NOAA COASTAL MAPPING PROGRAM
PROJECT COMPLETION REPORT

PROJECT SC1302

Port of Charleston, South Carolina

Introduction

Coastal Mapping Program (CMP) Project SC1302 provides highly accurate digital shoreline data for key areas of change within the Port of Charleston, South Carolina. 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 CMP Project SC1302 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 March 13, 2013, "Results of CSCAP Change Analysis for Charleston, South Carolina (SC1302)," 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

One WorldView-2 non-orthorectified black and white image with a spatial resolution of 0.5 meters, downloaded from the National Geospatial-Intelligence Agency's Web-Based Access and Retrieval Portal was georeferenced using ESRI's ArcGIS software. Ground control points (GCPs), which were photogrammetrically measured from metric quality aerial photography, were imported into ArcMap and used to georeference the satellite imagery. Within ArcMap, the Georeferencing 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 1.2 meters for the satellite image. This CE value was doubled 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 a member of AB in November 2013. Digital feature data was compiled in ESRI shapefile format from imagery using ESRI's ArcGIS 9.3 desktop GIS software. Feature attributes were established using 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 features were further modified with additional descriptive information to refine general classification.

Spatial data accuracies for Project were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were tested to have a horizontal accuracy of 2.9 meters at the 95% confidence level. 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 (Table 1) provides information on satellite images used in the project completion:

Table 1 - Image Sources

Image	Image Source	Source File Name	Acquisition Date/Time	Tide Level*
1	WorldView-2	04JAN13WV021200013JAN04163439-P1BS-052896673030_01_P002_RPC.tif	2013-01-04 16:34 GMT	1.6 m

* Tide levels are given in meters above MLLW and are based on actual observations recorded by the NOS gauge at Charleston, South Carolina at the time of photography.   The approximate tide range within the project area is 1.6 meters.

Quality Control / Final Review

Quality control tasks were conducted during all phases of project completion by a senior member of AB. The final QC review was completed in November 2013. The review process included analysis of the georeferencing results and assessment of the identification and attribution of digital feature data within the GC 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 9.3. 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 Georeferencing Report
- Hardcopy of the Project Completion Report (PCR)
- Page size graphic plot of GC11025 file contents, attached to PCR
- Hardcopy of the CSCAP evaluation memorandum

Remote Sensing Division Electronic Data Library
- GC11025 in shapefile format
- Digital copy of the PCR in Adobe PDF format
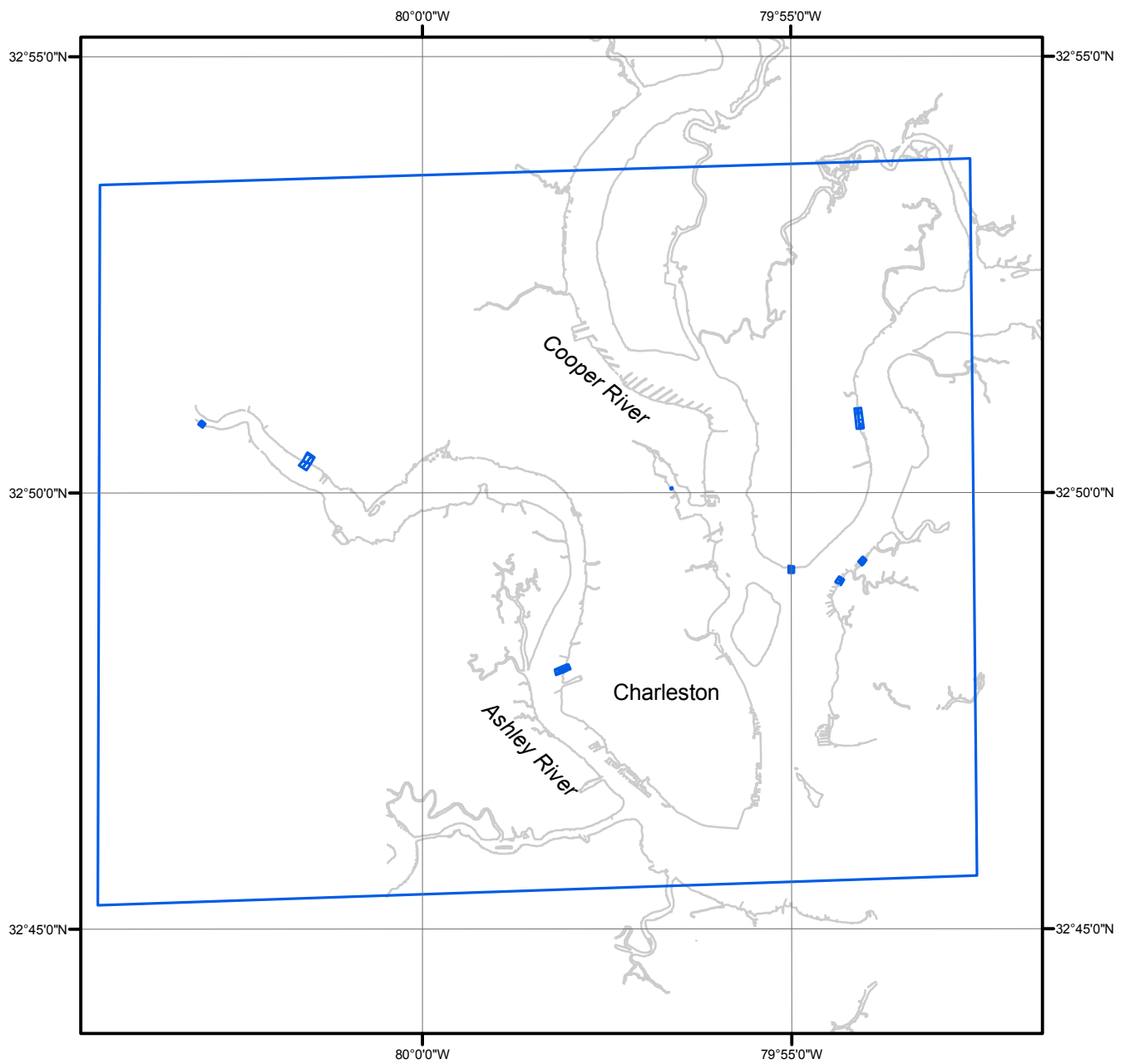- CEF in shapefile format

NOAA Shoreline Data Explorer
- GC11025 in shapefile format
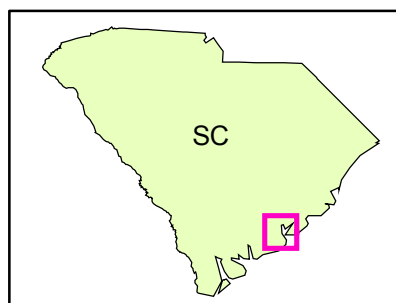- Metadata file for GC11025
- Digital copy of the PCR in Adobe PDF format

End of Report

PORT OF CHARLESTON

SOUTH CAROLINA

80°0'0"W 79°55'0"W

32°55'0"N

32°55'0"N

Cooper River

32°50'0"N

32°50'0"N

Charleston

Ashley River

32°45'0"N

32°45'0"N

80°0'0"W 79°55'0"W

Overview

SC

SC1302

GC11025