

NOAA COASTAL MAPPING PROGRAM  
PROJECT COMPLETION REPORT

PROJECT HI01K

GARDNER PINNACLES  
NORTHWESTERN HAWAIIAN ISLANDS, HI

## **Introduction**

Coastal Mapping Program (CMP) Project HI01K provides coastal zone mapping data of Gardner Pinnacles, Northwestern Hawaiian Islands (NWHI) , HI. The geographic area covered by this project is limited to Gardner Pinnacles. The Digital Cartographic Feature File (DCFF) may be utilized in support of the NOAA's Nautical Charting Program (NCP) and Coral Reef Mapping Initiative, and coastal zone management activities.

## **Project Design**

This project was designed per a request from the program offices within NOAA that manage the Nautical Charting Program, the National Marine Sanctuary Program, the National Marine Fisheries Program, and the Coral Reef Mapping Initiative. The project goal is to provide contemporary digital cartographic data in support of a variety of applications within the aforementioned programs. Based on an analysis of project requirements and results of a source data search, it was determined that CMP procedures for multiple source projects would apply for this project. A commercial satellite image acquired in Oct. 2000 was deemed appropriate to meet project requirements.

## **Field Operations**

Horizontal reference points were established on the island through field survey activities. However, the points were not visible in the satellite image, and were not used either to control or verify the georeferencing of the image. This survey was part of a field operation broad in scope, which included the establishment of Global Positioning System Continuously Operating Reference Stations on Midway Island, a high accuracy geodetic network to establish a spatial reference framework for operations being performed in the NWHI Project, hydrographic surveys of selected sites, and benthic habitat classification.

## **Aerotriangulation**

Aerotriangulation of the imagery was not required. The vendor provided the image, in NITF format, already georeferenced utilizing their sensor model. A project was created and the image was imported using the LHSystems SocetSet® v.4.3 digital photogrammetric software.

## **Compilation**

The Feature Extraction module of SocetSet® was utilized during the digital cartographic feature data compilation phase of project completion. Since stereo imagery was not available, monoscopic methods were used to compile only the interpreted Mean High Water shoreline. Other features (such as rocks, reefs, and ledges) could not be clearly distinguished, and were not compiled. The DCFF feature attribution was assigned utilizing a generic feature code specification file that was included with the software, and subsequently the attribution code was translated to conform with the Coastal Cartographic Object Attribute Source Table (C-COAST), the National Geodetic Survey's attribution scheme for coastal data.

Cartographic features were compiled to meet a horizontal accuracy of 50 meters at the 95% confidence level. This predicted accuracy of compiled, well-defined points is a deductive estimate based on information received from the vendor for georeferenced imagery, and on a comparison of the compiled shoreline to the NOAA nautical chart as described below.

## **Final Review**

Final office review operations were conducted after completion of the compilation phase. The process included review of the identification and attribution of cartographic features based on image analysis and criteria defined in C-COAST. Upon receipt of the new survey data from the NWHI field operation, it was determined that an accurate geodetic shift between the WGS84 Datum and the Chart Datum (1929 Local Astronomic) could not be computed. As part of the review process, an approximate datum shift was estimated and applied to a copy of the DCFF data in order to compare the new compilation with the charted shoreline. Visual inspection indicated that the two shorelines matched very well, in fact better than would be expected based on the stated horizontal accuracy of the image. However, in some areas the differences were significant enough to indicate that the new compilation provides a better representation of the shoreline than is depicted on the chart. For the final dataset the original compilation was used without any shift applied. The following NOAA nautical chart was used for chart comparison:

19421, Gardner Pinnacles, 6th edition (the inset used is at 1:20,000 scale)

The last step in the quality control process was the evaluation of the DCFF contents focusing on the integrity of topology once the DCFF was converted into the ESRI Shapefile format and the feature attributes translated to C-COAST.

