NOAA COASTAL MAPPING PROGRAM
PROJECT COMPLETION REPORT

PROJECT ME0701B

Blue Hill Neck to Skillings River, Maine

Introduction

Coastal Mapping Program (CMP) Project ME0701B provides coastal zone mapping data for portions of Blue Hill Bay and Frenchman Bay, from Blue Hill Neck to Skillings River. Project ME0701B is a subproject of a larger project, ME0701, which includes shoreline mapping from Jericho Bay north to Frenchman Bay, Maine.

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 digital feature data of the coastal zone that meet the requirements of the NOAA CMP, and 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.

The project database consists of information measured and extracted from aerial photographs and metadata related to photogrammetric compilation. Base mapping was conducted in a digital environment using stereo softcopy photogrammetry and associated cartographic practices. Project survey data is referenced to the North American Datum of 1983 (NAD 83).

Project Design

The design of project ME0701 was based on a comparison of image analysis to cartographic detail depicted on the pertinent NOAA nautical charts of the project site. The Requirements Branch (RB) of the Remote Sensing Division (RSD) formulated the project instructions for this project following the guidelines of Shoreline Mapping Scope of Work (SOW), version 13B. The instructions discussed the project's purpose, geographic area of coverage, scope and priority; photographic requirements; flight line priority; GPS data collection procedures and guidelines for both kinematic and static surveys; data recording and handling instructions; and contact and communication information. The RB created a Project Layout Diagram, and created flight maps, NOVA DIGITAL SYSTEMS, INC. strategically located twenty (20) photo-identifiable control points within the project area. No paneled control points were used since the ground control was accomplished after the photography was acquired.

Field Operations

The photographic missions operations were conducted August 27-28 and September 1, 2007 with a Cessna Citation II aircraft. All photography was acquired by NOAA through use of a Wild RC-30 camera with the NOS “A” lens cone with 60% end lap and

30% side lap, except the strip over Mount Desert Rock Island that has 80% end lap. All flights were accomplished within the calculated MHW and MLLW tides. Airborne Kinematic GPS (AGPS) and Inertial Measurement Unit (IMU) data were collected concurrently to the photographs. All photography was acquired at an approximate altitude of 18,000 feet for a nominal scale of 1:36,000.

A total of twenty GPS ground control sites photo-identified from imagery were surveyed in well-distributed locations throughout the area. Additional information concerning the Field operations can be found in the Ground Control Report.

Aerotriangulation

Aerotriangulation tasks were initiated in August 2009 by NOVA DIGITAL SYSTEMS, INC. All emulsions (Color, IR MHW, IR MLLW) were adjusted in one block; except for the offshore island Mount Desert Rock, which was adjusted as an independent block. All photographs were bridged using a softcopy 3D stereo photogrammetric system to establish the network of control required for the compilation phase. The photography measurements were made using the Multi-Sensor Triangulation module within SocetSet in a Windows XP environment, on Digital Photogrammetric Workstations. Based on the summary statistics for all of the aerotriangulated ground point standard deviations, the predicted horizontal circular error at the 95% confidence level is 0.6 meters for the main block and 0.3 meters for the Mt. Desert Rock block.

Additional information concerning the aerotriangulation phase can be found in the Aerotriangulation Report, which was written and is on file with other project data within the RSD Applications Branch (AB) Project Archive.

Compilation

The Compilation phase for Project ME0701B was completed by NOVA DIGITAL SYSTEMS, INC. in December 2009. Digital mapping was accomplished using SocetSet v5.3.0 Feature Extraction software. Feature identification and the assignment of cartographic codes were based on information extracted from the appropriate NOAA nautical charts, and on image analysis of the 1:36,000 scale natural-color and tide-coordinated infrared B&W photographs.

Spatial data accuracies for this project were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were compiled to meet a horizontal accuracy of 1.2 meters at the 95% confidence level. This predicted accuracy of compiled, well-defined points was calculated by doubling the circular error derived from the aerotriangulation statistics.

The following table provides information on aerial photographs used in the completion of this project:

Date	Time (UTC)	Roll Number	Photo Numbers	Scale (nominal)	Tide Level*
8/27/2007	13:45-13:49	07AR04	1858-1867	1:36,000	3.0
8/27/2007	13:54-13:59	07AR04	1868-1878	1:36,000	3.0
8/27/2007	14:08-14:14	07AR04	1887-1899	1:36,000	3.1
8/27/2007	14:21-14:25	07AR04	1905-1915	1:36,000	3.2
8/28/2007	13:08-13:12	07ACN16	2152-2161	1:36,000	2.3
8/28/2007	13:18-13:22	07ACN16	2162-2172	1:36,000	2.5
8/28/2007	13:31-13:36	07ACN16	2181-2193	1:36,000	2.6
8/28/2007	13:43-13:48	07ACN16	2199-2209	1:36,000	2.8
8/28/2007	20:12-20-17	07AR05	2422-2434	1:36,000	0.3
8/28/2007	20:25-20:28	07AR05	2444-2454	1:36,000	0.2
9/1/2007	12:56-13:00	07AR05	2603-2612	1:36,000	0.0
9/1/2007	13:04-13:08	07AR05	2613-2623	1:36,000	0.0

* NOTE: Tide levels are given in meters above the MLLW datum and are based on actual observations at the Bar Harbor, ME, reference station, with corrections applied to various tide zones in the project area. The height of the MHW datum in the project area varies between 3.2 – 3.3 meters above MLLW.

