

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

## ***PROJECT GA1501-CS-N***

### ***Ports of Kings Bay and Fernandina Beach, Georgia and Florida***

#### **Introduction**

Coastal Mapping Program (CMP) Project GA1501-CS-N provides highly accurate digital shoreline data for key areas of change within the ports of Kings Bay, Georgia and Fernandina Beach, Florida. 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 GA1501-CS-N was accomplished by the Requirements Branch (RB) of the Remote Sensing Division (RSD) in response to the need for timely updates to the NOAA chart suite within key U.S. ports. 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 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 change analysis memorandum of February 19, 2015 for details of the chart comparison process.

#### **Field Operations**

The field operations consisted of the collection of static and kinematic Global Positioning System (GPS) data and Inertial Measurement Unit (IMU) data and the acquisition of aerial imagery. Six (6) strips consisting of eighty-four (84) color digital images utilized for this project were acquired with the King Air (N68RF) aircraft on January 19, 2015 using an Applanix Digital Sensor System (DSS) 539 aerial camera at a nominal altitude of 10,500 feet, resulting in an approximate ground sample distance (GSD) of 0.36 meters. Although imagery was not acquired in strict coordination with local tides, the goal was to collect all imagery below Mean High Water (MHW).

#### **GPS Data Reduction**

The GPS/IMU data were processed by RSD personnel to yield precise camera positions in order to provide a control network necessary for aerotriangulation. The base station's geodetic position was derived using the NGS Online Processing User Service (OPUS), which computed fixed baseline solutions from nearby CORS stations. The kinematic GPS data was processed using Applanix POSPAC (ver. 7.1) software on 2/4/2015. For further information refer to the Airborne Positioning and Orientation Reports (APOR) on file with other project data within the AB Project Archive.

## Aerotriangulation

Routine softcopy aerotriangulation methods were applied to establish a network of precise camera positions and other control for mapping, and to provide model parameters and orientation elements required for digital compilation. This work was performed by RSD personnel in July 2015 utilizing SOCET GXP (ver. 4.1) software on a Digital Photogrammetric Workstation (DPW), which is a configuration of computer hardware, modular software components, and other associated peripheral devices. The images were measured and adjusted as a single block using the Triangulation module of SOCET GXP. Upon successful completion of this process, the Triangulation module provided the standard deviations for each aerotriangulated ground point, which were used to compute a predicted horizontal circular error of 0.33 meters based on a 95% confidence level. An Aerotriangulation Report was written and is on file with other project data within the RSD Project Archive. Positional data is referenced to the North American Datum of 1983 (NAD83).

## Compilation

The data compilation phase of this project was accomplished by a member of AB in July 2015. Digital feature data was compiled from the aerotriangulated imagery using the Feature Extraction software module of SOCET SET. 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 features were further modified with additional descriptive information to refine general classification.

Spatial data accuracies for Project GA1501-CS-N were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were compiled to meet a horizontal accuracy of 0.7 meters at the 95% confidence level. This predicted accuracy of compiled well-defined points is derived by doubling the circular error calculated from the aerotriangulation statistics.

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

Date	Time (UTC)	Roll #	Flight Line / Photo #s	Tide Level*
19-JAN-2015	19:27 – 19:30	15NC05	53-002 / 461 – 476	-0.1 – 0.0 m
19-JAN-2015	19:37 – 19:41	15NC05	53-001 / 477 – 497	-0.1 – 0.0 m
19-JAN-2015	19:44 – 19:47	15NC05	50-003 / 498 – 510	-0.1 – 0.0 m
19-JAN-2015	19:51 – 19:54	15NC05	50-004 / 511 – 522	0.0 m
19-JAN-2015	19:59 – 20:01	15NC05	50-005 / 523 – 532	0.0 m
19-JAN-2015	20:08 – 20:11	15NC05	50-006 / 533 – 544	0.1 – 0.0 m

\* Tide levels are given in meters above MLLW and are based on verified observations at the Fernandina Beach, FL reference station (#8720030) with time and height offsets applied to several tide zones within the project area. The elevation of MHW in the project area varies between 1.86 – 2.02 meters above MLLW.

