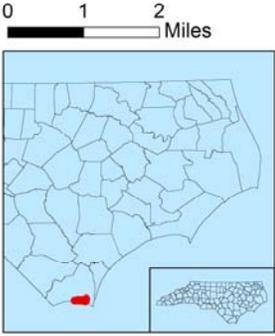
Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

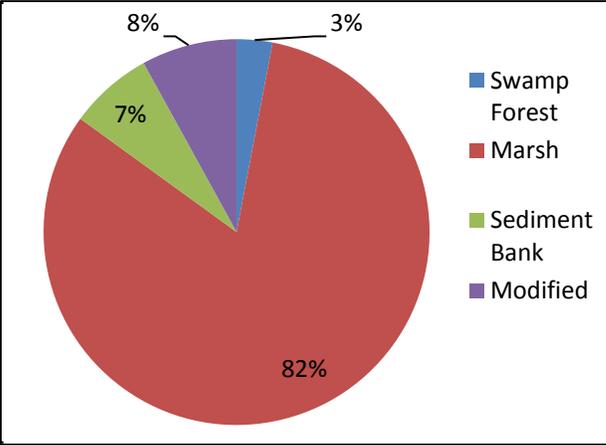
Other

- NC Shoreline
- Shoreline Access Structures



Estuarine Shoreline
Total Mileage: 60.4

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	1.6	3%
Marsh	49.4	82%
Sediment Bank	4.2	7%
Modified	5.2	8%



Stabilization Structures
Total Mileage: 7.6

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	223	<.1	9
Breakwater	37	<.1	1
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	1,556	.3	9
Bulkhead	38,562	7.3	95

Shoreline Access Structures
Total Acreage: 15.1

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	3.3	5
Pier/Float Dock/Wharf	11.8	630

Ocean Isle Beach



Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

Other

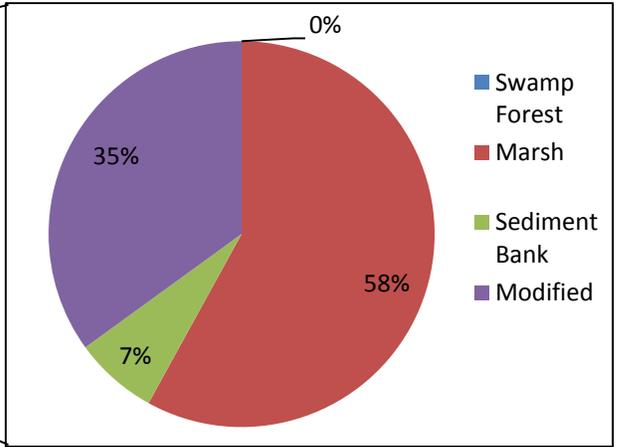
- NC Shoreline
- Shoreline Access Structures

0 0.5 1 Miles



Estuarine Shoreline
Total Mileage: 35.2

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	20.3	58%
Sediment Bank	2.5	7%
Modified	12.4	35%



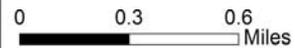
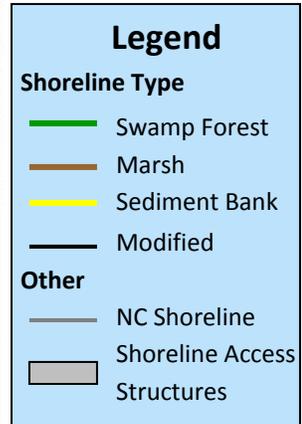
Stabilization Structures
Total Mileage: 16.9

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	129	<.1	7
Breakwater	0	0	0
Groin/Jetty	205	<.1	11
Sill	0	0	0
Rip-Rap	54,185	10.3	11
Bulkhead	35,073	6.6	28

Shoreline Access Structures
Total Acreage: 11.9

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	1.5	1
Pier/Float Dock/Wharf	10.4	1,255

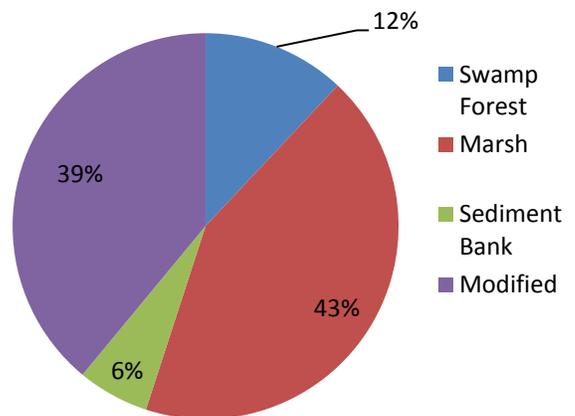
Oriental



Estuarine Shoreline

Total Mileage: 11.7

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	1.4	12%
Marsh	5.1	43%
Sediment Bank	.7	6%
Modified	4.5	39%



Stabilization Structures

Total Mileage: 5.3

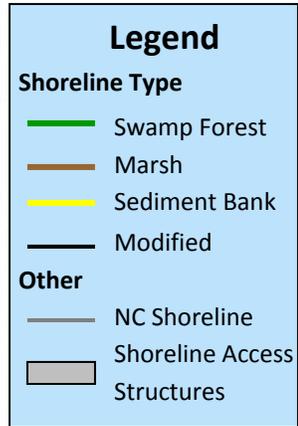
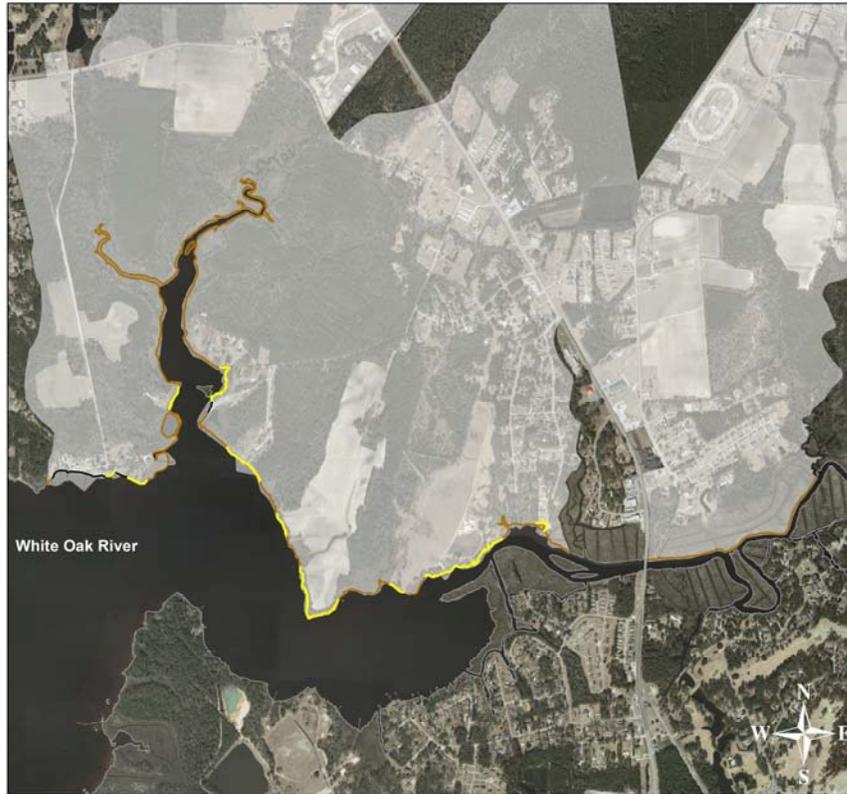
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	53	<.1	3
Breakwater	0	0	0
Groin/Jetty	963	.2	6
Sill	284	.1	1
Rip-Rap	12,748	2.4	29
Bulkhead	13,580	2.6	52

Shoreline Access Structures

Total Acreage: 5.0

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	5.0	244

Peletier



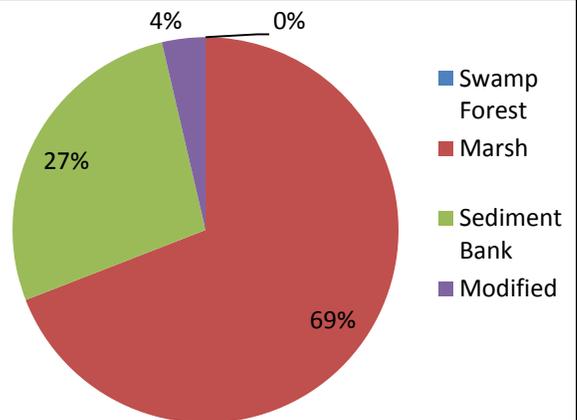
0 0.25 0.5 Miles



Estuarine Shoreline

Total Mileage: 5.9

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	4.5	76%
Sediment Bank	1.2	30%
Modified	.2	4%



Stabilization Structures

Total Mileage: .3

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	16	<.1	2
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	859	.2	2
Bulkhead	449	.1	4

Shoreline Access Structures

Total Acreage: .36

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	.36	21

Pine Knoll Shores



Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

Other

- NC Shoreline
- Shoreline Access Structures

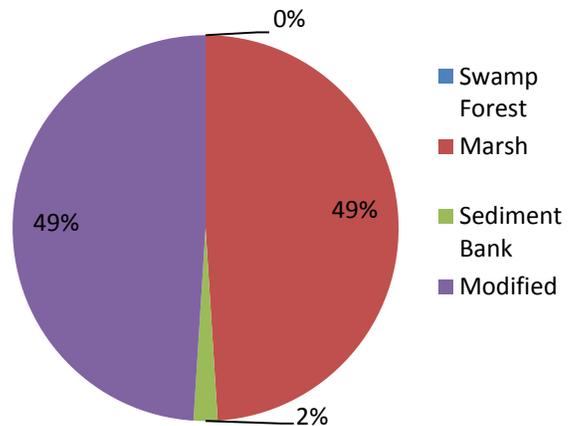
0 0.5 1 Miles



Estuarine Shoreline

Total Mileage: 11.8

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	5.8	49%
Sediment Bank	.2	2%
Modified	5.8	49%



Stabilization Structures

Total Mileage: 6.3

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	62	<.1	4
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	1,080	.2	3
Rip-Rap	214	<.1	1
Bulkhead	32,313	6.1	27

Shoreline Access Structures

Total Acreage: 3.1

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.1	2
Pier/Float Dock/Wharf	3.0	267

Plymouth



Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

Other

- NC Shoreline
- Shoreline Access Structures

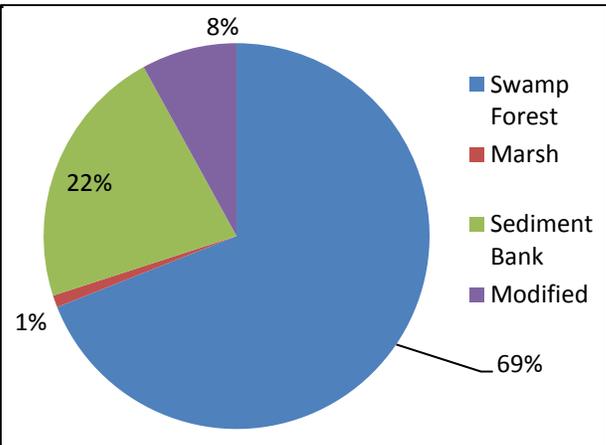
0 0.3 0.6 Miles



Estuarine Shoreline

Total Mileage: 5.2

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	3.6	69%
Marsh	<.1	1%
Sediment Bank	1.1	22%
Modified	.5	8%



Stabilization Structures

Total Mileage: .5

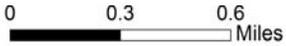
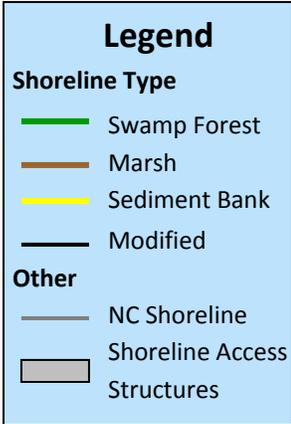
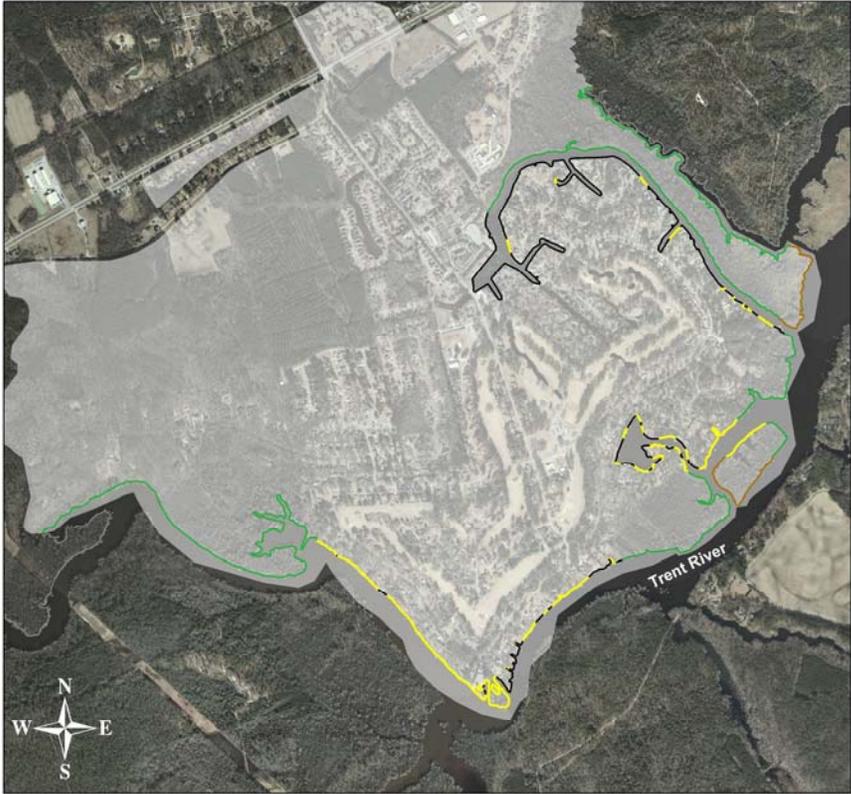
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	64	<.1	2
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	1,376	.3	3
Bulkhead	976	.2	5

Shoreline Access Structures

Total Acreage: 1.3

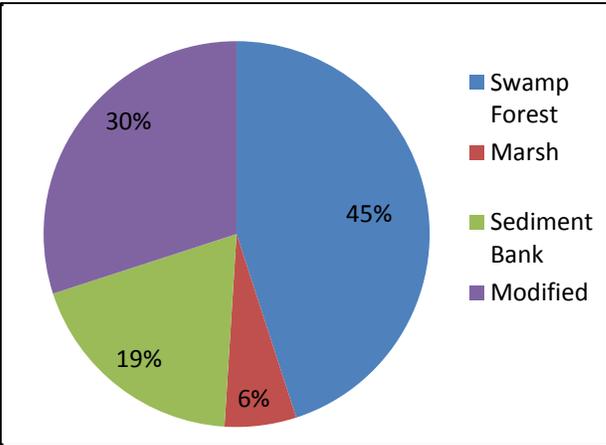
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.82	5
Pier/Float Dock/Wharf	.44	19

River Bend



Estuarine Shoreline
Total Mileage: 12.1

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	5.5	45%
Marsh	.8	6%
Sediment Bank	2.2	19%
Modified	3.6	30%



Stabilization Structures
Total Mileage: 3.7

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	70	<.1	5
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	1,364	.3	6
Bulkhead	17,965	3.4	39

Shoreline Access Structures
Total Acreage: 1.6

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	<.1	1
Pier/Float Dock/Wharf	1.6	184

Saint James



Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

Other

- NC Shoreline
- Shoreline Access Structures

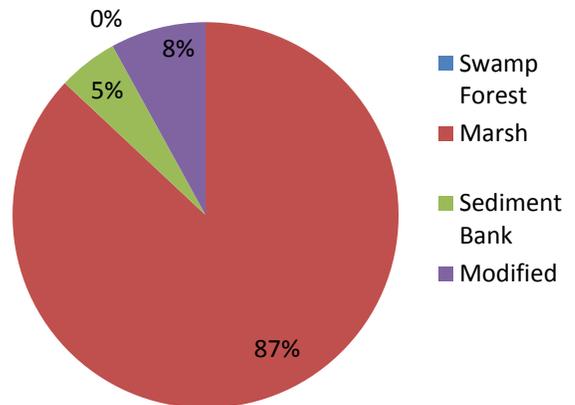
0 0.3 0.6 Miles



Estuarine Shoreline

Total Mileage: 6.6

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	5.7	87%
Sediment Bank	.3	5%
Modified	.6	8%



Stabilization Structures

Total Mileage: .9

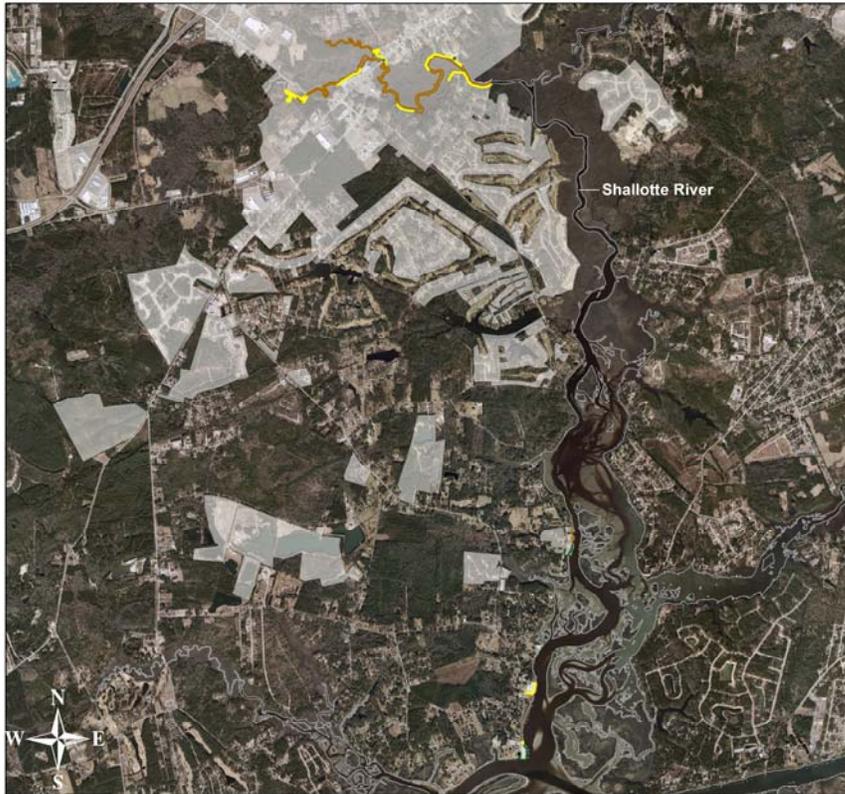
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	0	0	0
Breakwater	0	0	0
Groin/Jetty	43	<.1	1
Sill	2,058	.4	1
Rip-Rap	62	<.1	2
Bulkhead	2,881	.5	3

Shoreline Access Structures

Total Acreage: 2.1

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	2.1	43

Shalotte



Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

Other

- NC Shoreline
- Shoreline Access Structures

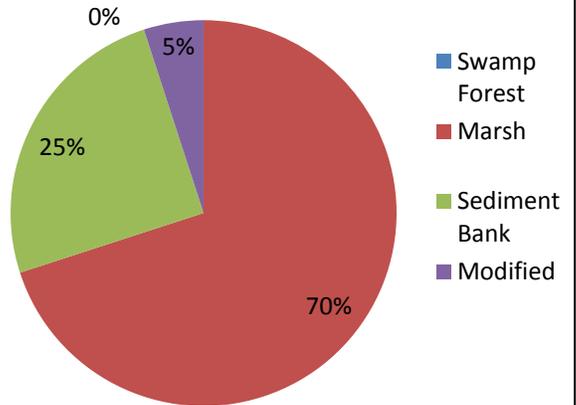
0 0.5 1 Miles



Estuarine Shoreline

Total Mileage: 6.8

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	4.8	70%
Sediment Bank	1.7	25%
Modified	.3	5%



Stabilization Structures

Total Mileage: .3

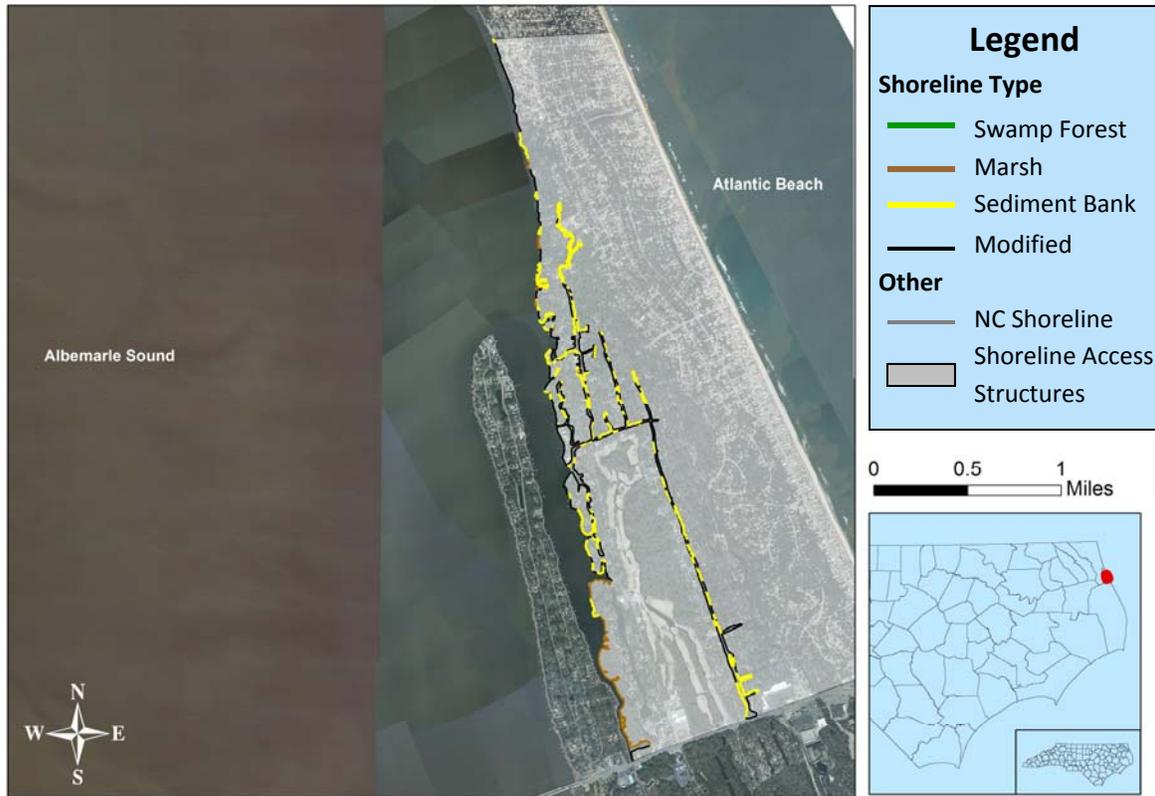
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	0	0	0
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	172	<.1	1
Bulkhead	1,437	.3	5

Shoreline Access Structures

Total Acreage: .46

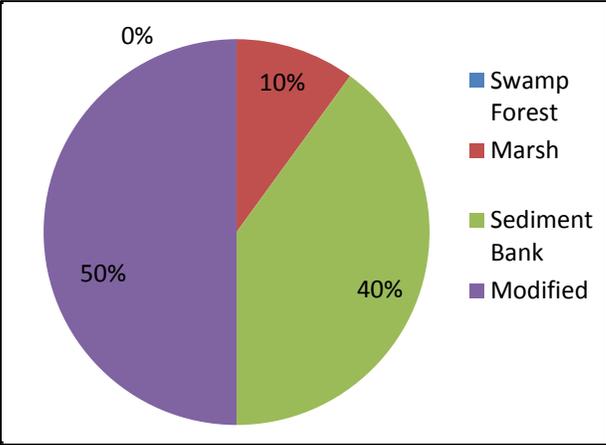
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.13	2
Pier/Float Dock/Wharf	.33	21

Southern Shores



Estuarine Shoreline
Total Mileage: 21.8

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	2.2	10%
Sediment Bank	8.6	40%
Modified	11.0	50%



