NOAA COASTAL MAPPING PROGRAM
PROJECT COMPLETION REPORT

PROJECT CA2203-CS-T

Ports of Los Angeles and Long Beach, California

Introduction

Coastal Mapping Program (CMP) Project CA2203-CS-T provides highly accurate digital shoreline data for key areas of change in the ports of Los Angeles and Long Beach, 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 CA2203-CS-T was accomplished by the Systems and Quality Assurance Branch (SQAB) 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. Commercial satellite imagery was utilized for the CSCAP analysis. A Chart Evaluation File (CEF) was created once the change analysis was complete. Refer to the CSCAP memorandum for CA2203-CS-T for details regarding the chart comparison process.

Subsequent to the CSCAP analysis and compilation of Project CA2203-CS-T, a request was received from NOAA's Office of Coast Survey to provide verification of the alignment of a new bridge (Long Beach International Gateway Bridge) in the project area. In response, an additional satellite image was obtained which was collected more recently.

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 by a member of the Applications Branch (AB) of RSD in June 2022 on one orthorectified, pan-sharpened WorldView-3 image, obtained via the Enhanced View Web Hosting Site and used for the CSCAP analysis. A subset of this image, downloaded as a set of tiles, was re-mosaicked and georeferenced with control points from previous project CA1804-CS-N using Esri's ArcGIS (ver. 10.8.1) desktop GIS software. Within ArcGIS, the Georeferencing tool was used, and the image was re-sampled using the Nearest Neighbor method with a 1st order polynomial model. Check points from CA1804-CS-N were used to assess the accuracy of the resampled imagery, and the Root Mean Square (RMS) of the residuals for each measured check point was used to compute a predicted horizontal circular error (CE) of 0.7 meters for based on a 95% confidence level. This CE value was doubled and added to the accuracy of the source dataset from the which check points were extracted in order 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 June 2022. Using Esri's ArcGIS software, digital feature data was compiled in shapefile format from the satellite imagery. 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 features were further modified with additional descriptive information to refine general classification.

Spatial data accuracies for CA2203-CS-T were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features extracted from the satellite imagery were compiled to meet a horizontal accuracy of 2.2 meters at the 95% confidence level. This accuracy is based on comparison of the georeferenced imagery with an independent source of higher accuracy. The table below provides information on imagery used in the completion of this project.

Image Source	Source File Name	GSD	Acquisition Date / Time (GMT)	Tide Level*
WorldView-3	20211111_WV03_ORI_mos.jp2	0.32 m	11-11-2021 / 18:41	1.0 m
WorldView-2	20220701_WV02_ORI_R1C1.jpg	0.48 m	07-01-2022 / 18:43	n/a

* Tide level is given in meters above MLLW and is based on verified observations recorded at the time of image acquisition by the NOS gauge at Los Angeles, CA (#9410660). The elevation of MHW at the Los Angeles gauge is 1.448 meters above MLLW.

Quality Control / Final Review

Final review tasks were completed in June 2022. The review process included analysis of image georeferencing 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
- Project database
- GC11787 in shapefile format
- Project Completion Report (PCR)
- CEF in shapefile format

