NOAA COASTAL MAPPING PROGRAM
PROJECT COMPLETION REPORT

PROJECT LA0003

INTRACOASTAL WATERWAY
MORGAN CITY TO FORKED ISLAND
LOUISIANA

Introduction

Coastal Mapping Program (CMP) Project LA0003 provides highly accurate digital shoreline data of the Intracoastal Waterway (ICW) from Morgan City to Forked Island, Louisiana. Project LA0003 is one of four CMP projects covering the ICW from New Orleans, Louisiana, to Galveston, Texas, joining Projects LA9801 to the west and LA0002 to the east.

Successful completion of this project resulted in a densification of the National Spatial Reference System (NSRS), a set of controlled metric quality aerial photographs and companion high resolution digital scans, and digital cartographic feature files of the coastal zone to complement the Nautical Charting Program (NCP), NOAA Electronic Navigational Chart (ENC) suite and other geographic information systems.

The project database consists of information measured and extracted from aerial photographs and metadata related to photogrammetric compilation. Base mapping was conducted in a fully digital environment using softcopy stereo photogrammetry and associated cartographic practices. Positional data is referenced to the North American Datum 1983 (NAD83).

Project Design

The design of Project LA0003 was accomplished by the Requirements Branch (RB) of the Remote Sensing Division (RSD). Project requirements were formulated in the planning phase and issued in the General Information/Instructions. These instructions discuss the project's intended purpose, coverage, photographic requirements, photographic control, guidelines for Global Positioning System (GPS) data collection and handling, project scheduling/priority, and communications.

Additional project requirements were submitted by the Office of Coast Survey (OCS) in the "Report On Requirements For The GIWW ENC" which had the effect of increasing the compilation scale and level of cartographic feature inclusion.

Field Operations

Field operations consisted of the collection of static and kinematic GPS data and the acquisition of aerial photographs. Static GPS data was collected prior to the photo missions and applied as a local reference point. Kinematic GPS data was collected during the ensuing photographic missions, rendering precise camera positions as a means of controlling the photographs. Aerial photographic survey operations were conducted during February of 2000 by the NOAA Cessna Citation II (N52RF) aircraft. Photographic requirements consisted of 1:40,000 scale photography, utilizing natural color film. There was no attempt to acquire tide coordinated black and white infrared photographs. All photographss were taken using a Wild RC-30 camera with the NOS "A" lens cone.

GPS Data Reduction

GPS data was processed to provide precise and accurate positions of camera centers for application as photogrammetric control in the aerotriangulation phase of the project. Static GPS data collected over the airport base station was processed using the Online Positioning User Service (OPUS), available through the NGS web site, to provide a reference position for differential processing of the kinematic data. The kinematic GPS data was processed using Applanix POSGPS (version 3.00) software by RSD personnel in December 2001. A GPS Processing Report was written and is on file with other project data within the RSD Applications Banch (AB) Project Archive.

Aerotriangulation

Softcopy aerotriangulation methods were applied to establish the network of horizontal and vertical control for mapping and to provide model parameter and orientation elements required for digital compilation. The aerotriangulation phase of the project was accomplished using digital images of the aerial photographs, scanned
at 25 micron resolution in VITec format, in conjunction with SOCET SET (version 4.4.0) software in a Windows NT environment on a Digital Photogrammetric Workstation (DPW), which is a configuration of computer hardware, modular software components and other associated peripheral devices. Nine strips of photographs were measured and adjusted as a block using the ORIMA aerotriangulation module within SOCET SET. ORIMA provided the RMS of the standard deviations of the residuals for each aerotriangulated ground point which were used to compute a predicted horizontal circular error (CE) of 1.3 meters based on a 95% confidence level. This CE value is doubled to yield a conservative predictor of the accuracy of well defined points measured during the compilation phase. The aerotriangulation task was completed by the RSD AB in April 2002 and an Aerotriangulation Report has been filed in the RSD archive.