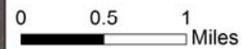
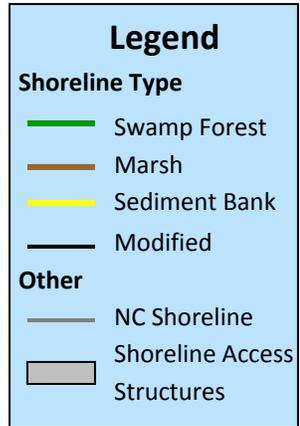
Stabilization Structures
Total Mileage: 11.2

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	72	<.1	5
Breakwater	148	<.1	1
Groin/Jetty	383	.1	18
Sill	0	0	0
Rip-Rap	375	.1	3
Bulkhead	58,174	11.0	94

Shoreline Access Structures
Total Acreage: 1.6

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.2	3
Pier/Float Dock/Wharf	1.4	189

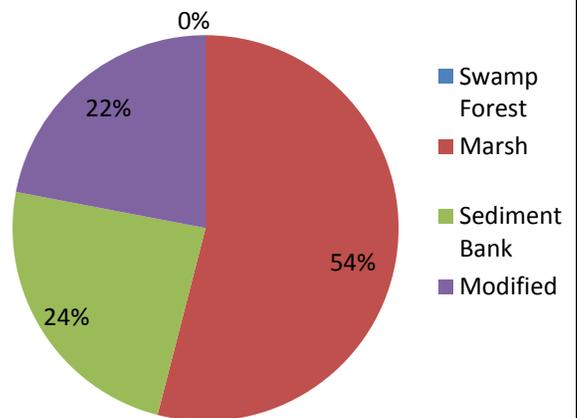
Southport



Estuarine Shoreline

Total Mileage: 8.4

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	4.5	54%
Sediment Bank	2.0	24%
Modified	1.9	22%



Stabilization Structures

Total Mileage: 2.1

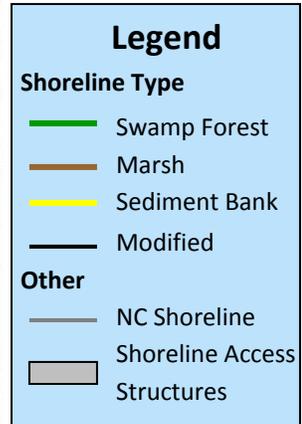
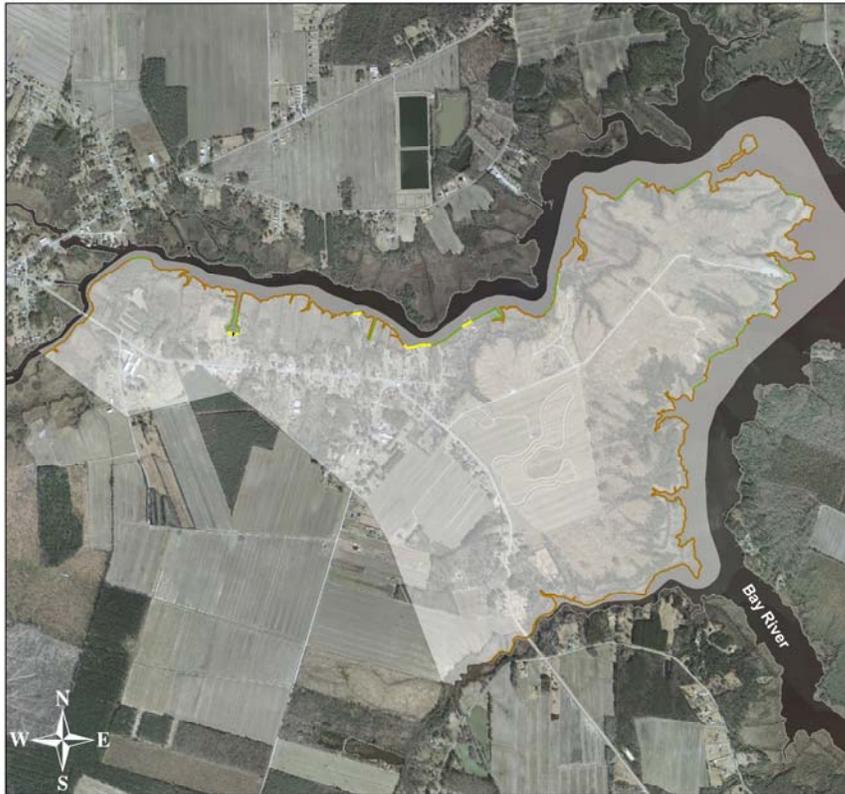
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	98	<.1	3
Breakwater	0	0	0
Groin/Jetty	35	<.1	1
Sill	0	0	0
Rip-Rap	1,351	.3	4
Bulkhead	9,528	1.8	15

Shoreline Access Structures

Total Acreage: 0

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	0	0

Stonewall



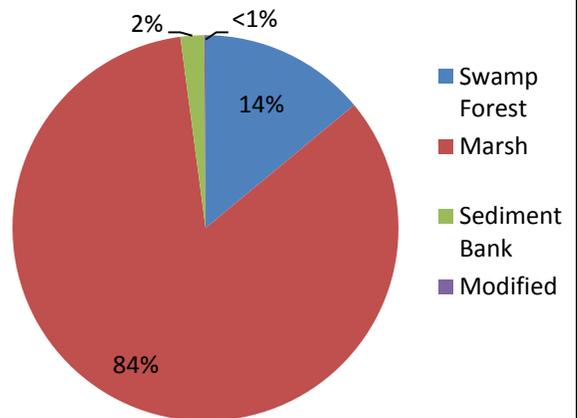
0 0.25 0.5 Miles



Estuarine Shoreline

Total Mileage: 9.6

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	1.4	14%
Marsh	8.2	84%
Sediment Bank	.2	2%
Modified	<.1	<1%



Stabilization Structures

Total Mileage: .02

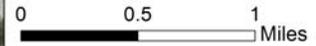
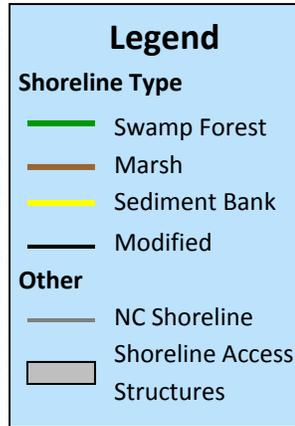
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	18	<.1	1
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	0	0	0
Bulkhead	77	<.1	1

Shoreline Access Structures

Total Acreage: .14

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	.14	5

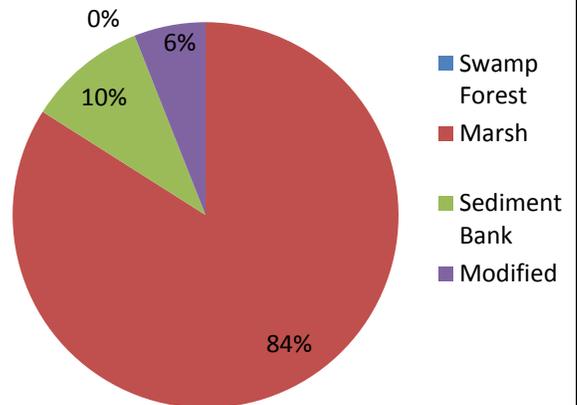
Sunset Beach



Estuarine Shoreline

Total Mileage: 35.9

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	30.1	84%
Sediment Bank	3.8	10%
Modified	2.0	6%



Stabilization Structures

Total Mileage: 4.5

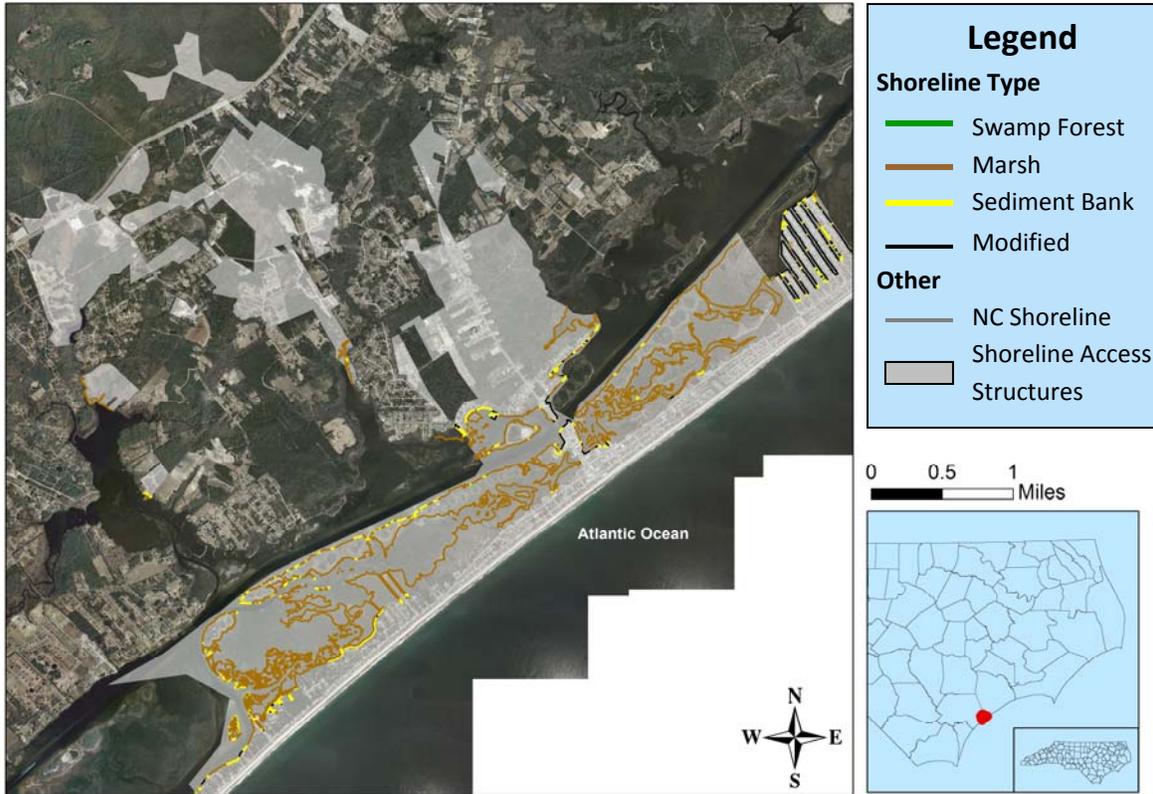
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	31	<.1	1
Breakwater	19	<.1	1
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	1,894	.4	11
Bulkhead	21,723	4.1	18

Shoreline Access Structures

Total Acreage: 6.4

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.3	1
Pier/Float Dock/Wharf	6.1	320

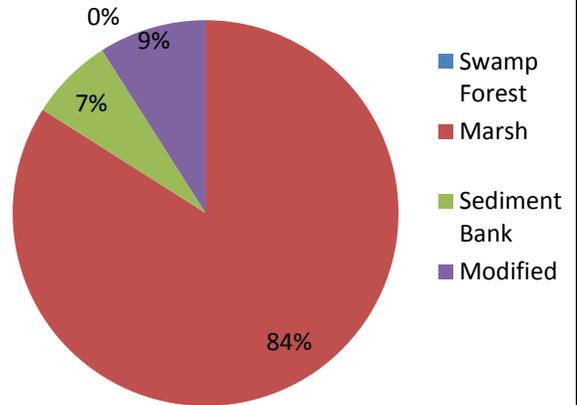
Surf City



Estuarine Shoreline

Total Mileage: 79.1

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	66.6	84%
Sediment Bank	5.1	7%
Modified	7.4	9%



Stabilization Structures

Total Mileage: 8.6

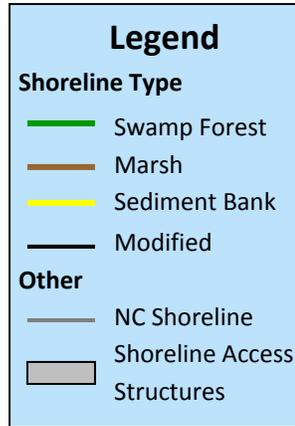
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	3,234	.6	225
Breakwater	0	0	0
Groin/Jetty	46	<.1	4
Sill	0	0	0
Rip-Rap	1,982	.4	10
Bulkhead	40,009	7.6	276

Shoreline Access Structures

Total Acreage: 9.9

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.4	2
Pier/Float Dock/Wharf	9.5	859

Swansboro



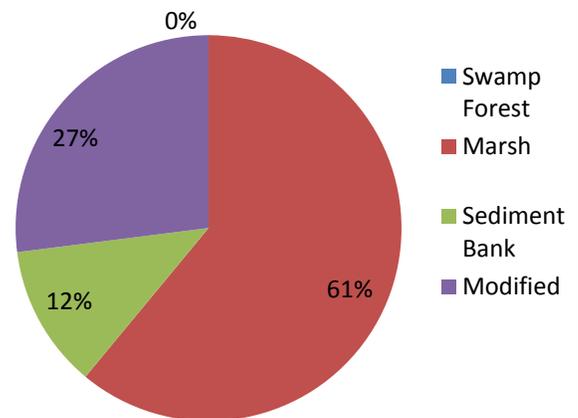
0 0.25 0.5 Miles



Estuarine Shoreline

Total Mileage: 4.8

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	2.9	61%
Sediment Bank	.6	12%
Modified	1.3	27%



Stabilization Structures

Total Mileage: 1.7

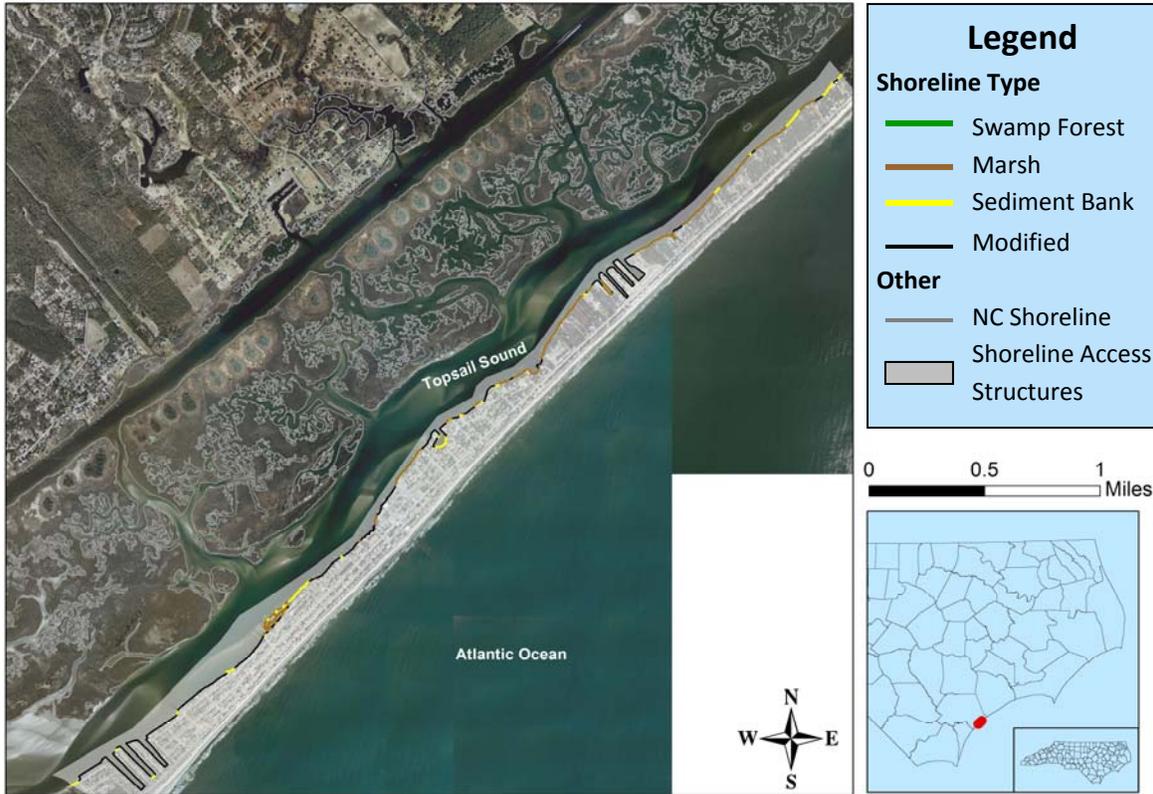
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	22	<.1	2
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	1,202	2	2
Bulkhead	8,157	1.5	19

Shoreline Access Structures

Total Acreage: 4.0

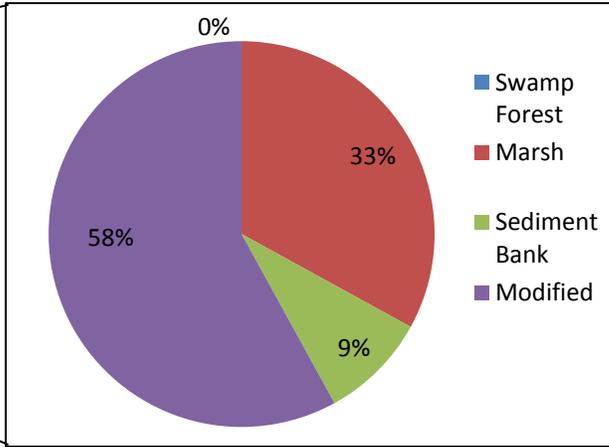
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	1.9	2
Pier/Float Dock/Wharf	2.1	78

Topsail Beach



Estuarine Shoreline
Total Mileage: 7.8

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	2.6	33%
Sediment Bank	.7	9%
Modified	4.5	58%



Stabilization Structures
Total Mileage: 5.6

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	171	<.1	9
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	746	.1	8
Bulkhead	28,970	5.5	42

Shoreline Access Structures
Total Acreage: 7.2

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	7.2	444

Trent Woods



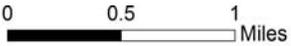
Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

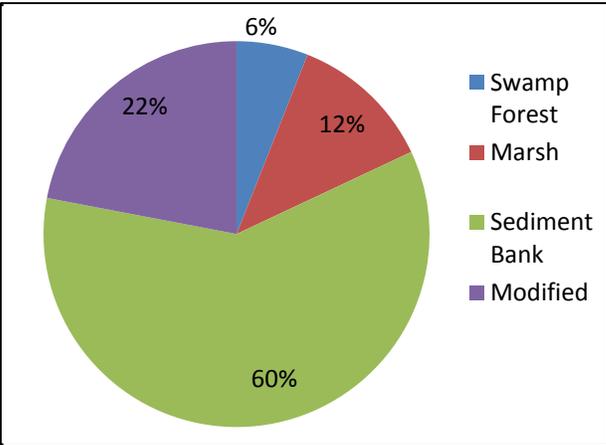
Other

- NC Shoreline
- Shoreline Access Structures



Estuarine Shoreline
Total Mileage: 9.7

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	.6	6%
Marsh	1.1	12%
Sediment Bank	5.8	60%
Modified	2.2	22%



Stabilization Structures
Total Mileage: 2.6

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	25	<.1	2
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	4,304	.8	16
Bulkhead	9,285	1.8	41

Shoreline Access Structures
Total Acreage: 3.9

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.2	2
Pier/Float Dock/Wharf	3.7	149

Vanceboro



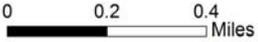
Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

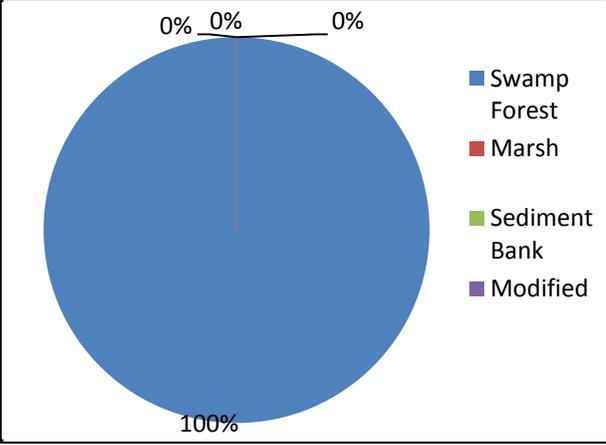
Other

- NC Shoreline
- Shoreline Access Structures



Estuarine Shoreline
Total Mileage: 4.4

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	4.4	100%
Marsh	0	0%
Sediment Bank	0	0%
Modified	0	0%



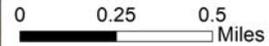
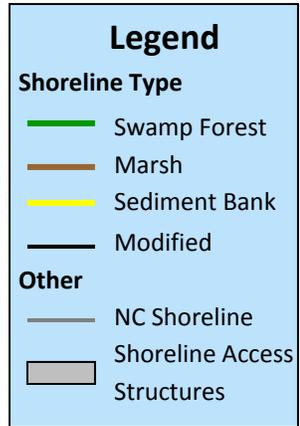
Stabilization Structures
Total Mileage: 0

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	0	0	0
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	0	0	0
Bulkhead	0	0	0

Shoreline Access Structures
Total Acreage: .24

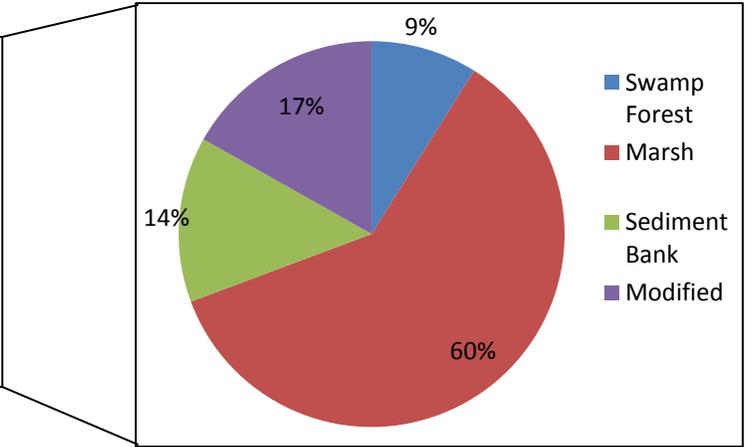
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.24	3
Pier/Float Dock/Wharf	0	0

Vandemere



Estuarine Shoreline
Total Mileage: 9.6

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	.8	9%
Marsh	5.9	61%
Sediment Bank	1.3	14%
Modified	1.6	17%



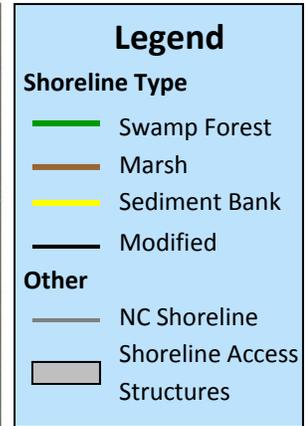
Stabilization Structures
Total Mileage: 1.7

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	40	<.1	3
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	5,684	1.1	21
Bulkhead	2,968	.6	21

Shoreline Access Structures
Total Acreage: .75

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	.75	40

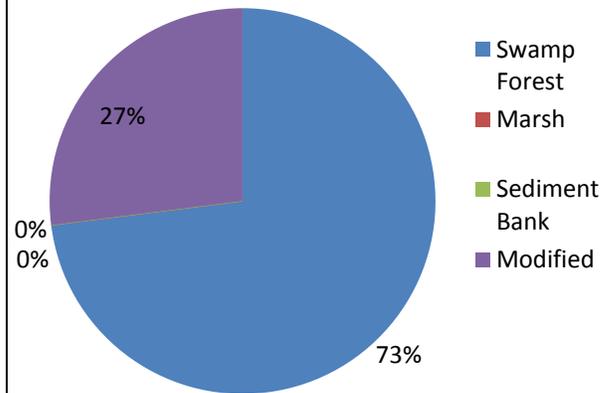
Varnamtown



Estuarine Shoreline

Total Mileage: 1.5

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	1.1	73%
Marsh	0	0%
Sediment Bank	0	0%
Modified	.4	27%



