

NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

PROJECT MI2412-CS-T

Port of Marysville/Port Huron, Michigan

Introduction

Coastal Mapping Program (CMP) Project MI2412-CS-T provides highly accurate digital shoreline data for key areas of change within the port of Marysville/Port Huron, Michigan. 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 MI2412-CS-T was accomplished by the Systems & Quality Assurance Branch (SQAB) of the Remote Sensing Division (RSD) in order to provide targeted updates to the NOAA chart suite in key 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. Commercial satellite imagery was utilized for the CSCAP analysis. A Chart Evaluation File (CEF) was created and forwarded to the Applications Branch (AB) of RSD once the change analysis was complete. Refer to the CSCAP memorandum for MI2412-CS-T for details regarding 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

Georeferencing tasks were initiated by a member of AB in September 2024. One orthorectified pan-sharpened WorldView image from DigitalGlobe, Inc. (downloaded in tiled format) was georeferenced using Esri's ArcGIS (ver. 10.8.2) desktop GIS software. Within ArcGIS, the Georeferencing tool was used, and the imagery was adjusted using a 1st order polynomial (affine) transformation. Check points from previously completed CMP projects MI0906B and MI0906C 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 1.49 meters based on a 95% confidence level. This CE value was doubled in order to conservatively predict the accuracy of well-defined points measured during compilation. Positional data is referenced to the North American Datum of 1983 (NAD 83).

Compilation

Data compilation was accomplished by a member of AB in September 2024. Digital feature data was compiled in shapefile format from the satellite imagery using Esri's ArcGIS 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.

Spatial data accuracies for Project MI2412-CS-T were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were compiled to meet a horizontal accuracy of 3.3 meters at the 95% confidence level, which is a deductive estimate based on georeferencing statistics. The table below provides further information on the satellite imagery used in the project completion.

Image Source	Source File (Tile) ID	GSD	Acquisition Date / Time	Lake Level*
WorldView-2	20240530_WV02_ORI_R#C#.jp2	0.50 m	2024-05-30 / 16:12:43 GMT	176.4 m

* Lake water levels are given in meters above IGLD 1985 and are based on verified observations at the NOS water level station at the Mouth of the Black River, MI (#9014090). The Low Water Datum (LWD) for the portion of the St. Clair River covered by this project varies between 175.08 – 175.93 meters above IGLD 1985.

Quality Control / Final Review

Quality control tasks were conducted subsequent to project completion, in October 2024, by senior CMP personnel. 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. 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:

Remote Sensing Division Electronic Data Library

- CSCAP evaluation memorandum
- GC12050 in shapefile format
- Project Completion Report (PCR)
- CEF in shapefile format

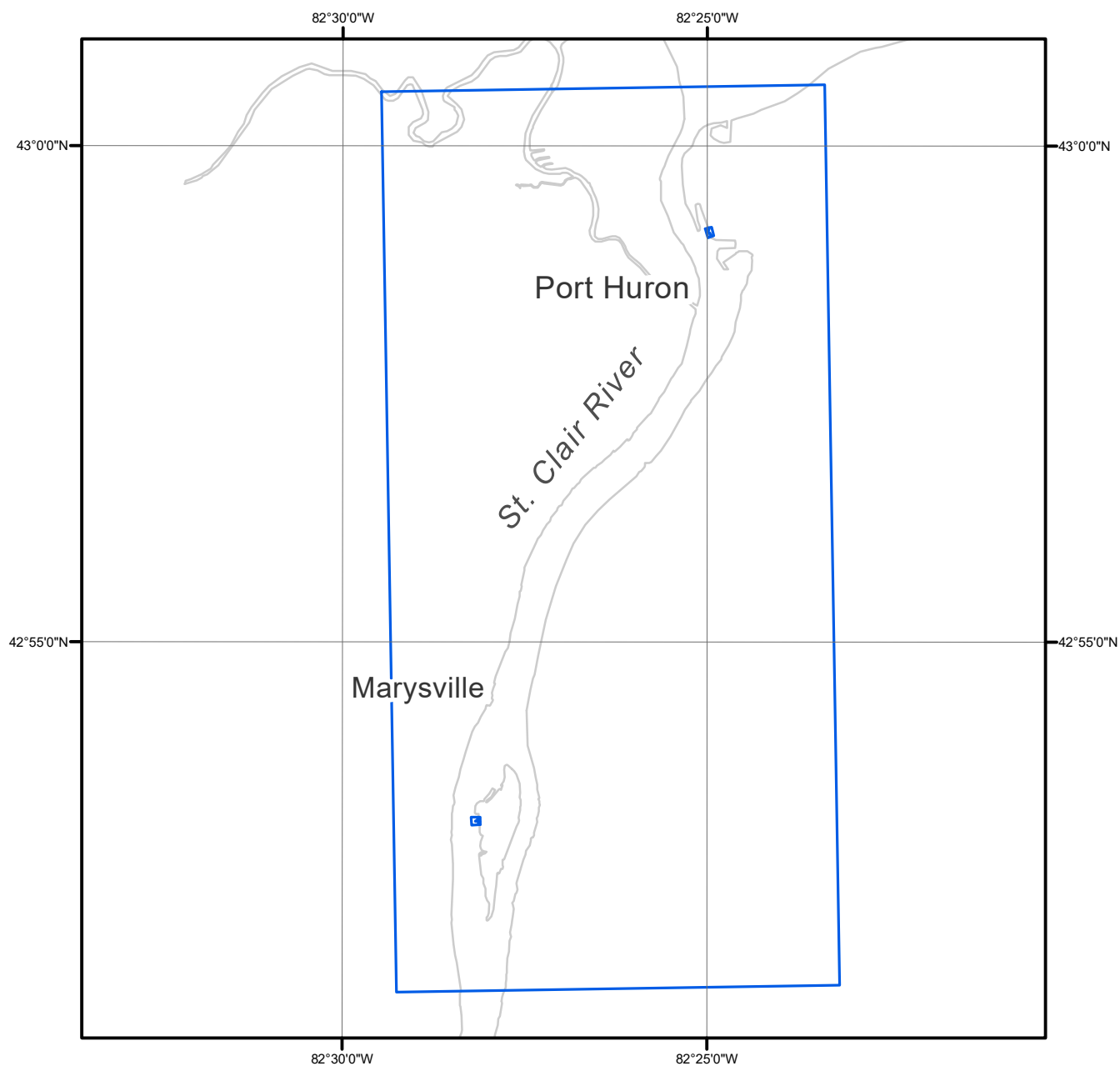
NOAA Shoreline Data Explorer

- GC12050 in shapefile format
- Metadata file for GC12050
- PCR in Adobe PDF format

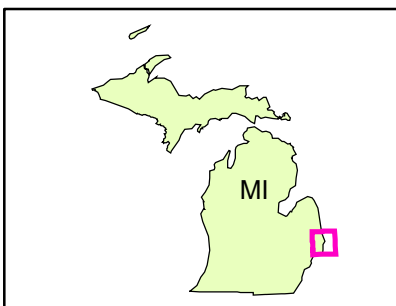
End of Report

PORT OF MARYSVILLE/PORT HURON

MICHIGAN



Overview



MI2412-CS-T

GC12050