

NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

PROJECT LA1102

West of Freshwater Bayou, Louisiana

Introduction

Coastal Mapping Program (CMP) Project LA1102 provides highly accurate digital shoreline data for the Gulf of Mexico west of Freshwater Bayou in southern 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 coastal zone management applications.

Project Design

Project LA1102 was designed per a request from the Marine Chart Division (MCD) of the Office of Coast Survey, NOAA, for updated shoreline west of, and junctioning with, previously compiled Project LA0501A.

Field Operations

Photographic mission operations were conducted from May 4 – June 15, 2010 as part of a larger emergency response effort during the ongoing Deepwater Horizon Oil Spill in the Gulf of Mexico, in which over 35,000 images were acquired. The field operations consisted of the collection of static and kinematic Global Positioning System (GPS) data, Inertial Measurement Unit (IMU) data, and the acquisition of aerial imagery. Imagery was acquired using an Applanix Digital Sensor System (DSS-439) DualCam digital camera with the NOAA King Air aircraft (N68RF). Only natural color images were acquired. Airborne kinematic GPS data was collected in conjunction with IMU data to determine precise camera positions and orientations. Two strips of photos acquired on May 29, 2010 were determined to be adequate for completion of Project LA1102.

GPS Data Reduction

GPS and IMU data were processed by Remote Sensing Division (RSD) personnel to yield precise positions and orientations of camera centers as a means of rendering accurately positioned digital images. The static GPS base station data was processed in May of 2010 using the NGS Online Processing User Service (OPUS) software to compute fixed baseline solutions from three CORS stations. The final NAD83 position reported by OPUS was the average of these three baseline solutions. The airborne kinematic data was processed using Applanix POSPAC (ver. 4.4) software in May 2010. It is not standard practice to document the specific GPS/IMU data processing steps and results in NGS emergency response acquisitions, therefore no additional details or reports are available.

Aerotriangulation

Routine softcopy aerotriangulation methods were applied to establish a network of precise camera positions and other control for mapping, and to provide model parameters and orientation elements required for digital compilation. This work was initiated by RSD personnel in February 2011 utilizing a Digital Photogrammetric Workstation (DPW), which is a configuration of computer hardware, modular software components, and other associated peripheral devices. Two strips, including thirty (30) digital images, were measured and adjusted as a single block using BAE Systems SOCET SET (version 5.5) photogrammetric suite in conjunction with the BINGO aerotriangulation software. Upon successful completion of the aerotriangulation process, the BINGO software provided the standard deviations for each aerotriangulated ground point, which were used to compute a predicted horizontal circular error of 0.3 meters based on a 95% confidence level. An Aerotriangulation Report was written and is on file with other project data within the RSD Project Archive.

The project database consists of project parameters and options, camera calibration data, interior orientation parameters, adjusted exterior orientation parameters, and positional listing of all measured points. Positional data is referenced to the North American Datum of 1983 (NAD83).

Compilation

The data compilation phase of this project was initiated by RSD in February 2011. Digital mapping was performed using a DPW in conjunction with the SOCET SET Feature Extraction software module. Feature identification and attribution within the Geographic Cell (GC) were based on image analysis of the digital photographs and information extracted from the appropriate NOAA nautical charts and other ancillary sources. 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 LA1102 were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were compiled to meet a horizontal accuracy of 0.6 meters at the 95% confidence level. The predicted accuracy of compiled, well defined points is derived by doubling the circular error computed from aerotriangulation statistics.

The following table provides information on the imagery used to complete this project:

Date	Time (UTC)	Roll Number	Photo Numbers	GSD (nominal)	Tide Level*
5-29-2010	15:08-15:09	n/a	14958110-14958208	0.35 m	0.5
5-29-2010	15:34-15:35	n/a	14959667-14959774	0.35 m	0.6

* Tide levels are given in meters above MLLW and are based on actual observations recorded by the NOS gauge at Freshwater Canal Locks, LA. The mean tide range at the NOS gauge is 0.5 meters.

Final Review

The final review of the project was completed by a senior member of RSD in February of 2011, and included analysis of aerotriangulation 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. All project data was evaluated for compliance to CMP requirements.

