NOAA COASTAL MAPPING PROGRAM
PROJECT COMPLETION REPORT

PROJECT HI1301

Port of Honolulu / Pearl Harbor, Hawaii

Introduction

Coastal Mapping Program (CMP) Project HI1301 provides highly accurate digital shoreline data for key areas of change within the port of Honolulu/Pearl Harbor, Hawaii. 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 H1301 was accomplished by the Requirements Branch (RB) of the Remote Sensing Division (RSD) in response to the need for updates to the NOAA Electronic Navigational Chart (ENC) 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. A Chart Evaluation File (CEF) was forwarded to the Applications Branch (AB) of RSD once the change analysis was complete. Refer to the RB Memorandum of January 29th, 2013, "Results of CSCAP Change Analysis for Honolulu and Pearl Harbor, Hawaii (HI1301)," 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

Two basic level panchromatic WorldView-1 satellite images from DigitalGlobe, Inc. with a spatial resolution of 0.5 meters, obtained through the National Geospatial-Intelligence Agency (NGA), were georeferenced. Existing ground control points from CMP project HI0601B (GC10650) and HI0601C (GC10649) were used to rectify the satellite imagery using the ArcGIS 9.3 Georeferencing tool. Once the imagery was rectified, a minimum of twenty check points were measured on each image to determine the RMS of the residuals. The RMS was used to compute a predicted horizontal circular error of 1.0 meters based on a 95% confidence level (CE95) for the May 2nd, 2012 image and a CE95 of 1.2 for the October 1st, 2012 image. These CE95 values were doubled 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 referenced to the North American Datum of 1983 (NAD 83).

Compilation

The data compilation phase of this project was accomplished by a member of AB in April 2014. Digital feature data was compiled in ESRI shapefile format from imagery using ESRI's ArcGIS 9.3 desktop GIS 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. Selected features were further modified with additional descriptive information to refine general classification.

Spatial data accuracies for Project HI1301 were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were tested to have horizontal accuracies at the 95% confidence level of 3.4 meters for features compiled from the May 2012 image, and 4.0 meters for features compiled from the October 2012 image. These predicted accuracies of compiled well-defined points are based on comparison to an independent source of higher accuracy.

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

Image #	Image Source	Source File Name	Acquisition Date/Time	Tide Level*
1	WorldView - 1	12MAY02214412-P1BS-052770782020_01_P004_RPC.tif	2012-05-02 21:44GMT	0.4 m
2	WorldView - 1	12OCT01214159-P1BS-052828304010_01_P001_rpc.tif	2012-10-01 21:41 GMT	0.2 m

* Tide levels are given in meters above MLLW and are based on actual observations recorded by the NOS gauge at the time of photography at the Honolulu, Hawaii reference station. The elevation of the MHW tidal datum is equal to 0.44 meters above MLLW.

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 July 2014. 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 9.3. 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:

RSD Applications Branch Archive

- Hardcopy of Accuracy Assessment
- Hardcopy of the Project Completion Report (PCR)
- Page size graphic plot of GC11064 file contents, attached to PCR
- Hardcopy of the CSCAP evaluation memorandum

Remote Sensing Division Electronic Data Library

- GC11064 in shapefile format
- Digital copy of the PCR in Adobe PDF format
- CEF in shapefile format

