

# **NOAA COASTAL MAPPING PROGRAM**

## **PROJECT COMPLETION REPORT**

### ***PROJECT CA0302***

### ***CARQUINEZ STRAIT, CALIFORNIA***

#### **Introduction**

Coastal Mapping Program (CMP) Project CA0302 provides highly accurate digital shoreline data for key areas of change within Mare Island Strait and Carquinez Strait, from San Pablo Bay to Suisun Bay. 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 CA0302 was accomplished by the Requirements Branch (RB) of the Remote Sensing Division (RSD) in response to the need for timely updates to NOAA Electronic Navigational Chart 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 Carquinez Strait, California CSCAP Analysis July 3, 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 Navigational 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 Carquinez Ground Control Point Positioning Report for details regarding equipment, data collection and data processing.

#### **Georeferencing**

Two IKONOS non-orthorectified panchromatic images with a spatial resolution of 1 meter, acquired from Space Imaging, Inc., were 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 sampling 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 1.17 meters for the first image, and 0.85 meters for the second image, based on a 95% confidence level. This CE value was 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 January 2006. 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. Cartographic features were compiled to meet a horizontal accuracy of 3.5 meters for the first image and 2.5 meters on the second image at the 95% confidence level. This predicted accuracy of compiled well-defined points is a deductive estimate based on georeferencing statistics.

Image #	Image Source	Source ID	Source File Name	Acquisition Date/Time	Tide Stage*
1	IKONOS	2003020719002710000010131335	po_106102_pan_0000000.tif	2003-02-07 19:00 GMT	0.6 m
2	IKONOS	2003020719002710000010131334	po_106102_pan_0010000.tif	2003-02-07 19:00 GMT	0.4 m

\* Tide levels are given in meters above MLLW and are based on actual observations recorded by the NOS gauges at the time of photography. The elevation of the MHW tidal datum at the Richmond Tide Gauge is equal to 1.66 meters above MLLW, and the elevation of the MHW tidal datum at the Port Chicago Tide Gauge is 1.34 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. 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 GC10574 file contents, attached to PCR
- CSCAP evaluation memorandum

### **Remote Sensing Division Electronic Data Library**

- Digital copy of DCFF GC10574 in ESRI shapefile format
- Digital copy of the PCR in Adobe PDF format
- Chart Evaluation File in shapefile format

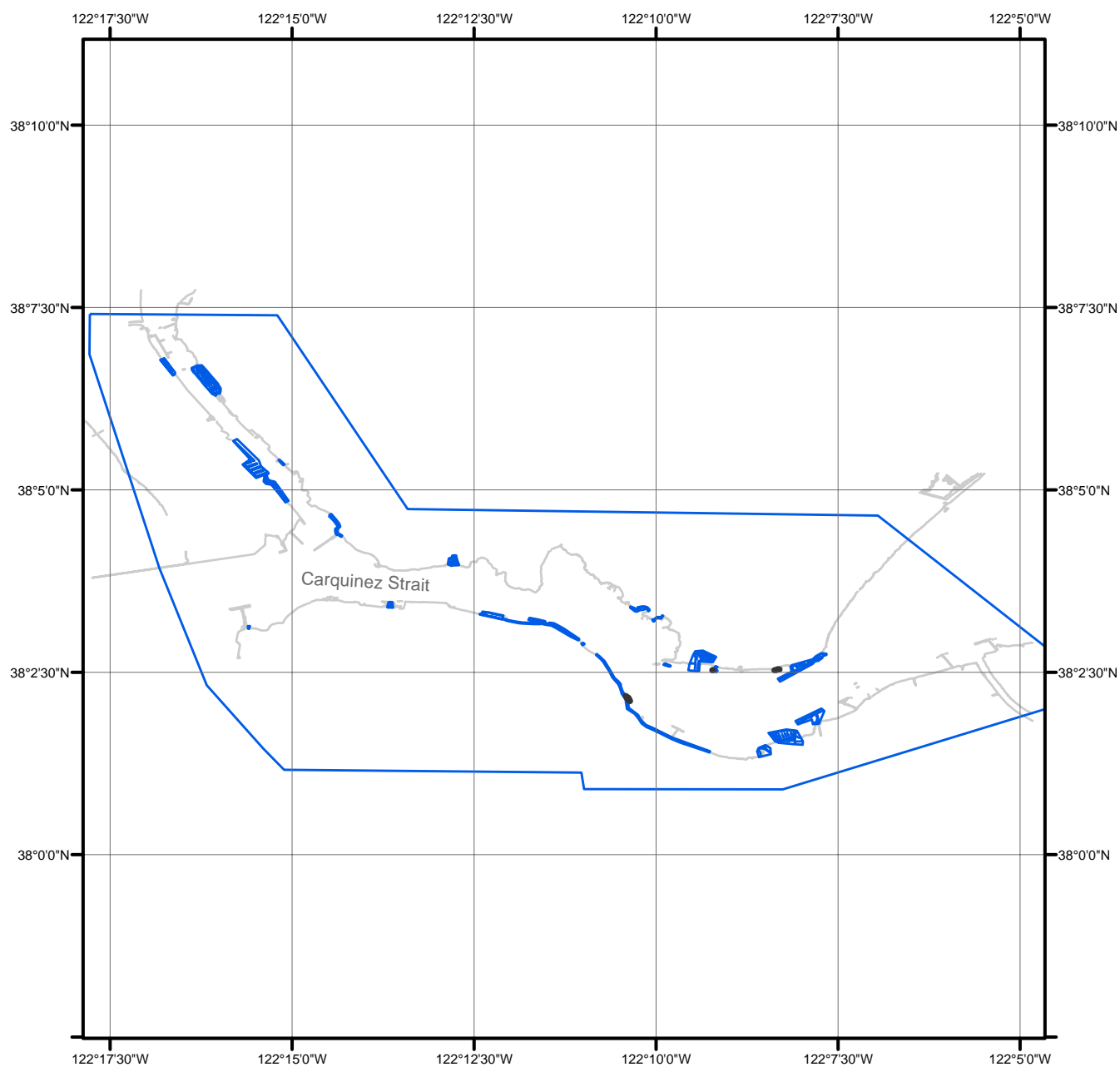
### **NOAA Shoreline Data Explorer**

- DCFF for GC10574
- Metadata file for GC10574
- Digital copy of the PCR in Adobe PDF format

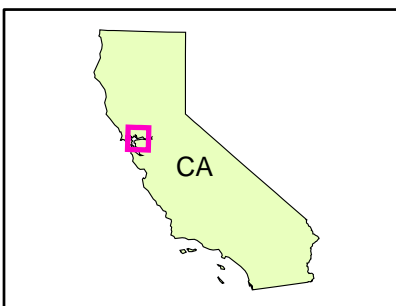
## End of Report

# CARQUINEZ STRAIT

## CALIFORNIA



Overview



CA0302

GC10574