

# **NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT**

## ***PROJECT SC0601***

### ***Charleston, South Carolina***

#### **Introduction**

Coastal Mapping Program (CMP) Project SC0601 provides highly accurate digital shoreline data for key areas of change in the vicinity of the Port of Charleston, South Carolina, including parts of the Ashley River, and the Cooper River from its mouth to Woods Point. 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 SC0601 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. Refer to the RB Memorandum of March 22, 2006, "Results of CSCAP Change Analysis for Charleston, South Carolina (SC0601)" 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 QuickBird non-orthorectified color image with a spatial resolution of 61 centimeters, acquired from DigitalGlobe, Inc., was georeferenced using Erdas IMAGINE 9.0 software on a Windows platform. Ground control points (GCPs), photogrammetrically measured from metric quality aerial photographs (project SC9701), were imported into IMAGINE and used to georeference the satellite imagery. Within IMAGINE the Raster Geometric Correction tool was used with a 1<sup>st</sup> order polynomial model. The imagery was resampled using the Nearest Neighbor sampling method. The RMS of the residuals for measured check points was used to compute a predicted horizontal circular error at the 95% confidence level (CE95) of 0.4 meters for the satellite image. 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 based on the UTM Coordinate System (zone 17), and referenced to the North American Datum of 1983.

## Compilation

The data compilation phase of this project was accomplished by RSD in August 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 SC0601 were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were tested to have a horizontal accuracy of 4.4 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 provides information on satellite images used in the project completion:

Image Source	Source ID	Source File Name	Acquisition Date/Time	Tide Level*
QuickBird	005542055010_01	06FEB13162937-S2AS-005542055010_01_P001	2006-02-13 16:29 GMT	0.6 – 1.0

\* Tide levels are given in meters above MLLW and are based on actual observations recorded by NOS gauges throughout the project area at the time of imagery acquisition. The elevation of the MHW tidal datum at the Charleston reference station (id #8665530) is equal to 1.6 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 September 2006. 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 GC10630 file contents, attached to PCR
- Hardcopy of the CSCAP evaluation memorandum

**Remote Sensing Division Electronic Data Library**

- GC10630 in ESRI shapefile format
- Digital copy of the PCR in Adobe PDF format
- Chart Evaluation File (CEF) in shapefile format

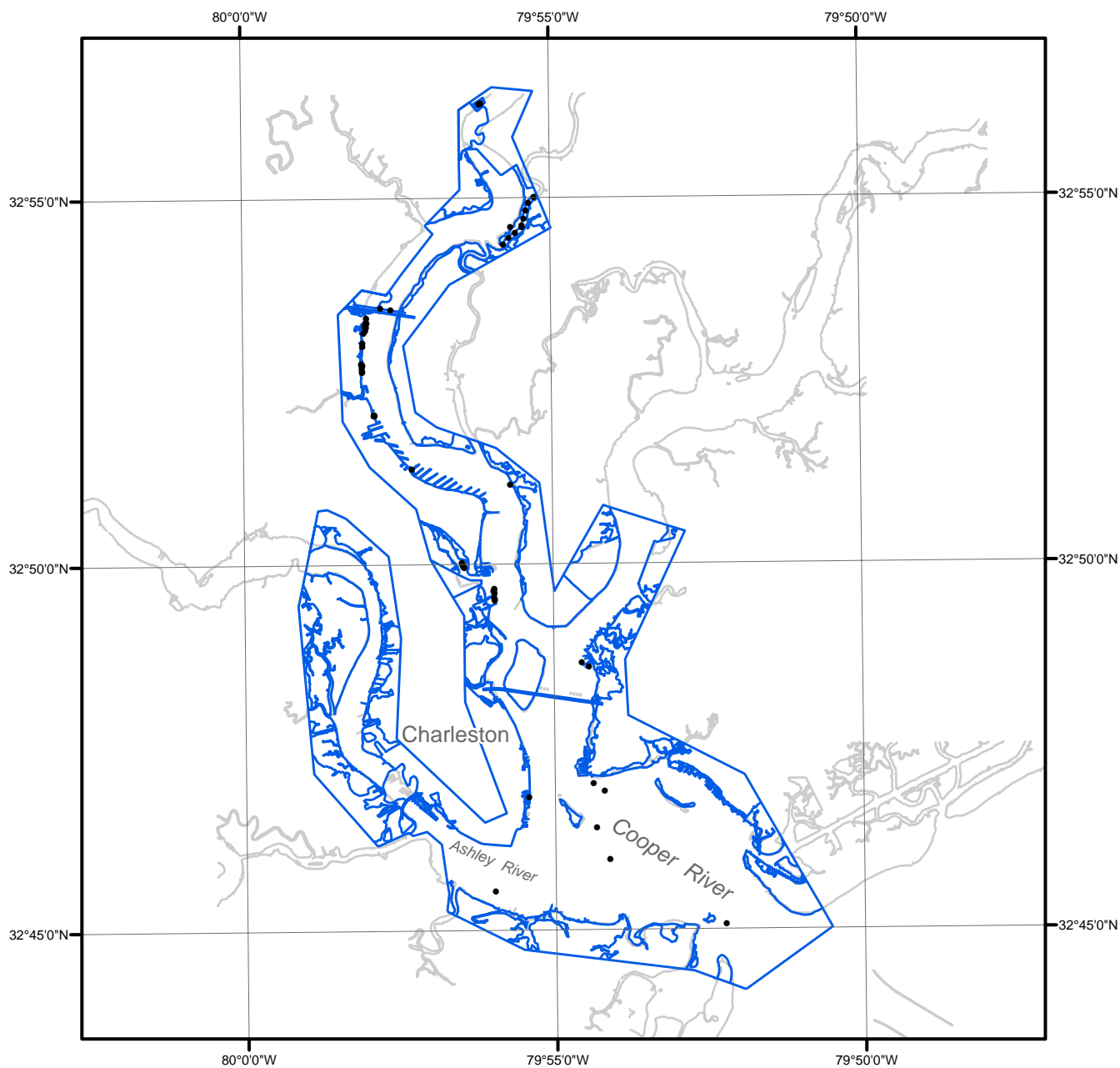
**NOAA Shoreline Data Explorer**

- GC10630 in shapefile format
- Metadata file for GC10630
- Digital copy of the PCR in Adobe PDF format

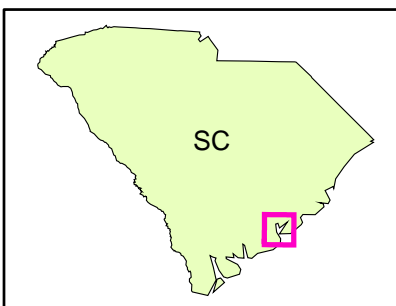
**End of Report**

# PORT OF CHARLESTON

## SOUTH CAROLINA



Overview



SC0601

GC10630