

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

## ***PROJECT HI0602***

### ***Port of Nawiliwili, Hawaii***

#### **Introduction**

Coastal Mapping Program (CMP) Project HI0602 provides highly accurate digital shoreline data for key areas of change within the Port of Nawiliwili, Kauai, 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 HI0602 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 February 6, 2006, "Results of CSCAP Change Analysis for Nawiliwili Bay, Hawaii (HI0602)" 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 black/white image with a spatial resolution of 1 meter, acquired from Space Imaging, Inc. was 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 1<sup>st</sup> 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 1.0 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 referenced to the North American Datum of 1983.

## Compilation

The data compilation phase of this project was accomplished by RSD in January 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 HI0602 were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were tested to have a horizontal accuracy of 4.3 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 the satellite image mosaic used in the project completion:

Image #	Image Source	Source ID	Source File Name	Acquisition Date/Time	Tide Level*
1	IKONOS	2004121221330710000011614947	po_166018_pan_0040001.tif	2004-12-12 21:33 GMT	0.4

\* Tide levels are given in meters above MLLW and are based on actual observations recorded by the NOS tide gauge at Nawiliwili Harbor, Kauai, HI. The elevation of the MHW tidal datum at the Nawiliwili Harbor station (ID #1611400) 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 February 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
- Hardcopy of the Georeferencing Report
- Hardcopy of the Project Completion Report (PCR)
- Page-size graphic plot of GC10639 file contents, attached to PCR
- Hardcopy of the CSCAP evaluation memorandum

**Remote Sensing Division Electronic Data Library**

- GC10639 in ESRI shapefile format
- Digital copy of the PCR in Adobe PDF format
- Chart Evaluation File (CEF) in shapefile format

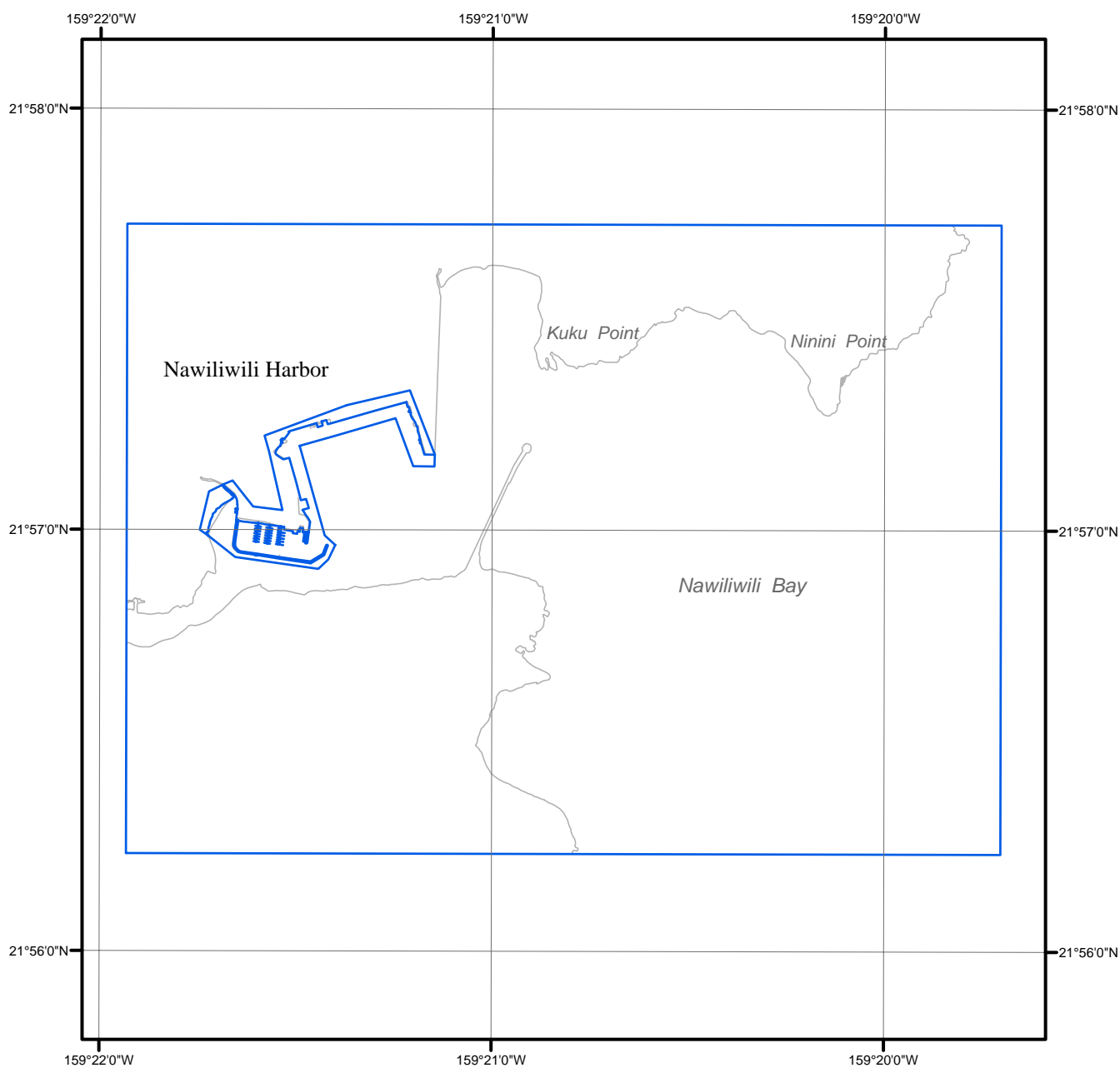
**NOAA Shoreline Data Explorer**

- GC10639 in ESRI shapefile format
- Metadata file for GC10639
- Digital copy of the PCR in Adobe PDF format

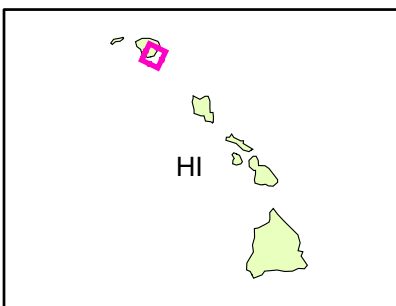
**End of Report**

# PORT OF NAWILIWILI

## HAWAII



Overview



HI0602

GC10639