

# **NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT**

## ***PROJECT MI0501***

### ***Port of Detroit, Michigan***

#### **Introduction**

Coastal Mapping Program (CMP) Project MI0501 provides highly accurate digital shoreline data for key areas of change within the port of Detroit, Michigan. The project covers a portion of the Detroit River extending from Belle Isle south to the entrance of Lake Erie. The analysis and the digital cartographic feature file (DCFF) may be used in support of the NOAA Nautical Charting Program (NCP) as well as geographic information systems (GIS) for coastal zone management applications.

#### **Project Design**

The design of Project MI0501 was accomplished by the Requirements Branch (RB) of the Remote Sensing Division (RSD) in response to the need for timely updates to NOAA Electronic Navigational Chart series. 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 satellite imagery in order to ascertain the need for more current shoreline data. Refer to the RB Memorandum, "Results of CSCAP Change Analysis for Detroit, Michigan (MI0501)," December 8, 2005, 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**

Four IKONOS non-orthorectified color images with a spatial resolution of 1 meter, acquired from Space Imaging, Inc., were georeferenced using Erdas IMAGINE 9.0 software on a Windows platform. Ground control points (GCPs) which were photogrammetrically measured from metric quality aerial photography were imported into IMAGINE and used to georeference the satellite imagery. Within IMAGINE, the Raster Geometric Correction tool was used with a 1st order polynomial model. Imagery was resampled using the Nearest Neighbor sampling method. The RMS of the residuals for measured check points were used to compute a predicted horizontal circular error at the 95% confidence level (CE95) of 1.6 meters for all images. This CE value was tripled and then added to the CE95 of the source imagery from which ground control points were extracted, in order to conservatively predict the accuracy of well defined points measured during the compilation process. Positional data is based on the UTM Coordinate System (zone 17), and referenced to the North American Datum of 1983.

## Compilation

The compilation of cartographic feature data for this project was accomplished by a member of the Applications Branch (AB) of RSD in August 2006. Digital feature data were compiled in ESRI shapefile format from imagery using ESRI's ArcGIS 9.1 desktop GIS software. Feature attributes were established according to 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 MI0501 were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were tested to have 5.8 meters horizontal accuracy at the 95% confidence level. This predicted accuracy of well-defined points is based on a minimum of twenty (20) check points that were compared to an independent source of higher accuracy.

The following table provides information on satellite images used in the project completion:

Image #	Image Source	Source ID	Source File Name	Acquisition Date/Time	Tide Level*
1	IKONOS	2005111216352450000011614638	po_183385_rgb_0010002.tif	2005-11-12 16:35 GMT	n/a
2	IKONOS	2005111216352450000011614638	po_183385_rgb_0010001.tif	2005-11-12 16:35 GMT	n/a
3	IKONOS	2005111216352450000011614638	po_183385_rgb_0010000.tif	2005-11-12 16:35 GMT	n/a
4	IKONOS	2005100216414310000011620393	po_183385_rgb_0000000.tif	2005-10-02 16:41 GMT	n/a

\* There are no periodic tides in the Detroit River.

## Quality Control / Final Review

Quality control tasks were conducted during all phases of project completion by a senior member of AB. The final QC review was completed in September 2006. The review process included analysis of the georeferencing results and assessment of the identification and attribution of cartographic features according to image analysis and criteria defined in C-COAST. The quality control process concluded with an inspection of topological connectivity within the DCFF using ArcGIS 9.1. 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 the products generated during the completion of this project:

### RSD Applications Branch Archive

- Hardcopy of the Project Completion Report (PCR)
- Page-size graphic plot of GC10623 file contents, attached to PCR
- Hardcopy of the CSCAP evaluation memorandum

**Remote Sensing Division Electronic Data Library**

- Digital copy of DCFF GC10623 in shapefile format
- Digital copy of the PCR in Adobe PDF format
- Chart Evaluation File (CEF) in shapefile format