Stabilization Structures

Total Mileage: .4

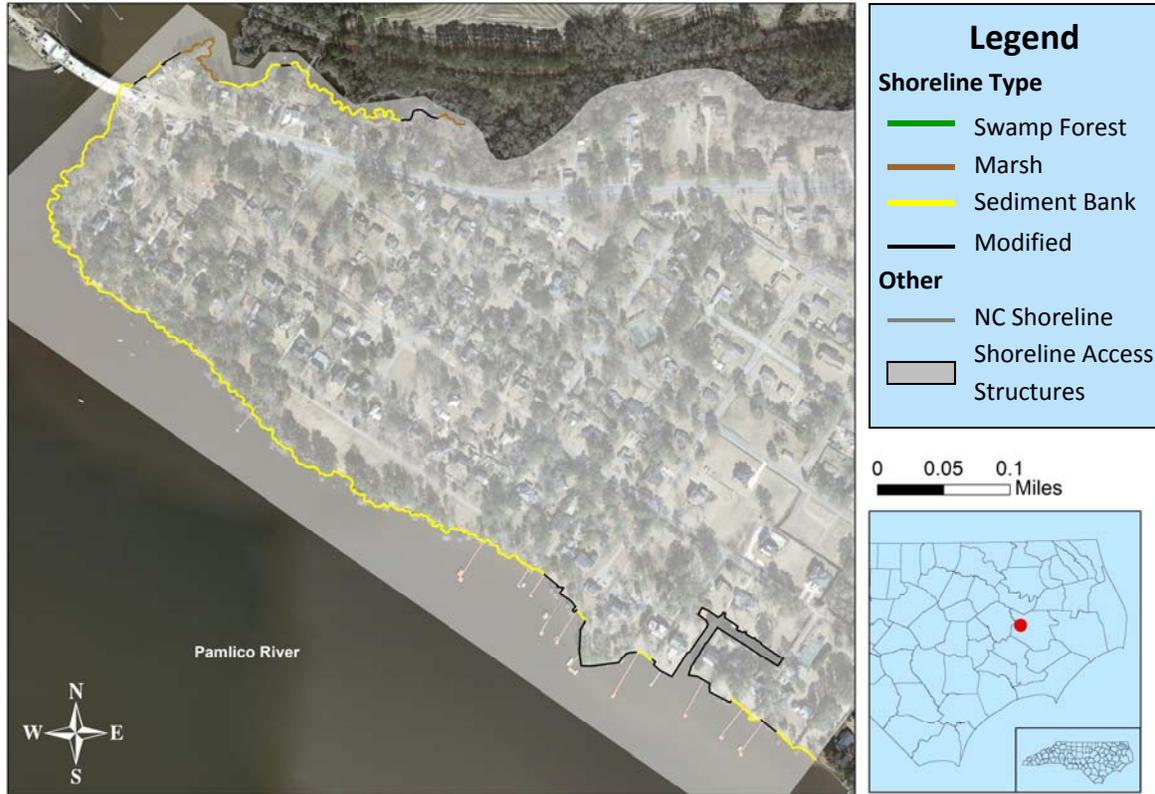
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	40	<.1	3
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	53	<.1	1
Bulkhead	2,124	.4	6

Shoreline Access Structures

Total Acreage: .66

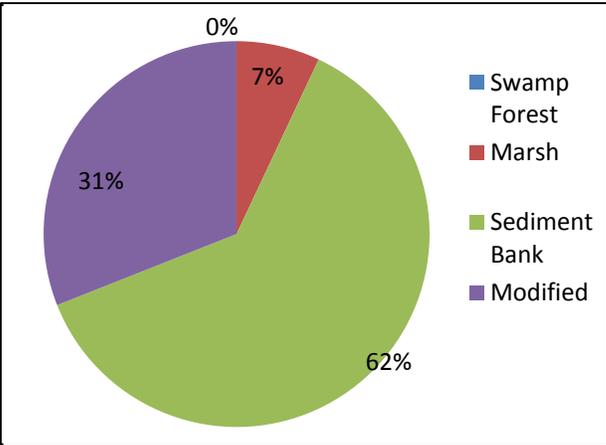
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	.66	36

Washington Park



Estuarine Shoreline
Total Mileage: 1.7

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	.1	7%
Sediment Bank	1.1	62%
Modified	.5	31%



Stabilization Structures
Total Mileage: .7

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	30	<.1	3
Breakwater	0	0	0
Groin/Jetty	360	.1	13
Sill	0	0	0
Rip-Rap	280	.1	3
Bulkhead	2,651	.5	14

Shoreline Access Structures
Total Acreage: .33

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	.33	16

Washington



Legend	
Shoreline Type	
	Swamp Forest
	Marsh
	Sediment Bank
	Modified
Other	
	NC Shoreline
	Shoreline Access Structures

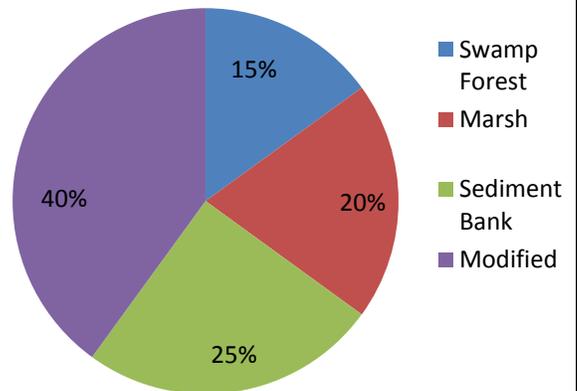
0 0.5 1 Miles



Estuarine Shoreline

Total Mileage: 6.1

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	1.0	15%
Marsh	1.2	20%
Sediment Bank	1.5	25%
Modified	2.4	40%



Stabilization Structures

Total Mileage: 2.5

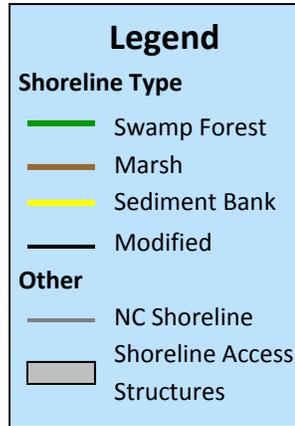
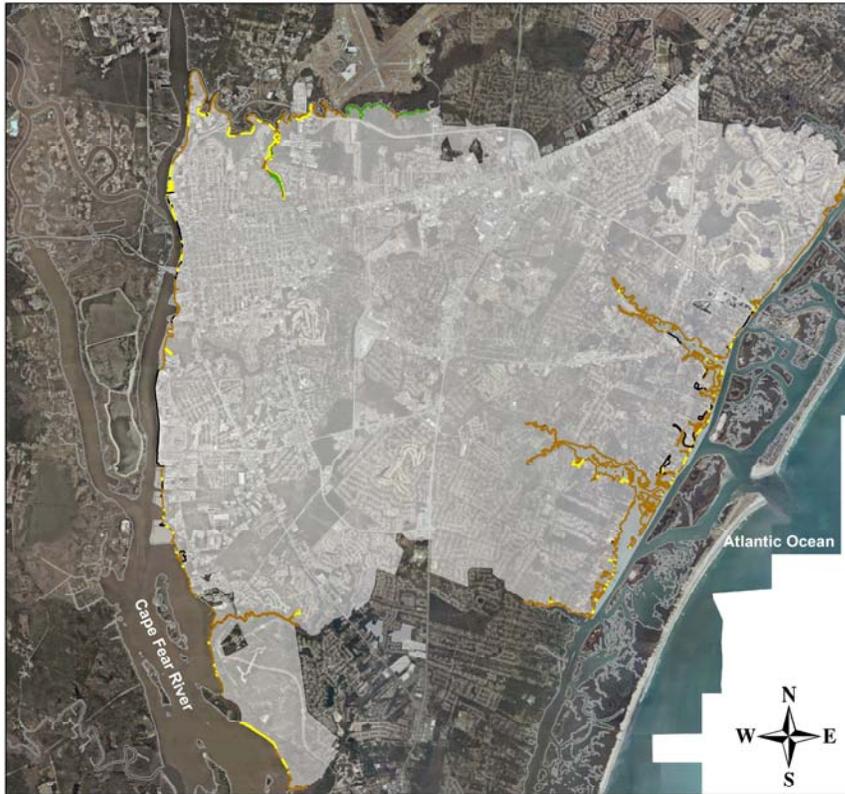
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	54	<.1	2
Breakwater	41	<.1	1
Groin/Jetty	44	<.1	2
Sill	0	0	0
Rip-Rap	4,556	.9	9
Bulkhead	8,318	1.6	15

Shoreline Access Structures

Total Acreage: 1.2

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	1.2	43

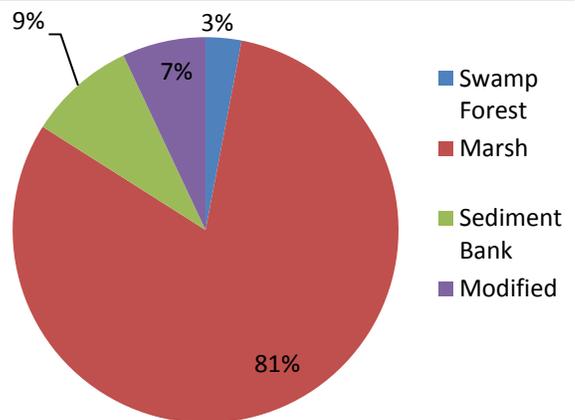
Wilmington



Estuarine Shoreline

Total Mileage: 91.0

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	3.2	3%
Marsh	74.1	81%
Sediment Bank	7.7	9%
Modified	6.9	7%



Stabilization Structures

Total Mileage: 7.0

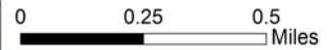
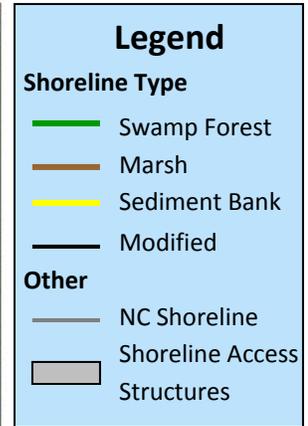
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	173	<.1	8
Breakwater	0	0	0
Groin/Jetty	1,812	.3	16
Sill	190	<.1	1
Rip-Rap	3,683	.7	16
Bulkhead	31,544	6.0	49

Shoreline Access Structures

Total Acreage: 29.4

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	5.2	9
Pier/Float Dock/Wharf	24.2	408

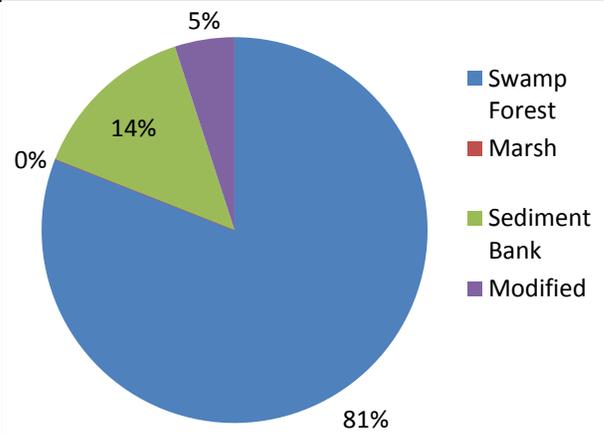
Windsor



Estuarine Shoreline

Total Mileage: 6.0

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	4.9	81%
Marsh	0	0%
Sediment Bank	.8	14%
Modified	.3	5%



Stabilization Structures

Total Mileage: .3

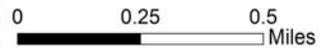
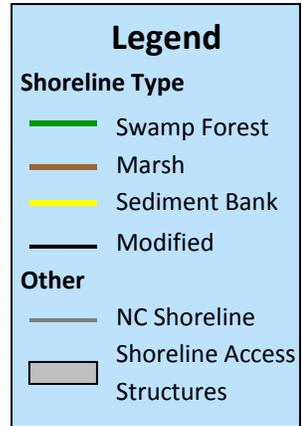
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	93	<.1	4
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	1,321	.3	4
Bulkhead	83	<.1	1

Shoreline Access Structures

Total Acreage: .53

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	.53	6

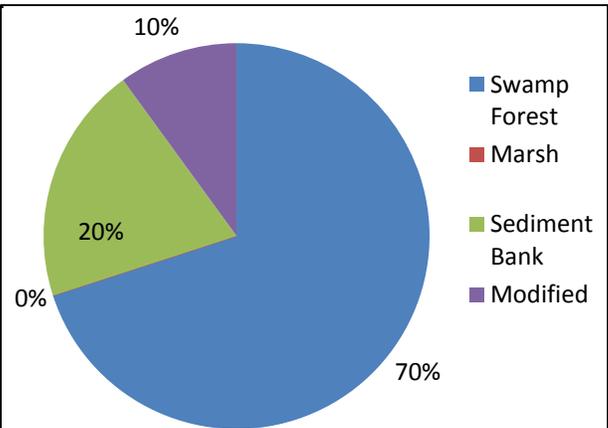
Windsor



Estuarine Shoreline

Total Mileage: 7.6

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	5.3	70%
Marsh	0	0%
Sediment Bank	1.5	20%
Modified	.8	10%



Stabilization Structures

Total Mileage: .8

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	12	<.1	1
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	886	.2	4
Bulkhead	3,199	.6	8

Shoreline Access Structures

Total Acreage: .47

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	.47	23

Winton



Legend

Shoreline Type

- Swamp Forest
- Marsh
- Sediment Bank
- Modified

Other

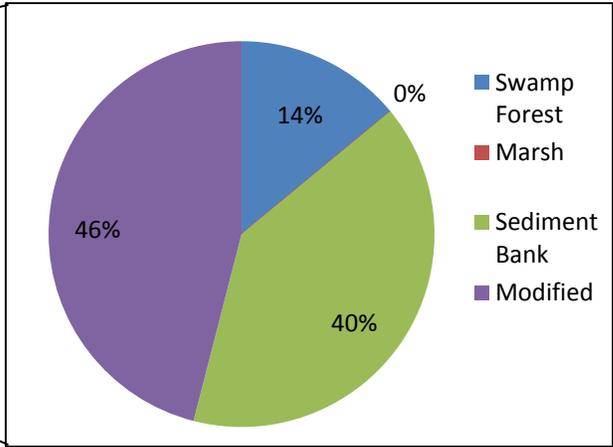
- NC Shoreline
- Shoreline Access Structures

0 0.05 0.1 Miles



Estuarine Shoreline
Total Mileage: .7

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	.1	14%
Marsh	0	0%
Sediment Bank	.3	40%
Modified	.3	46%



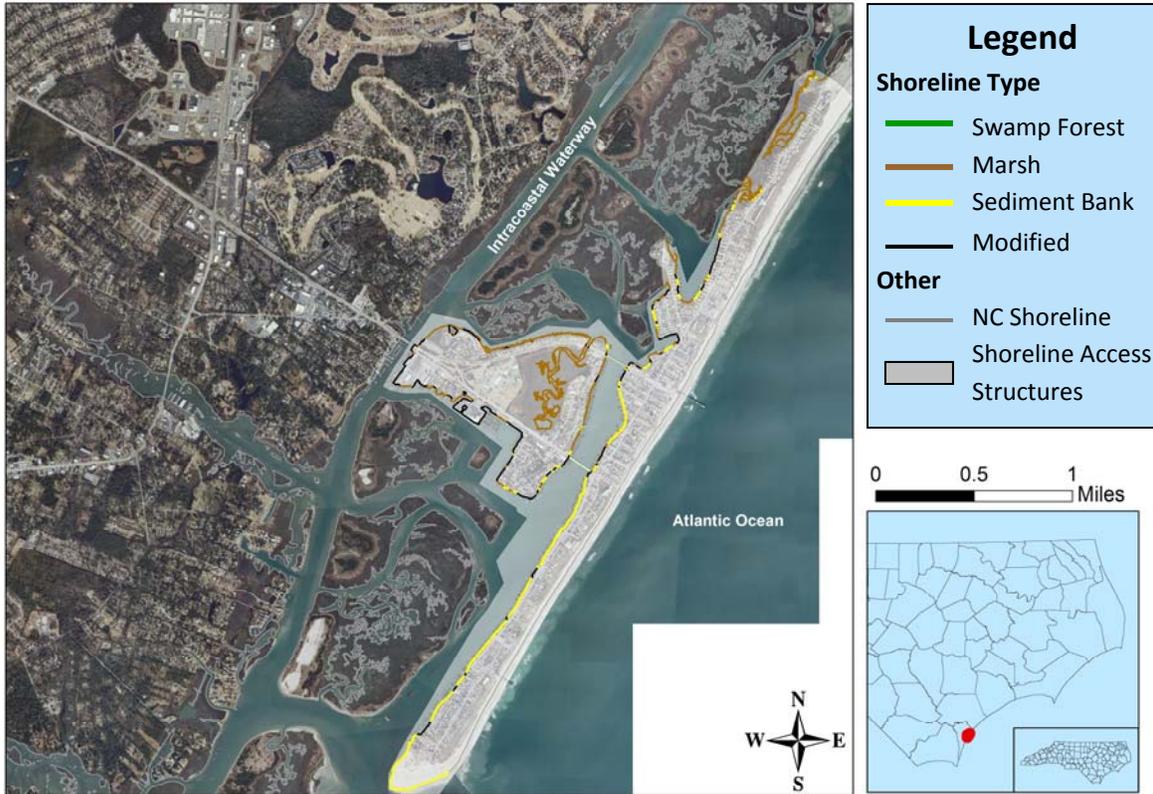
Stabilization Structures
Total Mileage: .3

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	9	<.1	1
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	0	0	0
Bulkhead	1,552	.3	3

Shoreline Access Structures
Total Acreage: .38

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	.38	11

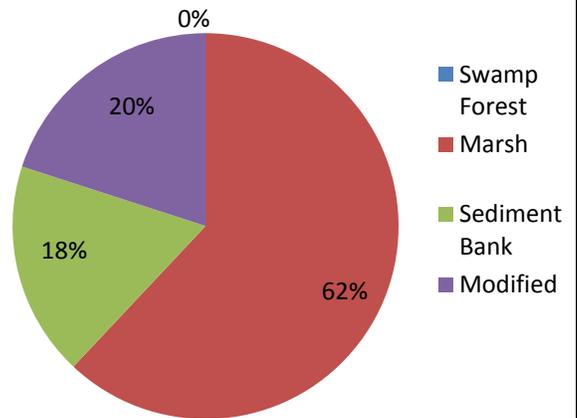
Wrightsville Beach



Estuarine Shoreline

Total Mileage: 17.2

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	0	0%
Marsh	10.6	62%
Sediment Bank	3.2	18%
Modified	2.4	20%



Stabilization Structures

Total Mileage: 5.5

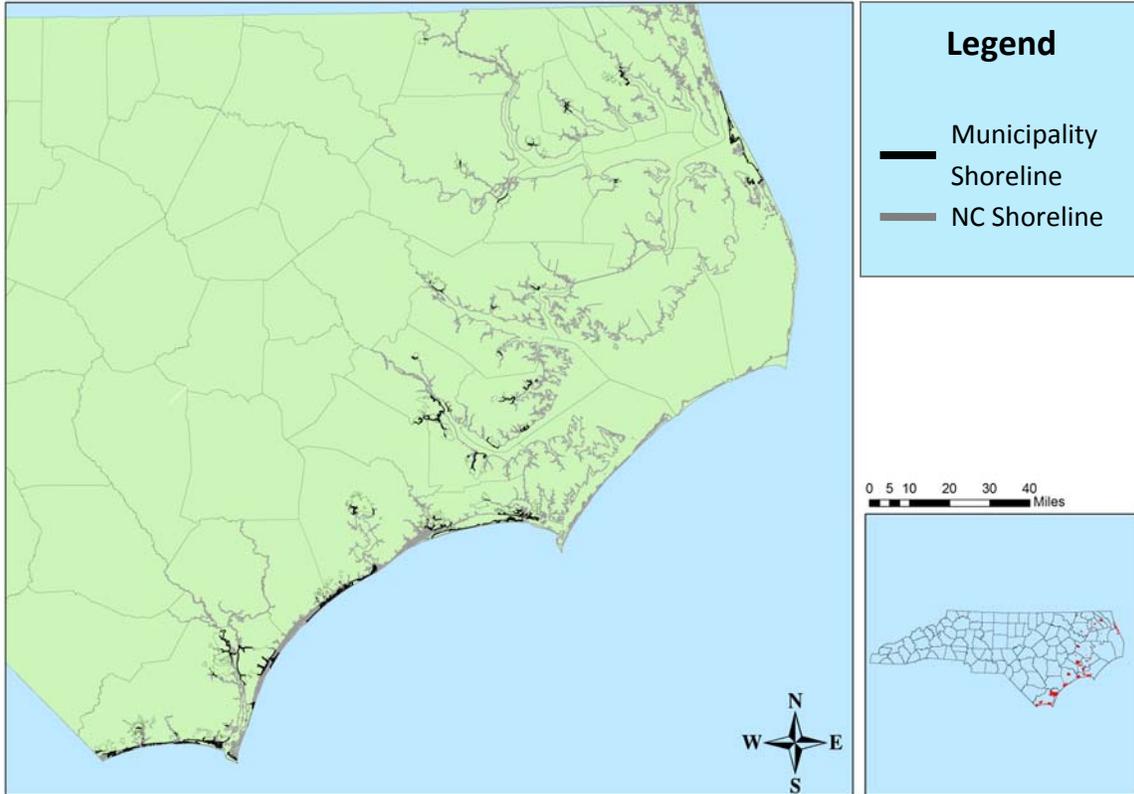
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	150	<.1	3
Breakwater	0	0	0
Groin/Jetty	159	<.1	3
Sill	0	0	0
Rip-Rap	1,056	.2	3
Bulkhead	28,056	5.3	50

Shoreline Access Structures

Total Acreage: 16.6

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	1.8	2
Pier/Float Dock/Wharf	14.8	475

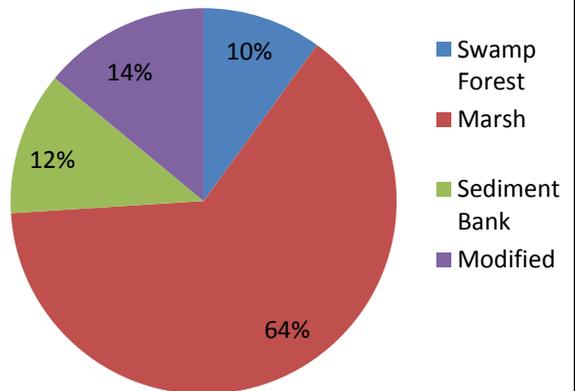
Summary



Estuarine Shoreline

Total Mileage: 1,223.1

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	125.6	52%
Marsh	782.1	48%
Sediment Bank	147.9	0%
Modified	167.5	0%



Stabilization Structures

Total Mileage: 209.2

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	8,661	1.6	545
Breakwater	4,633	.9	28
Groin/Jetty	13,630	2.6	244
Sill	10,147	1.9	35
Rip-Rap	177,175	33.6	532
Bulkhead	890,055	168.6	2,102

Shoreline Access Structures

Total Acreage: 262.4

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	33.1	110
Pier/Float Dock/Wharf	229.3	11,547

North Carolina Estuarine Shoreline Mapping Project

Hydrologic Unit Code (Waterbody) Statistics

June 2013

Prepared by: Kevin McVerry
North Carolina Division of Coastal Management
Department of Environment and Natural Resources

Outline

I. Project Background

Introduction.....	1
Methodology.....	1
Analysis.....	2

II. Analysis Results

Albemarle.....	3
Black.....	5
Blackwater.....	7
Chowan.....	9
Coastal Carolina.....	11
Lower Cape Fear.....	13
Lower Neuse.....	15
Lower Roanoke.....	17
Lower Tar.....	19
Meherrin.....	21
Middle Neuse.....	23
New River.....	25
Northeast Cape Fear.....	27
Nottoway.....	29
Pamlico.....	30
Pamlico Sound.....	33
White Oak River.....	35
Summary.....	37

Introduction

The North Carolina Department of the Environment and Natural Resources (DENR) Division of Coastal Management (DCM) is charged with the management and conservation of the state's coastal resources. The ability of DCM and other stakeholders to manage coastal resources could be augmented through the enhancement of digital mapping products, specifically, the representation of the estuarine shorelines as well as modification of those shorelines.

Recognizing that the creation of a digital shoreline based in a spatial framework would facilitate the ability of DCM and other agencies to monitor future trends of shoreline change, the Division developed a methodology for mapping the state's estuarine shoreline. DCM completed the methodology in June 2008 and began the mapping process in-house and through a contract with East Carolina University's Department of Geological Sciences and the Institute for Coastal Science and Policy.

The goal of the project was to identify the shoreline types and associated structures along each portion of shoreline. This work is intended to provide data and support the development and implementation of a sustainable estuarine shoreline policy for North Carolina. The completed shoreline data is available on DCM's website for use by other DENR agencies, local governments, academic institutions and interested stakeholders. Its application will vary dependent on the agency using it, however agencies will be able to link their own unique attributes and/or data to the shoreline and use it to better understand the physical and biological processes associated with North Carolina's estuarine shoreline.

