

NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

PROJECT AK2314F-CM-T

Knight Island Passage, Mummy Island to Point Helen, Alaska

Introduction

NOAA Coastal Mapping Program (CMP) Project AK2314F-CM-T provides accurate digital shoreline data for a portion of Knight Island Passage in western Prince William Sound, from Mummy Island to Point Helen, in Alaska. The Geographic Cell (GC) may be used in support of the NOAA Nautical Charting Program (NCP) as well as geographic information systems (GIS) for coastal zone management applications.

Project Design

Project AK2314F-CM-T was designed in response to a request from the Hydrographic Survey Division (HSD) of NOAA's Office of Coast Survey. 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 six stereo pairs of WorldView commercial satellite imagery acquired in October 2020.

Field Operations

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

Aerotriangulation

Routine softcopy aerotriangulation (AT) methods were applied to provide model parameters and orientation elements required for digital compilation. This work was performed by personnel of the Applications Branch (AB) of the Remote Sensing Division (RSD) in August 2023 utilizing BAE's SOCET GXP (ver. 4.5.1) software on a Windows-based photogrammetric workstation. The Multi-Sensor Triangulation (MST) module of SOCET GXP was used for point measurements and image adjustment. Within MST, the interactive point measurement tool was used to collect tie points and a simultaneous solve adjustment was then performed, computing a predicted horizontal circular error of 2.6 meters at the 95% confidence level. Positional data for this project is referenced to the North American Datum of 1983 (NAD 83). An Aerotriangulation Report was completed and is on file with other project data within the RSD Electronic Data Library.

Each of the stereo models were examined in SOCET GXP to ensure the horizontal and vertical integrity of the MST adjustment, and to verify the suitability of the data for use in the compilation phase. NGS geodetic control points were used to assess horizontal positions within the imagery. All stereo-models were examined and found to have acceptable levels of parallax for mapping purposes.

Compilation

Data compilation for this project was initiated by AB personnel in January 2024. Digital mapping was performed using stereo extraction capabilities within Esri's ArcGIS Pro software (ver. 3.2). 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.

Spatial data accuracies for Project AK2314F-CM-T were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were compiled to meet a horizontal accuracy of 5.2 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 table below provides information on the imagery used to complete this project:

Image Source	Source File IDs (Image Pairs)	Acquisition Date/Time	GSD	Tide Level*
WorldView-3	20OCT30205724-P1BS-507556654030 / 20OCT30205815-P1BS-507556654040	2020-10-30 / 20:57 GMT 2020-10-30 / 20:58 GMT	0.4 m	3.5 m
WorldView-3	20OCT30205726-P1BS-507556654030 / 20OCT30205817-P1BS-507556654040	2020-10-30 / 20:57 GMT 2020-10-30 / 20:58 GMT	0.4 m	3.5 m
WorldView-3	20OCT30205727-P1BS-507556654030 / 20OCT30205818-P1BS-507556654040	2020-10-30 / 20:57 GMT 2020-10-30 / 20:58 GMT	0.4 m	3.5 m
WorldView-1	20OCT30235931-P1BS-507514647060 / 20OCT31000021-P1BS-507514647070	2020-10-30 / 23:59 GMT 2020-10-31 / 00:00 GMT	0.6 m	2.4 m
WorldView-1	20OCT30235932-P1BS-507514647060 / 20OCT31000022-P1BS-507514647070	2020-10-30 / 23:59 GMT 2020-10-31 / 00:00 GMT	0.6 m	2.4 m
WorldView-1	20OCT30235933-P1BS-507514647060 / 20OCT31000023-P1BS-507514647070	2020-10-30 / 23:59 GMT 2020-10-31 / 00:00 GMT	0.6 m	2.4 m

* Tide levels are given in meters above MLLW and were 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 elevation of the MHW tidal datum is approximately 3.3 meters above MLLW.

