NOAA COASTAL MAPPING PROGRAM
PROJECT COMPLETION REPORT

PROJECT NC0503

Port of Wilmington, North Carolina

Introduction

Coastal Mapping Program (CMP) Project NC0503 provides highly accurate digital shoreline data for key areas of change within Port of Wilmington area extending from Eagle Island (north) to Bald Head Island (south). The Geographic Cell (GC) may be used in support of the NOAA Nautical Charting Program (NCP) as well as geographic information systems (GIS) for a variety of coastal zone management applications.

Project Design

The design of Project NC0503 was accomplished by the Requirements Branch (RB) of the Remote Sensing Division (RSD) in response to the need for timely updates to the NOAA Electronic Navigational Chart (ENC) series. Project requirements were formulated as a result of analysis conducted within the Coast and Shoreline Change Analysis Program (CSCAP), in which NOAA nautical chart products are compared to contemporary high resolution satellite imagery in order to ascertain the need for more current shoreline data. A Chart Evaluation File (CEF) was forwarded to the Applications Branch (AB) of RSD once the change analysis was complete. Refer to the RB Memorandum of September 14, 2005, "Change Analysis Report for Wilmington, North Carolina," for details of the chart comparison process.

Field Operations

Routine CMP field operations did not apply for this project based on the origin of the project source data. Existing sources of horizontal control were used for the georeferencing process.

Georeferencing

Seven IKONOS non-orthorectified color images with a spatial resolution of 1 meter, acquired from Space Imaging, Inc., were georeferenced using Erdas IMAGINE 9.0 software. Ground control points (GCPs) which were photogrammetrically measured from metric quality aerial photography were imported into IMAGINE and used to georeference the satellite imagery. Within IMAGINE, the Raster Geometric Correction tool was used with a 1st order Polynomial model. Imagery was resampled using the Nearest Neighbor sampling method. The RMS of the residuals for measured check points were used to compute a predicted horizontal circular error at the 95% confidence interval (CE95) of 1.6 meters for all satellite images. This CE value was tripled and then added to the CE95 of the source imagery from which ground control points were extracted, in order to conservatively predict the accuracy of well defined points measured during the compilation process. Positional data is referenced to the North American Datum of 1983 (NAD 83).

Compilation

The data compilation phase of this project was accomplished by RSD in December 2006. Digital feature data was compiled in ESRI shapefile format from imagery using ESRI's ArcGIS 9.1 desktop GIS software. Feature attribution was assigned in compliance with the Coastal Cartographic Object Attribute Source Table (C-COAST), which provides the definition and attribution scheme for the full range of cartographic features pertinent to the CMP. Selected cartographic features were further modified with additional descriptive information to refine general classification.

Spatial data accuracies for Project NC0503 were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were tested to have horizontal accuracy at the 95% confidence level of 6.9 meters. This predicted accuracy of well-defined points is based on a minimum of twenty (20) check points that were compared to an independent source of higher accuracy.

The following table provides information on satellite images used in the project completion:

Image #	Image Source	Source ID	Source File Name	Acquisition Date/Time	Tide Level*
1	IKONOS	2005022616030030000011603708	po_176389_rgb_0010000.tif	2005-02-26 16:03 GMT	1.4 m
2	IKONOS	2005022616030030000011603708	po_176389_rgb_0010001.tif	2005-02-26 16:03 GMT	1.4 m
3	IKONOS	2005022315545970000011600256	po_176389_rgb_0000000.tif	2005-02-23 15:54 GMT	0.6 m
4	IKONOS	2005022315545970000011600256	po_176389_rgb_0000001.tif	2005-02-23 15:54 GMT	0.4 m
5	IKONOS	2005022616032730000011603707	po_176389_rgb_0030000.tif	2005-02-26 16:03 GMT	1.1 m
6	IKONOS	2005022616031410000011603706	po_176389_rgb_0020001.tif	2005-02-26 16:03 GMT	1.1 m
7	IKONOS	2005022616032730000011603707	po_176389_rgb_0030001.tif	2005-02-26 16:03 GMT	1.1 m

* Tide levels are given in meters above MLLW and are based on actual observations recorded by the NOS gauge at the times of photography. The elevation of the MHW tidal datum at the Wilmington, NC Tide Gauge is equal to 1.35 meters above MLLW.

Quality Control / Final Review

Quality control tasks were conducted during all phases of project completion by a senior member of the Applications Branch of RSD. The final QC review was completed in April 2007. The review process included analysis of the georeferencing results and assessment of the identification and attribution of cartographic features according to image analysis and criteria defined in C-COAST. The quality control process concluded with an inspection of topological connectivity within the GC using ArcGIS 9.1. The entire suite of project products was evaluated for compliance to CMP requirements.