Comparison of the largest scale NOAA nautical chart with the project imagery resulted in creation of the Chart Evaluation File (CEF). The following nautical chart was used for comparison:

11349, Vermillion Bay and Approaches, 1:80,000 scale, 44th edition

End Products and Deliverables

The following specifies the location and identification of the products generated during the completion of this project:

RSD Applications Branch Archive

- Hardcopy of the Aerotriangulation Report
- Hardcopy of the Project Completion Report (PCR)
- Page-size graphic plot of GC10867 file contents, attached to PCR

Remote Sensing Division Electronic Data Library

- Project database
- GC10867 in shapefile format
- Digital copy of the PCR in Adobe PDF format
- CEF in shapefile format

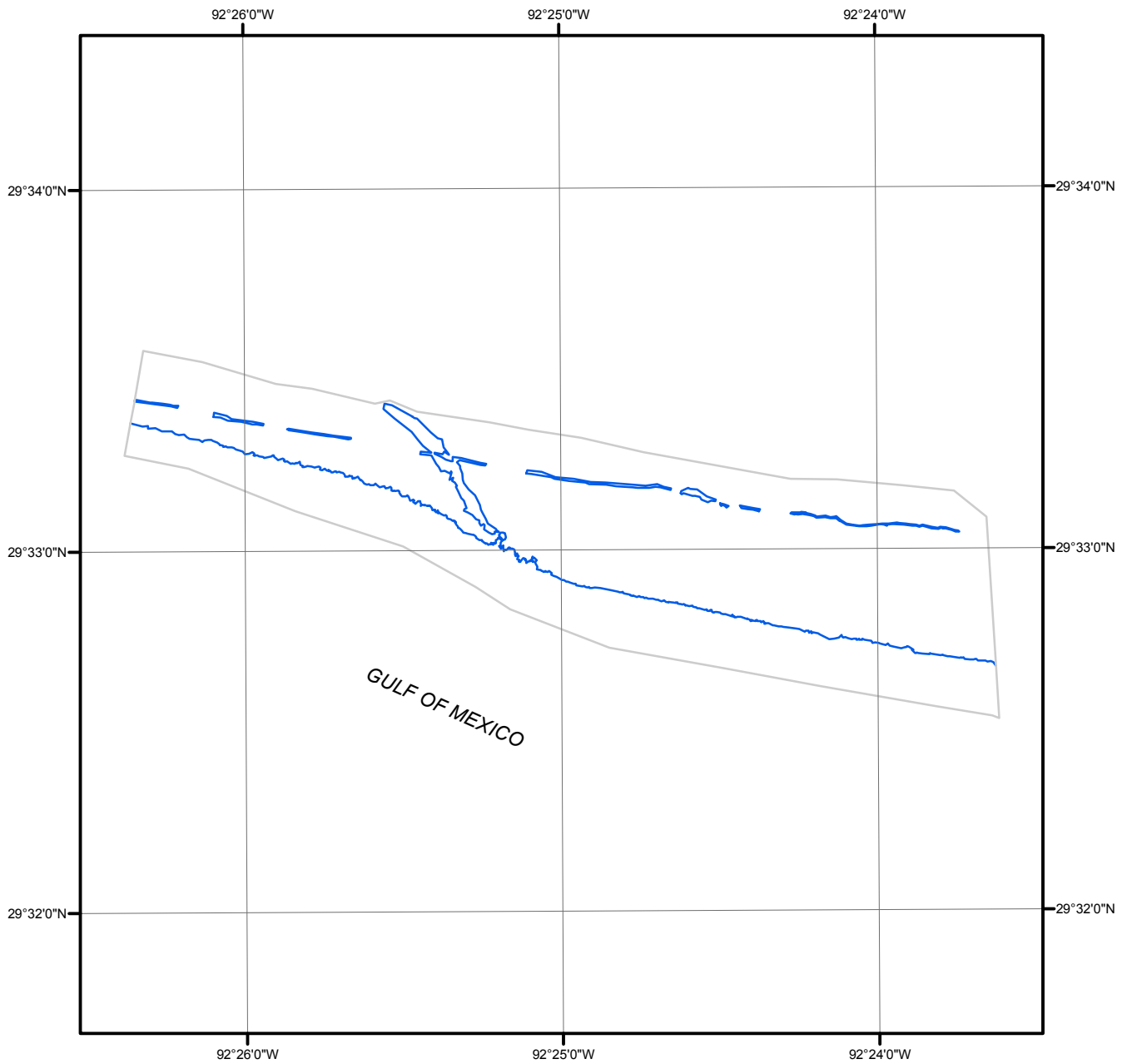
NOAA Shoreline Data Explorer

- GC10867 in shapefile format
- Metadata file for GC10867
- Digital copy of the PCR in Adobe PDF format

End of Report

WEST OF FRESHWATER BAYOU

LOUISIANA



Overview



LA1102

GC10867