Quality Control / Final Review

Quality control tasks were conducted during all phases of project completion by a senior member of AB. The final QC review was completed in January 2024. The review process included analysis of AT 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 (ver. 10.8.2) 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 Electronic Navigational Chart (ENC) was used in the comparison process:

- US4AK22M, 19th Ed., Dec. 2023

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

- Project database
- Aerotriangulation Report
- Project Completion Report (PCR)
- GC11953 in shapefile format
- CEF in shapefile format

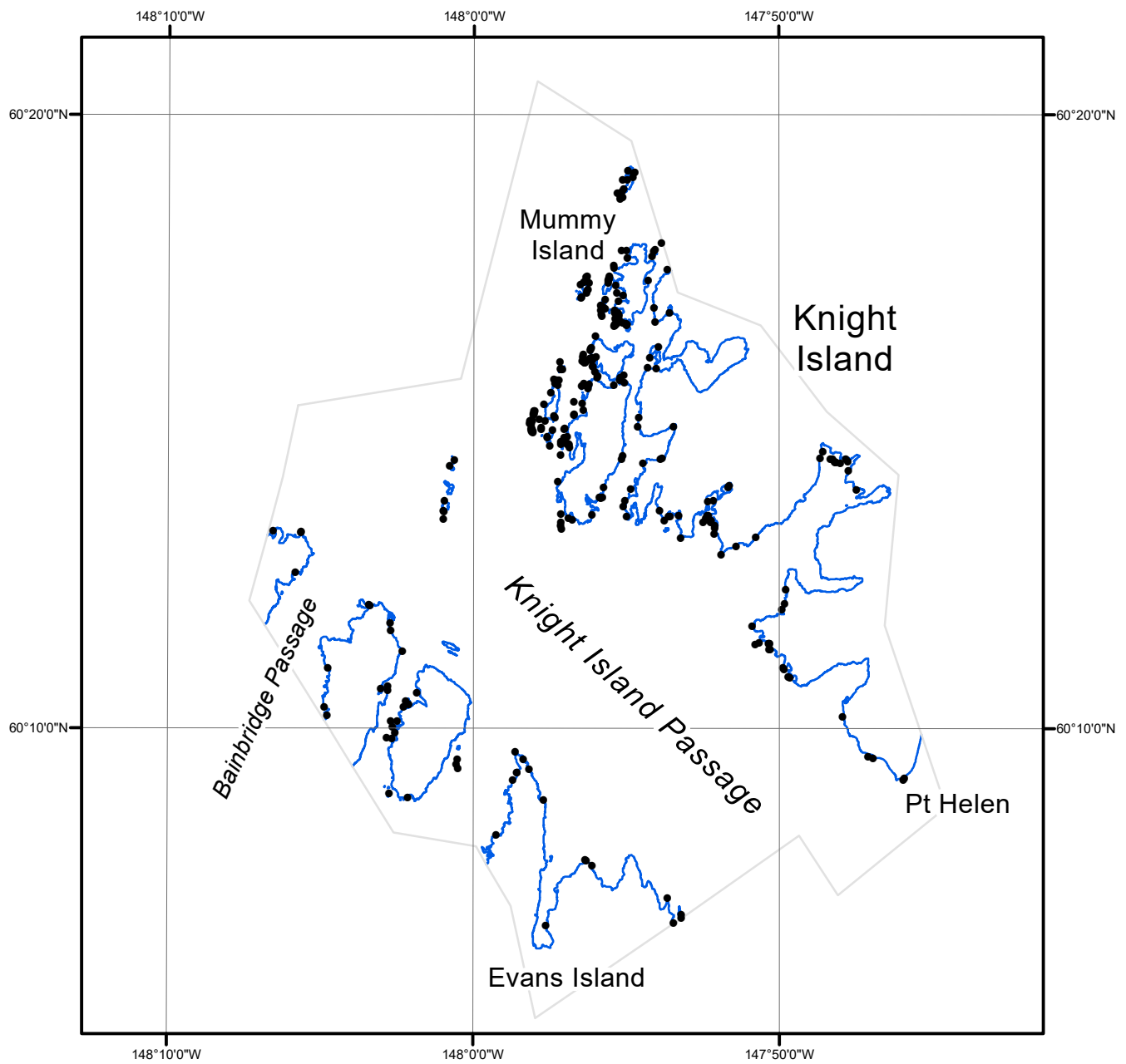
NOAA Shoreline Data Explorer

- GC11953 in shapefile format
- Metadata file for GC11953
- PCR in Adobe PDF format

End of Report

KNIGHT ISLAND PASSAGE, MUMMY ISLAND TO POINT HELEN

ALASKA



Overview



AK2314F-CM-T

GC11953