

NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

PROJECT CT2101-CS-N

Port of New London/Groton, Connecticut

Introduction

NOAA Coastal Mapping Program (CMP) Project CT2101-CS-N provides highly accurate digital shoreline data for key areas of change within the Port of New London/Groton, Connecticut. The Geographic Cell (GC) 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.

Project Design

The design of Project CT2101-CS-N was accomplished by the Requirements Branch (RB) of the Remote Sensing Division (RSD) in response to the need for timely updates to the NOAA chart suite within key U.S. ports. Project requirements were formulated as a result of analysis conducted within the Coast and Shoreline Change Analysis Program (CSCAP), in which NOAA nautical chart products are compared to contemporary high-resolution imagery in order to ascertain the need for more current shoreline data. A Chart Evaluation File (CEF) was forwarded to the Applications Branch (AB) of RSD once the change analysis was completed. Refer to the CSCAP memorandum for Project CT2104-CS-T for details of the chart comparison process.

Field Operations

The field operations consisted of collection kinematic Global Positioning System (GPS) data and Inertial Measurement Unit (IMU) data, and the acquisition of aerial imagery. Two strips of RGB (color) digital images utilized for this project were acquired with the NOAA King Air (N68RF) aircraft in August 2021 using an Applanix DSS 6150/6100 dual camera system at a nominal altitude of 10,500 feet, resulting in an approximate ground sample distance (GSD) of 0.23 meters for RGB project imagery. Near-infrared (NIR) images were also acquired concurrently but were not used. Although imagery was not acquired in strict coordination with local tides, the goal was to collect all imagery below Mean High Water (MHW) tide stage.

GPS Data Processing

The GPS/IMU data were processed by RSD personnel to yield precise camera positions in order to provide a control network necessary for aerotriangulation (AT). The kinematic GPS data was processed in November 2021 using Applanix POSPac MMS (ver. 8.7) software, utilizing the IN-Fusion PP-RTX processing mode, which is an implementation of Trimble's CenterPoint RTX GNSS correction service. For further information refer to the Airborne Positioning and Orientation Report (APOR) on file with other project data in the RSD Electronic Data Library.

Aerotriangulation

Routine softcopy AT 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 performed by AB personnel in January 2022 utilizing BAE's SOCET SET (ver. 5.6) software on a Windows-based photogrammetric workstation. The RGB images were measured and adjusted as a single block using the Multi-Sensor Triangulation (MST) module of SOCET SET. Upon successful completion MST provided the standard deviations for each aerotriangulated ground point, which were used to compute a predicted horizontal circular error of 0.45 meters based on a 95% confidence level. An AT Report was written and is on file with other project data within the RSD Electronic Data Library. Positional data is referenced to the North American Datum of 1983 (NAD83).

Compilation

Data compilation was accomplished by a member of AB in January 2022. Digital feature data was compiled from the aerotriangulated RGB imagery using the Feature Extraction software module of SOCET SET (ver. 5.6). 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 CT2101-CS-N were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were compiled to meet a horizontal accuracy of 0.9 meters at the 95% confidence level. This predicted accuracy of compiled well-defined points is derived by doubling the circular error calculated from the AT statistics.

The following table provides information on the images used in the project completion:

Date	Time (UTC)	Strip / Images	Tide Level*
26-AUG-2021	13:09 – 13:11	62-001 / 19777 – 19792	0.5 m
26-AUG-2021	13:17 – 13:20	62-002 / 19793 – 19808	0.5 – 0.6 m

* Tide level is given in meters above MLLW and calculated using the Pydro software tool with a TCARI grid referenced to verified water level observations at the time of photography from various NOS gauges in the vicinity of the project. The MHW tidal datum at the NOS gauge in New London is 0.839 meters above MLLW.

Quality Control / Final Review

The final review of the project was completed by senior CMP personnel in January 2022 and included 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 Esri's ArcGIS desktop GIS software (ver. 10.8.1). All project data was evaluated for compliance to CMP requirements.