End Products and Deliverables

The following specifies the location and identification of end products generated during the completion of this project:

RSD Applications Branch Archive

- Hardcopy of the Project Completion Report (PCR)
- Page size graphic plot of GC10637 file contents, attached to PCR
- Hardcopy of the CSCAP evaluation memorandum
- Mobile Ground Control Point Positioning Report

Remote Sensing Division Electronic Data Library

- GC10637 in shapefile format
- Digital copy of the PCR in Adobe PDF format
- Chart Evaluation File (CEF) in shapefile format

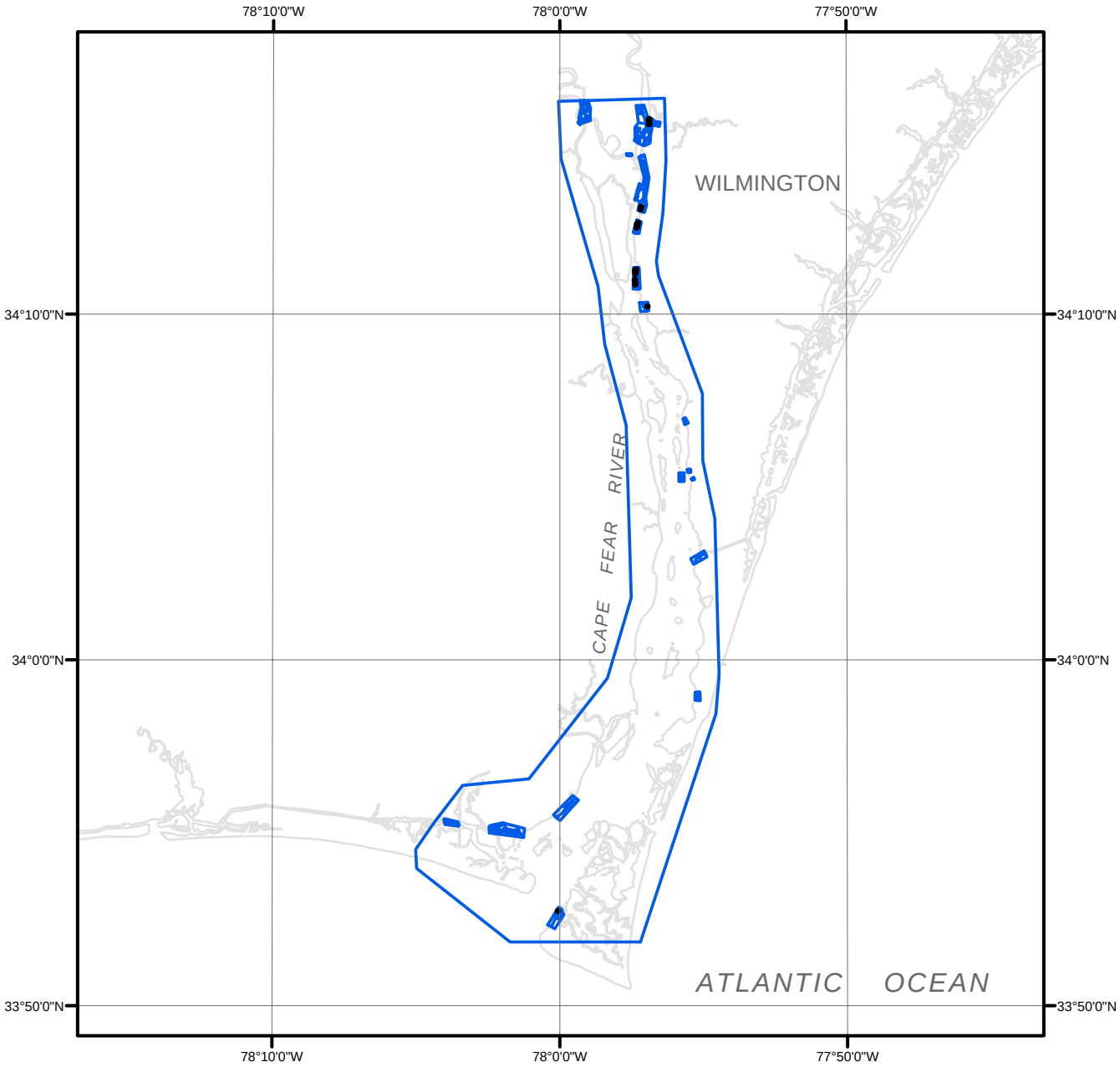
NOAA Shoreline Data Explorer

- GC10637 in shapefile format
- Metadata file for GC10637
- Digital copy of the PCR in Adobe PDF format

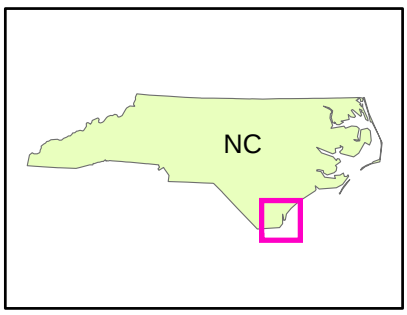
End of Report

PORT OF WILMINGTON

NORTH CAROLINA



Overview



NC0503

GC10637