Methodology

The DCM developed a methodology for digitally mapping a contiguous estuarine shoreline for North Carolina's 20 coastal counties under the jurisdiction of the NC Coastal Area Management Act (CAMA). This mapping included:

1. Delineation of the estuarine shoreline (land-water interface) with it broken down into five distinct shoreline types (marsh, swamp forest, modified with an engineered structure, sediment bank, and miscellaneous);
2. Delineation of shoreline stabilization structures (bulkhead, boat ramp, riprap revetment breakwaters, sills, and groins)
3. Delineation of structures that are typically found over water (piers, floating docks, wharves, and bridges).

This methodology utilized heads-up digitizing in ArcGIS[®], as this approach is widely used, accurate and affordable. The shoreline was digitized from geo-referenced, county-level aerial orthophotographs in NAD 1983 state plane feet. Digitizing was done on a county-by-county basis and each county shoreline was digitized using the most recent aerial imagery available/accessible for that county. Digitizing is accomplished using visual cues, pre-established digitizing rules and DCM-generated vegetation land-cover polygons to assist in segmenting the shoreline into various shoreline types. The final estuarine shoreline delineation consists of three distinct files. The first file is a linear estuarine shoreline broken down into five shoreline types (marsh, swamp forest, sediment bank, modified with engineered structure, and miscellaneous). The second file includes linear shoreline stabilization structures that are both coincident with the shoreline (also mapped as the modified with engineered structure shoreline type) and those that are landward of and/or waterward of the shoreline

(breakwater, bulkhead, boat ramp, sill, groin, and riprap revetment). The final file contains polygon shaped structures that are typically over water (piers, floating docks, wharves, and bridges), but also includes parts of the structures mapped that are over land as well.

To review DCM's approach to digitizing the estuarine shoreline, please see *Charting the Estuarine Environment: A methodology for spatially delineating a contiguous, estuarine shoreline for North Carolina* (available at <http://dcm2.enr.state.nc.us/estuarineshoreline/Complete%20Methodology%20Report.pdf>).

Statistics

A need was identified to have project data and statistics available at a finer scale than by county-level. For the purpose of this report shoreline data was summarized by Hydrologic Unit Code (HUC). The digital HUC layer¹ was created by the United States Geological Survey (USGS) and was used to extract shoreline and structure data. HUCs identify a hydrological feature such as rivers, creeks, or drainage basins. HUCs are divided into several scales, with 21 Regional HUCs and 160,000 Subwatersheds identified in the United States. Shoreline data was categorized by broad scale 8-digit HUCs and fine scale 12-digit HUCs. The data layer was overlaid on shoreline data to identify shoreline and structures within each HUC.

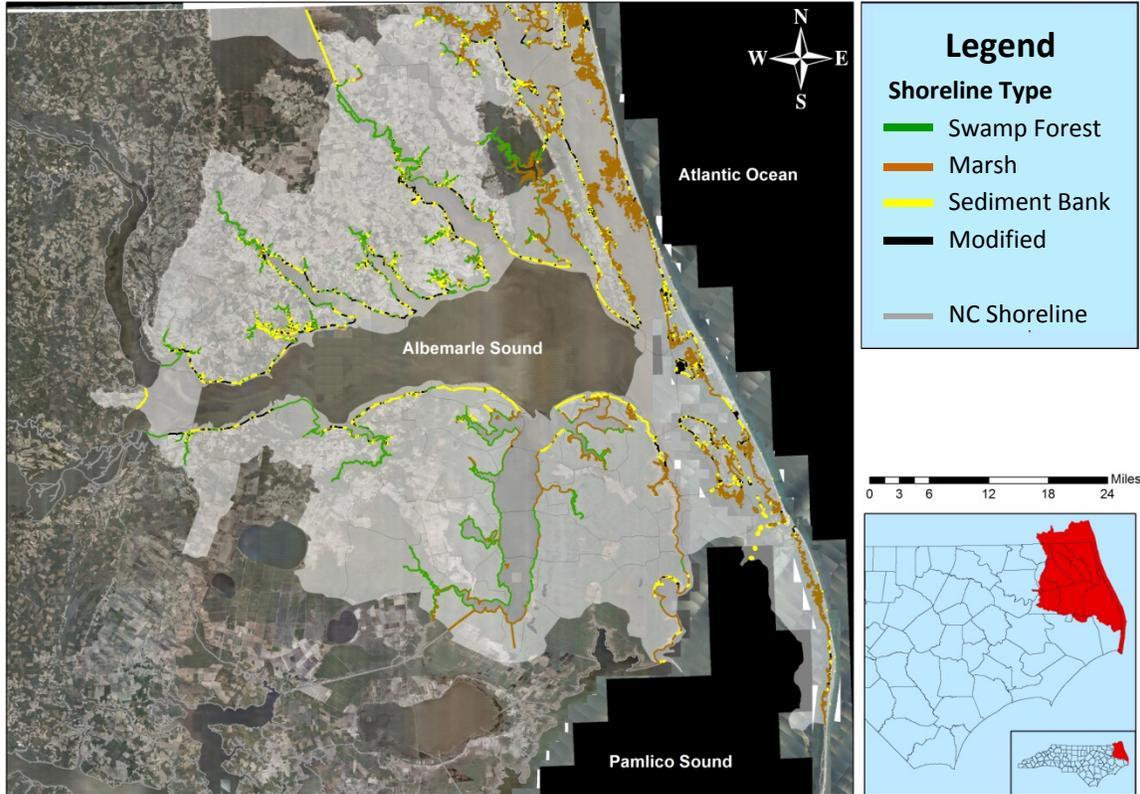
The shoreline itself is broken down into total length for each of the five shoreline types designated in DCM's estuarine shoreline delineation methodology. The statistics presented for modified with an engineered structure represent only a subset of the total structures present in the counties because only structures that are coincident with the estuarine shoreline (i.e. bulkheads) can be represented by the modified shoreline category. Additional structures, while important to understanding the overall modification and utilization of the estuarine shoreline and access to estuarine/public trust resources, are not included in the statistics for shoreline composition if they are not coincident with the shoreline. Therefore, when statistics are run for the overall length of erosion control/stabilization structures along the estuarine shoreline, this number will be greater than the correlating percentage in length that is represented by the modified shoreline category, as this category does not account for non-shoreline coincident structures.

The shoreline stabilization structure file was broken down into total length for each of the shoreline stabilization structures in miles. Again, these numbers do not add up to the same numbers presented in the modified shoreline structure breakdown because additional structures were mapped in this file.

Statistics generated for the polygon structures file (representing docks, piers, etc.) were broken down into total area in acres for each of the different structure types.

¹Hydrologic Unit Code GIS data <http://water.usgs.gov/GIS/huc.html>

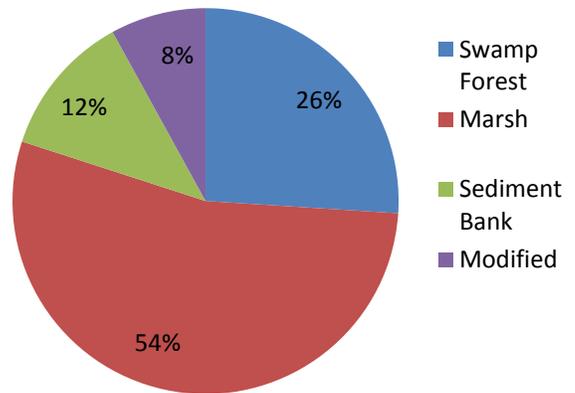
Albemarle



Estuarine Shoreline

Total Mileage: 3,065.6

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	796.7	26%
Marsh	1,664.1	54%
Sediment Bank	371.4	12%
Modified	233.4	8%



Stabilization Structures

Total Mileage: 231.4

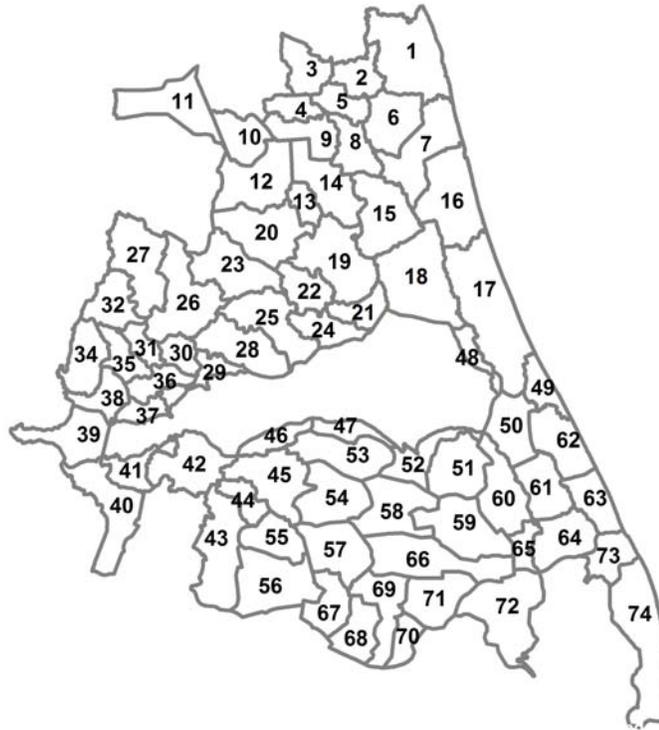
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	7,018	1.3	484
Breakwater	19,241	3.6	165
Groin/Jetty	40,241	7.6	938
Sill	3,701	.7	17
Rip-Rap	200,959	38.1	660
Bulkhead	950,949	180.1	2,116

Shoreline Access Structures

Total Acreage: 219.2

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	129.6	124
Pier/Float Dock/Wharf	89.5	5,621

Albemarle



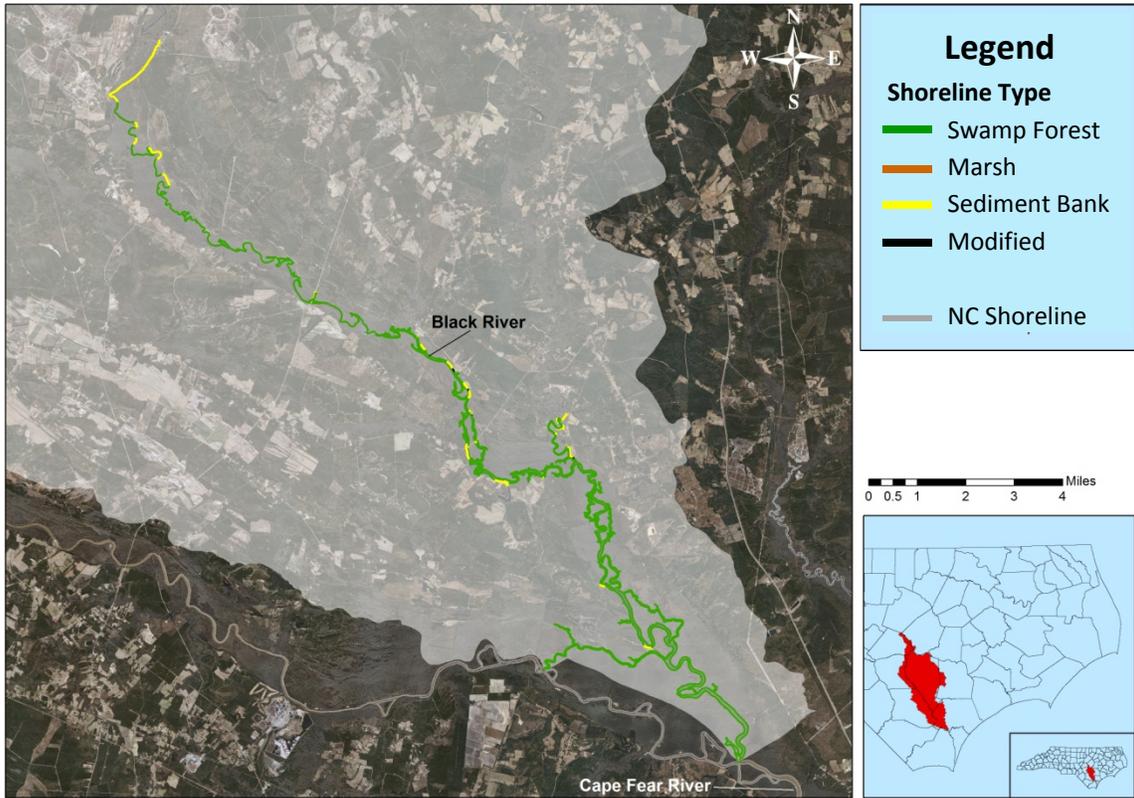
Legend

— HUC Boundary



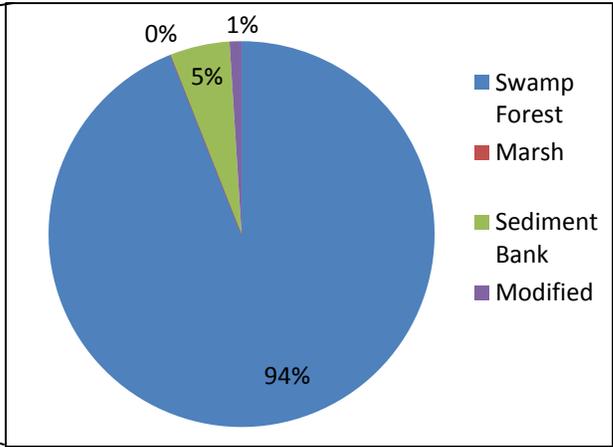
1. Back Bay	25. Symonds Creek – Lower Little River	49. Town of Kill Devil Hills – Kitty Hawk Bay
2. Milldam Creek – North Landing River	26. Sutton Creek – Middle Perquimans River	50. Albemarle Sound – Croatan Sound
3. Indian Creek – Northwest River	27. Town of Hertford – Upper Perquimans River	51. South Lake – East Lake
4. Moyock Run	28. Lower Perquimans River	52. Alligator River
5. Tull Bay – Northwest River	29. Holiday Island – Minzies Creek	53. Little Alligator River
6. Town of Currituck – North Landing River	30. Yeopim Creek	54. Second Creek
7. Coinjock Bay – Currituck Sound	31. Bethel Creek	55. Hollow Ground Swamp – Northwest Fork Alligator River
8. Tull Creek	32. Goodwin Creek	56. Southwest Fork – Northwest Fork Alligator River
9. Roland Creek	33. Middle Perquimans River	57. The Frying Pan – The Straights
10. Town of South Mills – Joyce Creek	34. Pembroke Creek	58. Goose Creek – Alligator River
11. Cross Canal – Dismal Swamp Canal	35. Burnt Mill Creek	59. Sawyer Lake – Milltail Creek
12. Shipyard Landing – Pasquotank River	36. Holiday Island – Yeopim River	60. Spencer Creek – Callaghan Creek
13. Town of Camden – Sawyers Creek	37. Sandy Point – Nixous Beach	61. Roanoke Island – Croatan Sound
14. Run Swamp Canal – Indiantown Creek	38. Edenton Bay	62. Buzzard Bay – Roanoke Sound
15. Great Swamp – North River	39. Town of Edenton – Albemarle Sound	63. Broad Creek – Roanoke Sound
16. Sanders Bay – Currituck Sound	40. Outlet Kendrick Creek	64. Croatan Sound
17. Dowdy Bay – Currituck Sound	41. Town of Skinnersville – Chapel Swamp	65. Roanoke Marsh – Croatan Sound
18. North River	42. Bull Creek – Deep Creek	66. Stumpy Point – Alligator River
19. Raymond Creek – Pasquotank River	43. Old Canal – Scuppernong River	67. Gum Neck Creek – Alligator River
20. Elizabeth City – Pasquotank River	44. Simmons Landing – Scuppernong River	68. Winn Bay – Alligator River
21. Pasquotank River	45. Riders Creek – Scuppernong River	69. Grapevine Bay – Alligator River
22. Newbegun Creek	46. Norman Smith Legion Beach – Bull Bay	70. Swan Creek Lake – Swan Creek
23. Rabbit Corner – Middle Little River	47. Lewis Point – Albemarle Sound	71. Whipping Creek Lake – Whipping Creek
24. Big Flatty Creek	48. Pleasant Branch – Albemarle Sound	72. Stumpy Point – Pamlico Sound
		73. Pamlico Sound – Oregon Inlet
		74. Hatteras Island Pamlico Sound

Black



Estuarine Shoreline
Total Mileage: 129.1

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	122.0	94%
Marsh	0	0%
Sediment Bank	6.8	5%
Modified	.3	1%



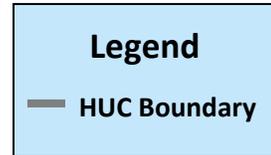
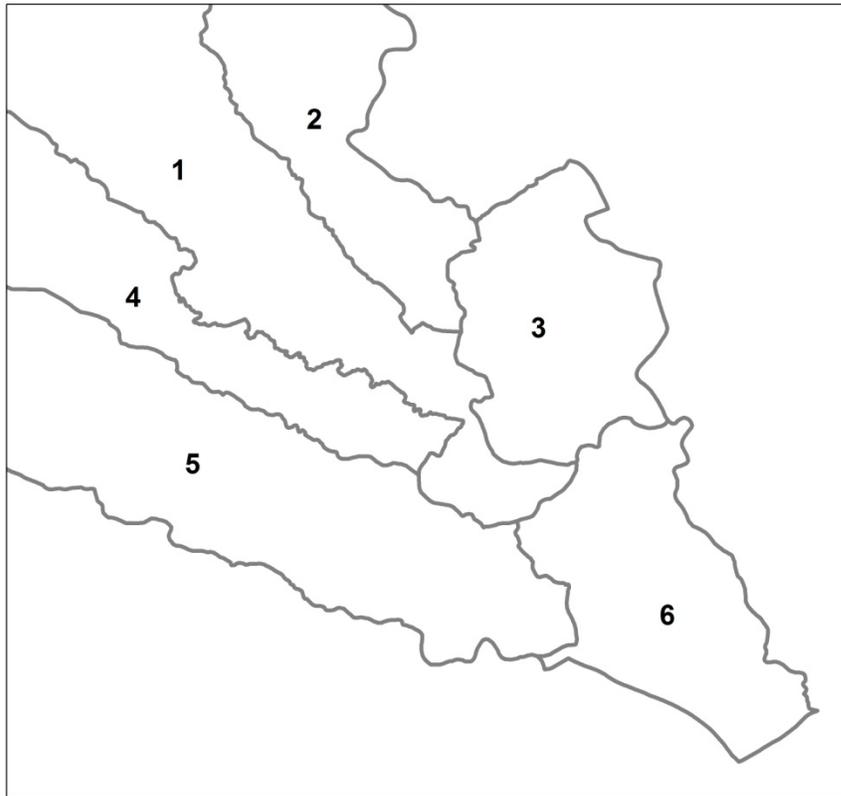
Stabilization Structures
Total Mileage: .29

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	10	<.01	1
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	362	.07	2
Bulkhead	1,155	.22	4

Shoreline Access Structures
Total Acreage: 1.9

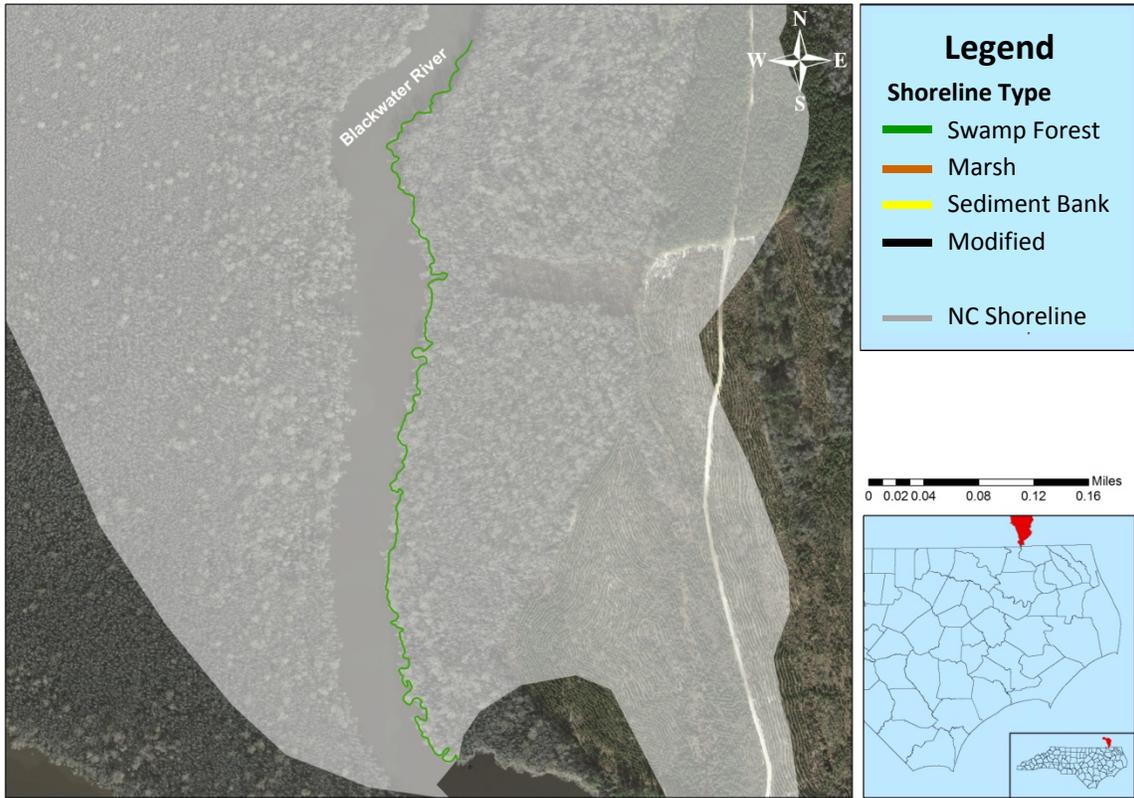
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	1.3	6
Pier/Float Dock/Wharf	.6	56

Black



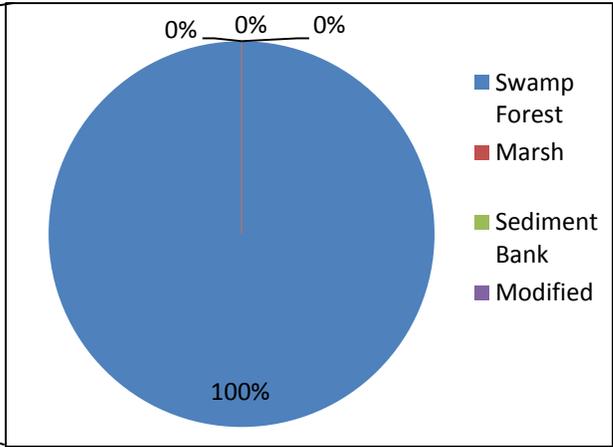
1. Rowan Creek – Black River
2. Colvins Creek
3. Lower Moores Creek
4. Lower Colly Creek
5. Lyon Creek
6. Cross Way Creek – Black River

Blackwater



Estuarine Shoreline
Total Mileage: .8

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	.8	100%
Marsh	0	0%
Sediment Bank	0	0%
Modified	0	0%



Stabilization Structures
Total Mileage: .7

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	0	0	0
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	0	0	0
Bulkhead	0	0	0

Shoreline Access Structures
Total Acreage: 0

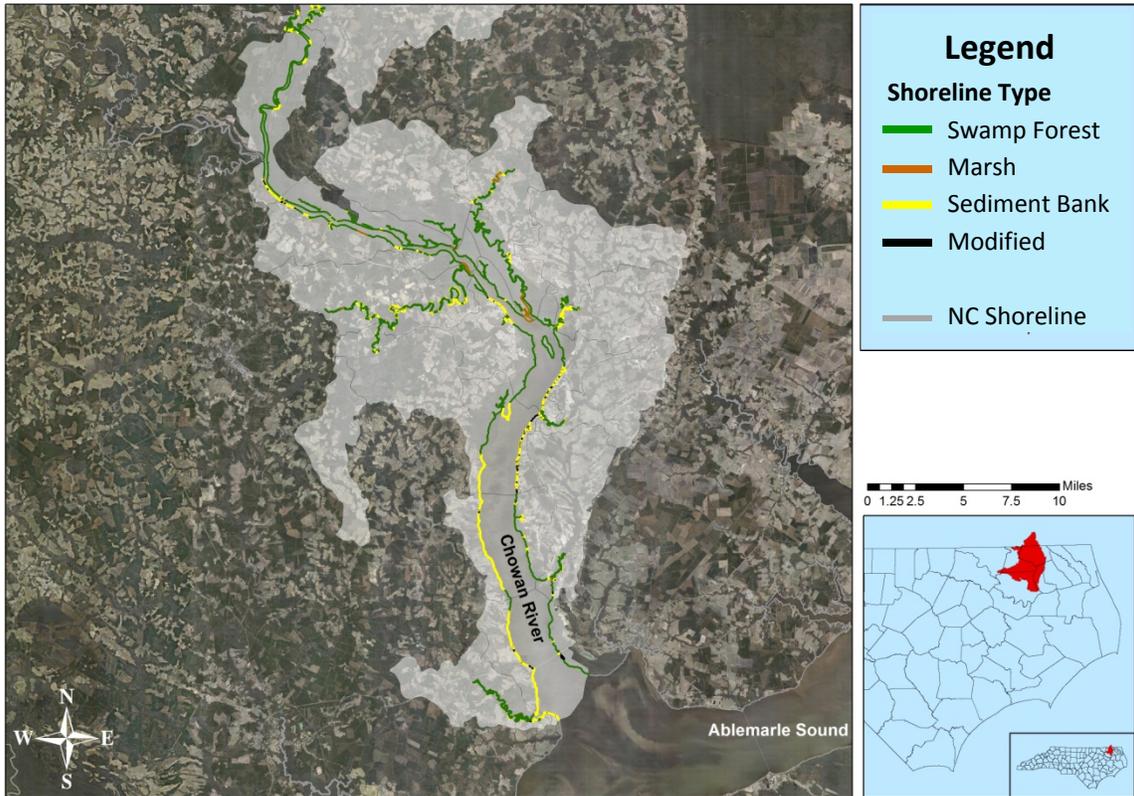
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	0	0