End Products and Deliverables

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

Remote Sensing Division Electronic Data Library

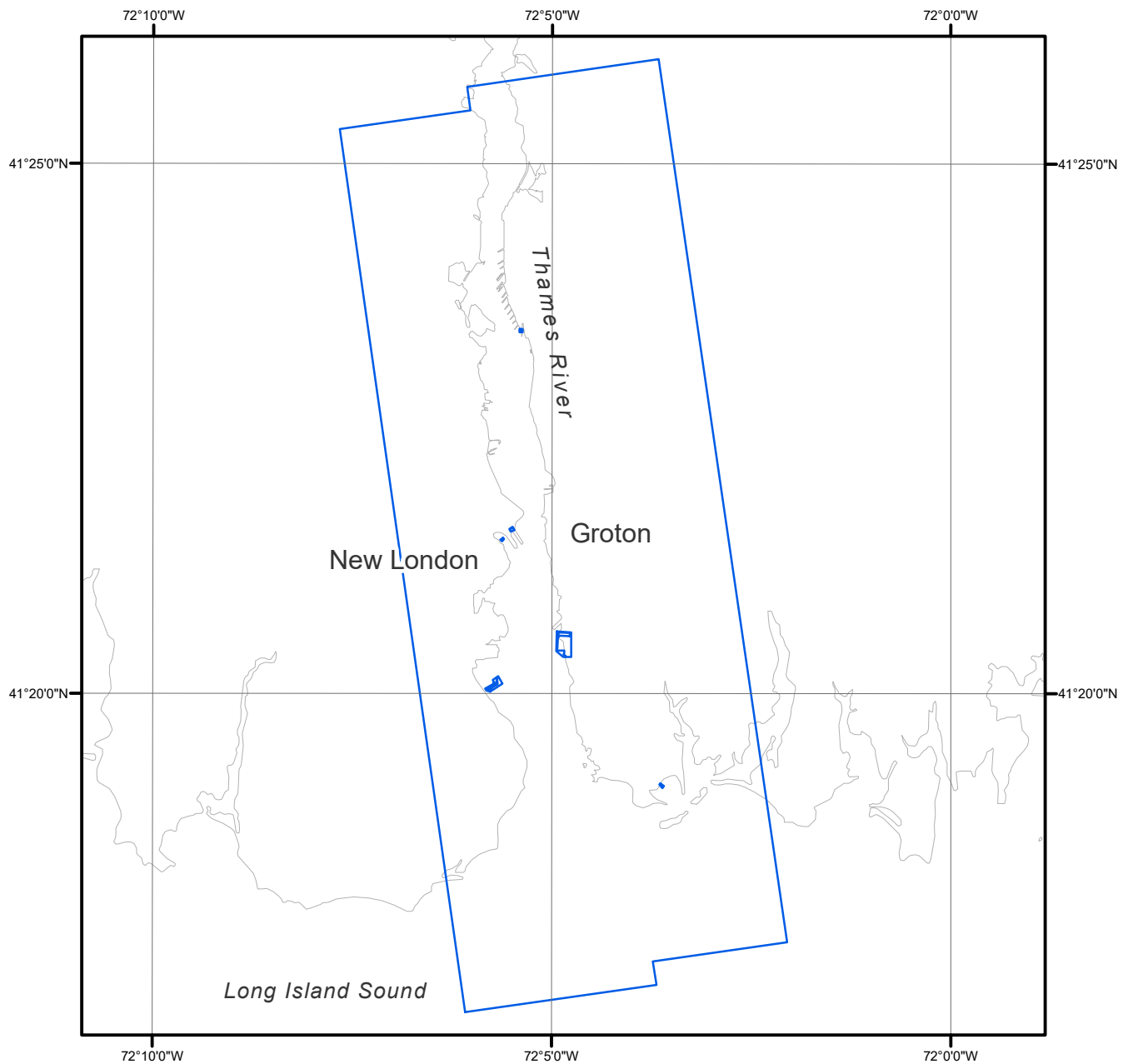
- CSCAP evaluation memorandum
- Airborne Positioning and Orientation Report (APOR)
- Project database
- AT Report
- Project Completion Report (PCR)
- GC11755 in shapefile format
- CEF in shapefile format

NOAA Shoreline Data Explorer

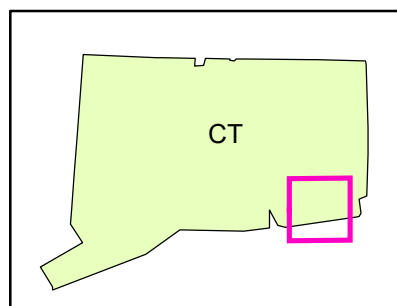
- GC11755 in shapefile format
- Metadata file for GC11755
- PCR in Adobe PDF format

End of Report

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Overview



CT2101-CS-N

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