NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

PROJECT CA2001-CS-T

Port of San Diego, California

Introduction

Coastal Mapping Program (CMP) Project CA2001-CS-T provides highly accurate digital shoreline data for key areas of change within the port of San Diego, California. 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 CA2001-CS-T was accomplished by the Requirements Branch (RB) of the Remote Sensing Division (RSD) in response to the need for updates to the NOAA chart suite in key ports. 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 imagery in order to ascertain the need for more current shoreline data. Two pan-sharpened GeoEye-1 satellite images from DigitalGlobe, Inc. were utilized for the CSCAP analysis. A Chart Evaluation File (CEF) was created once the change analysis was complete. Refer to the CSCAP memorandum for Project CA2001-CS-T 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

Georeferencing tasks were conducted using Esri's ArcGIS (ver. 10.7.1) desktop GIS software by a member of the Applications Branch (AB) of the RSD in September 2020. Aerotriangulated aerial imagery from a previously completed RSD project, CA1505-CS-N, was used as control for the satellite imagery. Within ArcGIS, the Georeferencing tool was used, and the imagery was re-sampled using the Nearest Neighbor method with a 1st order polynomial model. Check points from CA1505-CS-N were used to assess the accuracy of the resampled imagery, and the RMS of the residuals for the check points was used to compute a predicted horizontal circular error (CE) of 0.92 meters for image #1 and 1.02 meters for image #2 based on a 95% confidence level. These CE values were doubled and added to the accuracy of the source from which check points were extracted to conservatively predict the accuracy of well-defined points measured during compilation. Positional data is referenced to the North American Datum of 1983 (NAD 83).

Compilation

Data compilation was accomplished by a member of AB in September 2020. Digital feature data was compiled in shapefile format from the satellite imagery using Esri's ArcGIS 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.

Spatial data accuracies for Project CA2001-CS-T were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were tested to have horizontal accuracies of 2.2 meters for image #1 and 2.4 meters for image #2 at the 95% confidence level by comparing at least 20 check points 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 ID	GSD	Acquisition Date/Time	Tide Level
1	GeoEye-1	20200303_GE01_ORI_MOS1_Nad83Georef.tif	0.4 m	2020-03-03 / 18:33:11 UTC	0.4 m
2	GeoEye-1	20200303_GE01_ORI_2_MOS _Nad83Georef.tif	0.4 m	2020-03-03 / 18:32:40 UTC	0.4 m

* Tide levels are given in meters above MLLW and based on preliminary observations recorded at the time of image acquisition by the NOS gauge at San Diego, CA (#9410170). The elevation of MHW at the tide gauge is 1.52 meters above MLLW.

Quality Control / Final Review

Quality control tasks were conducted during all phases of project completion by senior CMP personnel. 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. 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:

Remote Sensing Division Electronic Data Library
- CSCAP evaluation memorandum
- GC11673 in shapefile format
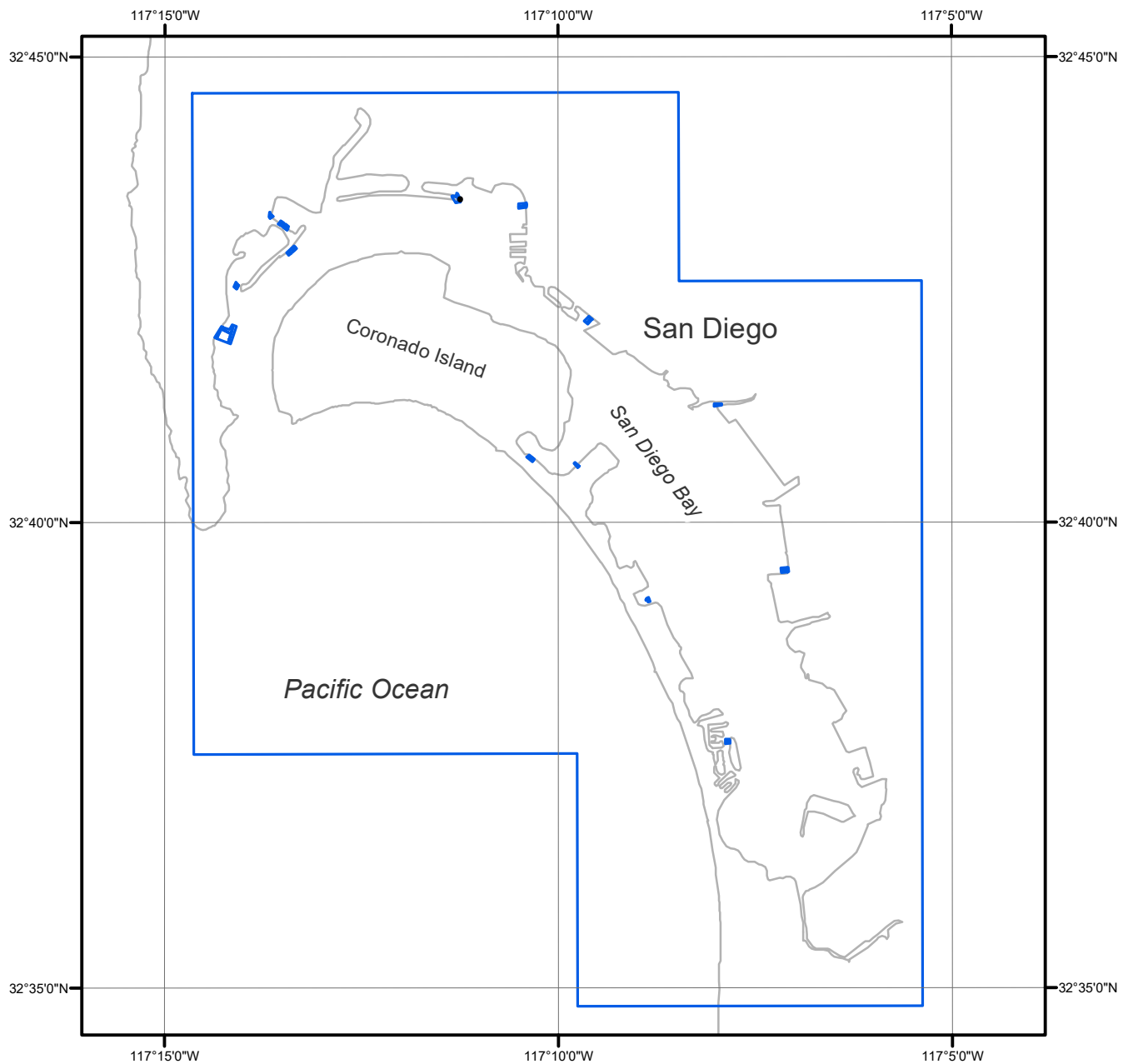- Project Completion Report (PCR)
- CEF in shapefile format

NOAA Shoreline Data Explorer
- GC11673 in shapefile format
- Metadata file for GC11673
- 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

Coronado Island

San Diego Bay

32°40'0"N

Pacific Ocean

32°35'0"N

117°15'0"W 117°10'0"W 117°5'0"W

Overview

CA

CA2001-CS-T

GC11673