NOAA COASTAL MAPPING PROGRAM
PROJECT COMPLETION REPORT

PROJECT AK0709

Port of Ketchikan, Alaska

Introduction

Coastal Mapping Program (CMP) Project AK0709 provides highly accurate digital shoreline data for key areas of change in the port of Ketchikan, Alaska, and vicinity. 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 AK0709 was accomplished by the Requirements Branch (RB) of the Remote Sensing Division (RSD) in response to the need for timely updates to the NOAA Electronic Navigational Chart (ENC) series. 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 satellite 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 complete. Refer to the RB Memorandum of June 12th, 2007, "Results of CSCAP Change Analysis for Ketchikan, Alaska (AK0709)," for details of the chart comparison process.

Field Operations

Routine CMP field operations did not apply for this project based on the origin of the project source data. Previously aerotriangulated imagery from CMP project AK9702A was imported into Socet Set v. 5.4.1 and used as the source data for the control.

Georeferencing

One QuickBird basic satellite image with a spatial resolution of approximately 0.6 meter, purchased from DigitalGlobe, was georeferenced using Erdas IMAGINE 9.2 software on a Windows platform. Ground control points (GCP's), measured from CMP Project AK9702A were imported into IMAGINE and used to georeference the satellite image. The Raster Geometric Correction tool within IMAGINE was used with a 1st order polynomial model. The imagery was resampled using the Nearest Neighbor sampling method. The RMS of the residuals for measured check points was used to compute a horizontal circular error at the 95% confidence interval (CE95) of 1.4 meters for the satellite image. This CE value was then tripled and then added to the CE95 of the source imagery from which ground control points were extracted, in order to conservatively predict the accuracy of well-defined points measured during the compilation process. A Georeferencing Report was written and is on file with other project data within the RSD

Project Archive. Positional data is based on the Universal Transverse Mercator coordinate system (Zone 9), and referenced to the North American Datum of 1983.

Compilation

The data compilation phase of this project was accomplished by RSD in December 2008. Digital feature data was compiled in ESRI shapefile format from the satellite image using ESRI's ArcGIS 9.2 desktop GIS software. 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 AK0709 were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were tested to have a horizontal accuracy of 5.8 meters at the 95% confidence level. This predicted accuracy of well-defined points is based on a minimum of twenty (20) check points that were compared to an independent source of higher accuracy.

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

Image Source	Source ID	Acquisition Date/Time	Tide Level*
Quickbird	06JUN13200709-S2AS-05602774020_01_P001	2006-06-13 20:07 GMT	1.9 m

* Tide levels are given in meters above MLLW and are based on actual observations recorded by the NOS gauge (Station 9450460) at the time of photography. The elevation of the MHW tidal datum at the Ketchikan, AK reference tide gauge is equal to 4.4 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 April 2009. The review process included analysis of the georeferencing 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 9.2. The entire suite of project products 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:

RSD Applications Branch Archive

- Hardcopy of the Georeferencing Report
- Hardcopy of the Project Completion Report (PCR)
- Page size graphic plot of GC10749 file contents, attached to PCR
- Hardcopy of the CSCAP evaluation memorandum

Remote Sensing Division Electronic Data Library

- GC10749 in shapefile format
- Digital copy of the PCR in Adobe PDF format
- CEF in shapefile format

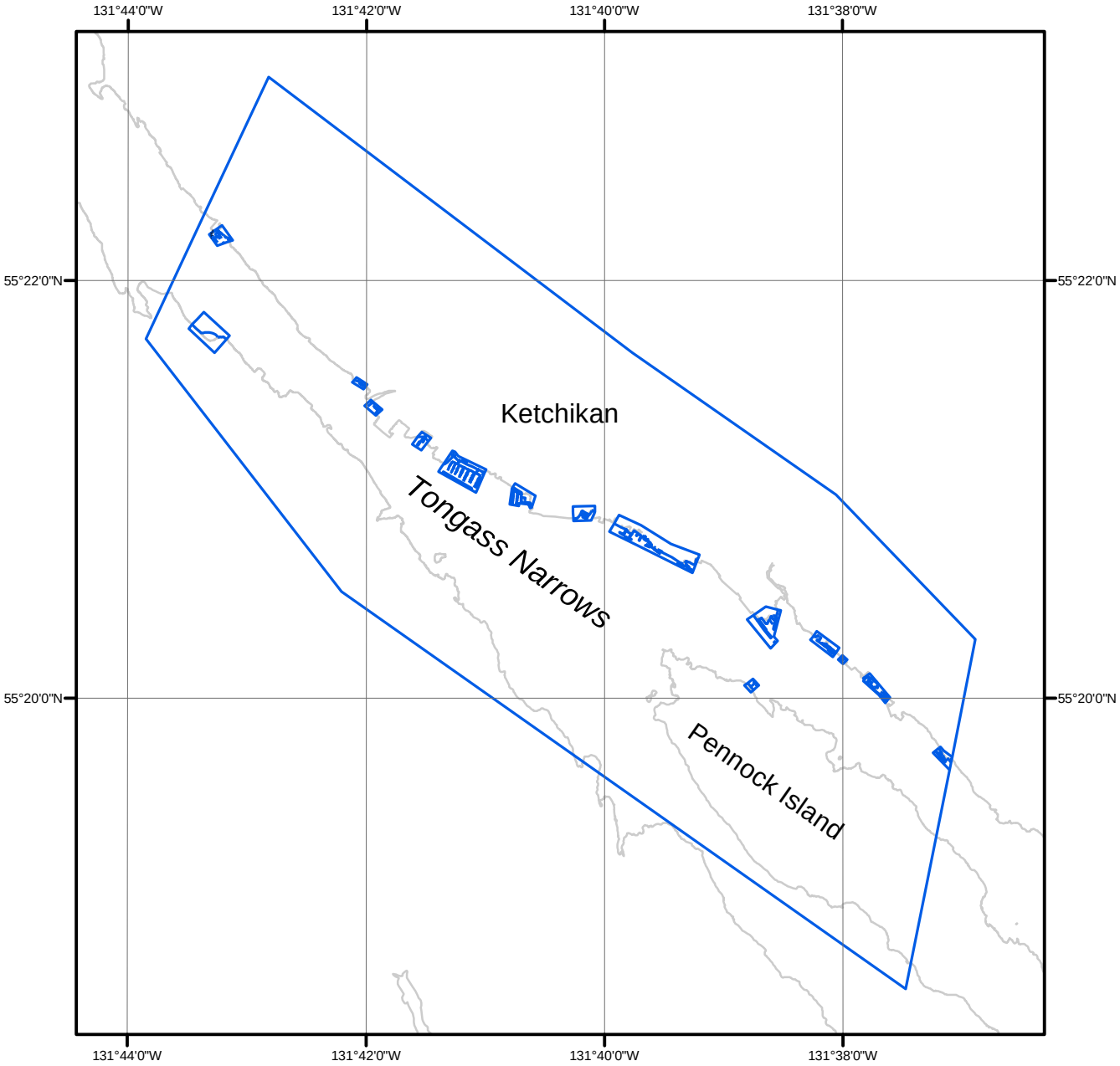
NOAA Shoreline Data Explorer

- GC10749 in shapefile format
- Metadata file for GC10749
- Digital copy of the PCR in Adobe PDF format

End of Report

PORT OF KETCHIKAN

ALASKA



Overview

AK0709

GC10749