

NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

PROJECT MI1401-CS-T

Port of Detroit, Michigan

Introduction

NOAA Coastal Mapping Program (CMP) Project MI1401-CS-T provides highly accurate digital shoreline data for key areas of change within the Port of Detroit, 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 MI1401-CS-T was accomplished by the Requirements Branch (RB) of the Remote Sensing Division (RSD) in response to the need for 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 to ascertain the need for more current shoreline data. Orthorectified WorldView satellite imagery from DigitalGlobe, Inc. with a spatial resolution of 0.5 meters was utilized for the CSCAP analysis. A Chart Evaluation File (CEF) was created once the change analysis was complete. Refer to the CSCAP memorandum of June 20, 2014 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 performed by a member of the Applications Branch (AB) of RSD in August 2016. Two of the four WorldView images used for CSCAP analysis were georeferenced for compilation using Esri's ArcGIS® (ver. 10.2.2) desktop GIS software. Within ArcGIS the Georeferencing tool was used and the imagery re-sampled using the Nearest Neighbor sampling method with a 1st order polynomial model. Check points measured from feature data from a previous CMP project (OH0906A) were used as control and to assess satellite image accuracy. The RMS of the residuals for each measured check point was used to compute a predicted horizontal circular error of 0.9 meters for both georeferenced images based on a 95% confidence level. This value was doubled and added to the accuracy of the data from which the check points were measured to conservatively predict the accuracy of well-defined points measured during compilation. Positional data for this project is referenced to the North American Datum of 1983 (NAD 83).

Compilation

Data compilation was accomplished by AB personnel in August 2016. Digital feature data was compiled in shapefile format from the satellite imagery using ArcGIS (v10.2.2). 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 MI1401-CS-T were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were tested to have a horizontal accuracy of 2.1 meters at the 95% confidence level. These predicted accuracies of well-defined points are based on comparisons of at least 20 check points to an independent source of higher accuracy. The following table provides further information on the imagery used to complete this project:

Image Source	Source File ID	Acquisition Date/Time	Water Level*
WorldView-2	20131016_163320_wv02_ORI.tif	2013-10-16 / 16:33 GMT	174.6 – 174.8 m
WorldView-2	20140405_163530_wv02_ORI_2.tif	2014-04-05 / 16:35 GMT	174.4 – 174.6 m

* Lake water levels are given in meters above IGLD 1985 and are based on verified observations at the Wyandotte, Fort Wayne, and Windmill Point stations in Michigan. The Low Water Datum (LWD) values for the Detroit River range from 173.6 m. in the south (Wyandotte) to 174.3 m. in the north (Windmill Point).

Quality Control / Final Review

Quality control tasks were conducted upon project completion by senior CMP personnel. The final QC review was completed in September 2016. 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 10.2.2. 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
- Project database
- GC11266 in shapefile format
- Project Completion Report (PCR)
- CEF in shapefile format

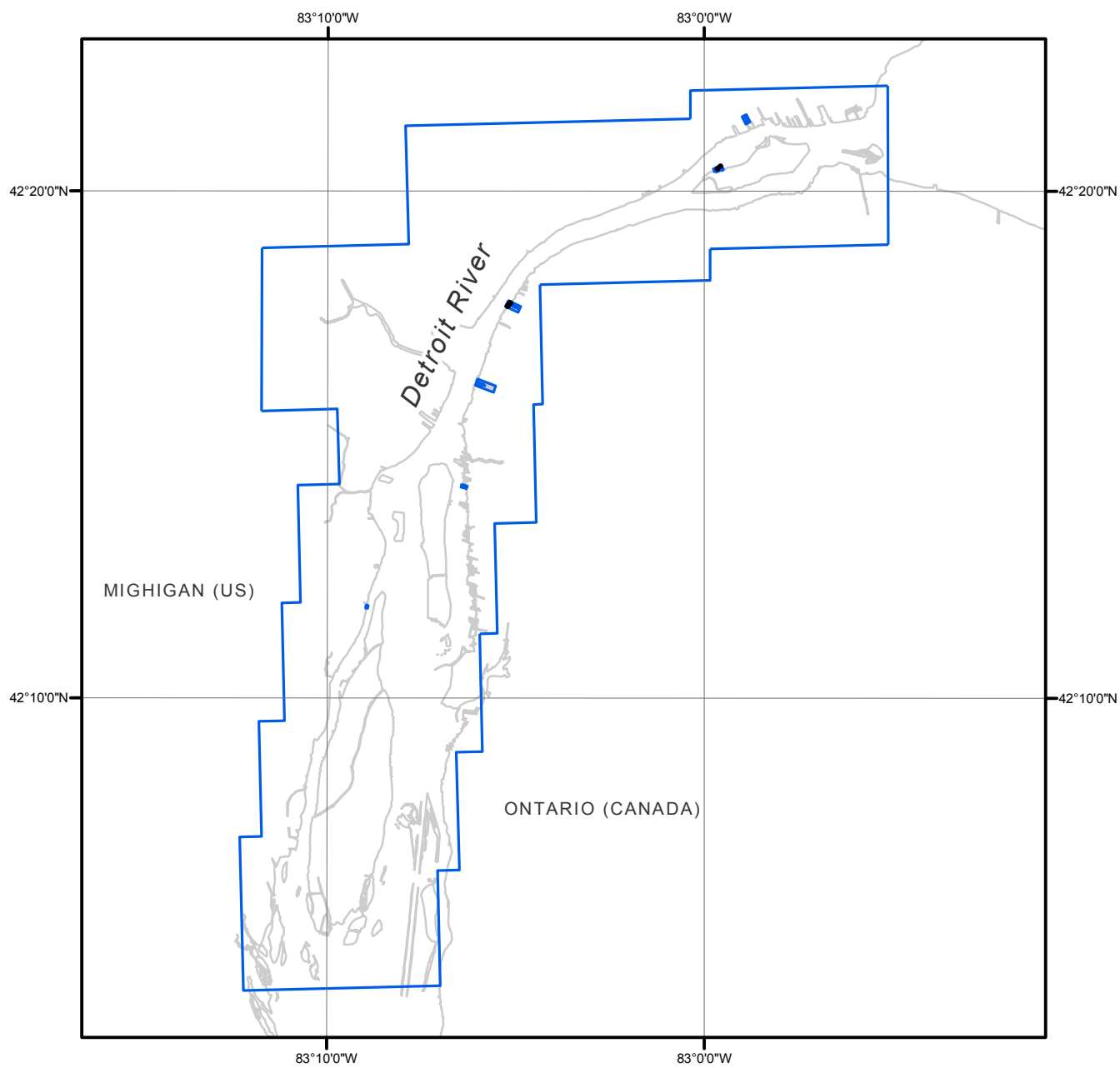
NOAA Shoreline Data Explorer

- GC11266 in shapefile format
- Metadata file for GC11266
- Digital copy of the PCR in Adobe PDF format

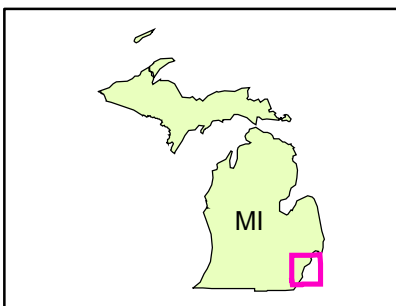
End of Report

PORT OF DETROIT

MICHIGAN



Overview



MI1401-CS-T

GC11266