

NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

PROJECT CM9413A

Northern Tillamook Bay, Oregon

Introduction

Coastal Mapping Program (CMP) Project CM9413A provides a highly accurate database of new digital shoreline data of northern Tillamook Bay, Oregon. Project CM9413A is part of project CM9413 and project OR9901 covering Columbia River to Nescutta Bay. Completion of this project resulted in a densification of the National Spatial Reference System (NSRS), a set of controlled metric quality aerial photographs and a Digital Cartographic Feature File (DCFF) of the coastal zone which compliments the Nautical Charting Program (NCP) 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 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 Requirements Branch (RB) of the Remote Sensing Division (RSD) formulated the photographic mission instructions for this project following the guidelines of the Photo Mission Standard Operating Procedure Version II (7/1/93) and also the GPS Controlled Photogrammetry Field Operations Manual (1/2/96). The instructions discussed the project's purpose, geographic area of coverage, scope and priority; photographic requirements; flight line priority; Global Positioning System (GPS) data collection procedures and guidelines for both kinematic and static surveys; data recording and handling instructions; and contact and communication information.

Field Operations

The photographic mission operations were conducted on two separate dates. Two strips of natural color photographs were used from the operations taken on August 13, 1995 and two strips of black-and-white infrared taken near mean high water on August 8, 1998. The photographs were acquired aboard the NOAA Cessna Citation II at a nominal scale of 1:40,000. The field operations consisted of surveying ground control points, collecting airborne GPS data, and acquiring aerial photographs.

Aerotriangulation

Softcopy aerotriangulation methods were applied to establish the network of precise airborne and ground control for mapping, and to provide model parameters and orientation elements required for digital compilation. The black-and-white infrared photographs were tied to the kinematic GPS controlled aerial color photographs. Third-order geodetic control positions acquired from the National Geodetic Survey's Data Sheets were used as check points to verify the aerotriangulation solution. Based on aerotriangulation statistics, the predicted horizontal circular error for this block is 3.0 meters at the 95% confidence level.

The project database consists of overall project parameters, camera calibration data, interior orientation parameters, airborne GPS antenna positions, adjusted exterior orientation parameters, and a positional listing of all measured points. Positional data is based on the North American Datum 1983, and is referenced to the UTM Coordinate System, Zone 10.

Compilation

The compilation phase of the project was accomplished by the RSD Systems and Quality Assurance Branch in December 2003. Digital mapping and review was accomplished using a Digital Photogrammetric Workstation (DPW) in conjunction with the SocetSet Feature Extraction module. Feature identification and the assignment of cartographic codes were based on image analysis of 1:40,000-scale natural color and black-and-white infrared photographs, information extracted from the appropriate NOAA Nautical Charts, and the US Coast Guard Light List. Cartographic feature attribution was assigned in compliance with the NGS Coastal Cartographic Object Attribute Source Table (C-COAST). Nomenclature was assigned to selected cartographic features to refine general classification.

Cartographic features were compiled to meet a horizontal accuracy of 6.0 meters at the 95% confidence level. This predicted accuracy of compiled, well-defined points is derived by doubling the circular error derived from aerotriangulation statistics.

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

Date	Time (UTC)	Roll Number	Photo Numbers	Scale (nominal)	Water Level (MLLW)
08-13-95	2121	95ACN08	2313-2314	1:40,000	2.15 m
08-13-95	2127	95ACN13	3225-3226	1:40,000	2.16 m
08-08-98	2118	98AR05	3172-3173	1:40,000	2.10 m
08-08-98	2128	98AR05	3176-3178	1:40,000	2.08 m

Reference Station Crescent City (9419750), Pacific Ocean, CA, MHW 1.90 m
Tillamook Bay, Garibaldi Corrections Applied: Times: High +1 hr. 14 min., Heights: High *1.13

Final Review

The final review was initiated by RSD in January 2004. The Digital Cartographic Feature File was evaluated for completeness and accuracy. Online data review consisted of reviewing stereo models on a DPW for cartographic feature codes selection, positional accuracies of features, and nomenclature. The cartographic feature attribution was judged to conform to NGS's C-COAST specification. An offline evaluation compared hard copy plots of the project data with the largest scale nautical charts available. A copy of NOAA nautical chart 18558 Tillamook Bay, Oregon, 1:20,000, 37th edition (Feb./02) and chart 18520 Yaquina Head to Columbia River, Oregon-Washington, 1:185,238, 24th edition (Apr./98) were used for the chart comparison process.