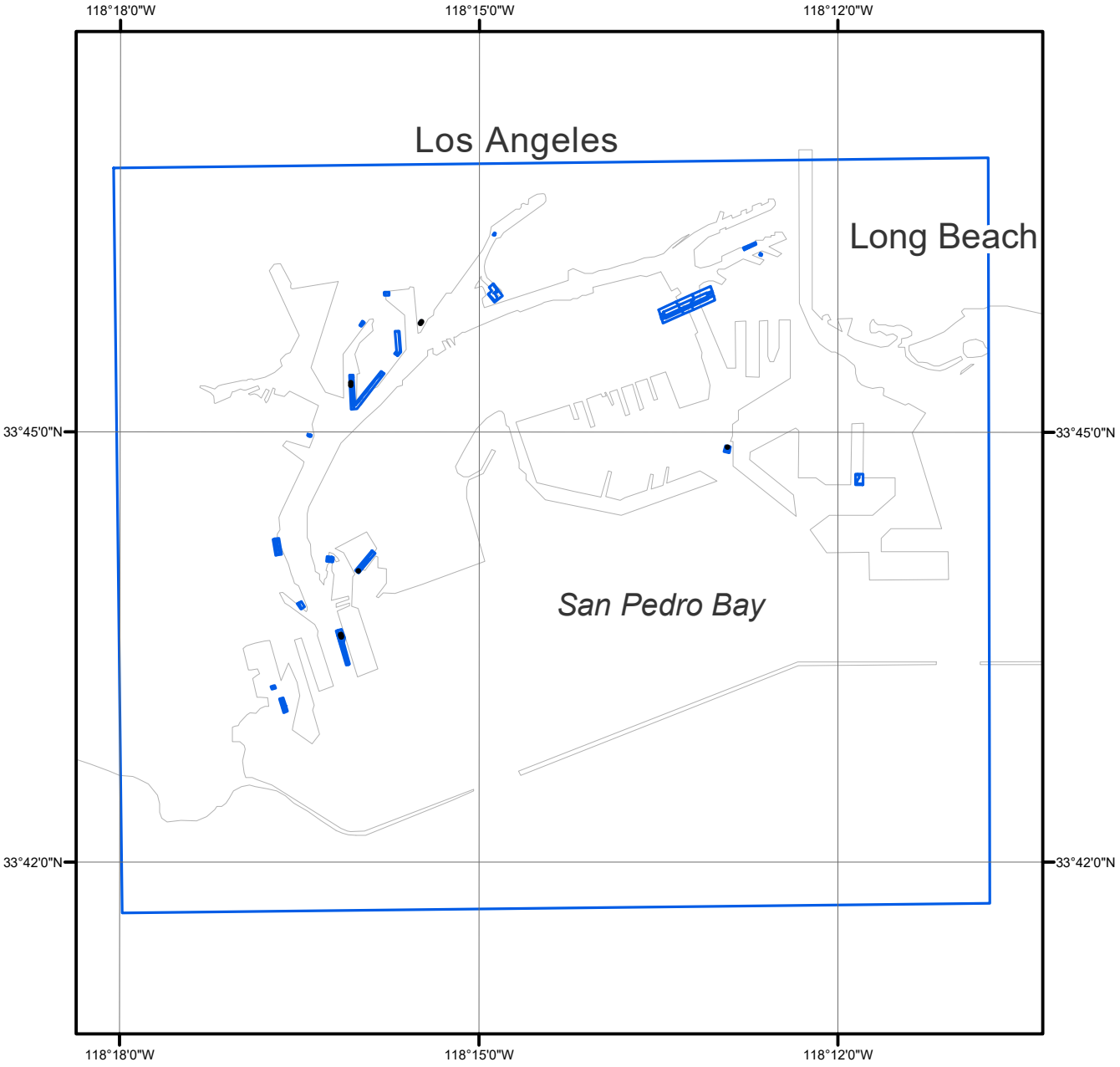
NOAA Shoreline Data Explorer

- GC11787 in shapefile format
- Metadata file for GC11787
- PCR in Adobe PDF format

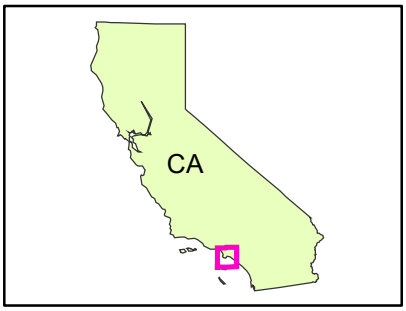
End of Report

PORTS OF LOS ANGELES AND LONG BEACH

CALIFORNIA



Overview



CA2203-CS-T

GC11787