

NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

PROJECT LA0701A

Bay Boudreau to Chandeleur Sound, Louisiana

Introduction

NOAA Coastal Mapping Program (CMP) Project LA0701A provides digital shoreline data for a portion of the Mississippi River delta and wetlands in Louisiana, extending from Bay Boudreau in the west, to Chandeleur Sound in the east, Grand Pass in the north and Drum Bay in the south. Project LA0701A 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, LA-MS". 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 very large extent of complex marsh shoreline in the requested area, and the general lack of significant cultural features, various automated feature extraction techniques were investigated and developed in order to speed the compilation of the shoreline.

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).

Ortho-Image

Using the image positions and orientations derived from the AT process and the MOSAIC module from within SS, an ortho-image covering the area of project LA0701A was created in April 2008. A constant elevation of zero meters (as opposed to an elevation model) was utilized to rectify the data.

Compilation

The data compilation phase of this project was initiated by RSD in September 2008. The digital mapping was performed using the ortho-image 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.9.1) polygon Shape file. The polygon Shape file 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 Shape File format. The interim shape file 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 November 2008. 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 9.1 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.

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 GC10739 file contents, attached to PCR

Remote Sensing Division Electronic Data Library

- Project database
- GC10739 in shapefile format
- Digital copy of the PCR in Adobe PDF format
- CEF in shapefile format

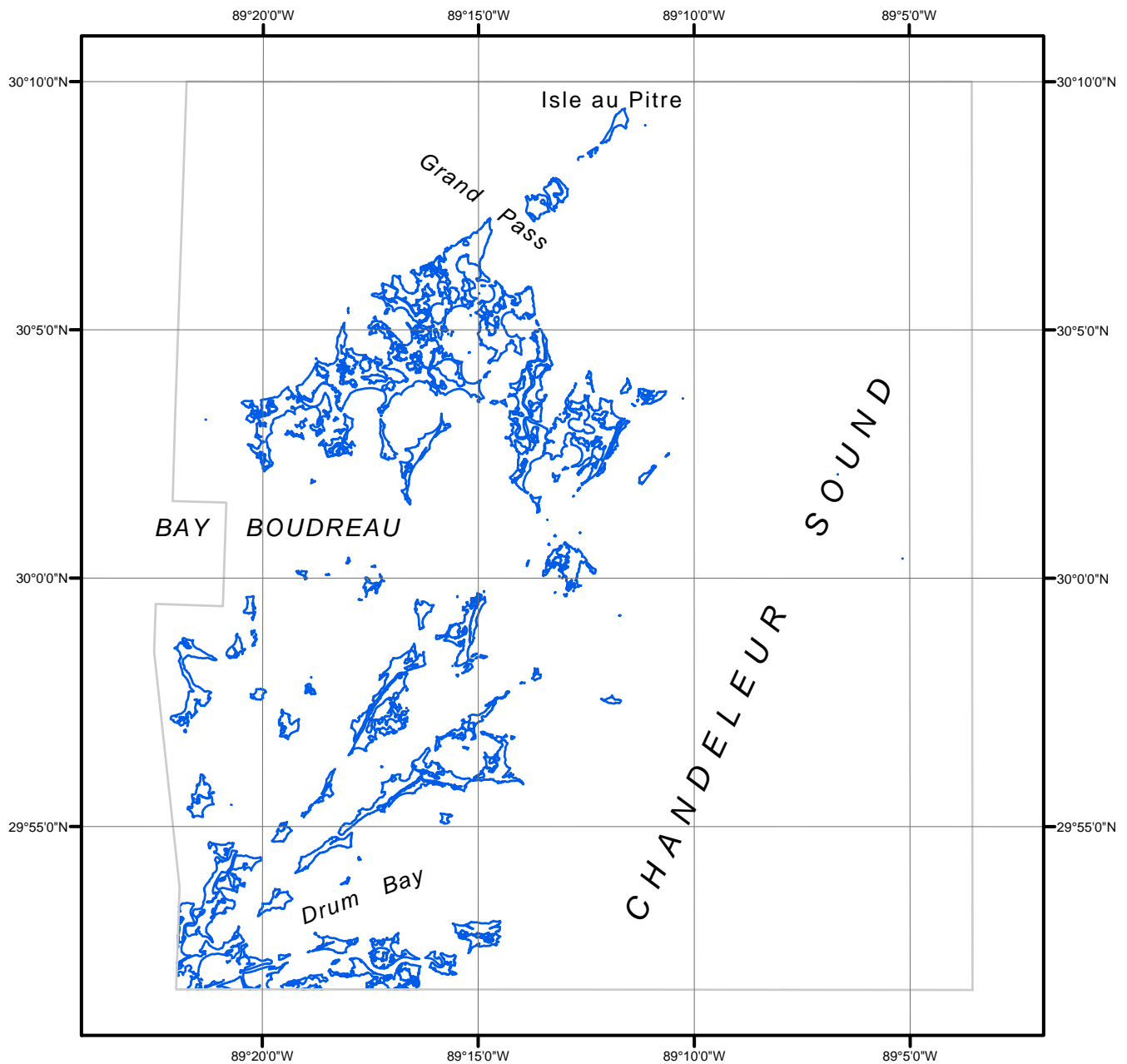
NOAA Shoreline Data Explorer

- GC10739 in shapefile format
- Metadata file for GC10739
- Digital copy of the PCR in Adobe PDF format

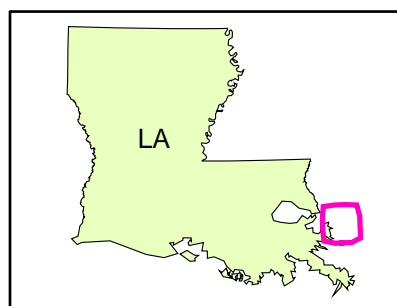
End of Report

BAY BOUDREAU TO CHANDELEUR SOUND

LOUISIANA



Overview



LA0701A

GC10739