

NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

PROJECT TX1406-CS-T

Port of Freeport, Texas

Introduction

Coastal Mapping Program (CMP) Project TX1406-CS-T provides highly accurate digital shoreline data for key areas of change within the port of Freeport, Texas. The project extends along the Old Brazos River from Freeport and Brazos Harbor to the Freeport Harbor Entrance, including the Dow Barge Canal and a portion of the Intracoastal Waterway. 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 TX1406-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. Two pan-sharpened color WorldView-2 commercial satellite images (tiles) from DigitalGlobe, Inc. with a spatial resolution of 0.5 meters were utilized for CSCAP analysis, although only one was deemed necessary for compilation. A Chart Evaluation File (CEF) was created once the change analysis was complete. Refer to the CSCAP memorandum of September 12, 2014 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 initiated by a member of the RSD Applications Branch (AB) in December 2015. The satellite image was georeferenced using Esri's ArcGIS® (ver. 10.2.2) desktop GIS software. Control and check points were extracted from previously compiled CSCAP project TX1001 (GC10788). Within ArcGIS, the Georeferencing tool was used, and the imagery was resampled using the Nearest Neighbor sampling method with a 1st order polynomial model. The RMS of the residuals for each measured check point was used to compute a predicted horizontal circular error (CE) of 1.3 meter based on a 95% confidence level. This CE value was doubled and added to the CE95 of the source from which check points were obtained 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 December 2015. Digital feature data was compiled in shapefile format from satellite imagery using Esri's ArcGIS (ver. 10.2.2) 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 TX1406-CS-T were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were tested to have a horizontal accuracy of 3.4 meters at the 95% confidence level. This predicted accuracy of well-defined points is based on a minimum of twenty (20) check points 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 Source	Source File ID (Tile Name)	Acquisition Date/Time	Tide Level*
WorldView-2	20131023_1719_WV02: (Freeport_R1C1.tif)	2013-10-23 / 17:19 GMT	0.2 m

* Tide levels are given in meters above MLLW and are based on verified observations recorded by the NOS gauge at Freeport, TX. The elevation of MHW at Freeport is equal to 0.50 meters above MLLW.

Quality Control / Final Review

Quality control tasks were conducted during all phases of project completion by a senior member of RSD. The final QC review was completed in December 2015. 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 10.2.2. 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 Completion Report (PCR)
- GC11150 in shapefile format
- CEF in shapefile format

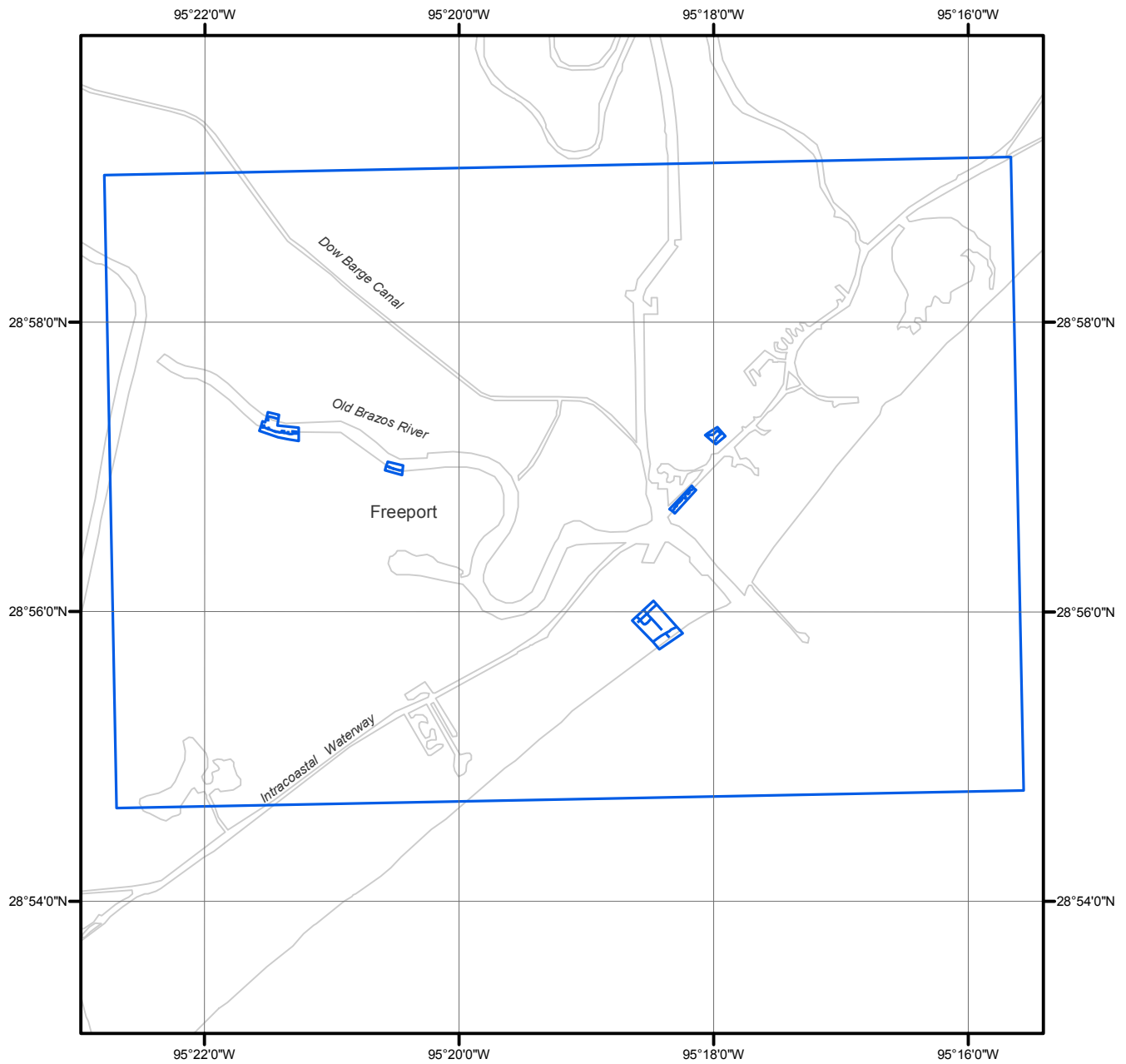
NOAA Shoreline Data Explorer

- GC11150 in shapefile format
- Metadata file for GC11150
- Digital copy of the PCR in Adobe PDF format

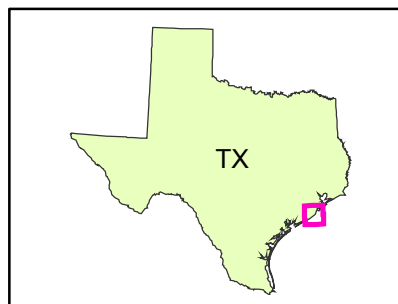
End of Report

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Overview



TX1406-CS-T

GC11150