North Carolina Estuarine Shoreline Mapping Project

2012 Imagery Update

June 2013

North Carolina Division of Coastal Management
Department of Environment and Natural Resources

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. In June of 2011 DCM completed the first detailed digital estuarine shoreline to aid with examining DCM's existing policy language within its estuarine and ocean system areas of environmental concern (AEC). The purpose of the project is to support numerous research ventures, creating inventories of shoreline and structure type, and quantifying shoreline mileage. The digital shoreline will support DCM as well as other agencies involved in the management of estuarine environments. As new imagery becomes available DCM will continue to update the digital estuarine shoreline to keep a current inventory of shorelines and structures.

The primary component of the Estuarine Shoreline Mapping Project (ESMP) involves deciphering digital imagery for shoreline type and shoreline structures. During the first mapping effort, DCM considered available imagery for heads-up digitizing to ascertain the best potential dataset. At that time, imagery for the entire coast did not exist so each county was digitized using the most recent and highest resolution photography available. Imagery was used from years varying from 2006 to 2010 and pixel width resolutions from 2-foot to 6-inch. The new mapping effort will utilize imagery from the Coastal Imagery 2012 Project[1] to delineate the shoreline and structures. The imagery is high resolution 6-inch pixel width, true color orthophotographs. Using this imagery will allow for a snapshot of the coast within the same year and provide the most accurate inventory of shoreline and structures.

Heads-up digitizing will be conducted by DCM staff and will follow the same methodology set forth in "Charting the Estuarine Environment: A methodology spatially delineating a contiguous, estuarine shoreline of North Carolina" [2]. After receiving feedback from users of the ESMP data, changes were identified to create a more complete and accurate digital shoreline. These alterations are outlined below.

[1] The Coastal Orthoimagery 2012 Project was funded by the NC 911 Board and managed by the NC Center for Geographic Information and Analysis. The project team includes the NC Department of Transportation Photogrammetry Unit, the Land Records Management Program in the Secretary of State and the NC Geodetic Survey. Imagery is available through the NC OneMap Geospatial portal
http://data.nconemap.com/geoportal/catalog/main/home.page

[2] Charting the Estuarine Environment: A methodology spatially delineating a contiguous, estuarine shoreline of North Carolina. Bendell and Geis 2010.
http://dcm2.enr.state.nc.us/estuarineshoreline/Complete%20Methodology%20Report.pdf

I. Amendments to Shoreline Delineation Methodology

a. Digitizing an area where the tree canopy obscures the shoreline

The original methodology states, "[In] areas where tree canopies are the only visible elements along the shoreline, technicians are instructed to approximate the waterward edge of the tree canopy for the shoreline," digitizing in this manner misrepresents the actual shape of the shoreline and may add significant mileage to total shoreline length. Some or most of the land/water interface is visible through the tree canopy. Digitizers are now instructed to digitize the shoreline visible through the tree canopy if it can be seen.

*Original method to digitize tree canopy

*New method to digitize land/water interface visible through tree canopy

b. Changes to attributes

After receiving input from stakeholders and users of the ESMP, it was determined that additional attribution of natural shoreline in front of modified structure would make the project data more accurate and functional. See attribution table below.

Attribution of the shoreline segments will be as follows:

Attribute	Shoreline Type
10	Swamp Forest
20	Marsh
20.71	Marsh shoreline waterward of a sloped structure
20.91	Marsh shoreline waterward of a vertical structure
30	Sediment Bank
30.71	Sediment Bank shoreline waterward of a sloped structure
30.91	Sediment Bank shoreline waterward of a vertical structure
40	Modified
99	Miscellaneous

*There are no instances where swamp forest shoreline is located waterward of rip-rap revetments or bulkhead structures

II. Amendments to Polyline Structure Delineation

a. Types of structures

For the purpose of creating a more detailed inventory of shoreline structures the Groin/Jetty (41) category will be broken down to identity each structure separately. Groins will be labeled 41.1 and jetties 41.2

As alternatives to bulkheads and rip-rap revetments become more widely used throughout the state, a more accurate inventory of these structures needs to be created. These alternatives to hardening a shoreline, sills and living shorelines, are constructed from a variety of construction materials. For the purpose of inventorying the range of construction materials, sills constructed from oyster shell (loose or bagged) will be labeled 61.2, sills constructed from rock will be labeled 61.3, and sills constructed from sheet pile, timber or other materials will be labeled 61.4.

b. Changes to attributes

After receiving input from stakeholders and users of the ESMP, it was determined that additional attribution of natural shoreline in front of modified structure would make the project data more accurate and functional. See attribution table below.

Attribution of shoreline structures will be as follows:

Attribute	**Shoreline Structure Type**
11	Boat Ramp
21	Breakwater
41.1	Groin
41.2	Jetty
61.2	Sill- Oyster Shell
61.3	Sill- Rock
61.4	Sill- Sheet Pile, Timber or Other
71	Sloped Structure
71.20	Sloped Structure landward of marsh shoreline
71.30	Sloped Structure landward of sediment bank shoreline
91	Vertical Structure
91.20	Vertical Structure landward of marsh shoreline
91.30	Vertical Structure of sediment bank shoreline

III. Amendments to Polygon Structure Delineation

a. Types of Structures

For the purpose of creating a more detailed inventory of shoreline access structures, a category for culverts (31.3) will be added to record these structures. During the initial mapping effort, culverts were not delineated because they represented where a waterbody narrowed to 20ft even if the waterbody was wider than 20ft upstream of the culvert. The shoreline will be digitized upstream of culverts to the point where the waterbody narrows to 20ft.

b. Abandoned/Historic shoreline access structures

After receiving input from stakeholders and users of the ESMP, a goal was identified to record shoreline access structures that are dilapidated in 2012 imagery. These abandoned/historic structures were not delineated during the initial mapping effort. Structures in this category could be in the process of being built or damaged by storm events. The entirety of the structure will be digitized as one single polygon even if the structure has broken into multiple pieces.


*examples of abandoned/historic structures

c. Changes to attributes

To record the presence of culverts and abandoned/historic structures, additional attributes will be used. These alterations to the attribute table will create a more complete inventory of structures. See attribute table below.

Attribution of shoreline structures will be as follows:

Attribute	**Shoreline Structure Type**
31	Bridge
31.1	Culvert
51	Pier/Float Dock/Wharf
111.31	Abandoned/Historic Bridge
111.51	Abandoned/Historic Pier/Float Dock/Wharf