NOAA COASTAL MAPPING PROGRAM

PROJECT COMPLETION REPORT

PROJECT CA0303

PORT OF ALAMEDA, CALIFORNIA

Introduction

Coastal Mapping Program (CMP) Project CA0303 provides highly accurate digital shoreline data for key areas of change over an area encompassing the Oakland Outer Harbor Area, and extending to Bay Farm Island, near Alameda California. The analysis and 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 coastal zone management applications.

Project Design

The design of Project CA0303 was accomplished by the Requirements Branch of the Remote Sensing Division (RSD) in response to the need for timely updates to NOAA's 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 Remote Sensing Division Minute Memo regarding the Alameda, California CSCAP Analysis March 3rd, 2003 for details regarding the chart comparison process.

Field Operations

Field operations consisted of the collection of static GPS data as a means of enhancing the geopositioning of commercial satellite imagery. The GPS data was collected by Navigation Response Team 6 of the Navigation Services Division, Office of Coast Survey. A series of well-distributed ground control points were surveyed throughout the project area based on information provided by the Applications Branch of RSD. Please refer to the Alameda Harbor Ground Control Point Positioning Report for details regarding equipment, data collection, and data processing.

Georeferencing

IKONOS non-orthorectified panchromatic imagery with a spatial resolution of 1 meter, acquired from Space Imaging, Inc., was georeferenced using Erdas Imagine 8.5 software on a Windows platform. Within Imagine, the Raster Geometric Correction tool was used with a 1st Order Polynomial Model. Once the control points were measured, the imagery was resampled using the Nearest Neighbor method. The RMS of the standard deviations of the residuals for each measured control point were used to compute a predicted horizontal circular error (CE) of 1.36 meters based on a 95% confidence level. This CE value was then tripled to yield a

conservative predictor of the accuracy of well defined points measured during compilation.

Compilation

The compilation of cartographic feature data for this project was accomplished by a member of the Applications Branch of RSD in July 2005. Digital feature data was compiled in ESRI shapefile format from imagery using ESRI'S ArcGIS 8.3 desktop GIS software. Feature attributes were established using the C-COAST specification file, which provides the definition and attribution scheme for the full range of cartographic features pertinent to the CMP. Compiled cartographic features were tested to have a horizontal accuracy of 4.1 meters at the 95% confidence level.

Image Source	Source ID	Source File Name	Acquisition Date/Time	Tide Stage*
IKONOS	2003021819010490000010110185	po_106421_pan_0000000.tif	2003-02-18 19:01 GMT	1.8 m

* Tide levels are given in meters above MLLW and are based upon actual observations recorded by the NOS gauge at the time the imagery was taken. The elevation of the MHW tidal datum at the Alameda Tide Gauge is equal to 1.82 meters above the 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. The final QC review was completed in January 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 GC10575 file contents, attached to PCR
- CSCAP evaluation memorandum
- Alameda Harbor Ground Control Positioning Report

Remote Sensing Division Electronic Data Library

- Digital copy of DCFF GC10575 in ESRI shapefile format
- Digital copy of the PCR in Adobe PDF format
- Chart Evaluation File in shapefile format