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

- Page size graphic plot of DCFF contents
- Hard copy of the Project Completion Report

RSD Electronic Data Library:

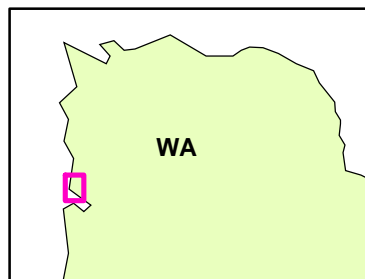
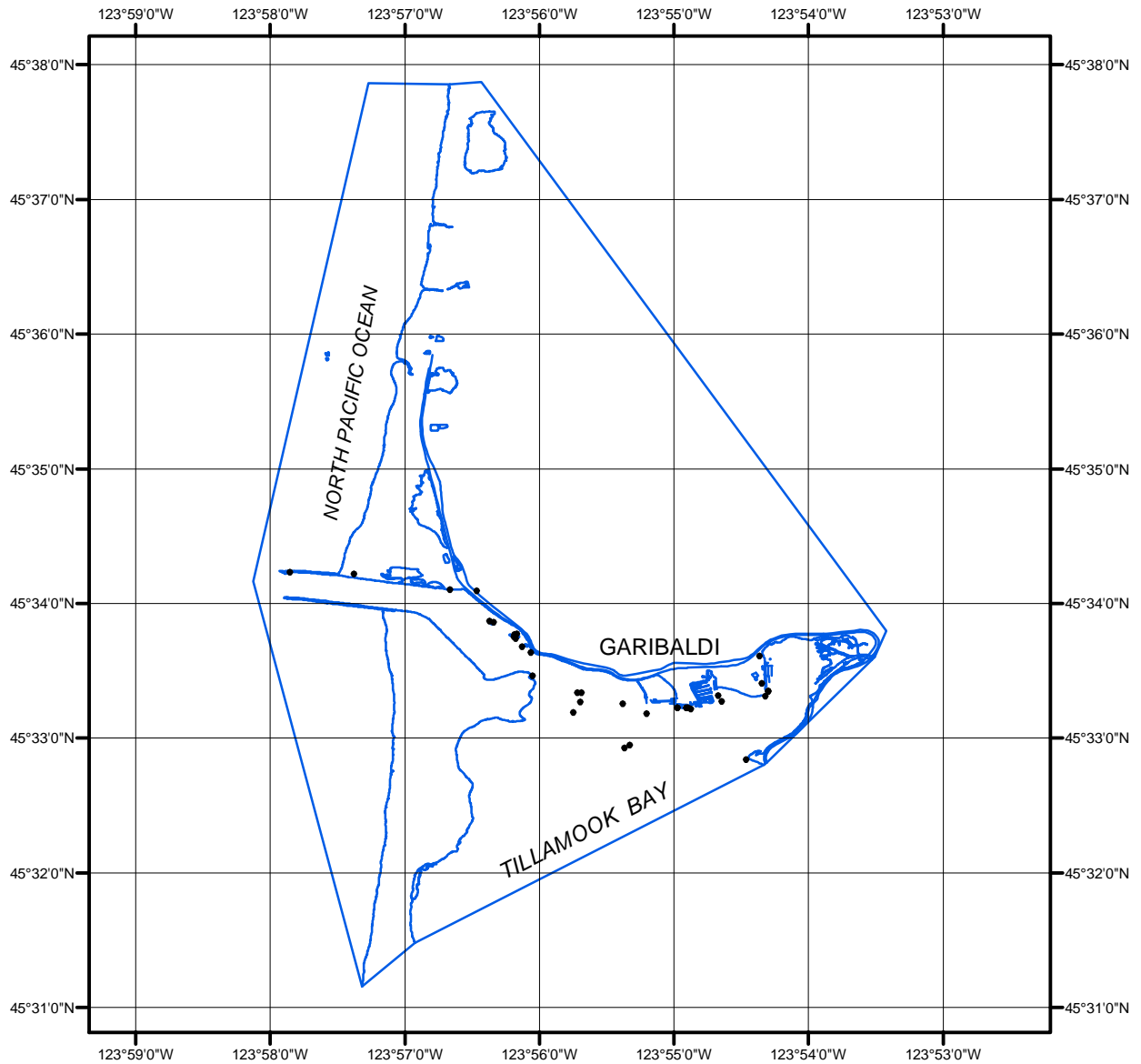
- Project Database
- DCFF: GC10555
- Digital copy of DCFF in ESRI Shapefile format
- Digital Copy of Project Completion Report (PCR)

NOAA Shoreline Data Explorer

- Feature Database for GC10555 in ESRI Shapefile format
- Metadata file for GC10555
- Digital copy of the PCR in Adobe Acrobat PDF format

End of Report

NORTHERN TILLAMOOK BAY, OREGON



CM9413A

GC10555