NOAA COASTAL MAPPING PROGRAM
PROJECT COMPLETION REPORT

PROJECT CA1004

Port of San Diego, California

Introduction

NOAA Coastal Mapping Program (CMP) Project CA1004 provides a highly accurate database of new digital shoreline data for the port of San Diego, including the North San Diego Bay and South San Diego Bay. 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 CA1004 was accomplished by the Requirements Branch (RB) of the Remote Sensing Division (RSD) in response to the need for updates to NOAA's 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 CSCAP analysis memo for the Port of San Diego, California, dated December 24, 2009 for details regarding 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

Two WorldView-1 panchromatic images with a spatial resolution of 0.5 meters were georeferenced using Erdas IMAGINE 9.3 software on a Windows platform. See the table in the Compilation section below for more information on the satellite images used. Ground control points (GCPs) were photogrammetrically measured from the aerotriangulated aerial imagery from previously completed CMP Project CA0101. These GCPs were then imported into IMAGINE and used to georeference the satellite imagery. Within IMAGINE the Raster Geometric Correction tool was used with a 1st order polynomial model. The satellite imagery 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 (CE) of 0.8 meters for image #1 and 1.2 meters for image #2, based on a 95% confidence level. This CE value was tripled and then added to the source imagery's CE95 in order to conservatively predict the accuracy of well-defined points measured during the compilation process. A Georeferencing Report was written and is on file with other project data within the AB Project Archive. Positional data is based on the UTM Coordinate System (Zone 11), and referenced to the North American Datum of 1983.

Compilation

The data compilation phase of this project was accomplished by RSD in July 2011. Digital feature data was compiled in ESRI shapefile format from imagery using ESRI's ArcGIS 9.3 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 CA1004 were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were tested to have a horizontal accuracy of 3.8 meters at the 95% confidence level for image #1 and 5.2 meters for image #2. This predicted accuracy of well-defined points is based on a minimum of twenty (20) check points for each image, that were compared to an independent source of higher accuracy.

The following table provides information on the satellite images used in the project completion:

Image #	Image Source	Source File Name	Acquisition Date/Time	Tide Level*
#1	WorldView-1	09oct20190600-p1bs-052236440010_01_p001.tif	2009-10-20, 19:05 GMT	1.8
#2	WorldView-1	10NOV24184608-P1BS-052253550010_01_P001.tif	2009-11-24, 18:46 GMT	1.1

* Tide levels are given in meters above MLLW and are based on actual observations recorded by the NOS tide gauge at San Diego at the times of imagery acquisition. The elevation of the MHW tidal datum at San Diego is equal to 1.5 meters above MLLW.

Quality Control / Final Review

Quality control tasks were conducted during all phases of project completion by a senior member of AB. The final QC review was completed in August 2011. The review process included analysis of the georeferencing results and assessment of the identification and attribution of digital feature data within the GC 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 9.3. 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 Georeferencing Report
- Hardcopy of the Project Completion Report (PCR)
- Page size graphic plot of GC10884 file contents, attached to PCR
- Hardcopy of the CSCAP evaluation memorandum

Remote Sensing Division Electronic Data Library
- GC10884 in shapefile format
- Digital copy of the PCR in Adobe PDF format
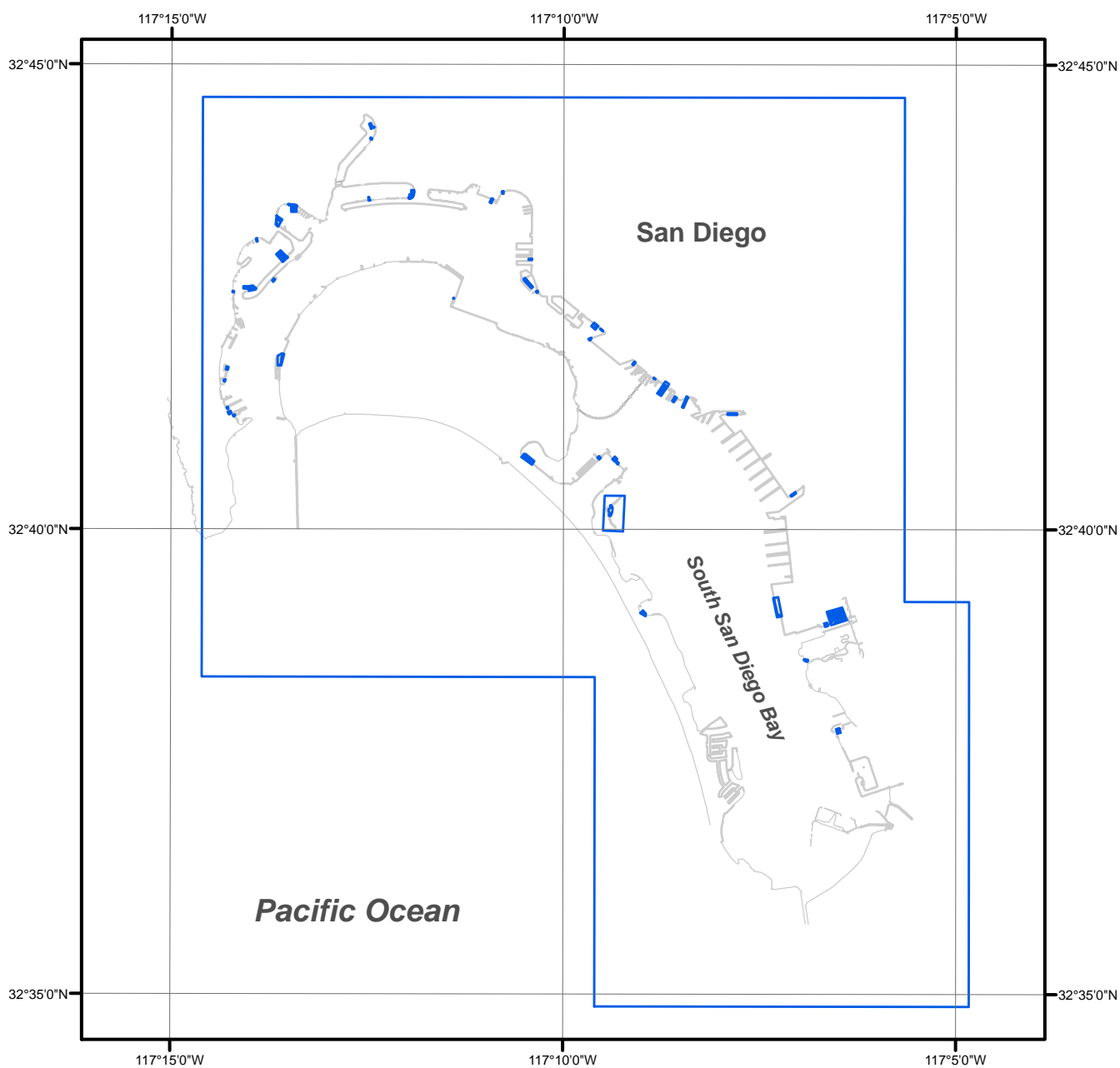- Chart Evaluation File (CEF) in shapefile format

NOAA Shoreline Data Explorer
- GC10884 in shapefile format
- Metadata file for GC10884
- Digital copy of the PCR in Adobe PDF format

End of Report

PORT OF SAN DIEGO

CALIFORNIA

117°15'0"W 117°10'0"W 117°5'0"W

32°45'0"N

San Diego

32°40'0"N

South San Diego Bay

Pacific Ocean

32°35'0"N

Overview

CA

CA1004

GC10884