Blackwater



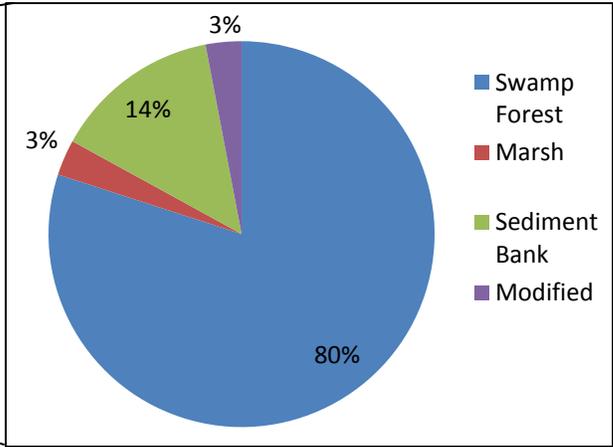
1. Union Camp Holding Point Pond – Black Water River

Chowan



Estuarine Shoreline
Total Mileage: 382.3

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	310.0	80%
Marsh	10.2	3%
Sediment Bank	52.5	14%
Modified	9.6	3%



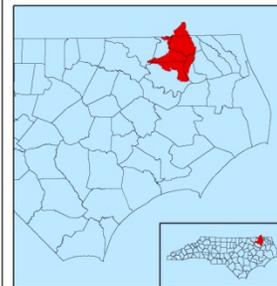
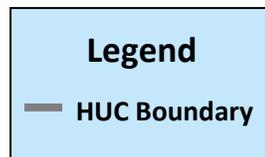
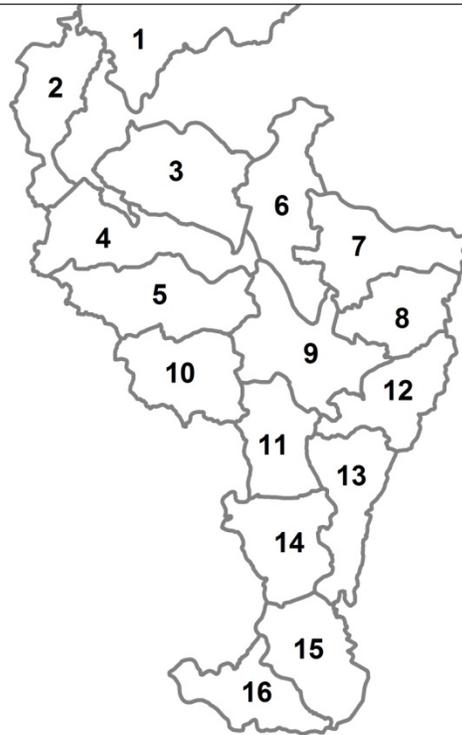
Stabilization Structures
Total Mileage: 13.7

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	657	.1	40
Breakwater	25	<.01	1
Groin/Jetty	3,810	.7	134
Sill	392	.1	5
Rip-Rap	6,453	1.2	36
Bulkhead	61,104	11.6	181

Shoreline Access Structures
Total Acreage: 29.0

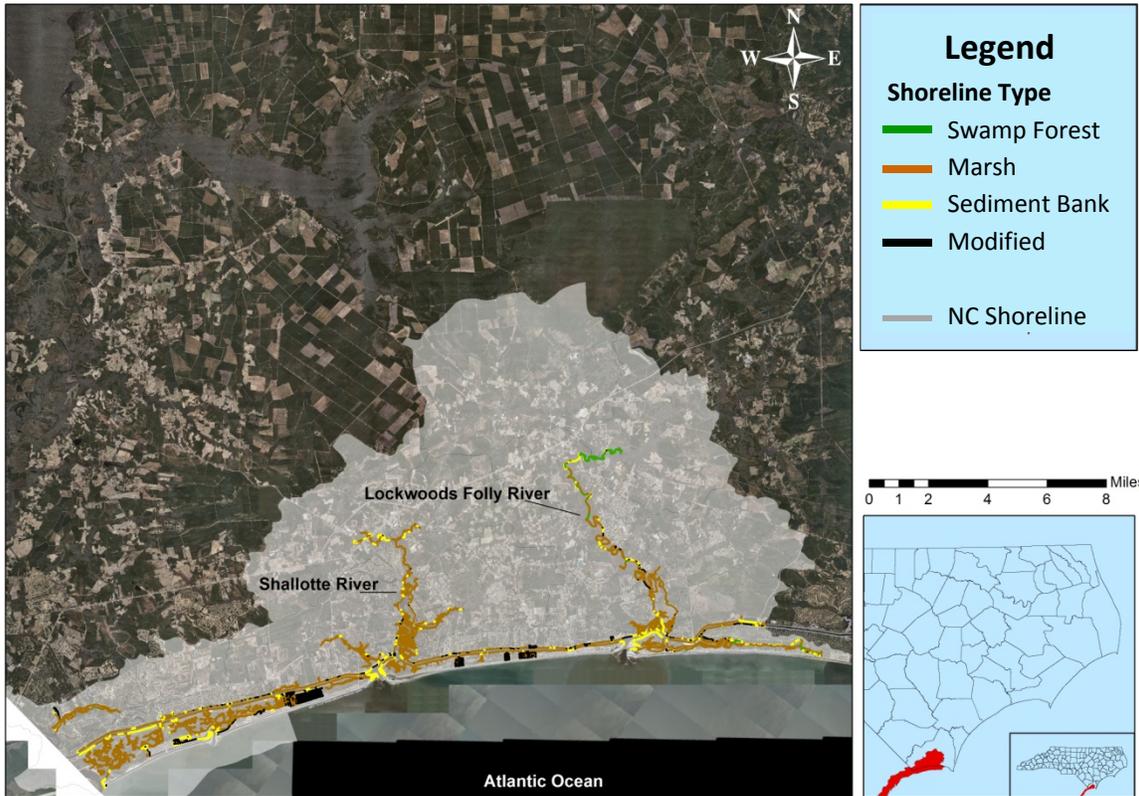
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	17.7	14
Pier/Float Dock/Wharf	11.3	504

Chowan



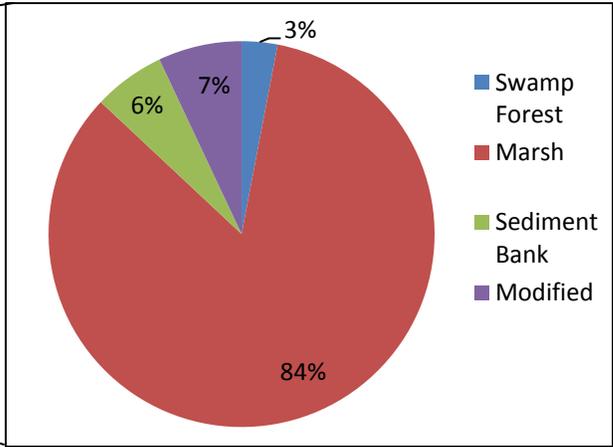
1. March Swamp – Somerton Creek
2. Town of Winton – Chowan River
3. Cole Creek – Sarem Creek
4. Sarem Creek – Chowan River
5. Wiccacon River
6. Bennetts Creek
7. Trotman Creek
8. Warwick Creek – Catherine Creek
9. Holiday Island – Chowan River
10. Chinkapin Creek
11. Town of Colerain – Chowan River
12. Dillard Millpond – Indian Creek
13. Bennett Millpond – Rockyhoch Creek
14. Mount Gould Landing – Chowan River
15. Edenhouse Point – Chowan River
16. Salmon Creek

Coastal Carolina



Estuarine Shoreline
Total Mileage: 398.0

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	10.4	3%
Marsh	334.5	84%
Sediment Bank	25.3	6%
Modified	27.8	7%



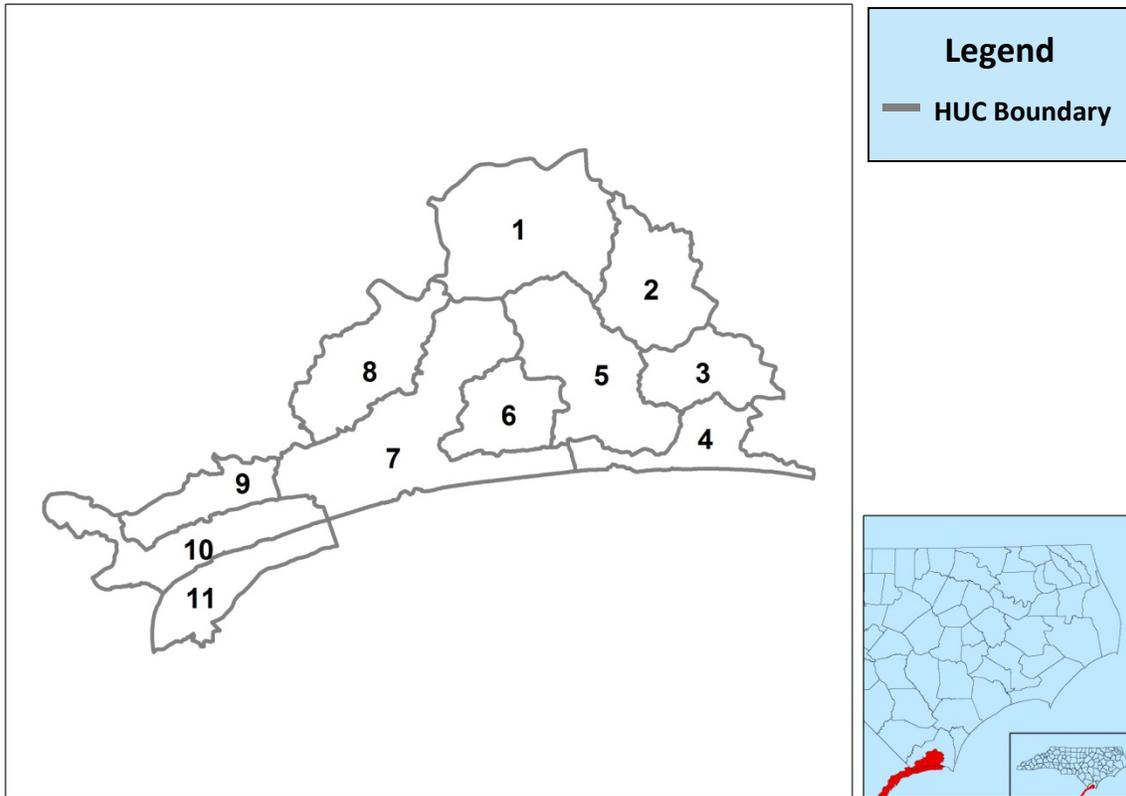
Stabilization Structures
Total Mileage: 45.4

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	1,188	.2	69
Breakwater	19	<.01	1
Groin/Jetty	3,120	.6	22
Sill	0	0	0
Rip-Rap	71,124	13.5	81
Bulkhead	164,135	31.1	235

Shoreline Access Structures
Total Acreage: 68.4

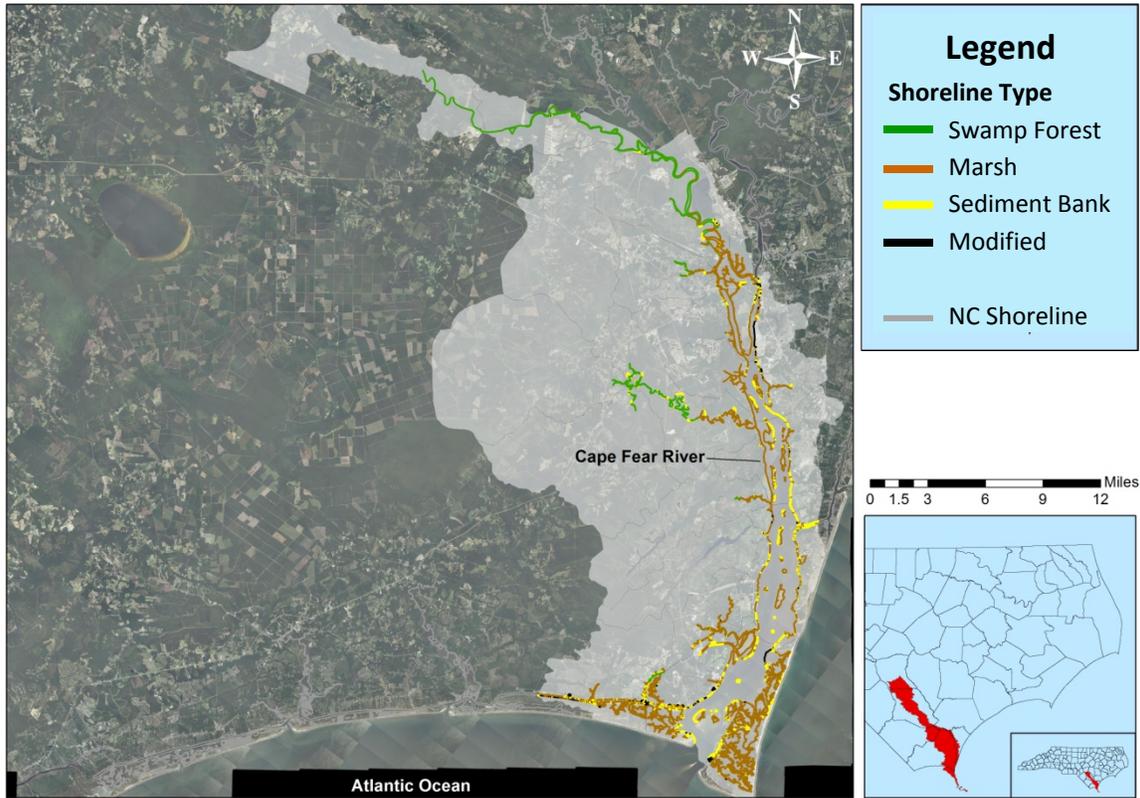
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	4.2	15
Pier/Float Dock/Wharf	64.2	3,749

Coastal Carolina



1. Royal Oak Swamp
2. Scotts Branch – Lockwoods Folly River
3. Mill Creek
4. Town of Long Beach – Montgomery Slough
5. Pamlico Creek – Lockwoods Folly River
6. Shallotte Creek
7. Middle Shallotte River
8. Lower Shallotte River
9. Calabash Creek
10. Lower Little River – Atlantic Intracoastal Waterway
11. Atlantic Ocean

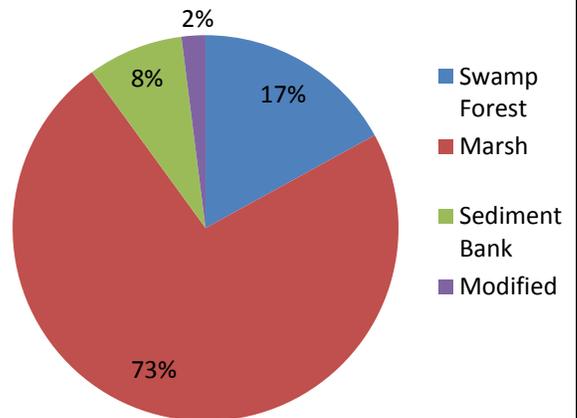
Lower Cape Fear



Estuarine Shoreline

Total Mileage: 662.7

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	118.2	17%
Marsh	480.8	73%
Sediment Bank	50.6	8%
Modified	13.1	2%



Stabilization Structures

Total Mileage: 19.3

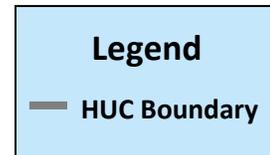
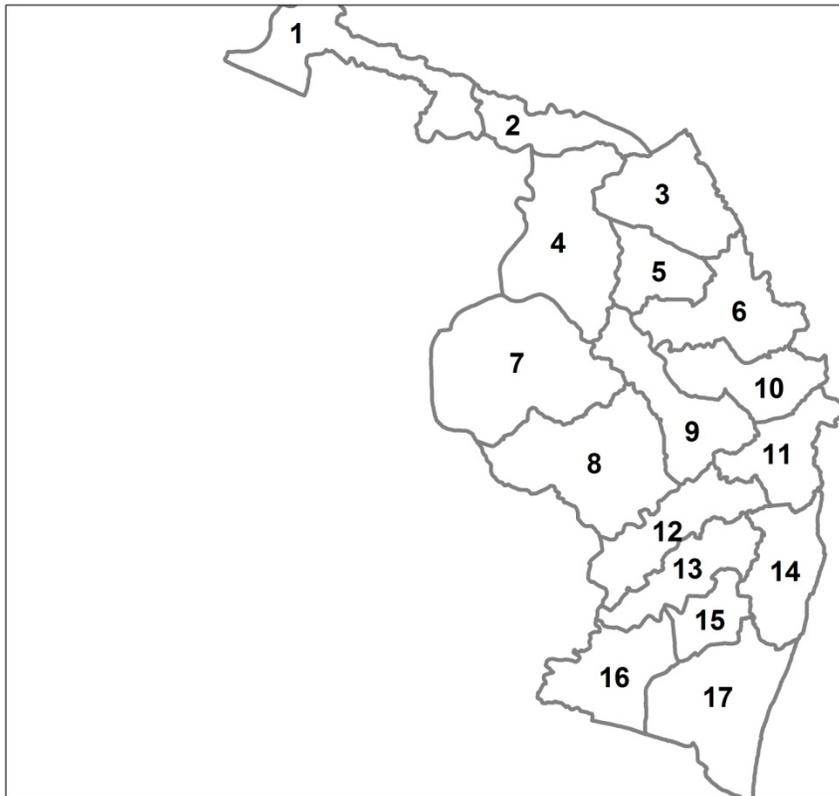
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	717	.1	33
Breakwater	27,485	5.2	32
Groin/Jetty	2,480	.5	24
Sill	351	.1	1
Rip-Rap	17,919	3.4	53
Bulkhead	52,871	10.0	93

Shoreline Access Structures

Total Acreage: 67.7

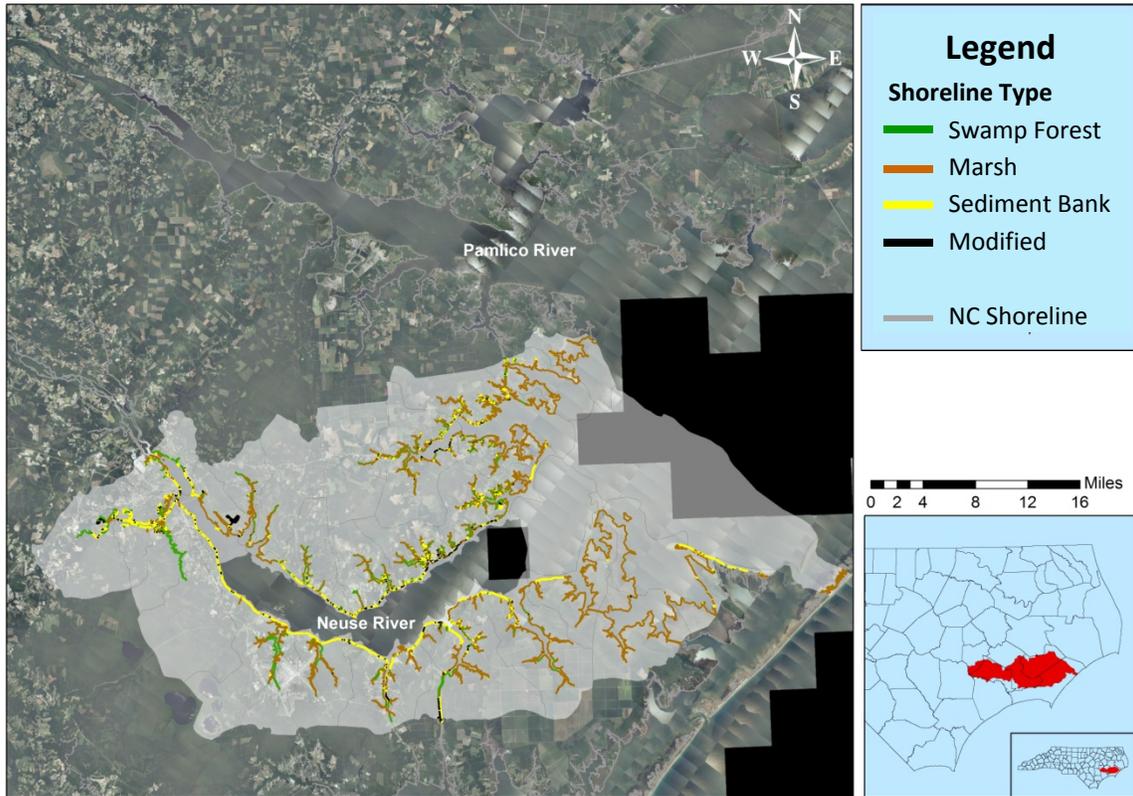
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	17.2	32
Pier/Float Dock/Wharf	50.5	588

Lower Cape Fear



1. Mitchell Landing – Cape Fear River
2. Grist Mill Branch – Cape Fear River
3. Indian Creek – Cape Fear River
4. Hood Creek
5. Town of Woodburn – Sturgeon Creek
6. Brunswick River – Cape Fear River
7. Upper Town Creek
8. Bell Swamp – Rice Creek
9. Lower Town Creek
10. Barnards Creek – Cape Fear River
11. Mott Creek – Cape Fear River
12. Lilput Creek
13. Orton Creek
14. Town of Kure Beach – Cape Fear River
15. Walden Creek
16. Jump and Run Creek – Gully Creek
17. Town of Southport – Cape Fear River

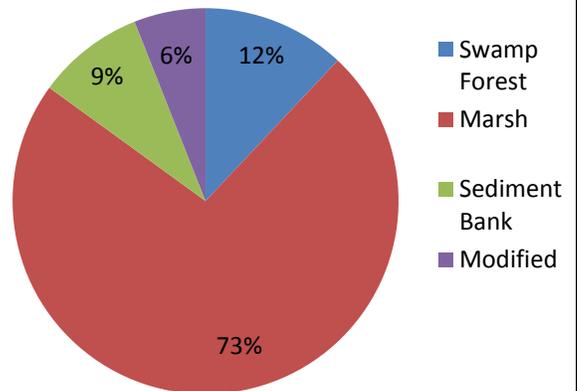
Lower Neuse



Estuarine Shoreline

Total Mileage: 1,127.7

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	134.5	12%
Marsh	825.0	73%
Sediment Bank	103.6	9%
Modified	64.6	6%