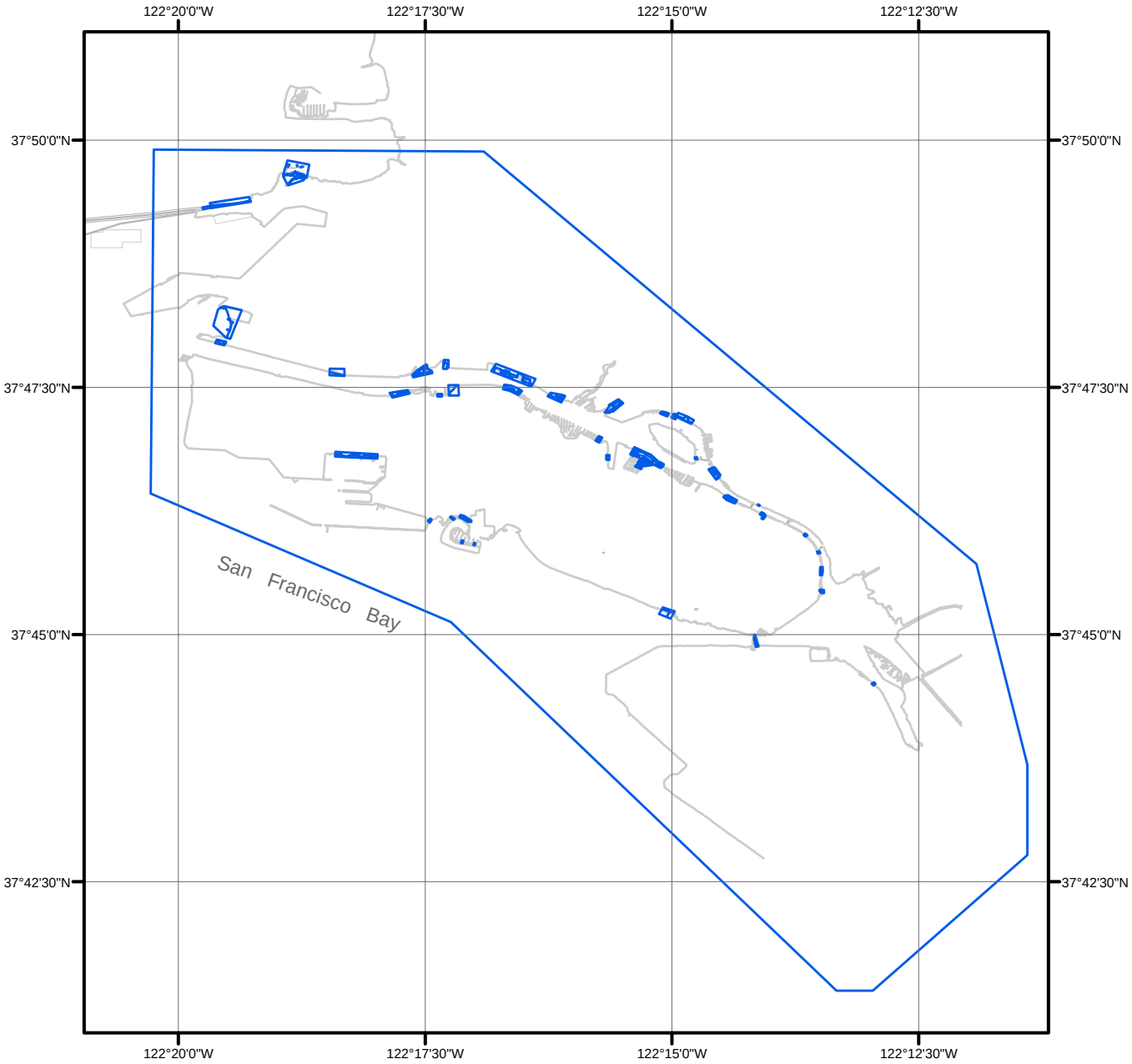
NOAA Shoreline Data Explorer

- DCFF for GC10575
- Metadata file for GC10575
- Digital copy of the PCR in Adobe PDF format

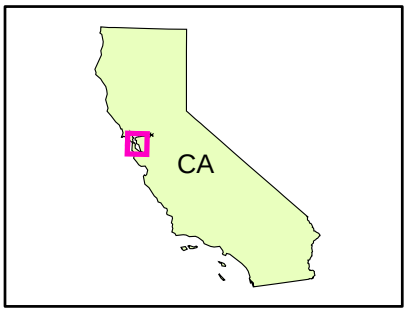
End of Report

PORT OF ALAMEDA

CALIFORNIA



Overview



CA0303

GC10575