NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

PROJECT MI2505-CM-T

Celeron and Sugar Island Breakwaters, Detroit River, Michigan

Introduction

Coastal Mapping Program (CMP) Project MI2505-CM-T provides accurate digital shoreline data for portions of Celeron and Sugar Islands in Detroit River, Michigan, specifically to include new breakwater construction. 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 MI2505-CM-T was designed by the Applications Branch (AB) of the Remote Sensing Division (RSD) in response to a request from the Marine Chart Division (MCD) 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 4-band orthomosaic of PhaseOne imagery obtained through the National Agriculture Imagery Program (NAIP). Metadata associated with the imagery is on file with other project data within the 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

Metadata which accompanied the NAIP imagery fully describes the collection, photogrammetric processing, and orthorectification of the imagery. Further georeferencing of this imagery was unnecessary since it compared well with sources used to assess spatial accuracy and was accompanied by an acceptable accuracy assessment from the image provider. The metadata contains information on the horizontal accuracy of the orthoimagery. 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 2025. Using Esri's ArcGIS desktop GIS software (ver. 10.8.2), digital feature data was compiled in shapefile format from the NAIP orthoimagery. For compilation purposes the original 4-band NAIP image was split into separate color (RGB) and near-infrared (NIR) images covering a smaller portion of the original image extent. 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 MI2505-CM-T were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features extracted from NAIP imagery were compiled to meet a horizontal accuracy of 4.0 meters at a 95% confidence level, a figure representing the level of accuracy claimed by the image provider. The table below provides information on imagery used in the completion of this project.

Image Source	Source File Name	GSD	Acquisition Date / Local Time	Water Level*
NAIP orthomosaic (PhaseOne)	2024OCT02_NAIP_UTM_NAD83.jp2	0.6 m	2024-10-02 / 16:30	174.5 m

* Detroit River water levels are given in meters above IGLD 1985 and are based on verified observations from the NOS gauge at Gibraltar, MI (9044020) at the time of image acquisition. The Low Water Datum (LWD) for the Detroit River at Gibraltar is 173.58 meters above IGLD 1985.

Quality Control / Final Review

Quality control tasks were conducted upon project completion by senior CMP personnel in March 2025. 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. 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 products were used for comparison:

- ENC US5DETDC, 1st Ed., Feb. 2025, Scale 1:12,000
- ENC US5DETDD, 1st Ed., Feb. 2025, Scale 1:12,000
- ENC US5DETEC, 1st Ed., Feb. 2025, Scale 1:12,000
- ENC US5DETED, 1st Ed., Feb. 2025, Scale 1:12,000

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
- GC12100 in shapefile format
- Project Completion Report (PCR)
- CEF in shapefile format

NOAA Shoreline Data Explorer

- GC12100 in shapefile format
- Metadata file for GC12100
- PCR in Adobe PDF format

End of Report

CELERON & SUGAR ISLAND BREAKWATERS, DETROIT RIVER



