NOAA COASTAL MAPPING PROGRAM
PROJECT COMPLETION REPORT

PROJECT LA0701D

Southern Lake Pontchartrain and Lake Borgne, from Bayou Bienvenue to the Rigolets, Louisiana

Introduction

NOAA Coastal Mapping Program (CMP) Project LA0701D provides digital shoreline data for a portion of the Mississippi River delta and wetlands in Louisiana, extending from Bayou Bienvenue in the southwest to Rabbit Island in the northeast, and includes the southern portion of Lake Pontchartrain. Project LA0701D is a sub-project of a larger project, LA0701, which includes the most of the area covered by NOAA nautical chart 11371: "Lake Borgne and Approaches". The Geographic Cell (GC) can be used to complement the Nautical Charting Program (NCP) as well as geographic information systems (GIS) for a variety of coastal zone management applications.

Project Design

Project LA0701 was designed per a request from the Marine Chart Division (MCD) of the Office of Coast Survey, NOAA, for updated shoreline data in support of marine debris clean-up operations. Based on an analysis of project requirements and results of a source data search, it was determined that CMP procedures for multiple source projects would apply for this project. Available source data deemed adequate for successful completion of this project included sources acquired in September and October of 2007. Due to the extensive, highly complex and intricate marshes in the project area, and the general lack of cultural and navigational infrastructure, various automated feature extraction techniques were utilized in the compilation phase of the project.

Field Operations

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

Aerotriangulation

The aero-triangulation (AT) task was initiated by RSD personnel in March 2008 utilizing a Digital Photogrammetric Workstation (DPW), which is a configuration of computer hardware, modular software components and other associated peripheral devices. The image files were imported into SOCET SET (SS, version 5.4.1) using the DataThruWay (version 5.4.1) software extension. The import process converted the stored compressed files to the National Imagery Transmission Format (NITF version 2.1) with headers and metadata. AT procedures were accomplished using the Multi-Sensor Triangulation (MST) module of SS. The Automatic Point Measurement (APM) algorithm, within MST, was used to collect tie points, and a simultaneous solve adjustment was then performed. The predicted horizontal circular error, using all measured image points, was

computed to be 7 meters at the 95% confidence level (95% CE). Positional data for this project is referenced to the North American Datum of 1983 (NAD 83).

Orthoimagery

Using the image positions and orientations derived from the AT process and the MOSAIC module from within SS, an orthoimage covering the area of project LA0701D was created in April 2008. During the image rectification process, a constant elevation of zero meters was utilized, rather than a digital elevation model.

Compilation

The data compilation phase of this project was completed by RSD in September 2009. The digital mapping was performed using the orthoimage in conjunction with an object-based auto-extraction approach from within the ENVI Feature Extraction (Fx) software. Fx allows the user to interactively create and classify objects, based on image rules that meet in-situ criteria, and then to run a raster-to-vector algorithm to convert the classified image to an ArcGIS (v.9.3) polygon shapefile. The polygon shapefile produced in Fx was then imported into ArcGIS and 1) converted to a polyline format, 2) smoothed and simplified, and 3) edited to create fields compatible with the RSD interim shapefile format. The interim shapefile was then imported into SS and a Feature Data Base (FDB) was created. The FDB was reviewed and edited, by the original compiler, using stereo-models derived from the AT solution. All elevated features were compiled using the stereo-models.

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. Selected features were further modified with additional descriptive information to refine general classification. Cartographic features were compiled to meet a horizontal accuracy of 10 meters at the 95% confidence level.

Tidal information was obtained from the NOS tide station at Bay Waveland Yacht Club (#874437), located in Bay St. Louis, MS. The observed tide for the imagery used in this project was approximately mid- to high-tide stage.

Quality Control / Final Review

Quality control tasks were conducted during all phases of project completion by a senior member of the Applications Branch of RSD. The final QC review was completed in December 2009. The review process included analysis of AT/orthoimage 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.

Comparisons of the largest scale NOAA nautical charts with source imagery and compiled project data resulted in creation of the Chart Evaluation File (CEF). The following nautical chart was used in the comparison process:

- Chart 11371, Lake Borgne and Approaches, MS-LA, 1:80,000 scale, 38th ed.
- Chart 11367, Waveland To Catahoula Bay, MI-LA, 1:40,000 scale, 35th ed.

