

NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

PROJECT HI0601B

Pearl Harbor, Hawaii

Introduction

Coastal Mapping Program (CMP) Project HI0601B provides highly accurate digital shoreline data for key areas of change within 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 HI0601B 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 change analysis memorandum 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

Two IKONOS non-orthorectified panchromatic images with a spatial resolution of 1.0 meter, acquired from Space Imaging, Inc., were georeferenced using Erdas IMAGINE 9.0 software on a Windows platform. Ground control points (GCPs), 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. The image (mosaic) was resampled using the Nearest Neighbor sampling method. The RMS of the residuals for measured check points was used to compute a predicted horizontal circular error at the 95% confidence interval (CE95) of 0.5 meters for image #1 and 0.3 meters for image #2. These CE values were 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 data compilation phase of this project was accomplished by RSD in March 2007. Digital feature data was compiled in ESRI shapefile format from imagery using ESRI's ArcGIS 9.1 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 cartographic features were further modified with additional descriptive information to refine general classification.

Spatial data accuracies for Project HI0601B were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were tested to have a horizontal accuracy of 2.5 meters for image #1 and 1.9 meters for image #2 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 the satellite images used in the project completion:

Image Source	Image Source	Source File Name	Acquisition Date/Time	Tide Level*
#1	IKONOS	Po_171729_pan_0030000.tif	2004-01-31, 21:23 GMT	0.1
#2	IKONOS	Po_167611_pan_0000000.tif	2005-01-22, 21:26 GMT	0.1

* Tide levels are given in meters above MLLW and are based on actual observations recorded by the NOS tide gauge at Honolulu Harbor, Oahu Island, Hawaii (station #1612340) at the time of imagery acquisition. The elevation of the MHW tidal datum at the Honolulu Harbor station is equal to 0.4 meters above MLLW.

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. QC activities for this project were finalized in May 2008. The review process also included analysis of the georeferencing results and evaluation 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 GC 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 Aerotriangulation Report for HI0001C
- Hardcopy of the Georeferencing Report
- Hardcopy of the Project Completion Report (PCR)
- Page-size graphic plot of GC10650 file contents, attached to PCR
- Hardcopy of the CSCAP evaluation memorandum

Remote Sensing Division Electronic Data Library

- GC10650 in shapefile format
- Digital copy of the PCR in Adobe PDF format
- Chart Evaluation File (CEF) in shapefile format

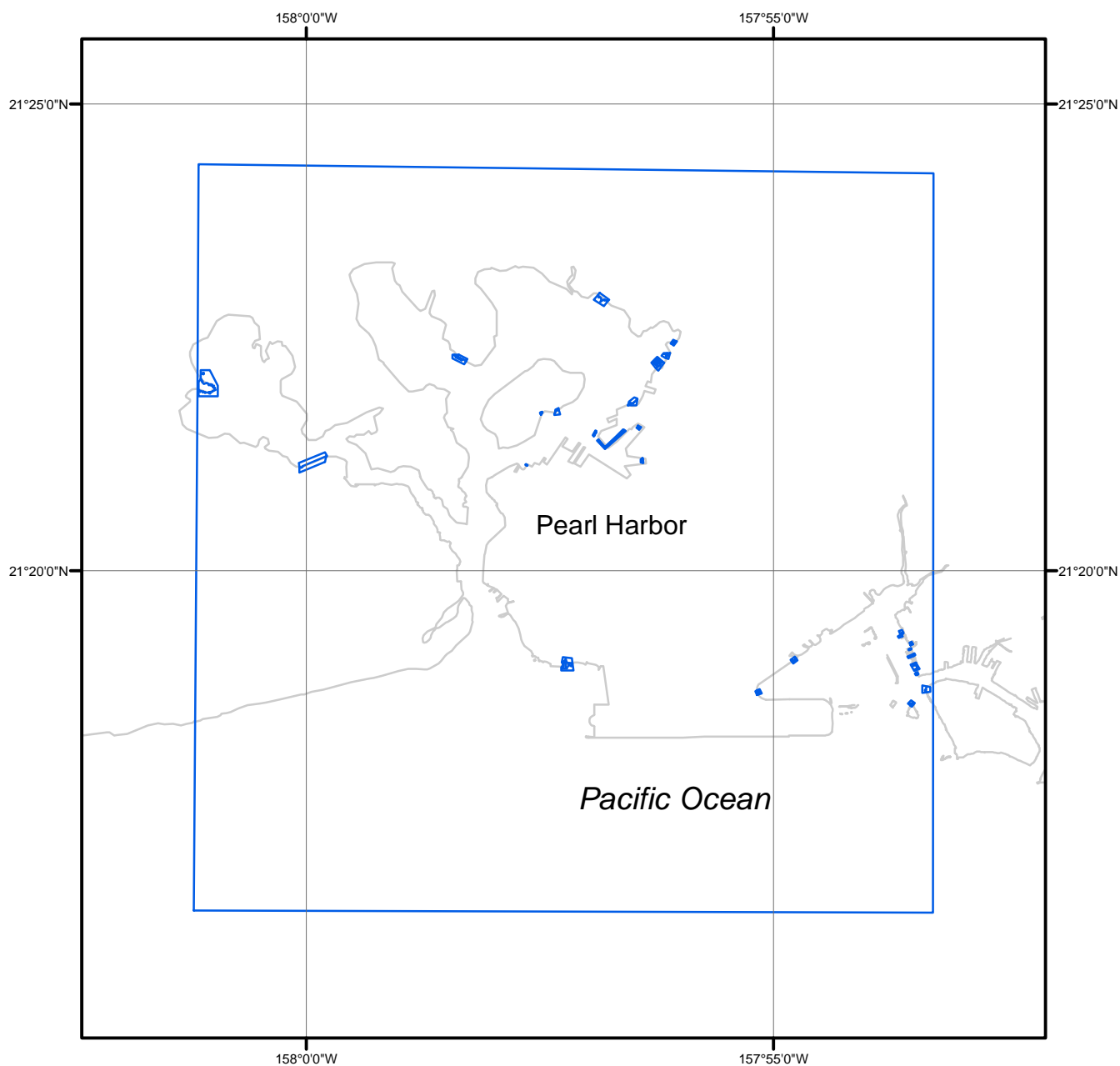
NOAA Shoreline Data Explorer

- GC10650 in shapefile format
- Metadata file for GC10650
- Digital copy of the PCR in Adobe PDF format

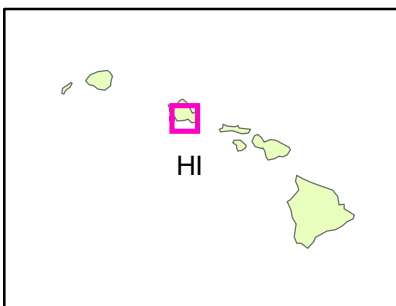
End of Report

PEARL HARBOR

HAWAII



Overview



HI0601B

GC10650