Compilation

The compilation phase of the project was carried out by the RSD AB using the Feature Extraction software module within SOCET SET (version 4.4.0) on a DPW. Feature identification and the assignment of cartographic codes were based on image analysis of the 1:40,000 scale natural color photographs and information extracted from corresponding NOAA Nautical Charts, the US Coast Guard Light List Publication, 2000 (Vol. IV), and the US Coast Pilot Publication, 27th ed. The following is a description of the source photographs used to compile cartographic features:

DATE	TIME (GMT)	FILM ROLL	PHOTOS	SCALE	WATER LEVEL*
02-20-00	1853-1901	00 ACN-03	#0439-0447	1:40,000	-
02-20-00	1905-1912	00 ACN-03	#0448-0457	1:40,000	-
02-20-00	1916-1923	00 ACN-03	#0473-0482	1:40,000	-
02-20-00	1932-1943	00 ACN-03	#0483-0506	1:40,000	-
02-20-00	1950-1956	00 ACN-03	#0507-0520	1:40,000	-
02-20-00	2000-2006	00 ACN-03	#0521-0524	1:40,000	-
02-20-00	2027-2031	00 ACN-03	#0554-0565	1:40,000	-
02-20-00	2034-2037	00 ACN-03	#0566-0573	1:40,000	-
02-20-00	2045-2050	00 ACN-03	#0574-0587	1:40,000	-

* No NOS tide gauge data exists. Since water levels for the ICW within the project area are controlled and remain consistent under normal conditions, shorelines were compiled based on the current water levels at the time of photography.

Digital compilation was completed in June 2002. Features were compiled to meet 2.5 meters horizontal accuracy at a 95% confidence level. This predicted accuracy of compiled well-defined points is a deductive estimate based on aerotriangulation statistics. Cartographic feature attribution was employed in compliance with the Coastal Cartographic Object Attribute Source Table (C-COAST). Nomenclature was assigned to selected cartographic features to refine general classification.

Final Review

As a means of assuring the quality of compiled digital data, the cartographic feature file was evaluated by a senior AB CMP team member for completeness and adherence to CMP requirements and accuracy standards. The digital data was reviewed on a model by model basis, utilizing SOCET SET on a DPW, insuring that all significant coastal features captured in the photography are accurately represented in the digital compilation. Offline data review included a comparison between hard copy plots of project data and largest scale current editions of NOAA nautical charts. Differences found in these comparisons are reflected on Chart Maintenance Prints, copies of the nautical charts annotated with comments to advise the nautical chart compiler. The following charts were used in the comparison process:

11348, ICW, Forked Island to Ellender, 1:40,000 scale, 19th ed.
11350, ICW, Wax Lake Outlet to Forked Island, 1:40,000 scale, 24th ed.
11354, ICW, Morgan City to Port Allen, 1:80,000 scale insets, 23rd ed.
11355, ICW, Catahoula Bay to Wax Lake Outlet, 1:40,000 scale, 23rd ed.

Project Final Data and Products

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

RSD Applications Branch Project Archive
- Hard copy of GPS Processing Report
- Hard copy of Aerotriangulation Report
- Page size graphic plot of DCFF contents
- Hard copy of the Project Completion Report

