

NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

PROJECT MS2201-CM-T

Ship Island, Mississippi

Introduction

Coastal Mapping Program (CMP) Project MS2201-CM-T provides digital shoreline data for Ship Island, Mississippi. 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 MS2201-CM-T was designed by the Remote Sensing Division (RSD) in response to a data request from NOAA's Office of Coast Survey. Based on 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 three orthorectified, pan-sharpened natural color satellite images (downloaded in tiled format) from DigitalGlobe, Inc. as well as lidar data acquired from the US Army Corps of Engineers (USACE) Joint Airborne Lidar Bathymetry Technical Center of Expertise (JALBTCX). The lidar data was acquired in October 2020 using a Coastal Zone Mapping and Imaging Lidar (CZMIL) system at a nominal altitude of 1,200 feet with a point density of 1-2 pts per square meter. Metadata which fully describes all third-party data used is on file in the RSD Electronic Data Library.

Field Operations

Routine CMP field operations did not apply for this project based on the origin of the project source data.

Georeferencing

Satellite image accuracy was refined for two of the three images (2021 GeoEye, 2020 WorldView) using the Georeferencing toolset within Esri's ArcGIS (ver. 10.8.1) software. This work was done by a member of the Applications Branch (AB) of RSD in August 2022. The images were adjusted to match the positioning of feature data from previously completed CMP project MS1401 (GC11050). Positional data for this project is referenced to the North American Datum of 1983 (NAD 83).

Lidar Data Processing

NOAA VDatum software was used by a member of RSD to transform the JALBTCX lidar data to local Mean High Water (MHW) and Mean Lower Low Water (MLLW) tidal datums. QTModeler and custom ArcGIS scripts were then used to derive MHW and MLLW elevation contours. The nominal vertical uncertainty of the lidar data (15 cm) was combined with the morphologic slope around the derived contours to assess corresponding horizontal uncertainties.

Compilation

Data compilation was completed by AB personnel in August 2022. Feature data was extracted from the images adjusted as described above, with the third image only being used for reference. The data was compiled in shapefile format from the satellite imagery using ArcGIS software. Feature identification and attribution within the GC were based on image analysis of the satellite imagery as well as information extracted from the largest scale NOAA nautical chart and other ancillary sources. 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 MS2201-CM-T were determined according to standard Federal Geographic Data Committee (FGDC) practices, with imagery-derived features compiled to meet a horizontal accuracy of 1.4 meters at the 95% confidence level based on the accuracy of the source imagery used to compile project MS1401. The lidar-derived MHW shorelines were compiled to meet a horizontal accuracy of 7.3 meters, and the MLLW depth contours were compiled to meet a horizontal accuracy of 8.4 meters, both at the 95% confidence level, based on the uncertainty assessment of the lidar data.

The following table provides information on the imagery used to complete this project.

Image Source	Source File ID	Acquisition Date/Time	GSD	Tide Level*
WorldView-2	20191230_WV02_ORI_mos.jp2	2019-12-30 / 16:36 GMT	0.5 m	n/a
WorldView-2	20200107_WV02_ORI_mos.jp2	2020-01-07 / 16:42 GMT	0.5 m	-0.1 m
GeoEye-1	20211028_GE01_ORI_mos.jp2	2021-10-28 / 16:40 GMT	0.44 m	0.4 m

* Tide levels are given in meters above MLLW and are based on actual observations recorded by the NOS gauge at Pascagoula, MS (#8741533). The elevation of MHW at the Pascagoula gauge is 0.439 meters above MLLW.

Quality Control / Final Review

Quality control tasks were conducted by senior members of RSD. The final QC review was completed in August 2022. 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 (ver. 10.8.1) software. All project data was evaluated for compliance to CMP requirements.

