

NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

PROJECT SC2301-CM-T

Crab Bank, Charleston Harbor, South Carolina

Introduction

Coastal Mapping Program (CMP) Project SC2301-CM-T provides accurate digital shoreline data for Crab Bank in Charleston Harbor, 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

Project SC2301-CM-T was designed in response to a request originating from the Navigation Services Division (NSD) of the Office of Coast Survey, NOAA. Based on an analysis of project requirements and results of a source data search, it was determined that CMP procedures for multiple source projects would apply for this project. Available source data deemed adequate for successful completion of this project included one orthorectified pan sharpened natural color satellite image (downloaded in tiled format) from DigitalGlobe, Inc. Metadata associated with this imagery is on file with other project data within the Remote Sensing Division (RSD) Electronic Data Library.

Field Operations

Routine CMP field operations did not apply for this project based on the origin of the project imagery, which was obtained from external sources.

Georeferencing

Georeferencing tasks were initiated by a member of the Applications Branch (AB) of RSD in March 2023. The satellite image was georeferenced using features from previously compiled projects SC1502A-CM-N and SC1601F-TB-C as control. Within ArcGIS, the Georeferencing tool was used, and the imagery was re-sampled using the Nearest Neighbor sampling method. Check points from the previous projects were used to assess the accuracy of the resampled imagery. The RMS of the residuals for each measured check point was used to compute a predicted horizontal circular error (CE) of 0.87 meters based on a 95% confidence level. This CE value was doubled and added to the accuracy of check point data in order to conservatively predict the accuracy of well-defined points measured during compilation. All positional data for this project is referenced to the North American Datum of 1983 (NAD 83).

Compilation

Data compilation was accomplished by a member of AB in March 2023. Using Esri's ArcGIS desktop GIS software (ver. 10.8.1), digital feature data was compiled in shapefile format. 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.

Spatial data accuracies for SC2301-CM-T were determined according to standard Federal Geographic Data Committee (FGDC) practices. Features extracted from the satellite imagery were compiled to meet a horizontal accuracy of 2.7 meters at a 95% confidence level, a predicted accuracy of well-defined points based on check points compared to an independent source of higher accuracy. The table below provides information on imagery used in the completion of this project.

Image Source	Source File Name	GSD	Acquisition Date / Time	Tide Level*
WorldView-3	2023March04_WV03_ORI_R1C1.jp2	0.39 m	2023-03-04 / 16:24	0.3 m

* Tide level is given in meters above MLLW and is based on preliminary observations recorded at the time of image acquisition by the NOS gauge at Charleston Harbor, SC (#8665530). The elevation of MHW in Charleston Harbor is 1.648 meters above MLLW.

Quality Control / Final Review

Quality control tasks were conducted upon project completion by senior CMP personnel in March 2023. The review process included an assessment of image georeferencing and 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 (ver. 10.8.1). The entire suite of project products was evaluated for compliance to CMP requirements.

Comparison of the largest scale NOAA nautical chart with project imagery and compiled feature data resulted in creation of the Chart Evaluation File (CEF). The following nautical chart product was used for comparison:

- ENC US5SC14M, 74th Ed., Feb. 2023, Scale 1:20,000

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

- Project database
- GC11919 in shapefile format
- Project Completion Report (PCR)
- CEF in shapefile format

