NOAA COASTAL MAPPING PROGRAM
PROJECT COMPLETION REPORT

PROJECT HI1501-CS-T

Port of Hilo, Hawaii

Introduction

Coastal Mapping Program (CMP) Project HI1501-CS-T provides highly accurate digital shoreline data for key areas of change within the port of Hilo, 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 HI1501-CS-T was accomplished by the Requirements Branch (RB) of the Remote Sensing Division (RSD) in response to the need for expedited 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 once the change analysis was complete. Refer to the CSCAP memorandum of October 23, 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 initiated by a member of the Applications Branch (AB) of the RSD in July 2015. One orthorectified, pan-sharpened color WorldView-2 image from DigitalGlobe, Inc. with a spatial resolution of 0.5 meters was georeferenced using Esri's ArcGIS® (ver. 10.2.2) desktop GIS software. Within ArcGIS, the Georeferencing tool was used, and the imagery was re-sampled using the Nearest Neighbor sampling method with a 1st order polynomial model. GPS-measured check points from a previous project (CMP Project HI0801) 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 1.0 meter 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 July 2015. Digital feature data was compiled in shapefile format from satellite imagery using Esri's ArcGIS (ver. 10.2.2) 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. A previously georeferenced IKONOS satellite image (Project HI0801) was used to extend delineation of updated shoreline slightly beyond the limits of the current project imagery.

Spatial data accuracies for Project HI1501-CS-T were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were compiled to meet a horizontal accuracy of 2.0 meters at the 95% confidence level, which is a deductive estimate based on georeferencing statistics. The following table provides information on the satellite images used in the project completion:

Image Source	Source File ID	Resolution	Acquisition Date/Time	Tide Level*
WorldView-2	20140307_211157_WV02_ORI.tif	0.5 m	2014-03-07 / 21:11 GMT	0.2 m
IKONOS-2	2006121721073770000011601789.tif	1.0 m	2006-12-17 / 21:07 GMT	0.5 m

* Tide levels are given in meters above MLLW and based on verified observations recorded at the NOS gage in Hilo Bay, Hawaii at the time of image acquisition. The MHW tidal datum is 0.60 meters above MLLW at the NOS gage.

Quality Control / Final Review

Quality control tasks were conducted during all phases of project completion by a senior member of RSD. The final QC review was completed in July 2015. 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

- GC11161 in shapefile format
- Digital copy of the PCR in Adobe PDF format
- CEF in shapefile format

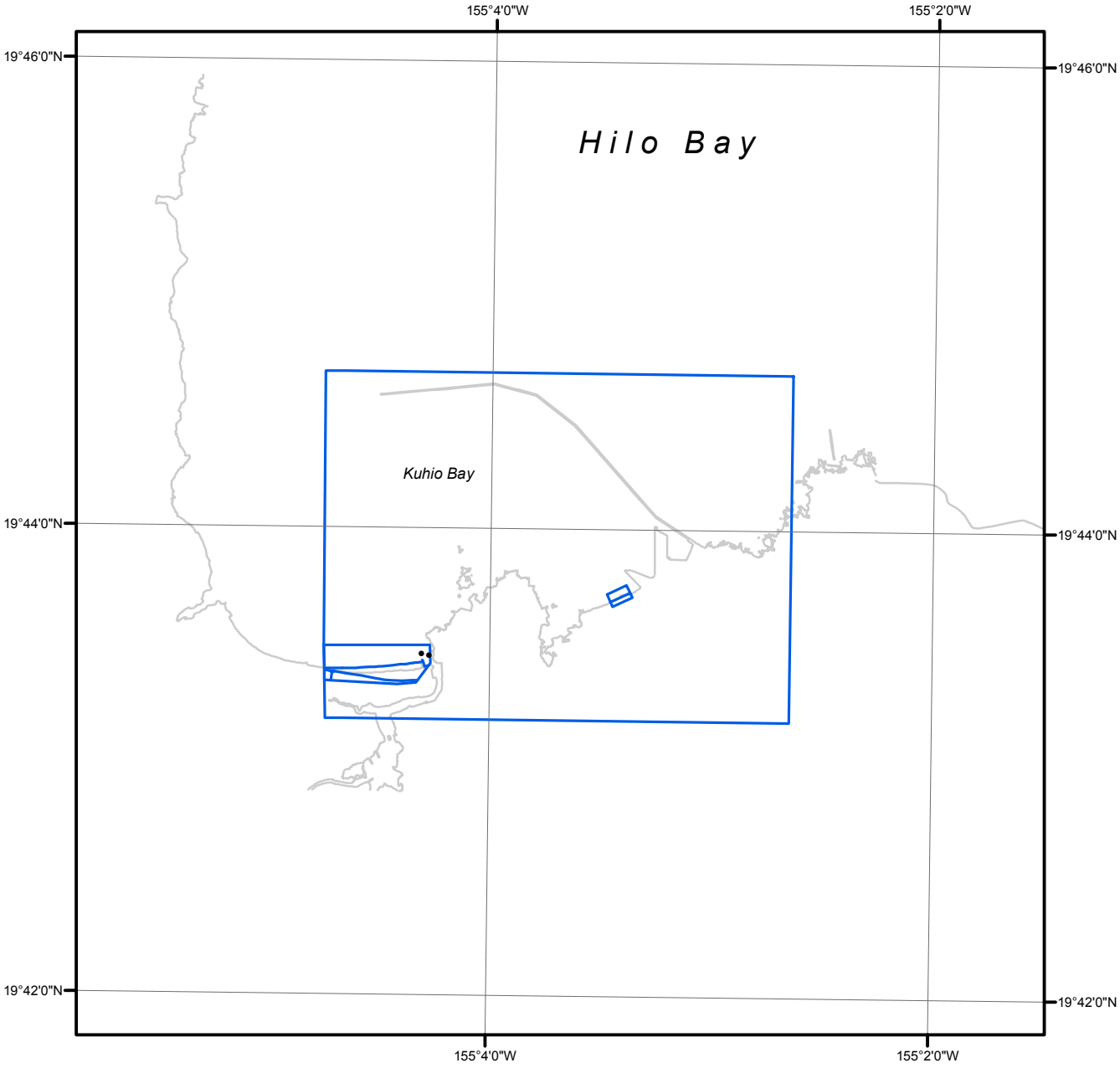
NOAA Shoreline Data Explorer

- GC11161 in shapefile format
- Metadata file for GC11161
- Digital copy of the PCR in Adobe PDF format

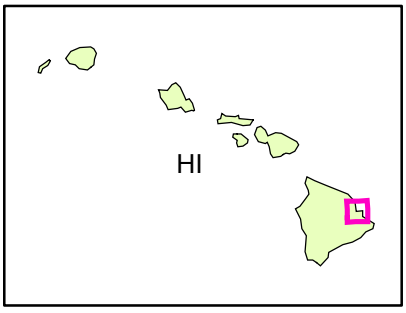
End of Report

PORT OF HILO

HAWAII



Overview



HI1501-CS-T

GC11161