## **Project Products**

The following specifies the location and identification of the products generated during the completion of this project:

RSD Applications Branch Archive  
- Hard copy of the Project Completion Report (PCR)

RSD Electronic Data Library

- Project Data Base
- DCFF for GC-10515 in ESRI Shapefile format
- Digital copy of the PCR in Adobe Acrobat PDF format

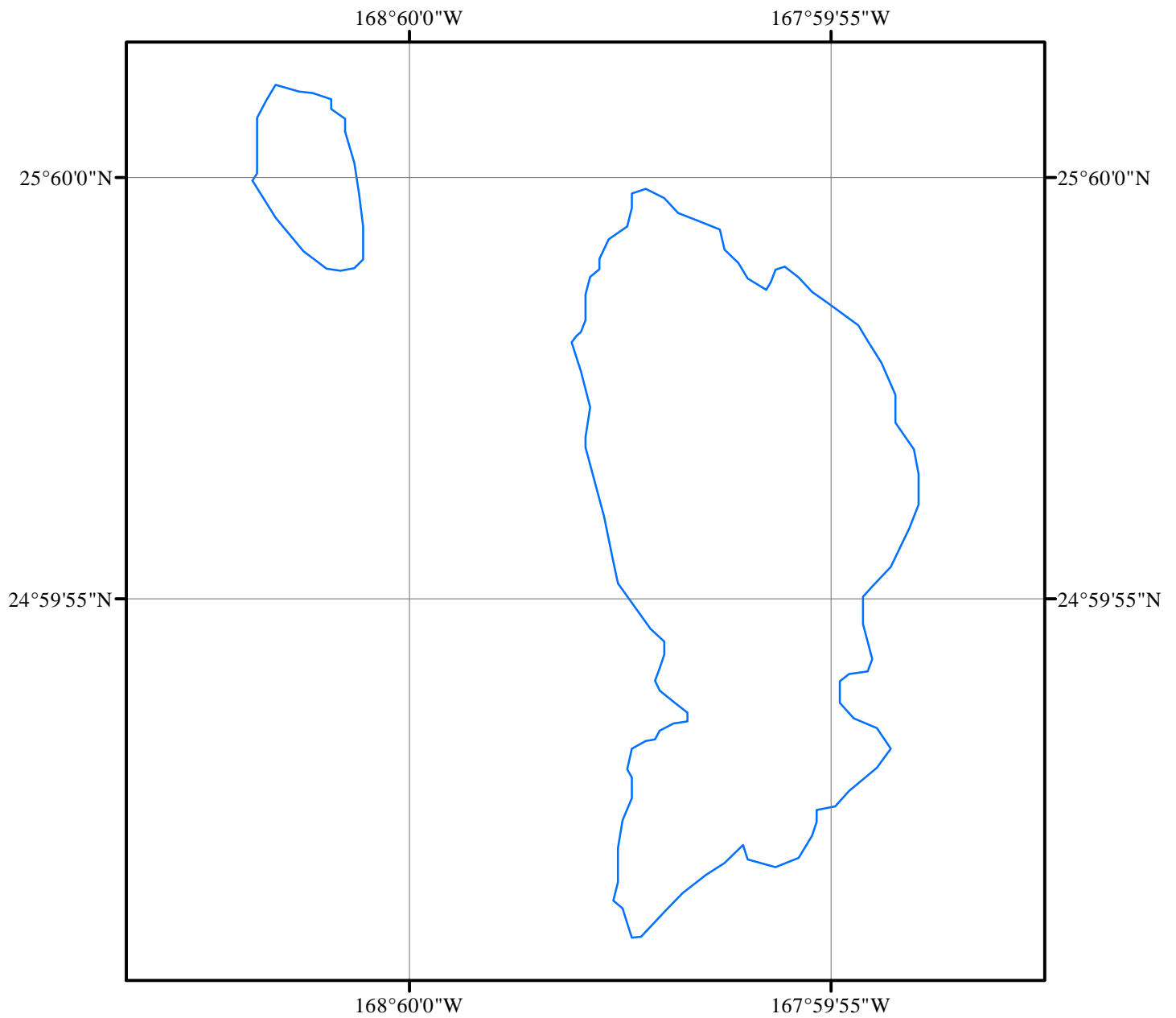
NOAA Shoreline Data Explorer

- DCFF for GC-10515
- Metadata file for GC-10515
- Digital copy of the PCR in Adobe Acrobat PDF format

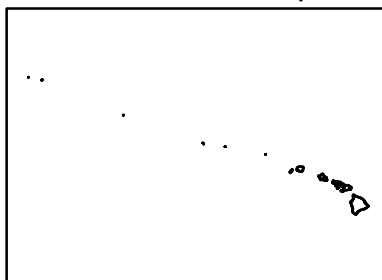
End of Report

# GARDNER PINNACLES

## NORTHWESTERN HAWAIIAN ISLANDS, HI



Overview Map



HI01K  
GC10515