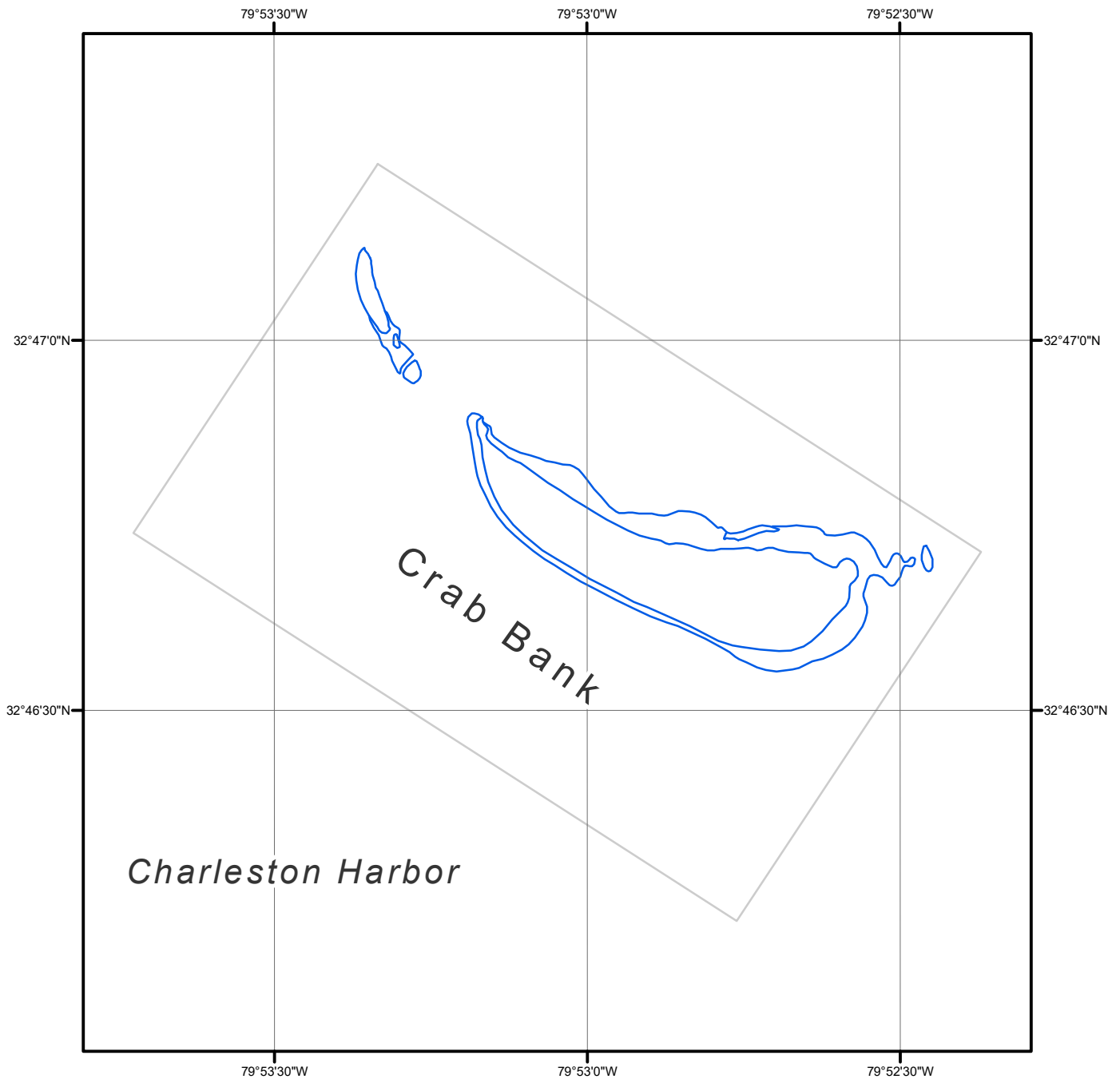
NOAA Shoreline Data Explorer

- GC11919 in shapefile format
- Metadata file for GC11919
- PCR in Adobe PDF format

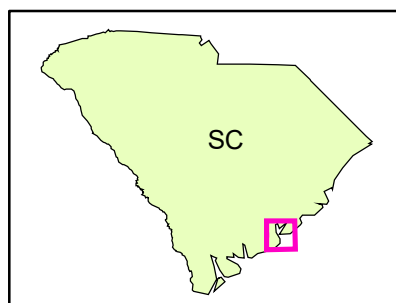
End of Report

CRAB BANK, CHARLESTON HARBOR

SOUTH CAROLINA



Overview



SC2301-CM-T

GC11919