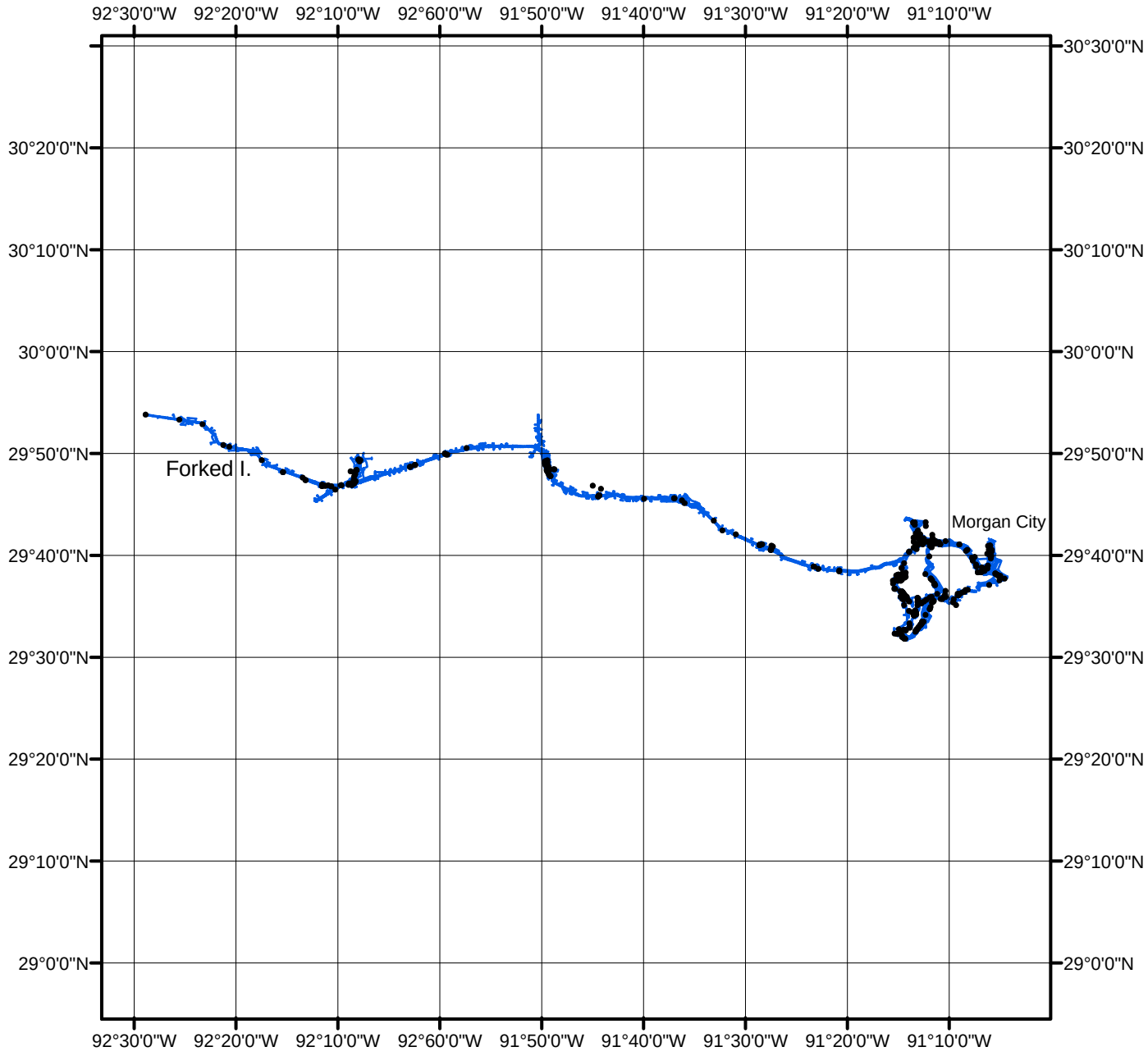
RSD Electronic Data Library:
- Project Database
- Digital Cartographic Feature File: GC-10518
- Digital copy of DCFF in Shapefile format
- Digital Copy of Project Completion Report

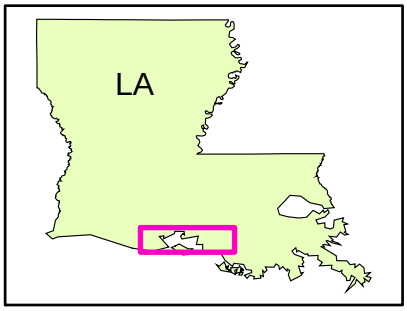
NOAA Shoreline Data Explorer
- Digital Cartographic Feature File for GC-10518
- Metadata file for GC-10518
- Digital Copy of the Project Completion Report

End of Report

INTRACOASTAL WATERWAY

MORGAN CITY TO FORKED ISLAND, LOUISIANA





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GC10518