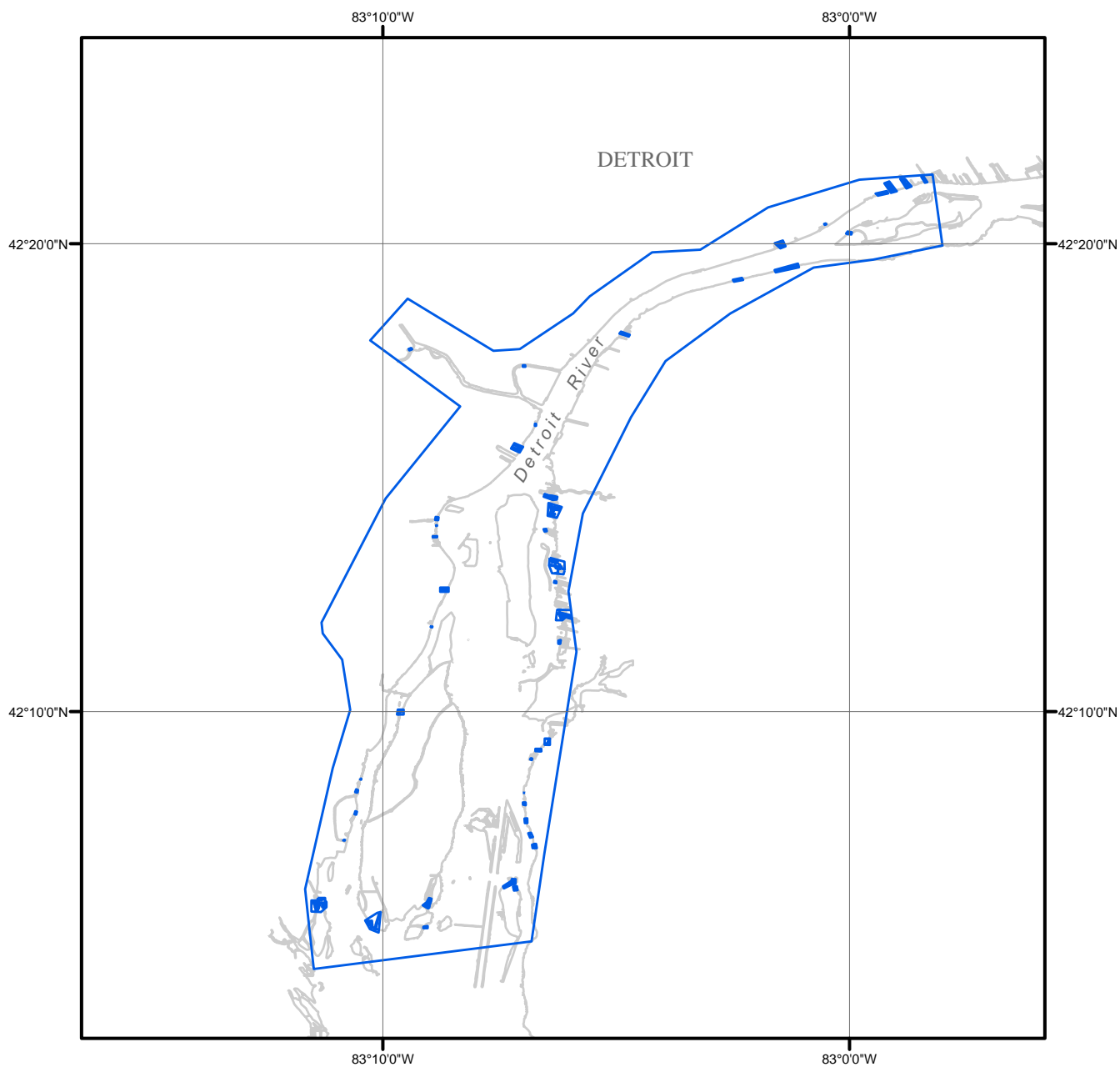
**NOAA Shoreline Data Explorer**

- DCFF for GC10623
- Metadata file for GC10623
- Digital copy of the PCR in Adobe PDF format

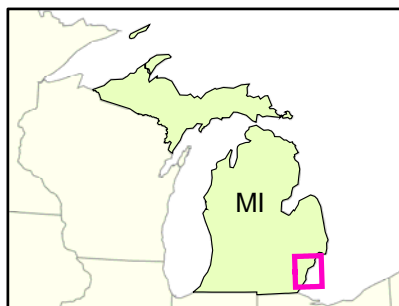
**End of Report**

# PORT OF DETROIT

## MICHIGAN



Overview



MI0501

GC10623