

# NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

## PROJECT HI01C

### FRENCH FRIGATE SHOALS, NORTHWESTERN HAWAIIAN ISLANDS, HI

#### Introduction

Coastal Mapping Program (CMP) Project HI01C provides coastal zone mapping data of French Frigate Shoals, Northwestern Hawaiian Islands (NWHI) , HI. The geographic area covered by this project is bounded by Shark and Tern Islands to the northwest, thence easterly along a string of islands and reef awash to a point located approximately at 23-49 N, 166-05W, thence southwesterly to Gin and Little Gin Islands. Compilation efforts also include Trig, Skate, Whale, Round, Mullet, Near, East and Bare Islands. 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.

#### Field Operations

Horizontal control points were provided through field survey activities. 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

Analytical aerotriangulation procedures were completed utilizing the appropriate modules of a suite of Autometrics Softplotter™ v.2.0 (AS) software with additional information provided with the source data files. The root mean square of the standard deviations of the residuals for each triangulated ground point were used in the computations of a predicted horizontal circular error of 6.85 meters at 95% confidence level, which is a predicted accuracy of well defined points.

## Compilation

The appropriate modules of AS software were utilized during the digital cartographic feature data compilation phase of project completion. Feature attributes were assigned utilizing the cartographic feature codes found in the Nautical Charting Division Standard Digital Data Exchange Format version 1.0, April 1, 1985 in adherence with the standard procedures of the CMP. The DCFF feature attribution codes were 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 13.7 meters at the 95% confidence level. This predicted accuracy of compiled, well defined points is established by doubling the circular error derived from the aerotriangulation statistics.

## Final Review

Final office review operations were conducted interactively as the compilation phase was in progress, and independently upon initial completion of feature extraction. The process included review of aerotriangulation results, review of the identification and attribution of cartographic features based on image analysis and criteria defined in C-COAST, and review of client specific support products; such as the Chart Maintenance Print generated for NCP application. The entire suite of project products was evaluated for compliance to CMP requirements.

In October 2001, supplemental horizontal control was received from the NWHI field operation, after the compilation and office review phases were completed. A comparison was made between the DCFF data and the supplemental control which resulted in a positional shift being applied to the DCFF data.

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. A copy of the following NOAA nautical charts was used for chart comparison:

- 19401, French Frigate Shoals, 1:80,000 scale, 7th edition,
- 19402, French Frigate Shoals Anchorage, 1:25,000 scale, 5th edition.

## Project Products

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

- RSD Applications Branch Archive
  - Textual copy of the Project Completion Report (PCR)
  - Page size graphic plot of GC-10504 file contents

RSD Electronic Data Library

- Project Data Base
- 3-D MicroStation DGN file for GC-10504
- DCFF for GC-10504 in ESRI Shapefile format
- Digital copy of the PCR in Word Perfect WPD format
- Digital copy of the PCR in Adobe Acrobat PDF format

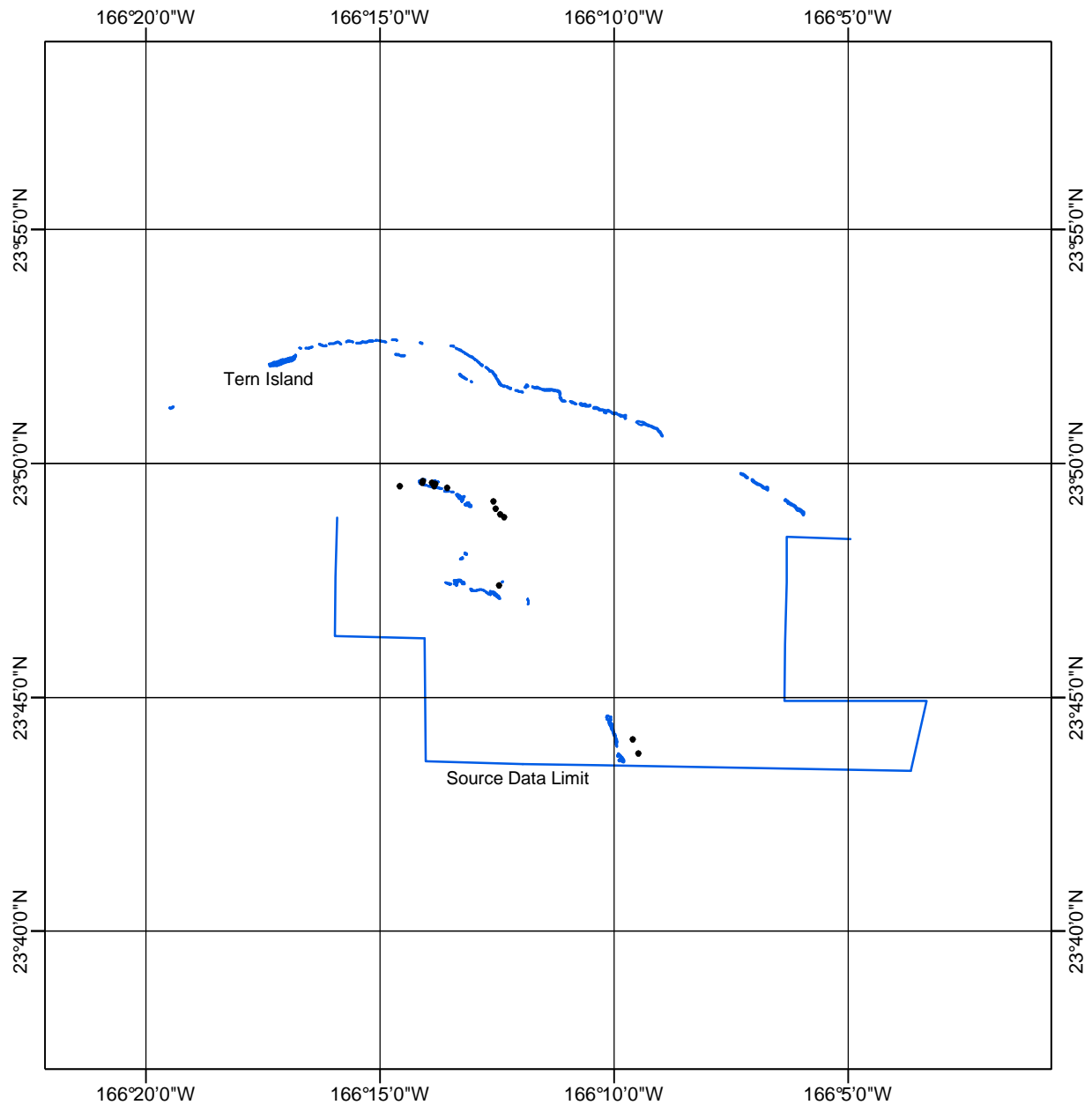
NOAA Shoreline Data Explorer

- DCFF for GC-10504
- Metadata file for GC-10504
- Digital copy of the PCR in Adobe Acrobat PDF format

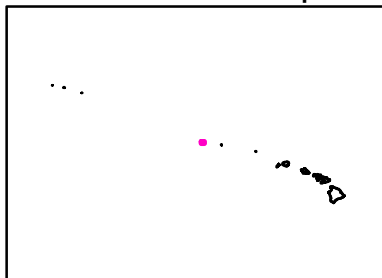
End of Report

# FRENCH FRIGATE SHOALS

## NORTHWESTERN HAWAIIAN ISLANDS, HI



Overview Map



HI01C  
GC10504