NOAA COASTAL MAPPING PROGRAM
PROJECT COMPLETION REPORT

PROJECT TX2007-CS-T

Port of Corpus Christi/Port Ingleside, Texas

Introduction

Coastal Mapping Program (CMP) Project TX2007-CS-T provides highly accurate digital shoreline data for key areas of change in the port of Corpus Christi/Port Ingleside, Texas. 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 TX2007-CS-T was accomplished by the Systems & Quality Assurance Branch (SQAB) of the Remote Sensing Division (RSD) in response to the need for timely updates to the NOAA chart suite within key U.S. ports. Project requirements were initially 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 commercial satellite and aerial imagery, from DigitalGlobe, Inc. and the US Department of Agriculture's National Aerial Imagery Program (NAIP) respectively, were used for this analysis. NAIP image tiles were organized into two image mosaics to better facilitate change analysis. A Chart Evaluation File (CEF) was forwarded to the Applications Branch (AB) of RSD once the change analysis was complete. Refer to the CSCAP memorandum for TX2007-CS-T for details of 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.

Georeferencing

Metadata which accompanied the NAIP imagery fully describes the photogrammetric processing and orthorectification of the imagery. Further georeferencing tasks were deemed unnecessary for this imagery since it compared well with sources used to assess spatial accuracy, and the image provider conducted an acceptable accuracy assessment. As a means of further verifying image accuracy, comparisons were made between published locations of various NGS third order geodetic control points and their locations as measured within the NAIP imagery. These comparisons revealed offsets ranging from 0-2 meters.

One WorldView-3 pan-sharpened natural color satellite image was georeferenced for use in compilation, in March 2021. The image was spatially adjusted to align with feature data from previously completed CMP project TX1504B-CS-N, with check points extracted from this

project used to statistically assess the georeferencing results. The RMS of the residuals for each measured check point was used to compute a predicted horizontal circular error of 0.48 meters based on a 95% confidence level (CE95). This value was 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. The other satellite images used in CSCAP analysis were not georeferenced and therefore not used to extract feature data, but were useful for interpretation and attribution of features during compilation. All project data is referenced to the North American Datum of 1983 (NAD83).

Compilation

The compilation of cartographic feature data for this project was accomplished by a member of AB in March 2021. Using Esri's ArcGIS desktop GIS software (ver. 10.8.1), digital feature data was compiled in shapefile format. Feature attribution was assigned in compliance with the Coastal Cartographic Object Attribute Source Table (C-COAST) specification file, 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.

Cartographic features extracted from the NAIP imagery were compiled to meet a horizontal accuracy of 6.0 meters CE95, a figure representing the level of accuracy claimed by the image provider. Features extracted from satellite imagery were compiled to meet an accuracy of 1.5 meters CE95, which is a deductive estimate based on the georeferencing statistics. The table below provides detailed information on the imagery used for compilation. (Note: One additional NAIP image tile was downloaded in order to compile features extending just beyond the original CSCAP analysis.)

Sensor	Source File Name	GSD	Acquisition Date/Time (GMT)	Tide Level*
ADS-100	naip18-nc-cir-60cm_2797161_20180517.jp2	0.6 m	2018-05-17 / 17:18 – 17:26	0.4 m
ADS-100	naip18-nc-cir-60cm_MOS2.jp2	0.6 m	2018-05-17 / 22:18 – 22:56 2018-12-10 / 19:40 – 19:59	-0.1 – 0.3 m -0.1 – 0.1 m
ADS-100	naip18-nc-cir-60cm_MOS1.jp2	0.6 m	2018-12-10 / 18:11 – 19:15	-0.1 m
WorldView-2	20190407_WV02_ORI_R1C1_NAD83.jp2	0.5 m	2019-04-07 / 17:08	n/a
WorldView-2	20191110_WV02_ORI_MOS_NAD83.jp2	0.5 m	2019-11-10 / 17:18	n/a
WorldView-3	20200327_WV03_ORI_MOS_NAD83.jp2	0.32 m	2020-03-27 / 17:28	0.4 m

* Tide levels are given in meters above MLLW and based on observations recorded by the NOS gages at Port Aransas and USS Lexington in Corpus Christi Bay, TX. The elevation of MHW in the project area ranges from 0.180 (USS Lexington) to 0.308 (Port Aransas) meters above MLLW.

