

NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

PROJECT LA1002I

Port of New Orleans, Louisiana

Introduction

Coastal Mapping Program (CMP) Project LA1002I provides highly accurate digital shoreline data for key areas of change in the Port of New Orleans, in the Mississippi River, from Bonnet Carré to Alliance, Louisiana. 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. This project is a subproject of a larger CMP Project LA1002 which extends from Baton Rouge to Southwest Pass, Louisiana.

Project Design

The initial design of Project LA1002I was accomplished by the Requirements Branch (RB) of the Remote Sensing Division (RSD) in response to the need for updates to the NOAA Electronic Navigational Chart (ENC) series. 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. Orthomosaics from aerial photography were utilized for the CSCAP analysis.

Additionally, commercial satellite imagery was used to extend the coverage of this project after further shoreline updates were requested by NOAA's Office of Coast Survey (OCS) just beyond the coverage of the aerial photography. A panchromatic WorldView-1 image, acquired by DigitalGlobe, Inc. in February 2013, was obtained for this purpose. The vendor's image georeferencing was refined to match the geolocation accuracy of the aerial imagery using Esri's ArcGIS 9.3 desktop GIS software.

A Chart Evaluation File (CEF) created in CSCAP was forwarded to the Applications Branch (AB) of RSD once the change analysis was complete. Refer to the RB CSCAP memorandum of October 12, 2010 for details of the chart comparison process.

Field Operations

Field operations consisted of the collection of static and kinematic Global Positioning System (GPS) data and Inertial Measurement Unit (IMU) data, and the acquisition of aerial imagery. Aerial survey operations were conducted on March 13-15, 2010 with the NOAA King Air (N68RF) aircraft. A total of fifty nine strips of digital RGB (color) images were acquired, although only twelve strips (483 images) were used for this

subproject. All photography was acquired with an Applanix DSS-439 medium format digital camera at a nominal altitude of 10,000 feet.

Direct Georeferencing Data Processing

GPS/IMU data were processed by RSD personnel to yield precise camera positions and orientations for direct georeferencing (DG) of the imagery. A local GPS base station was established for use as a reference station for kinematic GPS processing operations. The position of the base station was determined using the NGS Online Processing User Service (OPUS), which computed fixed baseline solutions from nearby CORS stations. The airborne kinematic data was processed using Applanix POSPAC (ver. 4.4) software in June 2010. For further information on steps used to process this data, refer to the Airborne Positioning and Orientation Report (APOR) on file within the AB Project Archive. The DG imagery was then used to produce orthorectified mosaics for CSCAP analysis and feature compilation. NGS third order geodetic control points were used to assess the accuracy of the mosaics, which were determined to be suitable for feature compilation.

Compilation

The data compilation phase of this project was accomplished by a member of AB in September 2013. Digital feature data was compiled in ESRI shapefile format from the orthomosaics and satellite image using ESRI's ArcGIS 9.3 desktop GIS software. Feature attributes were established using 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 LA1002I were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features compiled from orthomosaic imagery were tested to have a horizontal accuracy of **1.1** meters at the 95% confidence level, and features extracted from the satellite imagery were tested to have a horizontal accuracy of **3.0** meters. These predicted accuracies of well-defined points are based on comparisons of a minimum twenty (20) check points to independent sources of higher accuracy.

Additional information on the imagery used to complete this project:

Aerial Photographs					
Date	Time (UTC)	Roll #	Strip / Frame #s	~GSD	Water Level*
3/13/2010	19:13 - 19:15	10NC04	50-031 / 0439-0451	0.35 m	2.9 - 3.0 m
3/13/2010	19:22 - 19:26	10NC04	50-032 / 0452-0480	0.35 m	2.8 - 3.1 m
3/14/2010	19:07 - 19:11	10NC10	50-030 / 3769-3794	0.35 m	2.8 - 2.9 m
3/14/2010	19:18 - 19:28	10NC10	50-026 / 3795-3861	0.35 m	1.5 - 1.6 m
3/14/2010	19:32 - 19:41	10NC10	50-029 / 3862-3928	0.35 m	1.6 - 1.7 m
3/14/2010	19:46 - 19:56	10NC10	50-027 / 3929-3994	0.35 m	1.7 - 2.8 m
3/14/2010	20:02 - 20:07	10NC10	50-021 / 3995-4024	0.35 m	1.7 - 2.7 m

3/14/2010	20:11 - 20:15	10NC10	50-023 / 4025-4052	0.35 m	1.7 - 2.7 m
3/14/2010	20:21 - 20:25	10NC10	50-022 / 4053-4081	0.35 m	1.8 - 2.7 m
3/14/2010	20:31 - 20:39	10NC10	50-028 / 4082-4147	0.35 m	1.4 - 1.6 m
3/14/2010	20:44 - 20:48	10NC10	50-025 / 4148-4178	0.35 m	1.4 - 1.5 m
3/14/2010	20:54 - 20:58	10NC10	50-024 / 4179-4209	0.35 m	1.3 - 1.5 m
Satellite Imagery					
Date	Time (UTC)	Source File Name		Resolution	Water Level
2/7/2013	16:39	13FEB07163948-P1BS-500069331040_01_P007		0.5 m	n/a

* Water (river) levels are given in meters above the LWRP and were interpolated from actual observations recorded by US Army Corps of Engineers gages throughout the project area. The height of the LWRP in the project area ranges from approximately 0.2 - 0.3 meters above Mean Sea Level.