Stabilization Structures

Total Mileage: 81.3

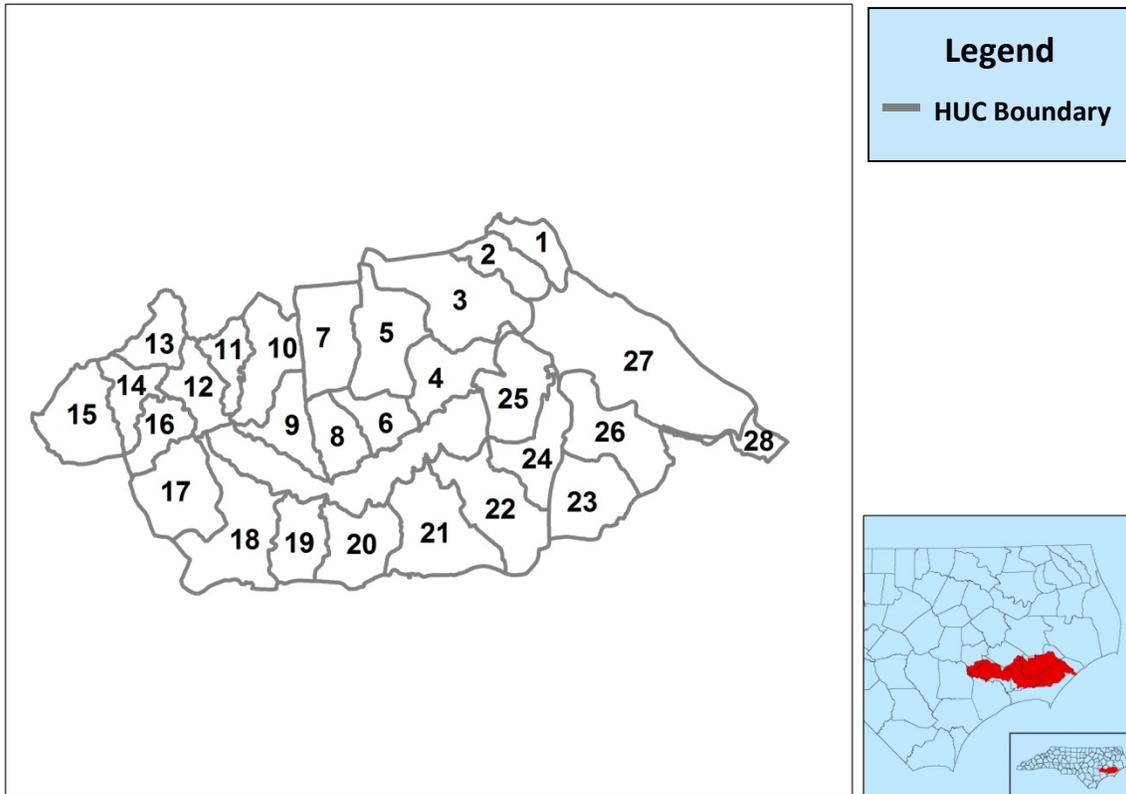
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	2,645	.5	191
Breakwater	1,963	.4	26
Groin/Jetty	13,877	2.6	240
Sill	918	.2	13
Rip-Rap	167,697	31.8	655
Bulkhead	242,033	45.8	975

Shoreline Access Structures

Total Acreage: 78.0

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	39.8	35
Pier/Float Dock/Wharf	38.2	2,220

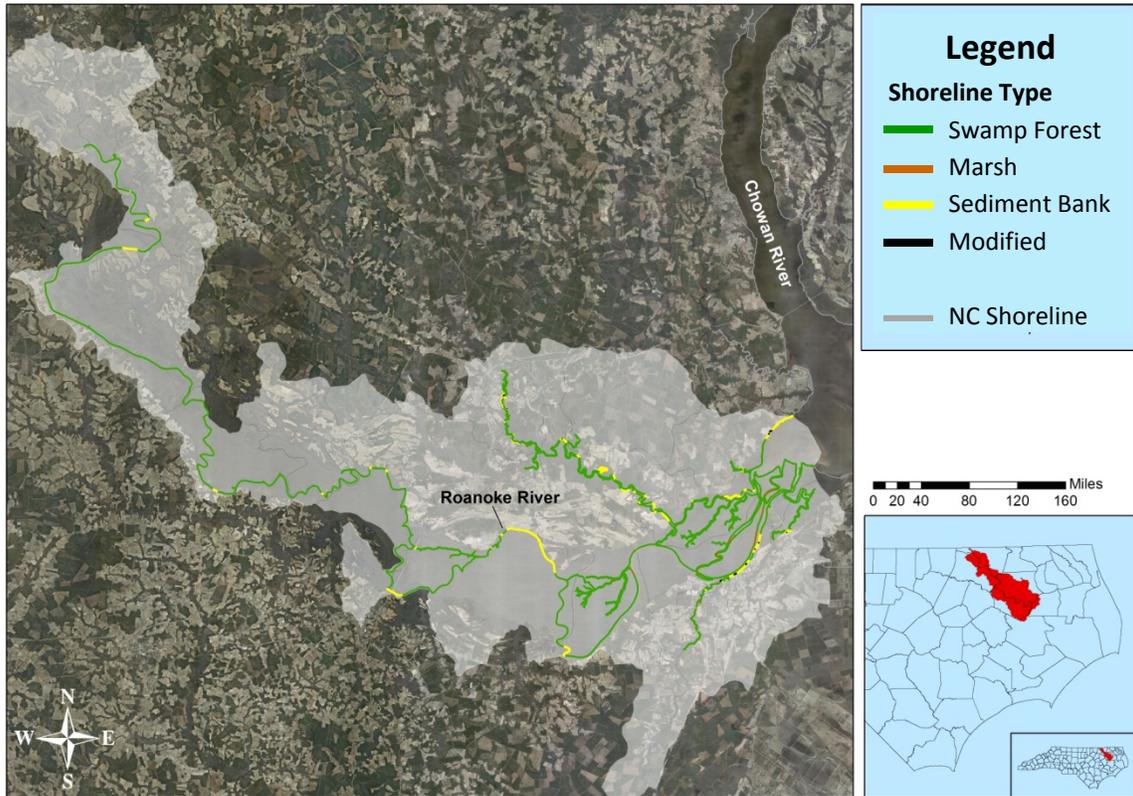
Lower Neuse



1. Middle Bay
2. Jones Bay
3. Lower Bay River
4. Broad Creek
5. Middle Bay River
6. Greens Creek
7. Upper Bay River
8. Dawson Creek
9. Beard Creek
10. Goose Creek
11. Outlet Upper Goose Creek
12. Northwest Creek – Neuse River
13. City of New Bern – Neuse River
14. City of New Bern – Trent River

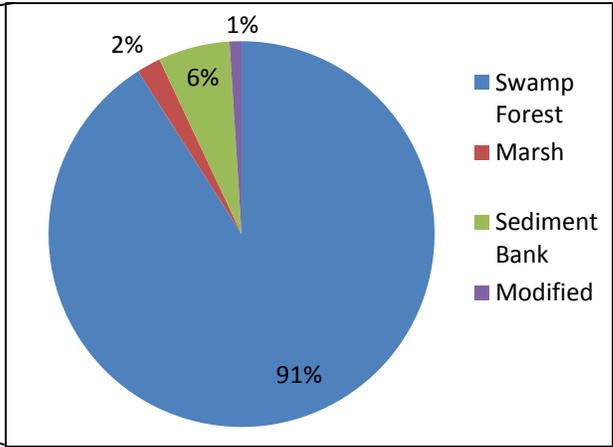
15. Island Creek – Trent River
16. Outlet Bridge Creek
17. Headwaters Brice Creek
18. Cherry Point MCAS – Slocum Creek
19. Cherry Point MCAS – Hancock Creek
20. Clubfoot Creek
21. Adams Creek
22. South River
23. West Thorofare Bay – Long Bay
24. Turnagain Bay – Rattan Bay
25. Neuse River
26. Cedar Island – West Bay
27. Neuse River – Pamlico Sound
28. Portsmouth Island – Pamlico Sound

Lower Roanoke



Estuarine Shoreline
Total Mileage: 305.1

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	279.8	91%
Marsh	5.2	2%
Sediment Bank	18.6	6%
Modified	1.5	1%



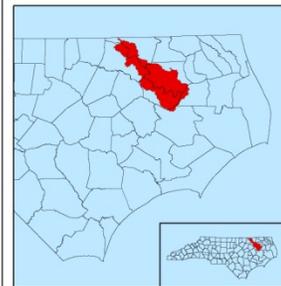
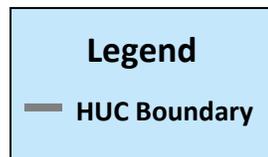
Stabilization Structures
Total Mileage: 1.7

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	384	.1	16
Breakwater	0	0	0
Groin/Jetty	239	<.1	5
Sill	0	0	0
Rip-Rap	3,418	.6	11
Bulkhead	5,091	1.0	22

Shoreline Access Structures
Total Acreage: 11.1

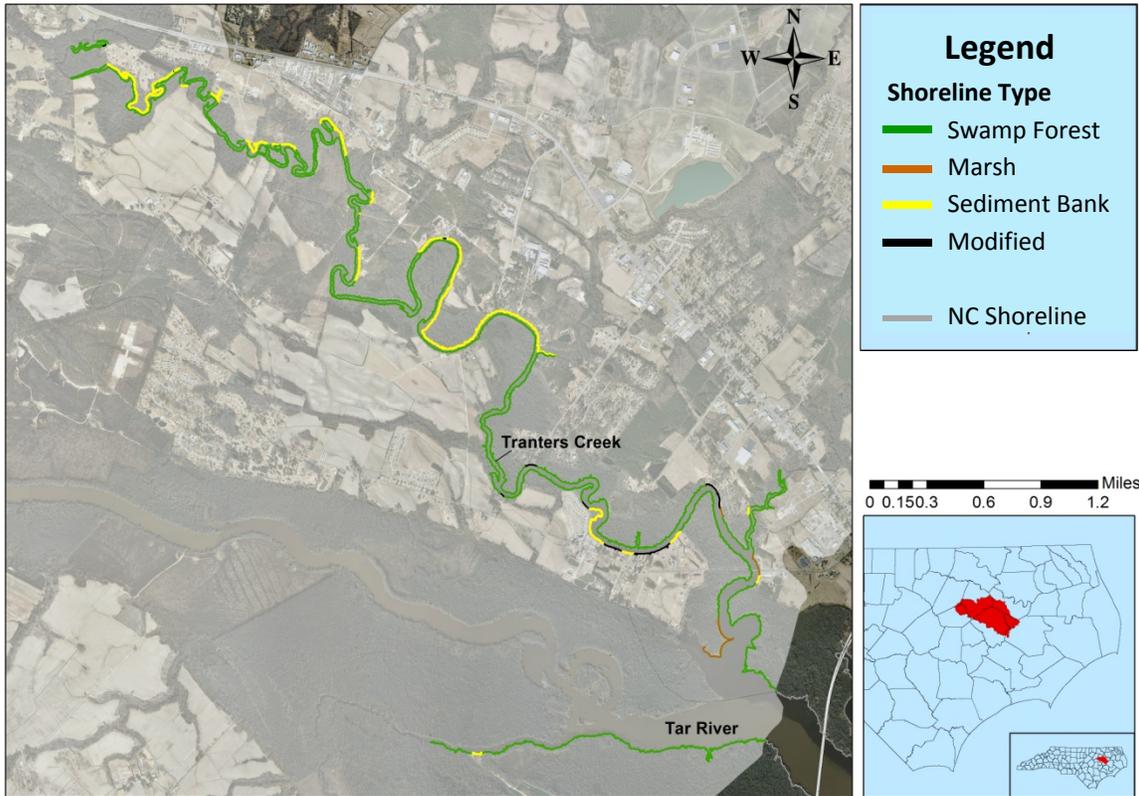
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	9.1	22
Pier/Float Dock/Wharf	2.0	90

Lower Roanoke



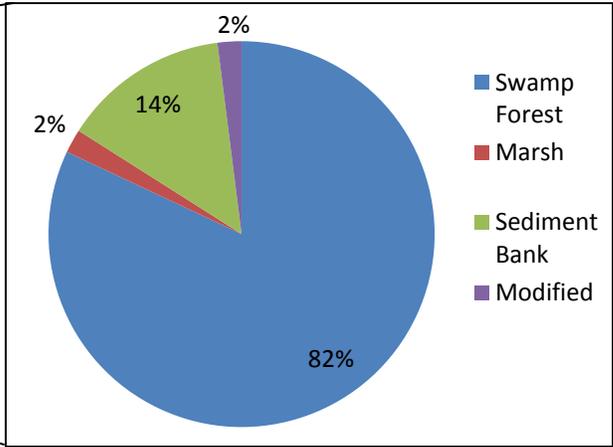
1. Sandy Run – Roanoke River
2. Flag Run – Roanoke River
3. Blue Hole Swamp – Roanoke River
4. Town of Hamilton – Roanoke River
5. Coniott Creek – Roanoke River
6. Outlet Roquist Creek
7. City of Williamston – Roanoke River
8. Devils Gut – Roanoke River
9. Town of Windsor – Cashie River
10. Wading Place Creek
11. Swamp Creek – Cashie River
12. Board Creek – Roanoke River
13. Broad Creek – Cashie River
14. Town of Plymouth – Roanoke River
15. Conaby Creek
16. Welch Creek

Lower Tar



Estuarine Shoreline
Total Mileage: 39.0

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	32.2	82%
Marsh	.7	2%
Sediment Bank	5.3	14%
Modified	.8	2%



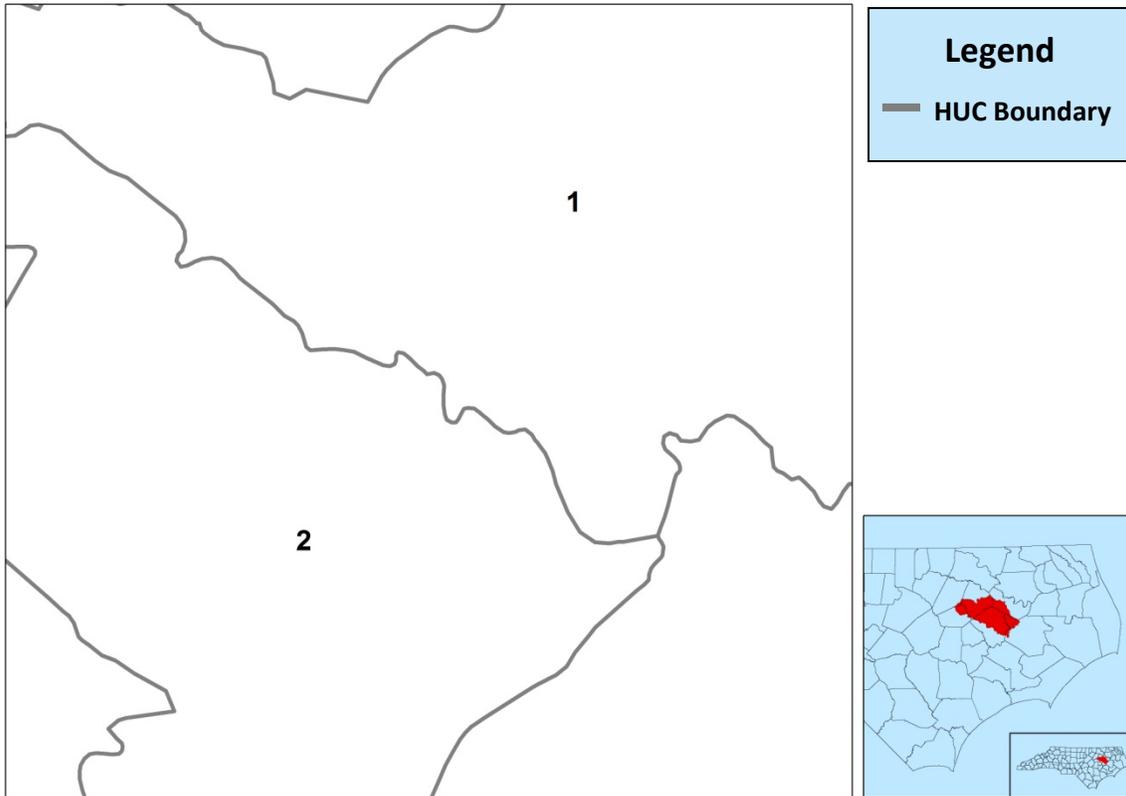
Stabilization Structures
Total Mileage: .4

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	44	<.1	2
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	73	<.1	1
Bulkhead	2,050	.4	7

Shoreline Access Structures
Total Acreage: .40

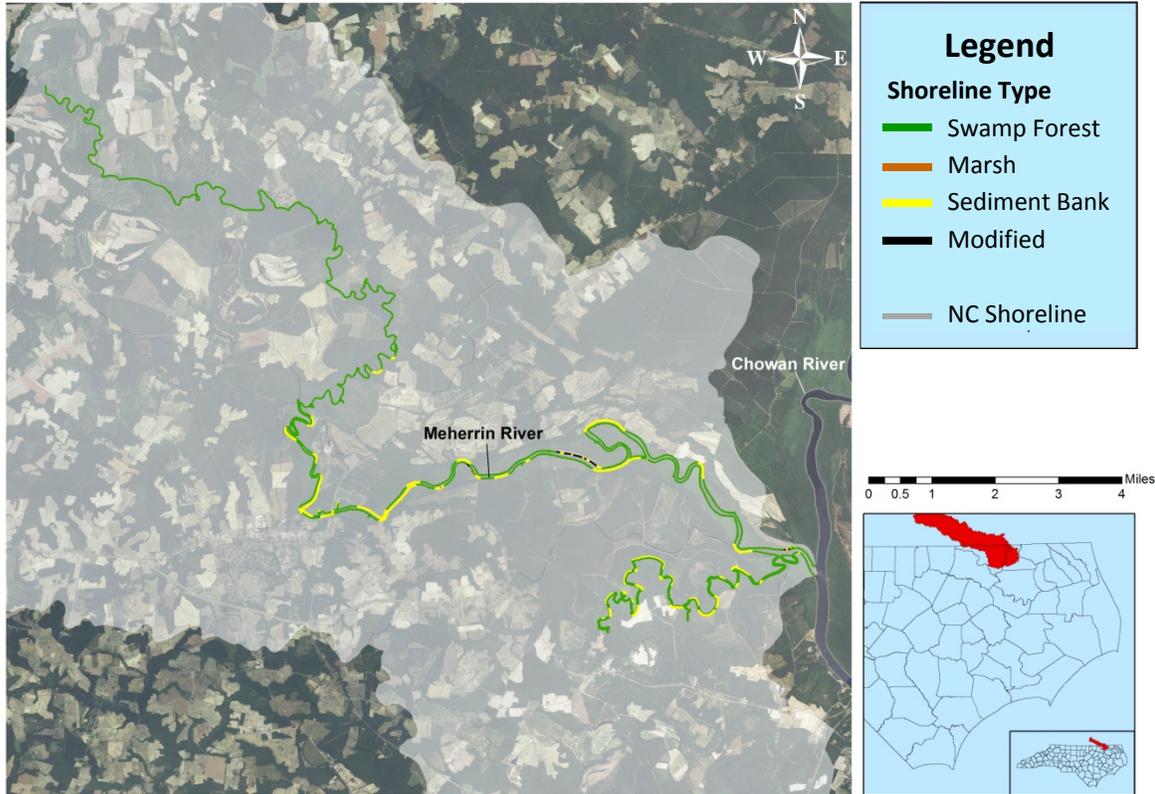
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.21	1
Pier/Float Dock/Wharf	.19	27

Lower Tar



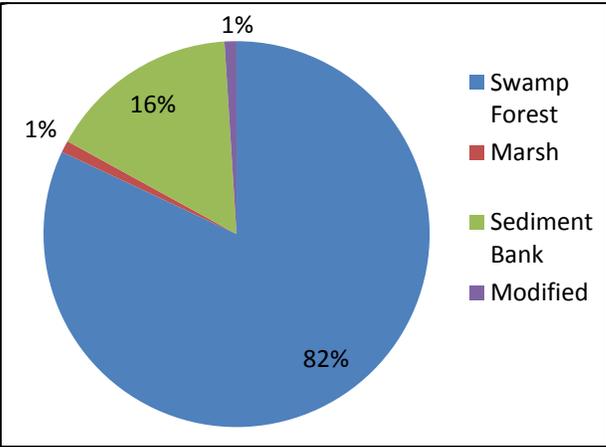
1. Cherry Run – Lower Tranters Creek
2. Tranters Creek – Tar River

Meherrin



Estuarine Shoreline
Total Mileage: 82.9

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	69.1	82%
Marsh	.1	1%
Sediment Bank	12.9	16%
Modified	.8	1%



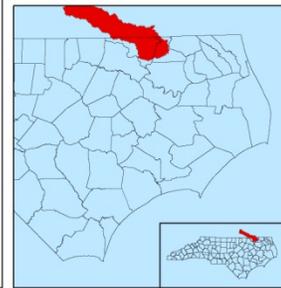
Stabilization Structures
Total Mileage: .7

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	212	<.1	13
Breakwater	0	0	0
Groin/Jetty	14	<.1	2
Sill	0	0	0
Rip-Rap	156	<.1	3
Bulkhead	3,835	.7	23

Shoreline Access Structures
Total Acreage: 1.2

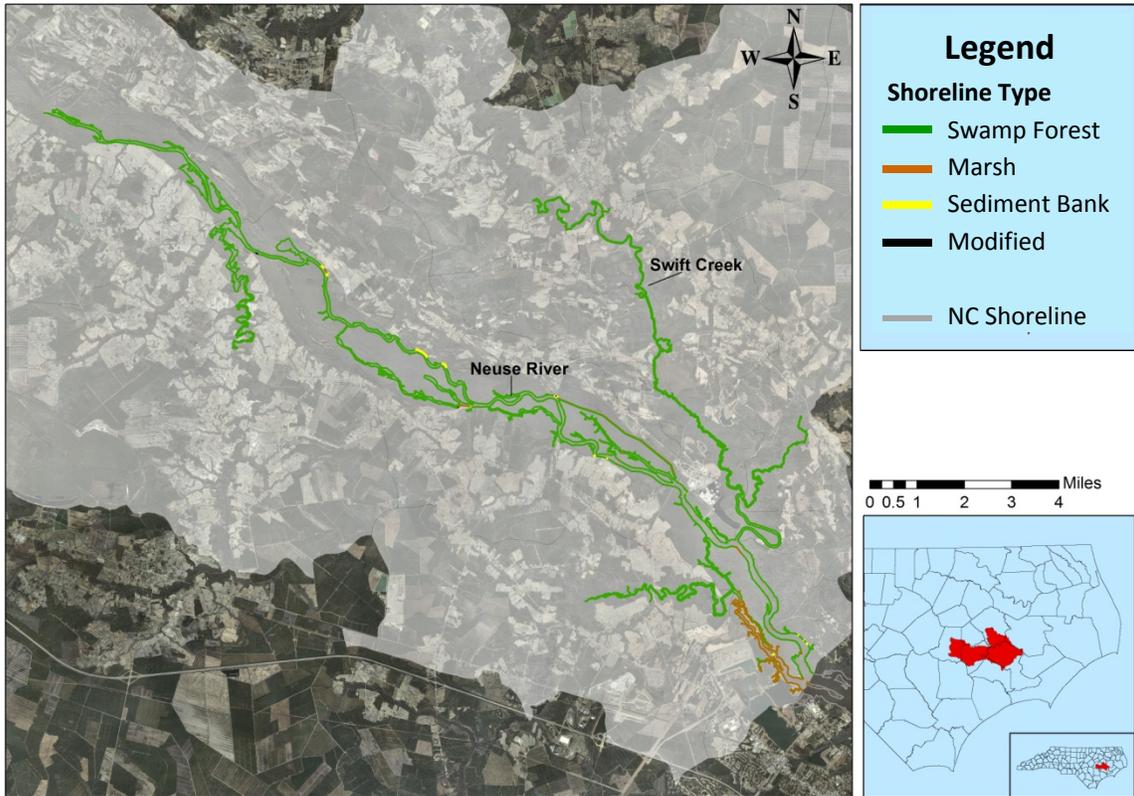
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	.85	3
Pier/Float Dock/Wharf	.33	38

Meherrin



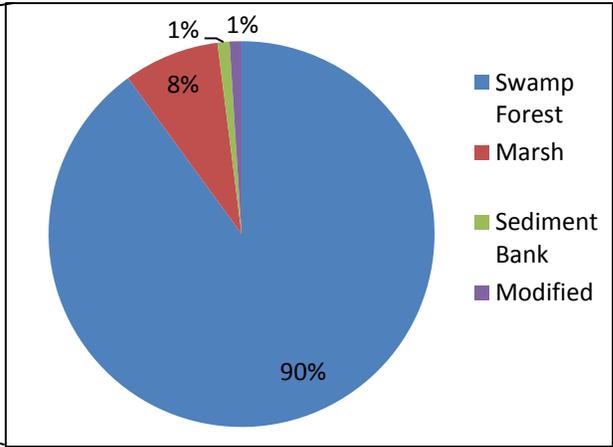
- 1. Barretts Crossroads – Meherrin River
- 2. Town of Murfreesboro – Meherrin River
- 3. Lower Potecasi River

