

NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

PROJECT HI0601A

Barbers Point Harbor, Hawaii

Introduction

Coastal Mapping Program (CMP) Project HI0601A provides highly accurate digital shoreline data for key areas of change within Barbers Point Harbor, Hawaii. 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 a variety of coastal zone management applications.

Project Design

The design of Project HI0601A was accomplished by the Requirements Branch (RB) of the Remote Sensing Division (RSD) in response to the need for timely 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. Refer to the RB Memorandum of January 13, 2006, "Results of CSCAP Change Analysis for Barbers Point Harbor, Hawaii (HI0601A)," for details of 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

One IKONOS non-orthorectified color image with a spatial resolution of 1 meter, acquired from Space Imaging, Inc., was georeferenced using Erdas IMAGINE 8.7 software. Ground control points (GCPs) which were photogrammetrically measured from metric quality aerial photography were imported into IMAGINE and used to georeference the 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 interval (CE95) of 1.7 meters for the satellite image. 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 4), 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 of RSD in April 2006. Digital feature data was compiled in ESRI shapefile format from imagery using ESRI's ArcGIS 9.1 desktop GIS software. Feature attributes were established using 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.

Although project data consists of two satellite images, all feature data was compiled using image #1 (see Table 1). The second, and more recent, image was received from the vendor subsequent to completion of georeferencing and compilation of feature data. A comparison was performed between the compiled features and newer imagery as a means of validating the currency of the features. All feature data included in final data products for HI0601A is current as of December 2005, the date of newer imagery.

Cartographic features were tested to have a horizontal accuracy of 6.5 meters 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:

Table 1 - Image Sources

Image #	Image Source	Source ID	Source File Name	Acquisition Date/Time	Tide Level*
1	IKONOS	2003020821184460000011632041	160779_0000001_pansharp_bgrn.tif	2003-02-08 21:18 GMT	0.1 m
2	Quickbird	05DEC312122_P3DM_R5C2_0055 ...44325010	05DEC312122_P3DM_R5C2_00554 ...4325010.tif	2005-12-31 21:22 GMT	n/a

* Tide levels are given in meters above MLLW and are based on actual observations recorded by the NOS gauge at Honolulu, Hawaii, at the time of photography. The approximate tide range within the project area is 0.4 meters.

Quality Control / Final Review

Quality control tasks were conducted during all phases of project completion by a senior member of the Applications Branch of RSD. The final QC review was completed in May 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 end products generated during the completion of this project:

RSD Applications Branch Archive

- Hardcopy of the Project Completion Report (PCR)
- Page size graphic plot of GC10607 file contents, attached to PCR
- Hardcopy of the CSCAP evaluation memorandum

Remote Sensing Division Electronic Data Library

- Digital copy of DCFF GC10607 in ESRI shapefile format
- Digital copy of the PCR in Adobe PDF format
- Chart Evaluation File (CEF) in shapefile format

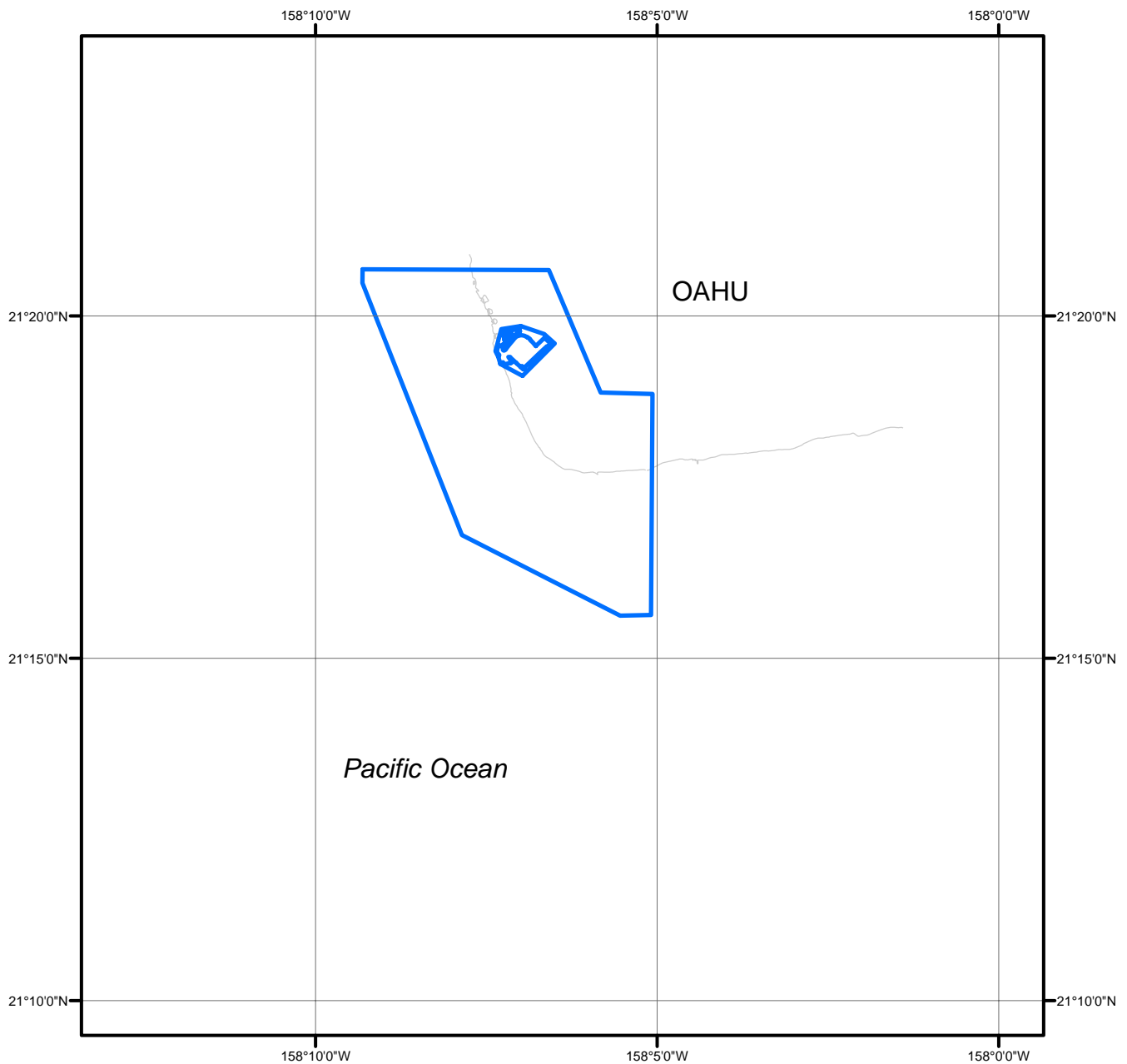
NOAA Shoreline Data Explorer

- DCFF for GC10607
- Metadata file for GC10607
- Digital copy of the PCR in Adobe PDF format

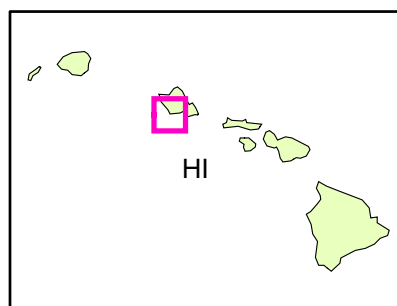
End of Report

BARBERS POINT HARBOR

HAWAII



Overview



HI0601A

GC10607