## **Quality Control / Final Review**

The final review of the project was completed by a senior member of RSD in July 2015, and included analysis of aerotriangulation 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 Esri's ArcGIS desktop GIS software (v10.2.2). All project data 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:

### **Remote Sensing Division Electronic Data Library**

- CSCAP evaluation memorandum
- Airborne Positioning and Orientation Report (APOR)
- Aerotriangulation Report
- Project Completion Report (PCR)
- Project database
- GC11164 in shapefile format
- Chart Evaluation File (CEF) in shapefile format

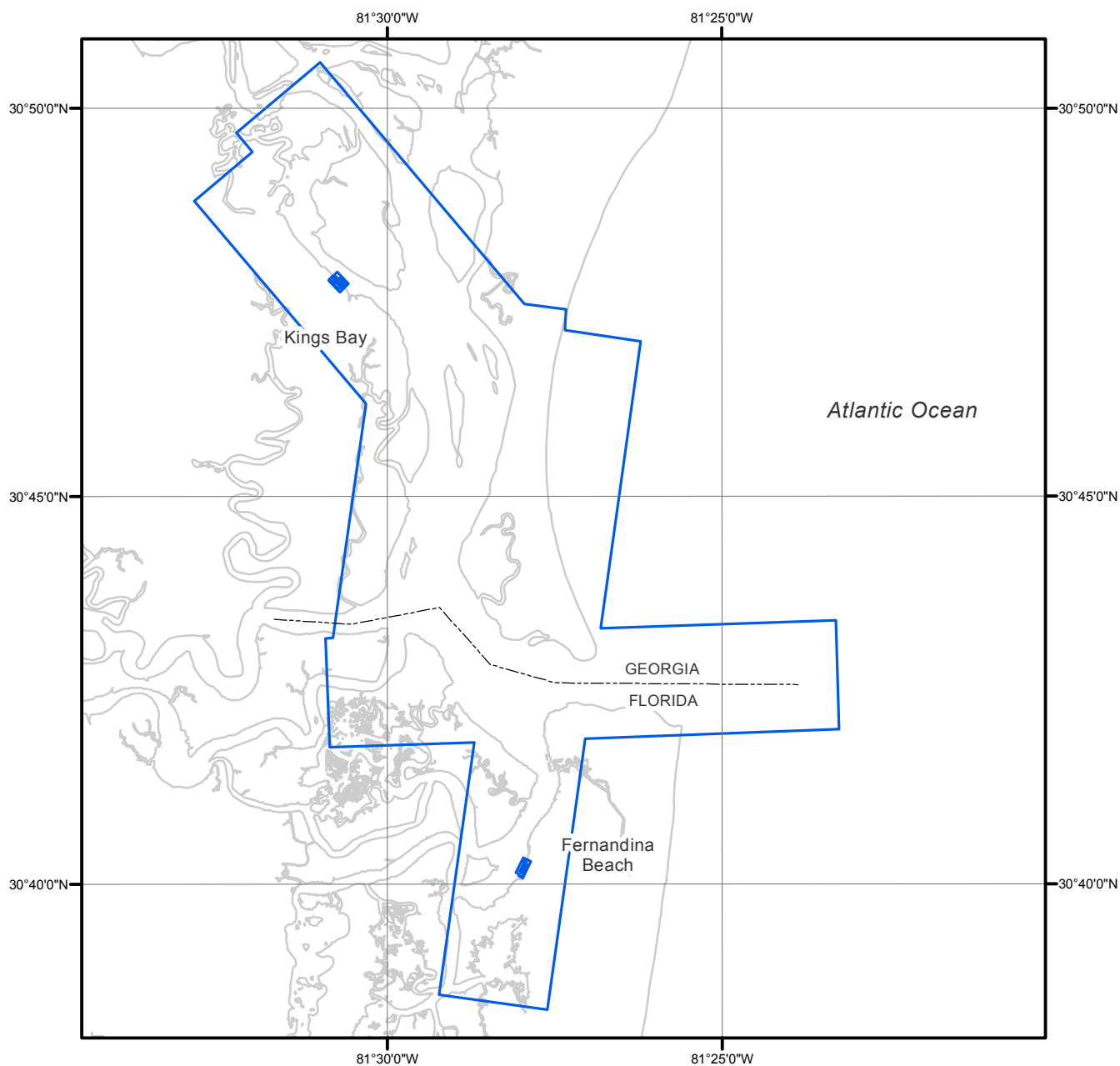
### **NOAA Shoreline Data Explorer**

- GC11164 in shapefile format
- Metadata file for GC11164
- Digital copy of the PCR in Adobe PDF format

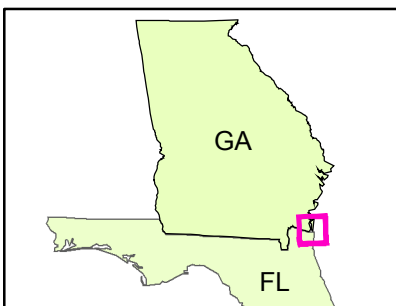
## **End of Report**

# PORTS OF KINGS BAY AND FERNANDINA BEACH

## GEORGIA AND FLORIDA



Overview



GA1501-CS-N

GC11164