Middle Neuse



Estuarine Shoreline
Total Mileage: 209.4

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	190.3	90%
Marsh	18.1	8%
Sediment Bank	.9	1%
Modified	.1	1%



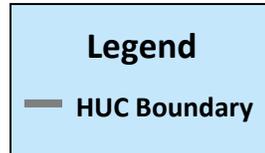
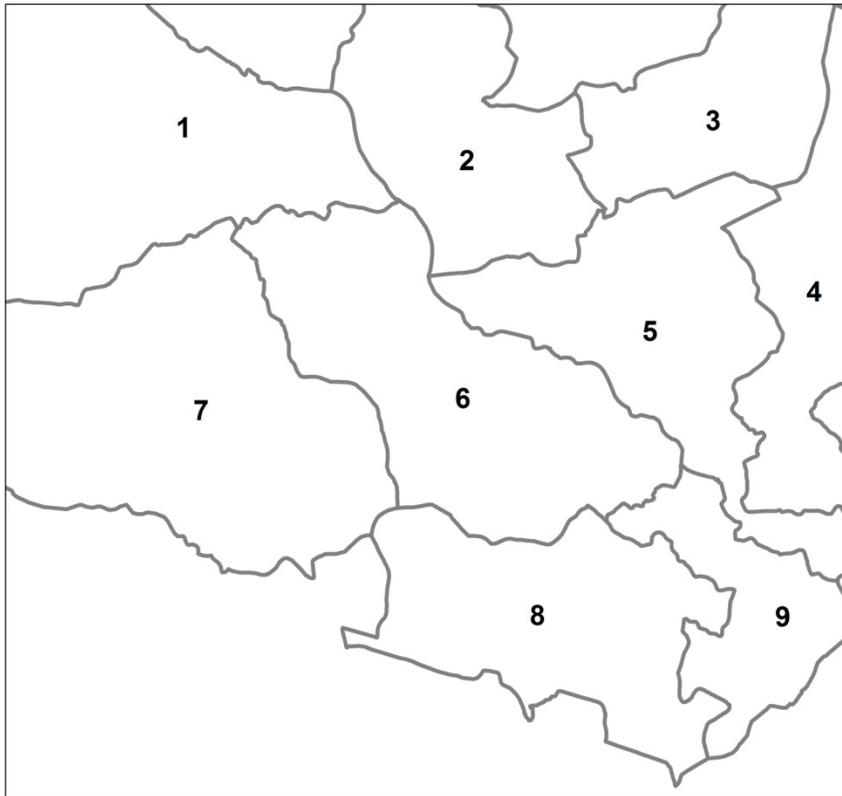
Stabilization Structures
Total Mileage: .1

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	26	<.1	2
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	0	0	0
Bulkhead	745	.1	6

Shoreline Access Structures
Total Acreage: 2.1

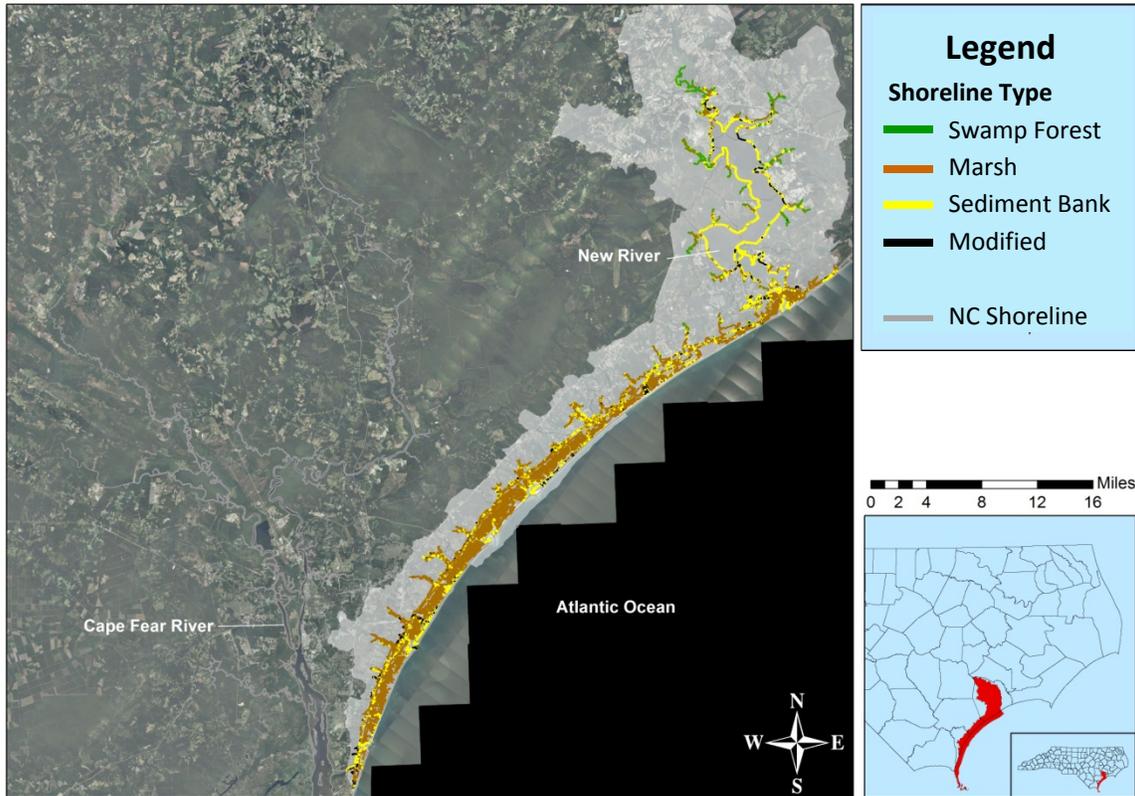
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	1.4	8
Pier/Float Dock/Wharf	.74	17

Middle Neuse



1. Halfmoon Creek – Neuse River
2. Town of Vanceboro – Swift Creek
3. Maults Swamp
4. Fisher Swamp – Little Swift Creek
5. Swift Creek
6. Pinetree Creek – Neuse River
7. Outlet Core Creek
8. Outlet Bachelor Creek
9. Hog Island – Neuse River

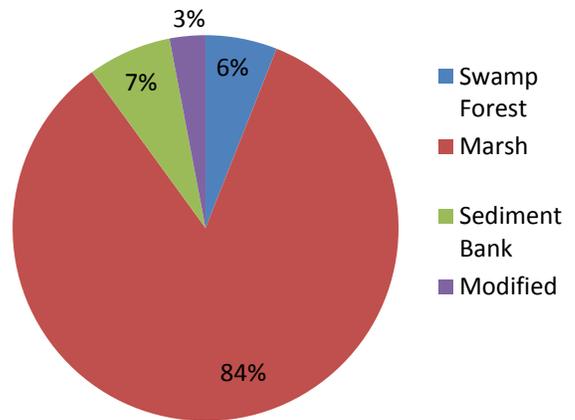
New River



Estuarine Shoreline

Total Mileage: 1,730.7

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	92.1	6%
Marsh	1,458.6	84%
Sediment Bank	128.8	7%
Modified	51.2	3%



Stabilization Structures

Total Mileage: 66.6

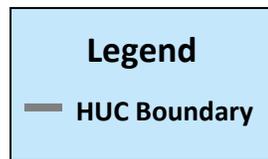
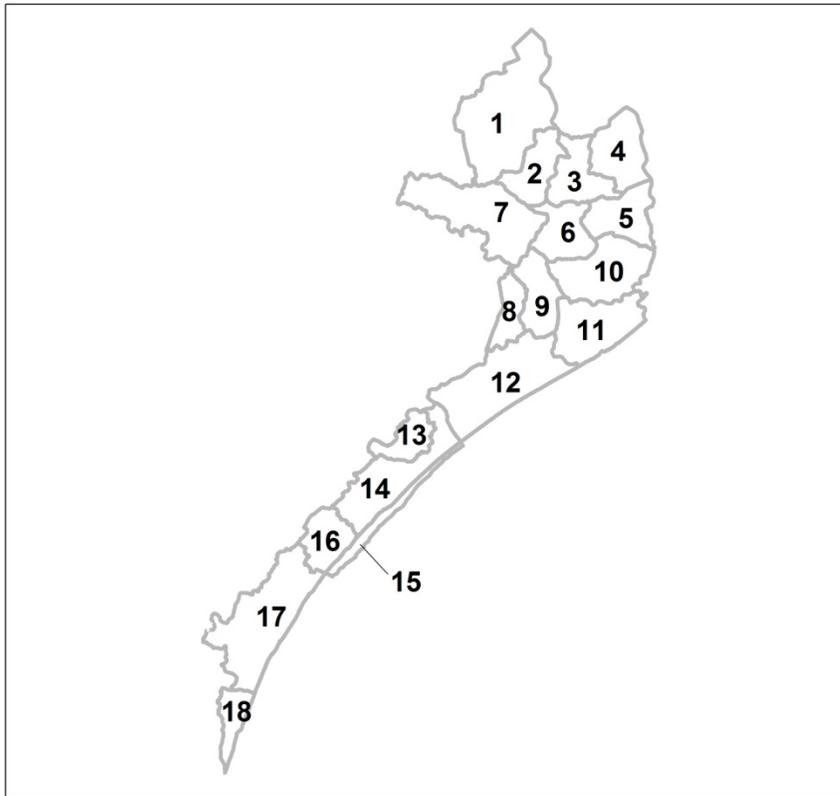
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	6,611	1.3	413
Breakwater	2,600	.5	35
Groin/Jetty	9,617	1.8	67
Sill	1,248	.2	17
Rip-Rap	59,008	11.2	190
Bulkhead	272,431	51.6	872

Shoreline Access Structures

Total Acreage: 152.2

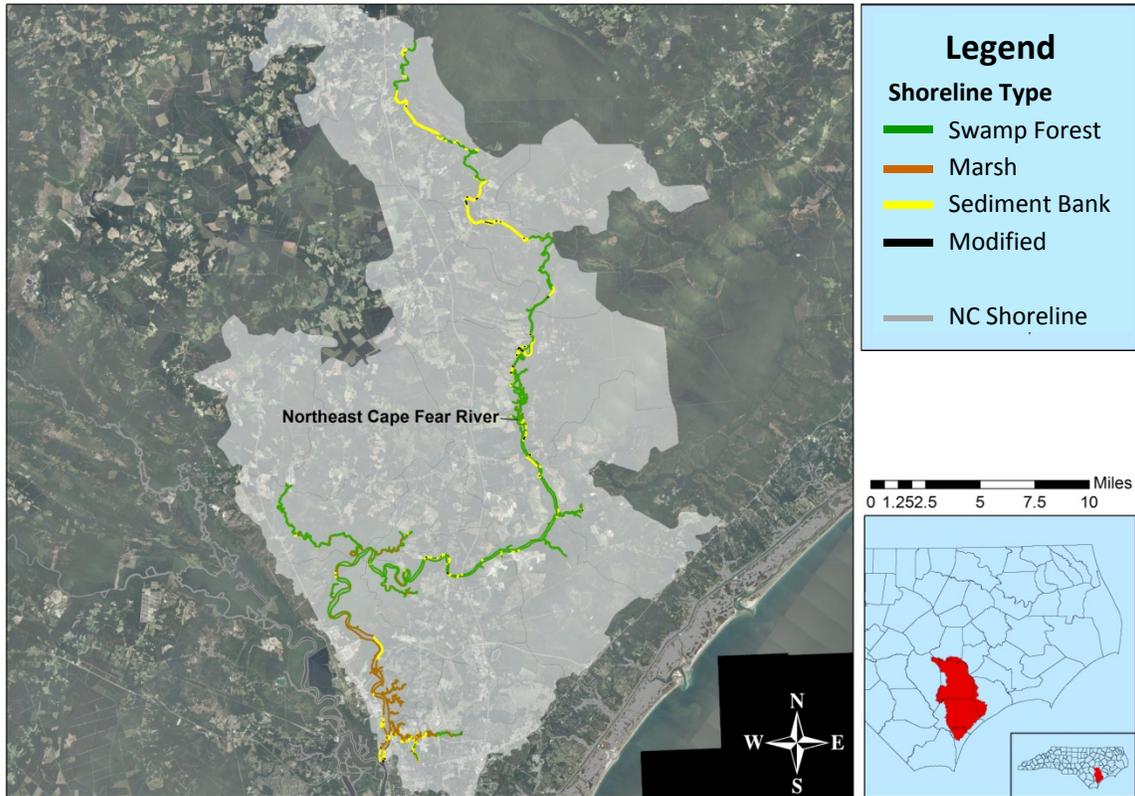
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	35.4	39
Pier/Float Dock/Wharf	116.8	4,993

New River



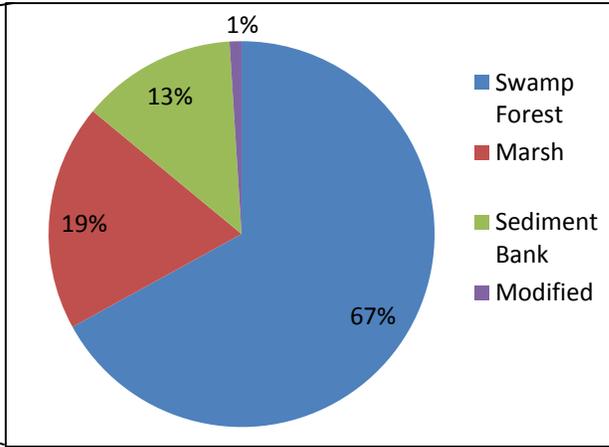
1. Blue Creek – New River
2. Wilson Bay – New River
3. Northeast Creek
4. Little Northeast Creek
5. Wallace Creek
6. Camp Lejune – New River
7. Outlet Southwest Creek
8. Stones Creek
9. Everett Creek – New River
10. Frenchs Creek – New River
11. Holover Creek – New River Inlet
12. Ashe Island – Stump Sound
13. Virginia Creek
14. Beckys Creek – New Topsail Inlet
15. New Topsail Inlet – Topsail Beach
16. Futch Creek – Rich Inlet
17. Masonboro Inlet – Mason Inlet
18. Everett Creek – Carolina Beach Inlet

Northeast Cape Fear



Estuarine Shoreline
Total Mileage: 328.6

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	223.9	67%
Marsh	62.0	19%
Sediment Bank	41.4	13%
Modified	1.3	1%



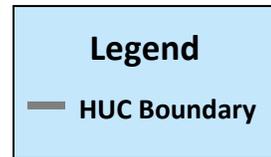
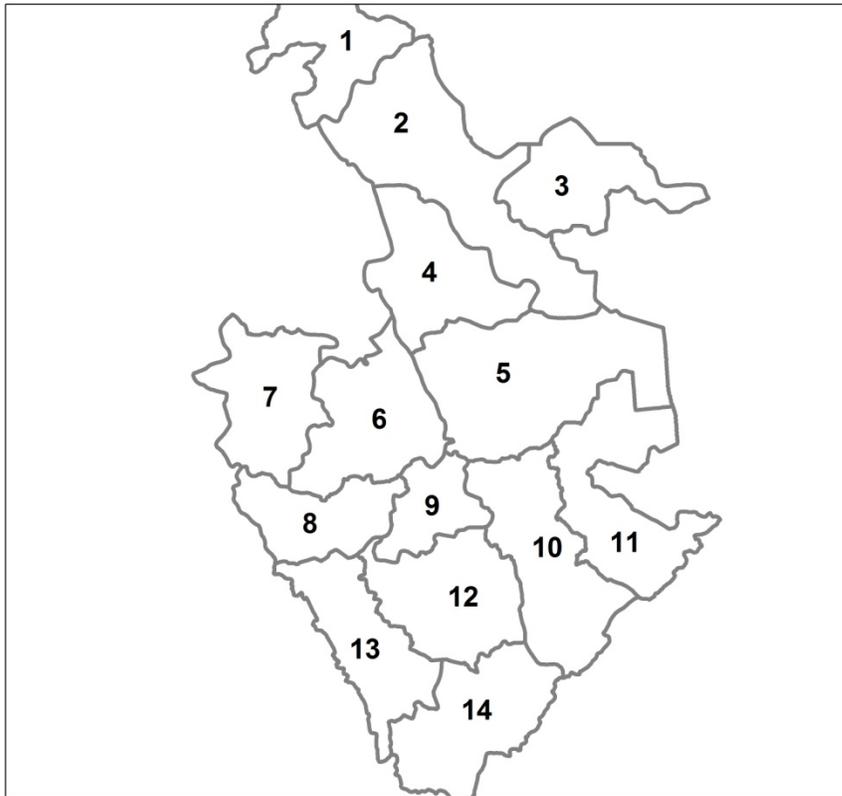
Stabilization Structures
Total Mileage: 1.5

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	291	.1	20
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	1,139	.2	5
Bulkhead	6,375	1.2	29

Shoreline Access Structures
Total Acreage: 49.2

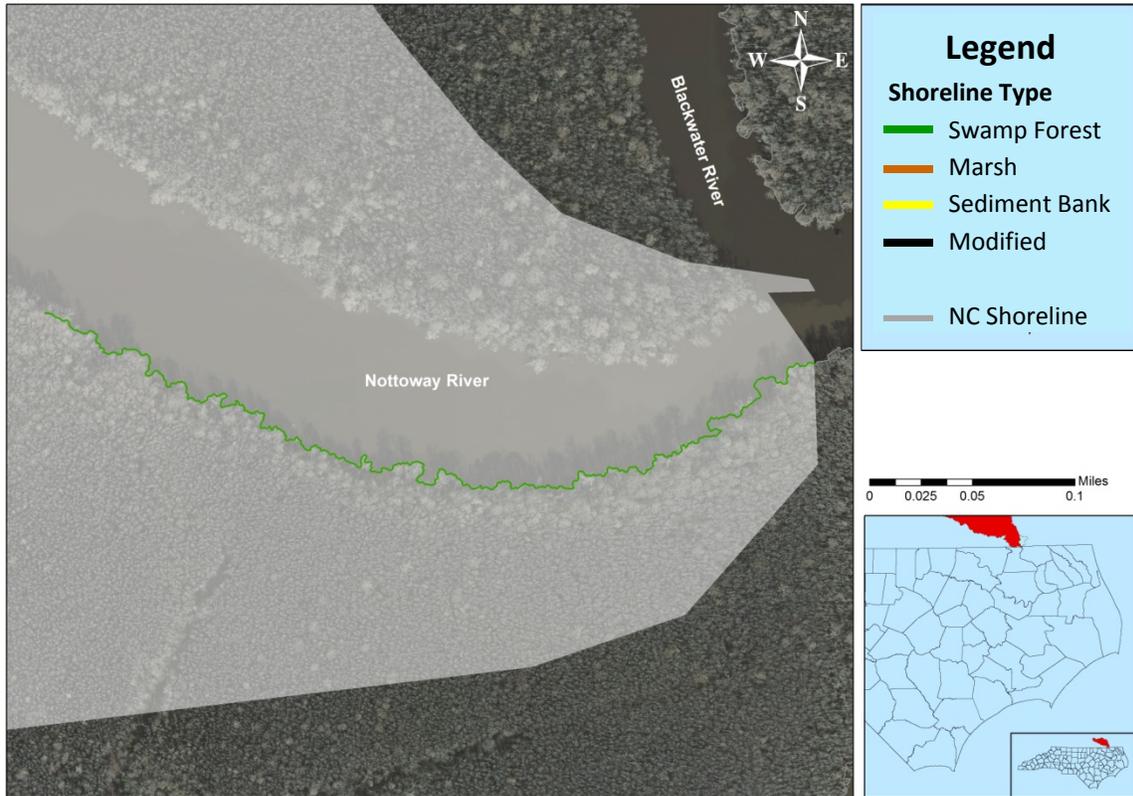
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	40.5	22
Pier/Float Dock/Wharf	8.7	285

Northeast Cape Fear



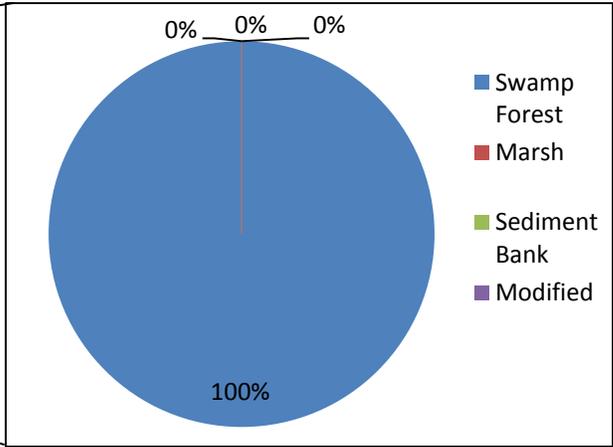
1. Lower Rockfish Creek
2. Lewis Creek – Northeast Cape Fear River
3. Lower Holly Shelter Creek
4. Burgaw Creek
5. Pike Creek - Northeast Cape Fear River
6. Rileys Creek
7. Middle Long Creek
8. Lower Long Creek
9. Turkey Creek
10. Island Creek - Northeast Cape Fear River
11. Harrisons Creek
12. Price George Creek - Northeast Cape Fear River
13. Ness Creek - Northeast Cape Fear River
14. Smith Creek

Nottoway



Estuarine Shoreline
Total Mileage: .6

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	.6	100%
Marsh	0	0%
Sediment Bank	0	0%
Modified	0	0%



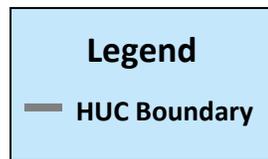
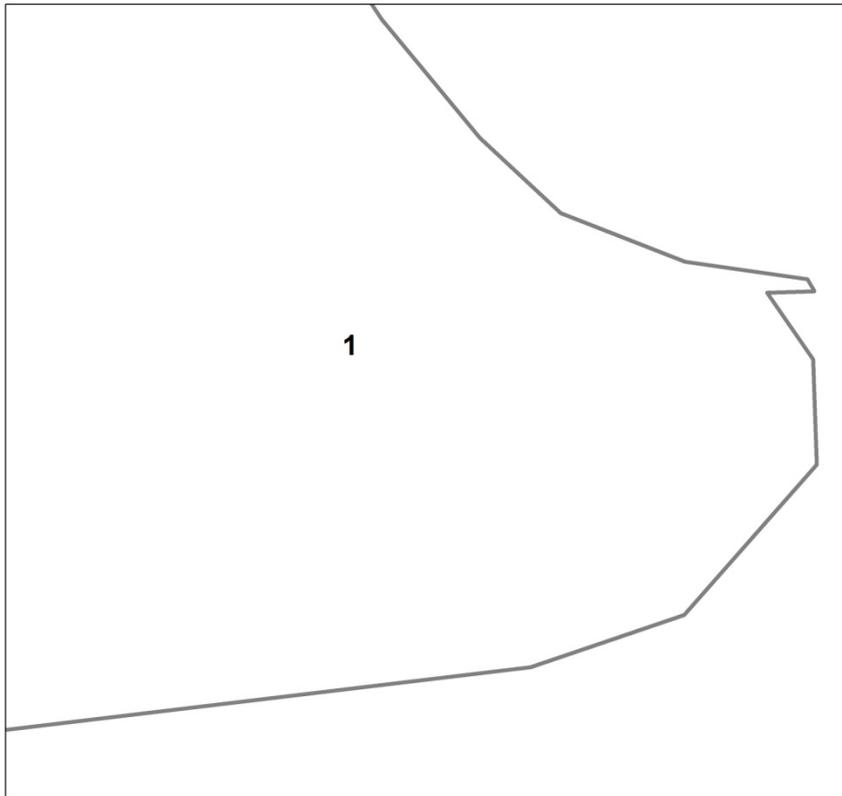
Stabilization Structures
Total Mileage: .7

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	0	0	0
Breakwater	0	0	0
Groin/Jetty	0	0	0
Sill	0	0	0
Rip-Rap	0	0	0
Bulkhead	0	0	0