Quality Control / Final Review

The final QC review was completed in September 2013 by a senior member of RSD. The review process included analysis of the direct 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 9.3 software. 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:

RSD Applications Branch Archive

- Hardcopy of the APOR
- Hardcopy of the Project Completion Report (PCR)
- Page size graphic plot of GC11016 file contents, attached to PCR
- Hardcopy of the CSCAP evaluation memorandum

Remote Sensing Division Electronic Data Library

- GC11016 in shapefile format
- Digital copy of the PCR in Adobe PDF format
- CEF in shapefile format

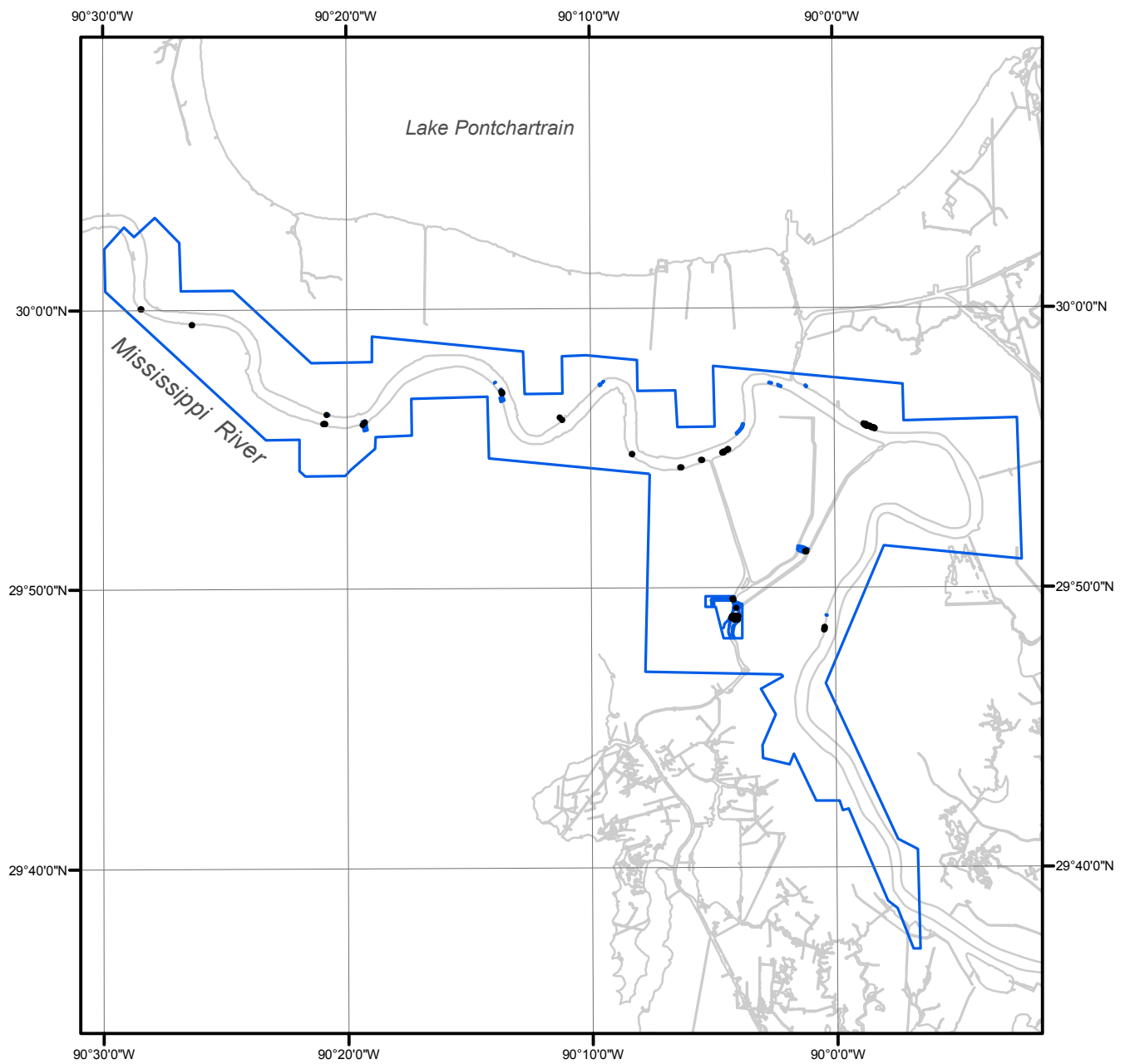
NOAA Shoreline Data Explorer

- GC11016 in shapefile format
- Metadata file for GC11016
- Digital copy of the PCR in Adobe PDF format

End of Report

PORT OF NEW ORLEANS

LOUISIANA



Overview



LA1002I

GC11016