A Chart Evaluation File (CEF) resulted from the comparison of source imagery and compiled project data with the largest scale NOAA electronic navigational chart (ENC) covering the project area:

US5MS11M, 64th Ed., Aug. 2022, Scale 1:40,000

End Products and Deliverables

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

RSD Electronic Data Library

- Project database
- Project Completion Report (PCR)
- GC11811 in shapefile format
- CEF in shapefile format

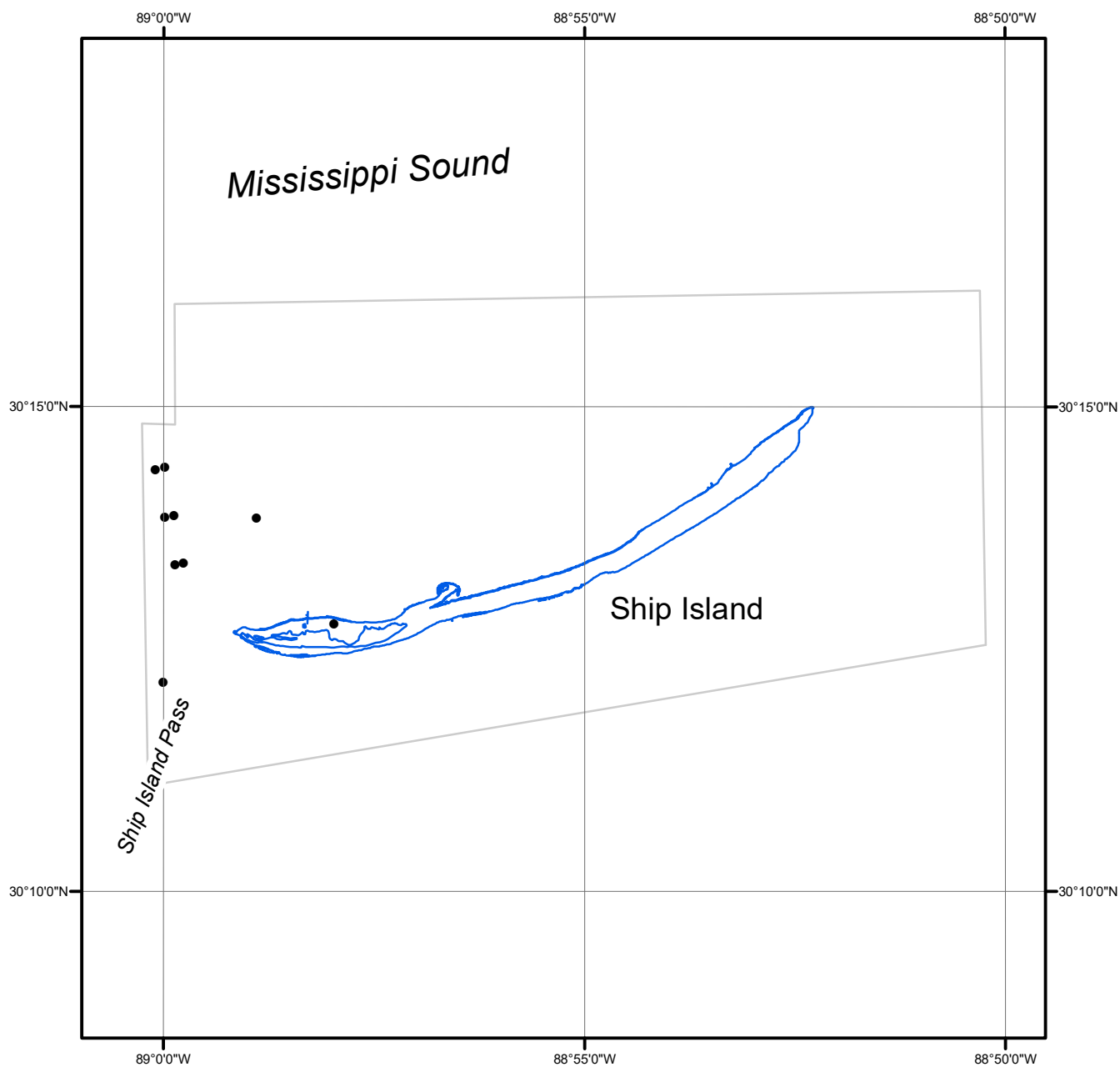
NOAA Shoreline Data Explorer

- GC11811 in shapefile format
- Metadata file for GC11811
- PCR in Adobe PDF format

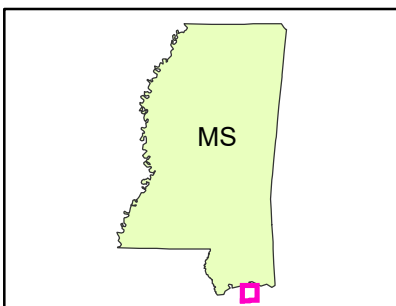
End of Report

SHIP ISLAND

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Overview



MS2201-CM-T

GC11811