Shoreline Access Structures
Total Acreage: 0

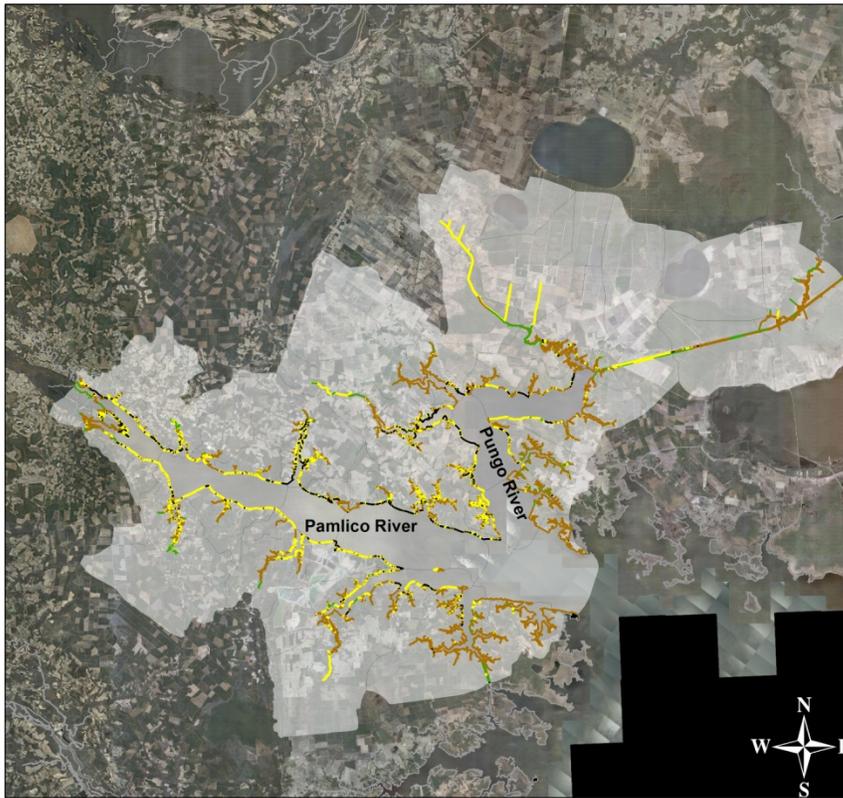
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	0	0
Pier/Float Dock/Wharf	0	0

Nottoway



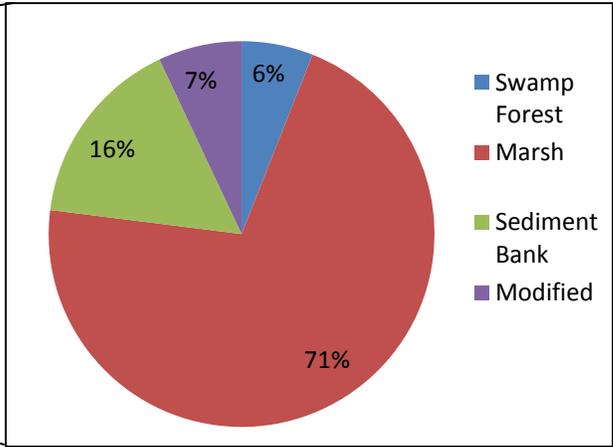
1. Round Gut – Nottoway River

Pamlico



Estuarine Shoreline
Total Mileage: 1,201.4

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	70.7	6%
Marsh	857.1	71%
Sediment Bank	188.5	16%
Modified	85.1	7%



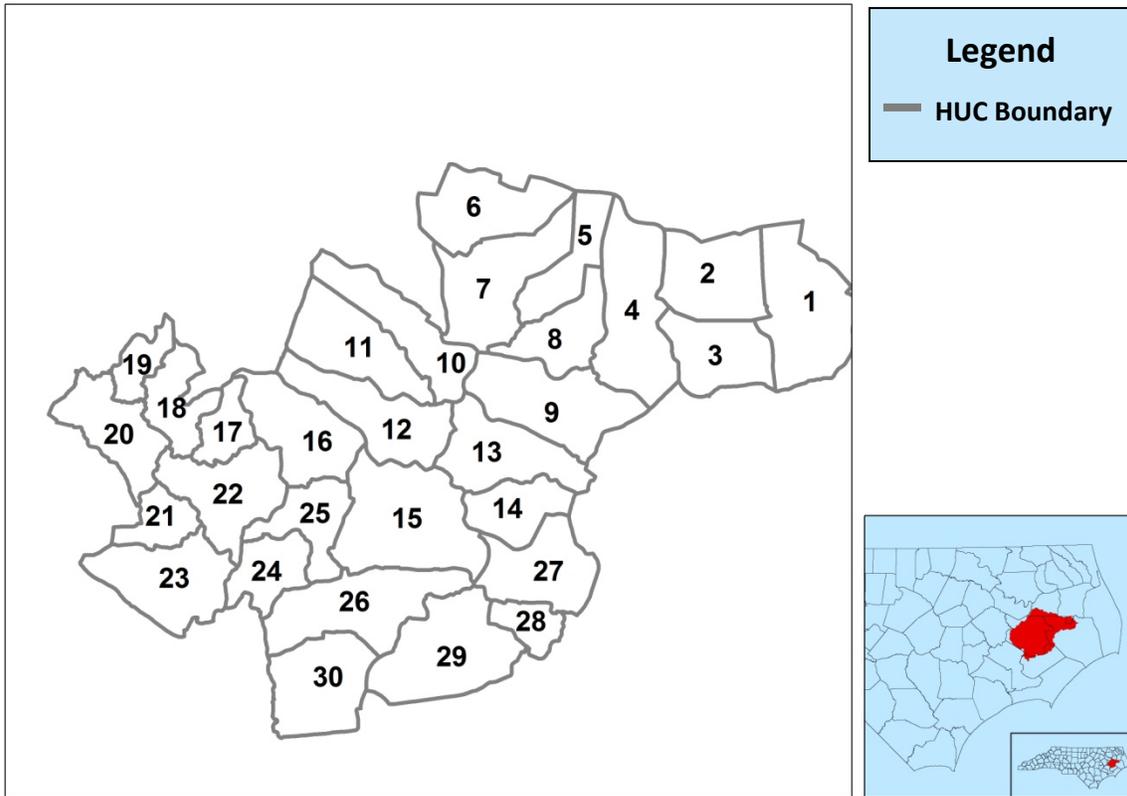
Stabilization Structures
Total Mileage: 129.8

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	4,316	.8	315
Breakwater	1,120	.2	21
Groin/Jetty	27,212	5.2	883
Sill	0	0	0
Rip-Rap	182,289	34.5	712
Bulkhead	470,562	89.1	1,903

Shoreline Access Structures
Total Acreage: 120.8

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	23.0	104
Pier/Float Dock/Wharf	97.8	3,396

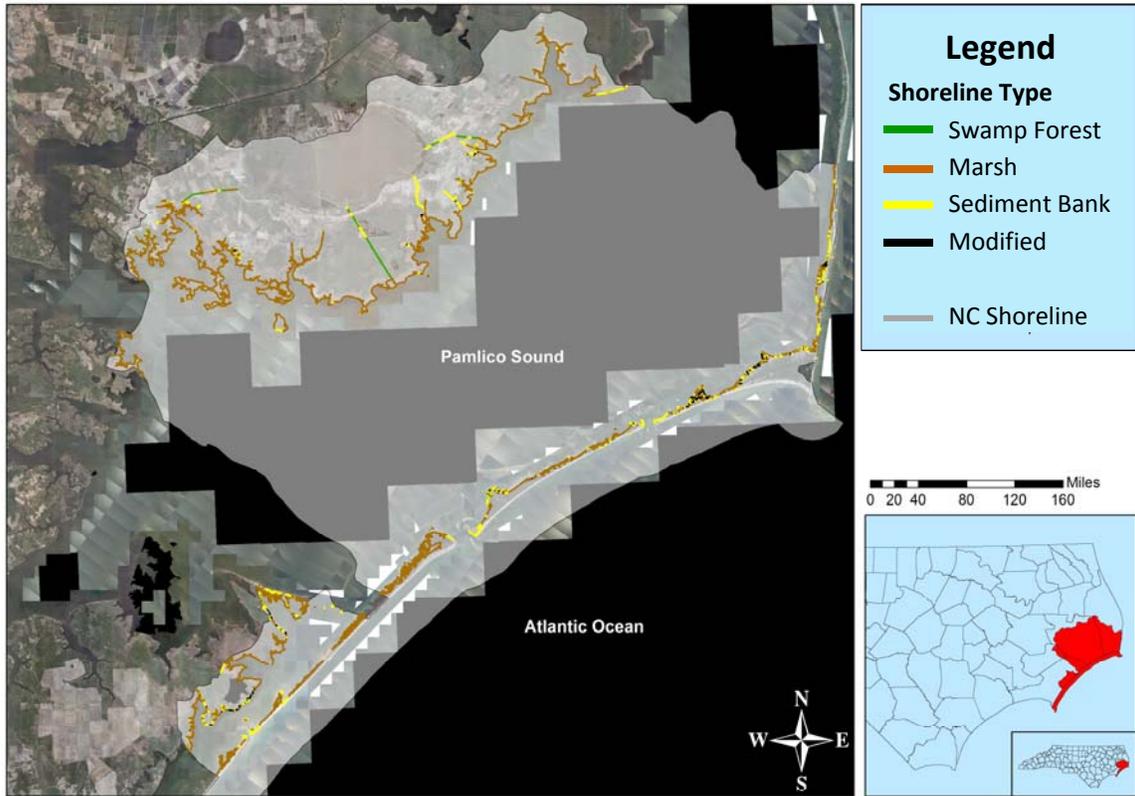
Pamlico



1. Intracoastal Waterway – Alligator River
2. New Lake – New Lake Fork
3. Intracoastal Waterway
4. Rutman Creek - Intracoastal Waterway
5. Shallop Creek – Pungo River
6. Pungo Lake – Headwaters Pungo River
7. Pungo Lake Canal – Pungo River
8. Clark Mill – Pungo River
9. Town of Belhaven – Pungo River
10. Pantego Creek
11. Deep Run – Broad Creek
12. Pungo Swamp – Pungo Creek
13. Slade Creek – Pungo River
14. Pungo River
15. East Fork Pamlico River – Pamlico River

16. Back Creek – Bath Creek
17. Goose Creek
18. Broad Creek
19. Herring Run – Runyon Creek
20. Hills Creek – Pamlico River
21. Outlet Blounts Creek
22. Duck Creek – Pamlico River
23. Headwaters Blounts Creek
24. Outlet Durham Creek
25. Mixon Creek – Pamlico River
26. Indian Island – South Creek
27. Pamlico River
28. Cedar Island – Oyster Creek
29. Campbell Creek – Goose Creek
30. Headwaters South Creek

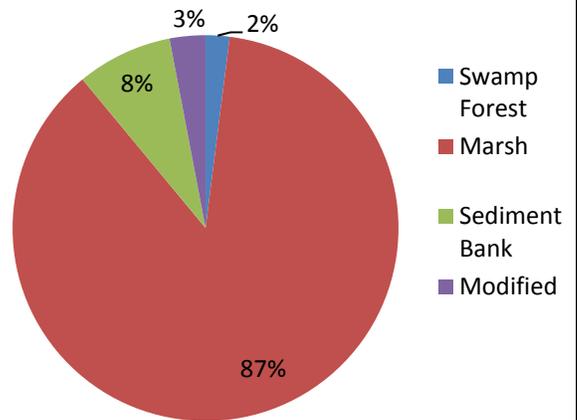
Pamlico Sound



Estuarine Shoreline

Total Mileage: 839.1

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	17.9	2%
Marsh	727.4	87%
Sediment Bank	66.9	8%
Modified	26.9	3%



Stabilization Structures

Total Mileage: 36.8

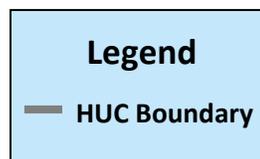
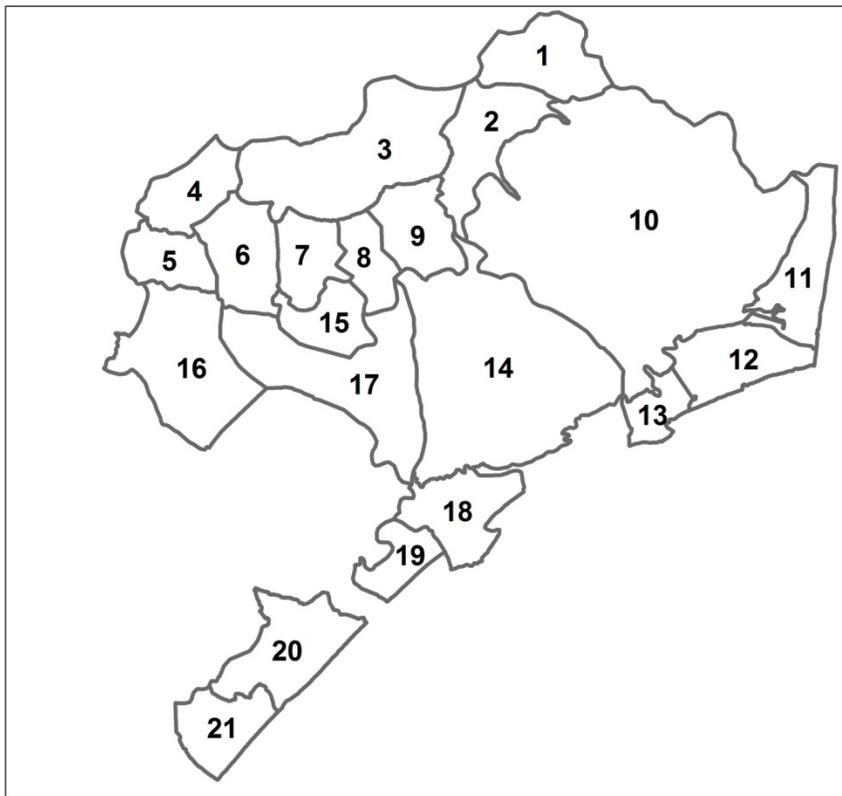
<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	1,877	.4	112
Breakwater	2,265	.4	19
Groin/Jetty	7,430	1.4	101
Sill	1,759	<.1	15
Rip-Rap	37,847	7.2	114
Bulkhead	144,727	27.4	417

Shoreline Access Structures

Total Acreage: 20.5

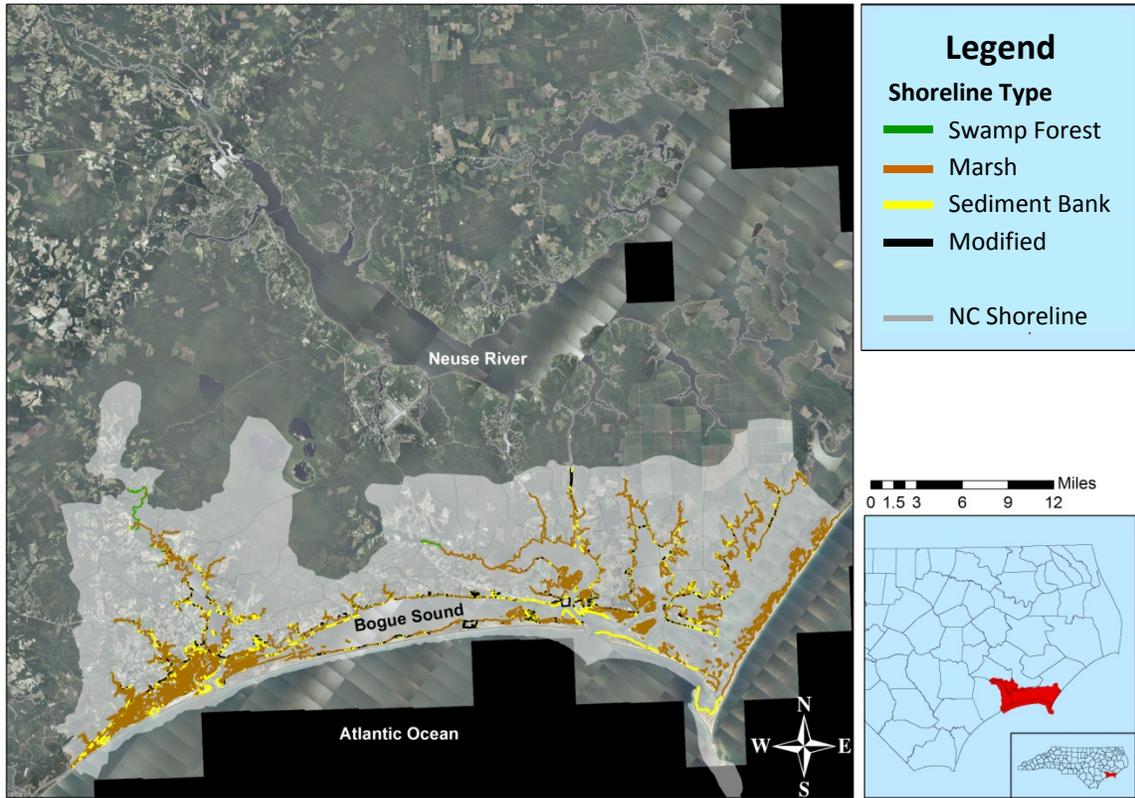
<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	5.9	63
Pier/Float Dock/Wharf	14.6	1,058

Pamlico Sound



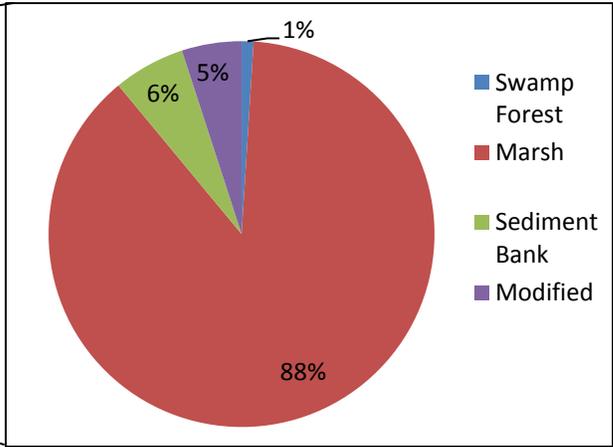
1. Pains Bay – Long Shoal River
2. Otter Creek – Far Creek
3. Lake Mattamuskeet
4. Rose Bay – Rose Bay Creek
5. Spencer Bay – Rose Bay
6. Town of SwanQuarter – SwanQuarter Bay
7. Juniper Bay Creek – Juniper Bay
8. Outfall Canal – East Bluff Bay
9. Gray Ditch – Wysocking Bay
10. Long Shoal – Gull Shoal
11. Town of Avon – Hatteras Island
12. Sand Bay – Hatteras Island
13. Pamlico Sound – Hatteras Island
14. Bluff Shoal – Gull Shoal
15. Juniper Bay – Lake Landing
16. Deep Cove – Middle Ground
17. Bluff Shoal – Middle Ground
18. Pamlico Sound – Ocracoke Inlet
19. Town of Portsmouth – Portsmouth Island
20. Core Banks – Drum Inlet
21. Styron Bay – Cedar Island

White Oak River



Estuarine Shoreline
Total Mileage: 1,718.0

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	16.4	1%
Marsh	1,518.3	88%
Sediment Bank	103.1	6%
Modified	80.2	5%



Stabilization Structures
Total Mileage: 28.0

<u>Structure Type</u>	<u>Feet</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	6,059	1.1	362
Breakwater	120	<.1	2
Groin/Jetty	6,857	1.3	67
Sill	9,490	1.8	43
Rip-Rap	121,151	22.9	467
Bulkhead	268,999	50.9	1,119

Shoreline Access Structures
Total Acreage: 120.8

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	23.0	66
Pier/Float Dock/Wharf	97.8	5,287

White Oak River



Legend

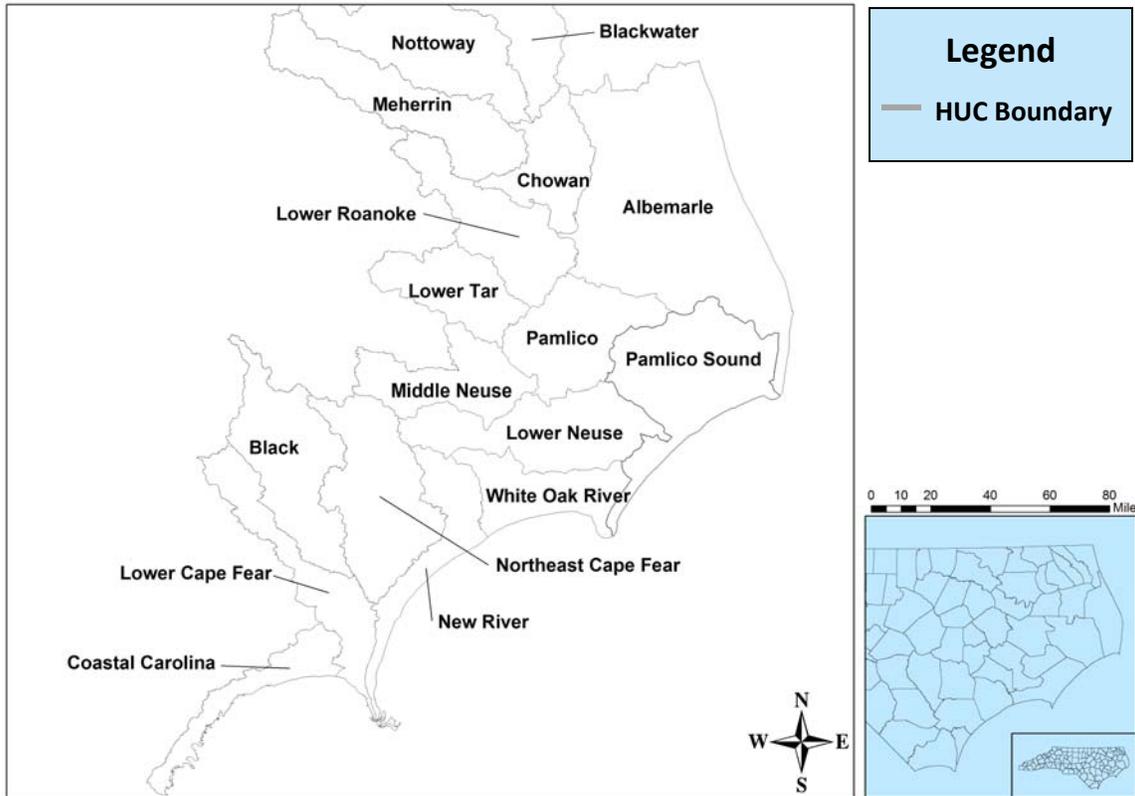
— HUC Boundary



1. Black Swamp Creek – White Oak River
2. Grants Creek
3. Mulberry Creek
4. Hunters Creek
5. Hadnet Creek
6. White Oak River
7. Queens Creek
8. Bear Creek – Bear Inlet
9. Bogue Sound – Bogue Inlet
10. Pettiford Creek
11. Bogue Banks – Bogue Sound
12. Town of Salter Path – Jumping Run
13. Middle Newport River
14. Black Creek

15. Harlowe Creek
16. Core Creek
17. Newport Marshes – Lower Newport River
18. Morehead City – Drum Shoals
19. Carrot Island – Beaufort Inlet
20. Bogue Banks – Shackleford Banks
21. Lighthouse Channel – Back Sound
22. Outlet North River
23. Headwaters North River
24. Ward Creek
25. Smyrna Creek – Jarrett Bay
26. Oyster Creek
27. Great Island – Horse Island
28. Town of Marshallberg – Great Shoal

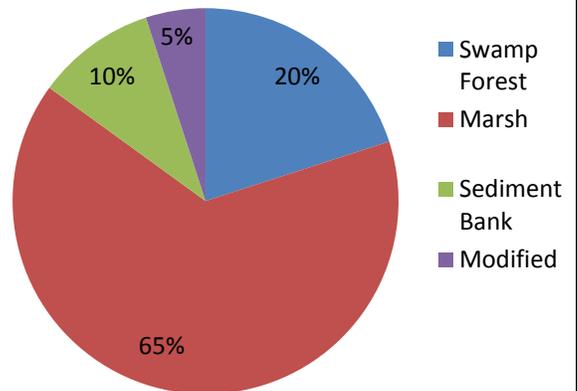
Summary



Estuarine Shoreline

Total Mileage: 12,336.1

<u>Shoreline Type</u>	<u>Miles</u>	<u>Percent</u>
Swamp Forest	2,490.7	20%
Marsh	8,053.5	65%
Sediment Bank	1,191.0	10%
Modified	600.9	5%



Stabilization Structures

Total Mileage: 724.7

<u>Structure Type</u>	<u>Miles</u>	<u>Count</u>
Boat Ramp	6.0	2,072
Breakwater	6.5	129
Groin/Jetty	21.8	2,476
Sill	5.4	103
Rip-Rap	164.6	2,984
Bulkhead	520.4	7,995

Shoreline Access Structures

Total Acreage: 938.0

<u>Structure Type</u>	<u>Area in Acres</u>	<u>Count</u>
Bridge	339.2	578
Pier/Float Dock/Wharf	598.8	29,864