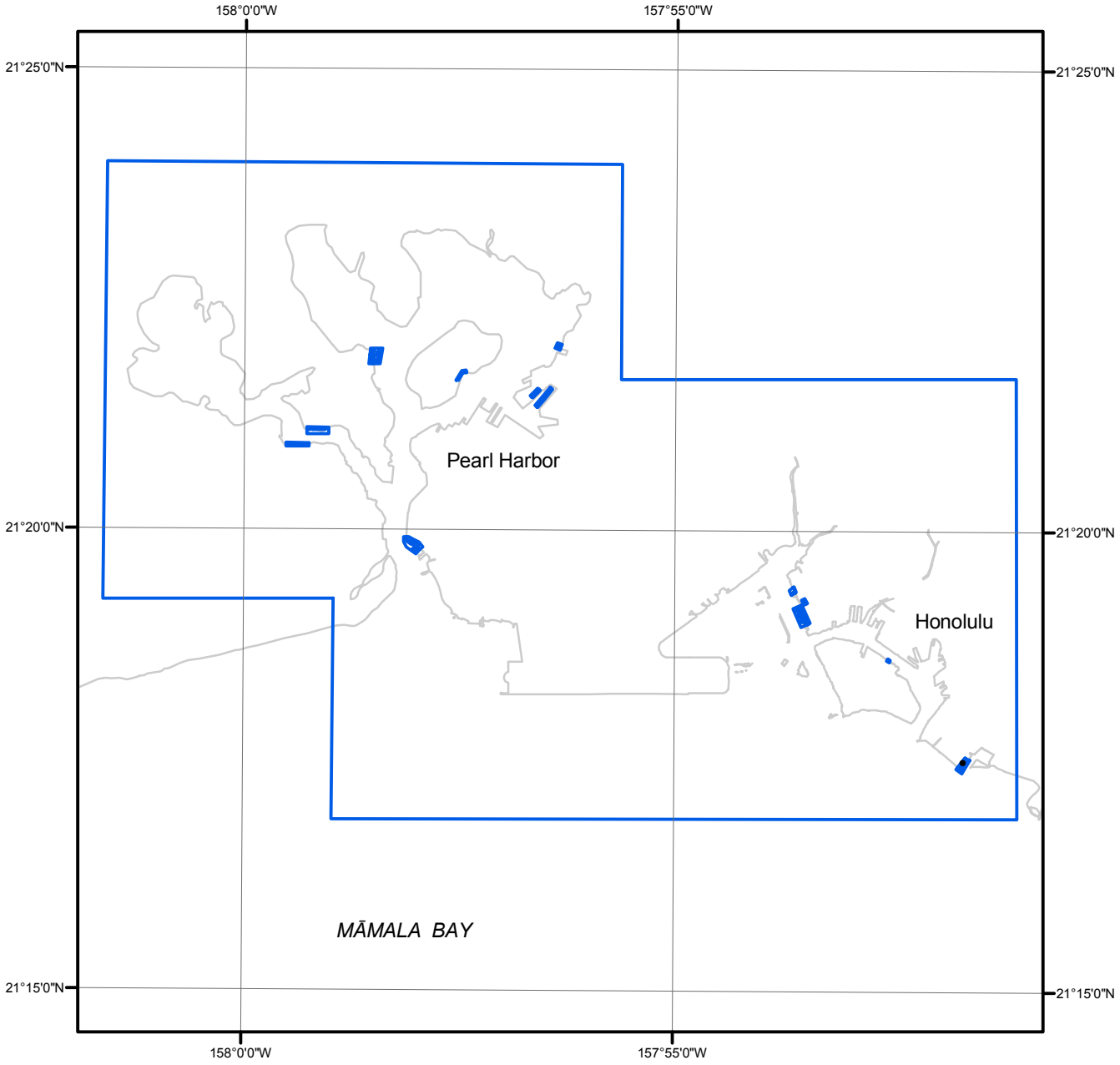
NOAA Shoreline Data Explorer

- GC11064 in shapefile format
- Metadata file for GC11064
- Digital copy of the PCR in Adobe PDF format

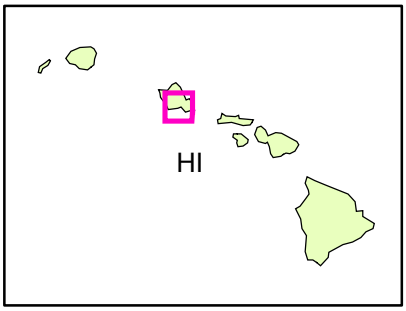
End of Report

PORT OF HONOLULU / PEARL HARBOR

HAWAII



Overview



HI1301

GC11064