Quality Control / Final Review

The final review of the project was completed by senior CMP personnel in March 2021, and included analysis of project 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 software. All project data 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
- GC11713 in shapefile format
- Project Completion Report (PCR)
- CEF in shapefile format

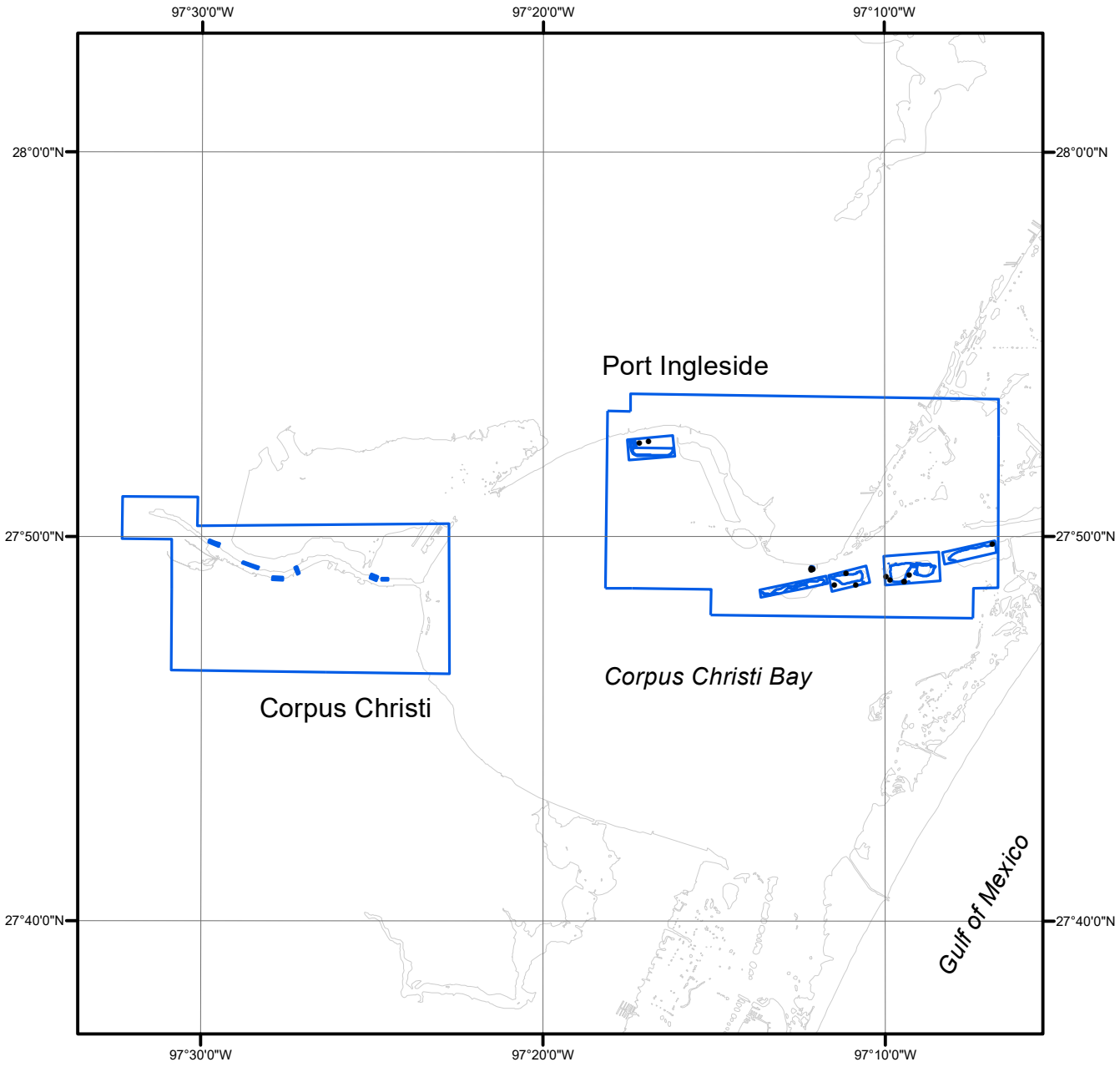
NOAA Shoreline Data Explorer

- GC11713 in shapefile format
- Metadata file for GC11713
- PCR in Adobe PDF format

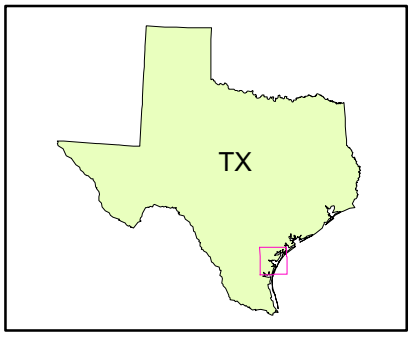
End of Report

PORT OF CORPUS CHRISTI/PORT INGLESIDE

TEXAS



Overview



TX2007-CS-T

GC11713