NOAA COASTAL MAPPING PROGRAM
PROJECT COMPLETION REPORT

PROJECT PR2002-CS-T

Port San Juan, Puerto Rico

Introduction

Coastal Mapping Program (CMP) Project PR2002-CS-T provides highly accurate digital shoreline data for key areas of change within the port of San Juan, Puerto Rico. 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 PR2002-CS-T was accomplished by the Requirements Branch (RB) of the Remote Sensing Division (RSD) in response to the need for expedited 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. Orthorectified pan-sharpened WorldView satellite imagery from DigitalGlobe was utilized for the CSCAP analysis, with Phase One iXU1000RS image mosaics subsequently obtained from the US Army Corps of Engineers (USACE) Joint Airborne Lidar Bathymetry Technical Center of eXpertise (JALBTCX) to assist compilation. A Chart Evaluation File (CEF) was created once the change analysis was complete. Refer to the CSCAP memorandum for PR2002-CS-T for details regarding the chart comparison.

Field Operations

Routine CMP field operations did not apply for this project based on the origin of the project source data.

Georeferencing

Refinement of the georeferencing of images used in the CSCAP analysis was not necessary since imagery compared favorably spatially with data sources used to check its geolocation and since the distributors provided acceptable accuracy assessments. USACE reported a horizontal accuracy of 1 meter at the 95% confidence level for the Phase One mosaics, a value that was doubled in order to conservatively predict the accuracy of well-defined points in the compilation process. DigitalGlobe reported an RMSE of 3.9 meters for the WorldView imagery, which was used to calculate a horizontal accuracy of 6.8 meters at the 95% confidence level for features compiled from the satellite imagery. Positional data is referenced to the North American Datum of 1983 (NAD 83).

Compilation

Data compilation was accomplished by a member of the RSD Applications Branch (AB) in February 2020. Digital feature data was compiled in shapefile format from the project

imagery using Esri's ArcGIS (ver. 10.7.1) 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.

Spatial data accuracies for Project PR2002-CS-T were determined according to standard Federal Geographic Data Committee (FGDC) practices, with the actual values indicated in the preceding section. The following table provides information on the satellite images used in the project completion:

Image Source	Source File ID	GSD	Acquisition Date/Time	Tide Level*
Phase One	2018_USACE_NaturalColorImagery_(tileID).jp2	0.05 m	2018	n/a
WorldView-2	20190912_WV02_ORI_MOS.jp2	0.5 m	2019-09-12 / 15:11:18 GMT	0.3 m
WorldView-2	20191004_WV02_ORI_R1C1.jp2	0.48 m	2019-10-04 / 15:02:26 GMT	0.4 m

* Tide levels are given in meters above MLLW and are based on verified observations recorded by the NOS gauge at San Juan, PR. The height of Mean High Water at the San Juan gauge is 0.40 m.

Quality Control / Final Review

Quality control tasks were conducted subsequent to project completion, in February 2020, 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
- GC11638 in shapefile format
- Project Completion Report (PCR)
- CEF in shapefile format

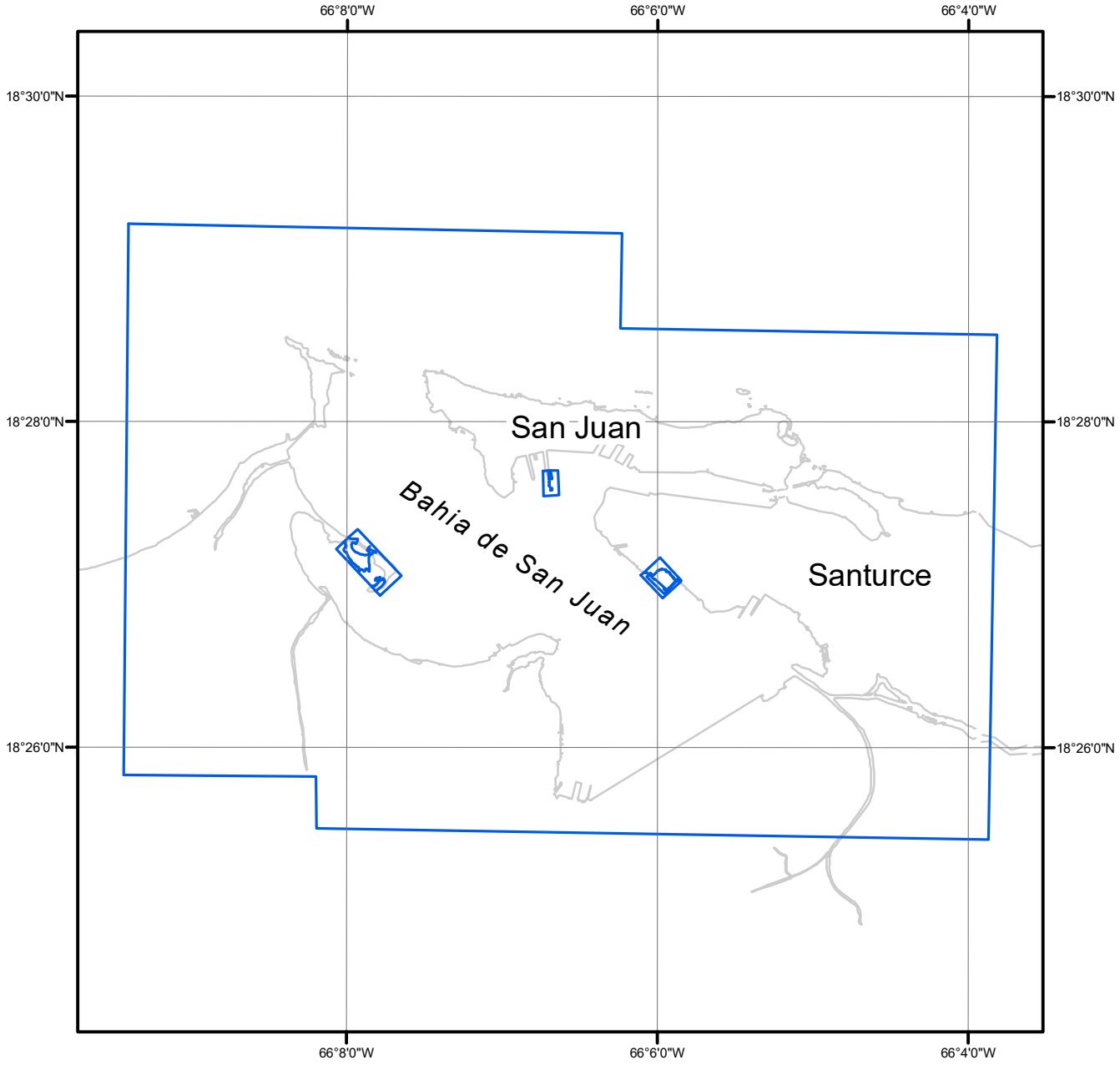
NOAA Shoreline Data Explorer

- GC11638 in shapefile format
- Metadata file for GC11638
- PCR in Adobe PDF format

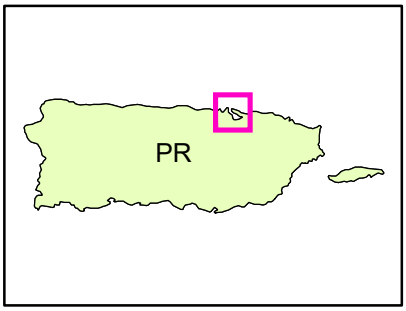
End of Report

PORT OF SAN JUAN

PUERTO RICO



Overview



PR2002-CS-T

GC11638