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 Project Completion Report (PCR)
- Page size graphic plot of GC10742 file contents, attached to PCR

Remote Sensing Division Electronic Data Library

- Project database
- GC10742 in shapefile format
- Digital copy of the PCR in Adobe PDF format
- CEF in shapefile format

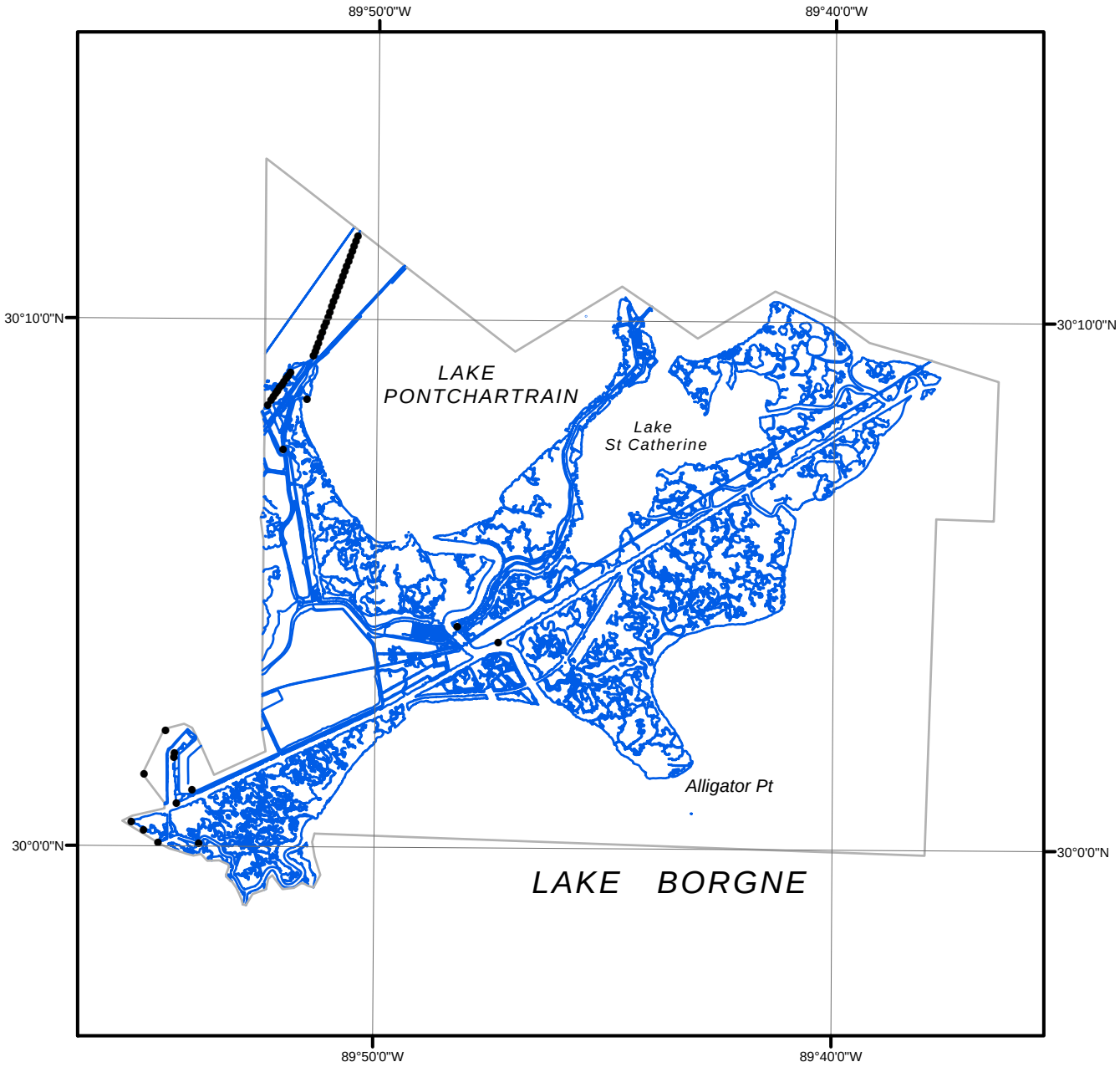
NOAA Shoreline Data Explorer

- GC10742 in shapefile format
- Metadata file for GC10742
- Digital copy of the PCR in Adobe PDF format

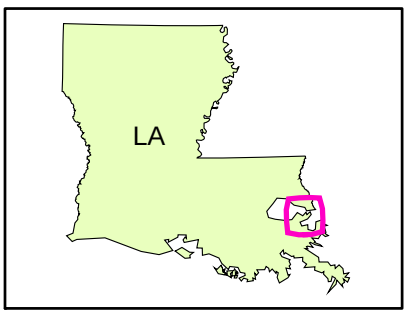
End of Report

SOUTHERN LAKE PONTCHARTRAIN AND LAKE BORGNE

LOUISIANA



Overview



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