Quality Control / Final Review

Final office review operations were initiated in March 2010 upon completion of the compilation phase. The review process included analysis of aerotriangulation results and assessment of the identification and attribution of digital feature data within the Geographic Cell (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 project imagery and compiled project data resulted in creation of the Chart Evaluation File (CEF). The following nautical charts were used in the comparison process:

13312, Frenchman and Blue Hill Bays & Approaches, 1:80,000 scale, 22nd edition
13316, Blue Hill Bay, ME, 1:40,000 scale, 22nd edition
13318, Frenchman Bay & Mount Desert Island, ME, 1:40,000 scale, 18th 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 Ground Control Report
- Hardcopy of the Aerotriangulation Report
- Hardcopy of the Project Completion Report (PCR)

- Page-size graphic plot of GC10831 file contents, attached to PCR

Remote Sensing Division Electronic Data Library

- Project database
- GC10831 in shapefile format
- Digital copy of the PCR in Adobe PDF format
- CEF in shapefile format

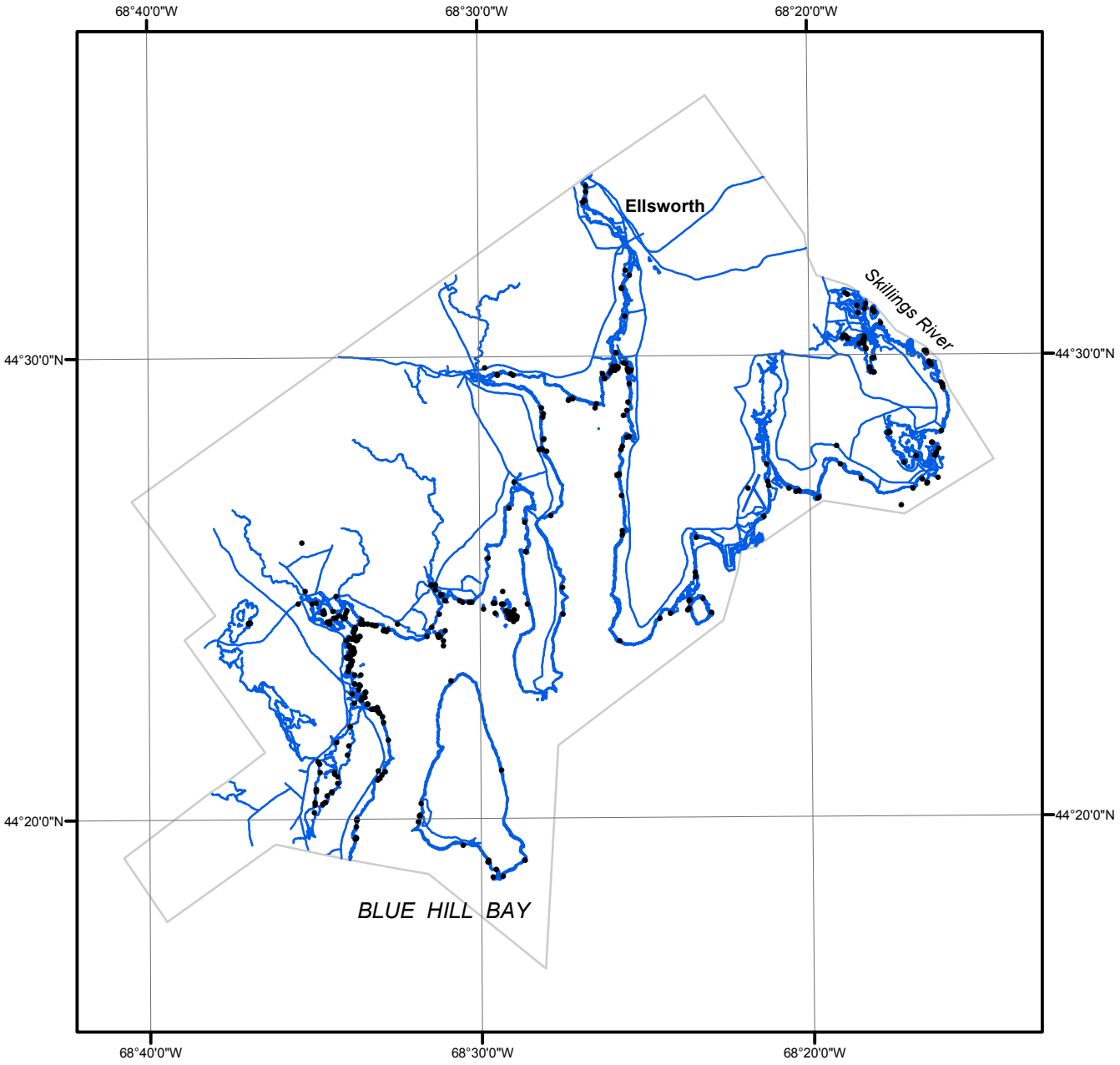
NOAA Shoreline Data Explorer

- GC10831 in shapefile format
- Metadata file for GC10831
- Digital copy of the PCR in Adobe PDF format

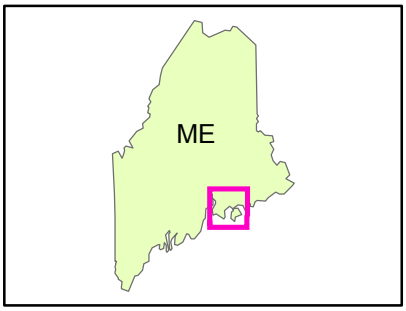
End of Report

BLUE HILL NECK TO SKILLINGS RIVER

MAINE



Overview



ME0701B

GC10831