

# **NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT**

## ***PROJECT AK0802***

### ***Icy Bay, Alaska***

#### **Introduction**

NOAA Coastal Mapping Program (CMP) Project AK0802 provides digital shoreline data for Icy Bay, Alaska north of 60° latitude. The project extends through the northern portion of Icy Bay and includes both Tsaa Fiord and Taan Fiord. The Geographic Cell (GC) may be used to compliment the Nautical Charting Program (NCP) as well as geographic information systems (GIS) for a variety of coastal zone management applications.

#### **Project Design**

Project AK0802 was designed per a request from the Hydrographic Surveys Division (HSD) of the Office of Coast Survey, NOAA, for GIS data in support of HSD operations. 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. The project source data was acquired from DigitalGlobe, Inc. and includes twelve (12) QuickBird ortho-rectified images, collected in August 2004 and October 2004, with a pixel resolution of 0.6 meters.

#### **Field Operations**

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

#### **Georeferencing**

The horizontal accuracy reported by the vendor for this imagery is 15.4 meters RMSE. For reporting purposes this accuracy was converted to the 95% confidence level ( $CE95 = 1.7308 * 15.4 = 27$  meters) according to the methodology described by the FGDC National Standard for Spatial Data Accuracy.

During data processing it was discovered that portions of some of the satellite images were not as accurate as the vendor reported. Comparisons to previously acquired IFSAR imagery (from July 2000) of a known higher accuracy revealed significant differences in the horizontal positioning of the QuickBird imagery in some areas. The magnitude of these discrepancies was estimated to vary between 30 meters and 150 meters.

To compensate for these positioning errors, five of the images were shifted using the Georeferencing tool in ArcGIS with a first order polynomial (affine) transformation. Several points in each satellite image were tied to corresponding points in the IFSAR

imagery for use as control for the adjustment. After this adjustment, the horizontal positioning of the images throughout the project agreed very well with the older IFSAR.

## **Compilation**

The data compilation phase of this project was initiated by RSD in February 2008. Digital feature data was compiled in ESRI shapefile format from the satellite imagery using ESRI's ArcGIS 9.1 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 cartographic features were further modified with additional descriptive information to refine general classification.

Cartographic features were compiled to meet a horizontal accuracy of 27 meters at the 95% confidence level. This value is based on the reported accuracy of the imagery as provided by the vendor, DigitalGlobe Inc.

Verified tide level data was obtained from the NOS reference tide station at Sitka, Alaska, and corrections were applied to the Tyndall Glacier, Icy Bay substation. The tide level in the project area for all source imagery was determined to be 1.4 meters above MLLW. The elevation of the MHW datum in Icy Bay is about 2.7 meters, thus the water level was about mid-tide at the time the source imagery for the project was acquired.

## **Quality Control / Final Review**

Quality control tasks were conducted during all phases of project completion by a senior member of the Applications Branch of RSD. The final QC review was completed in April 2008. The review process included an 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 9.1 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 nautical chart was used in the comparison process:

16741, Icy Bay, AK, 1:40,000 scale, 11th ed., May 2005

## **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 Project Completion Report (PCR)
- Page size graphic plot of GC10698 file contents, attached to PCR

### **Remote Sensing Division Electronic Data Library**

- Project database
- GC10698 in shapefile format

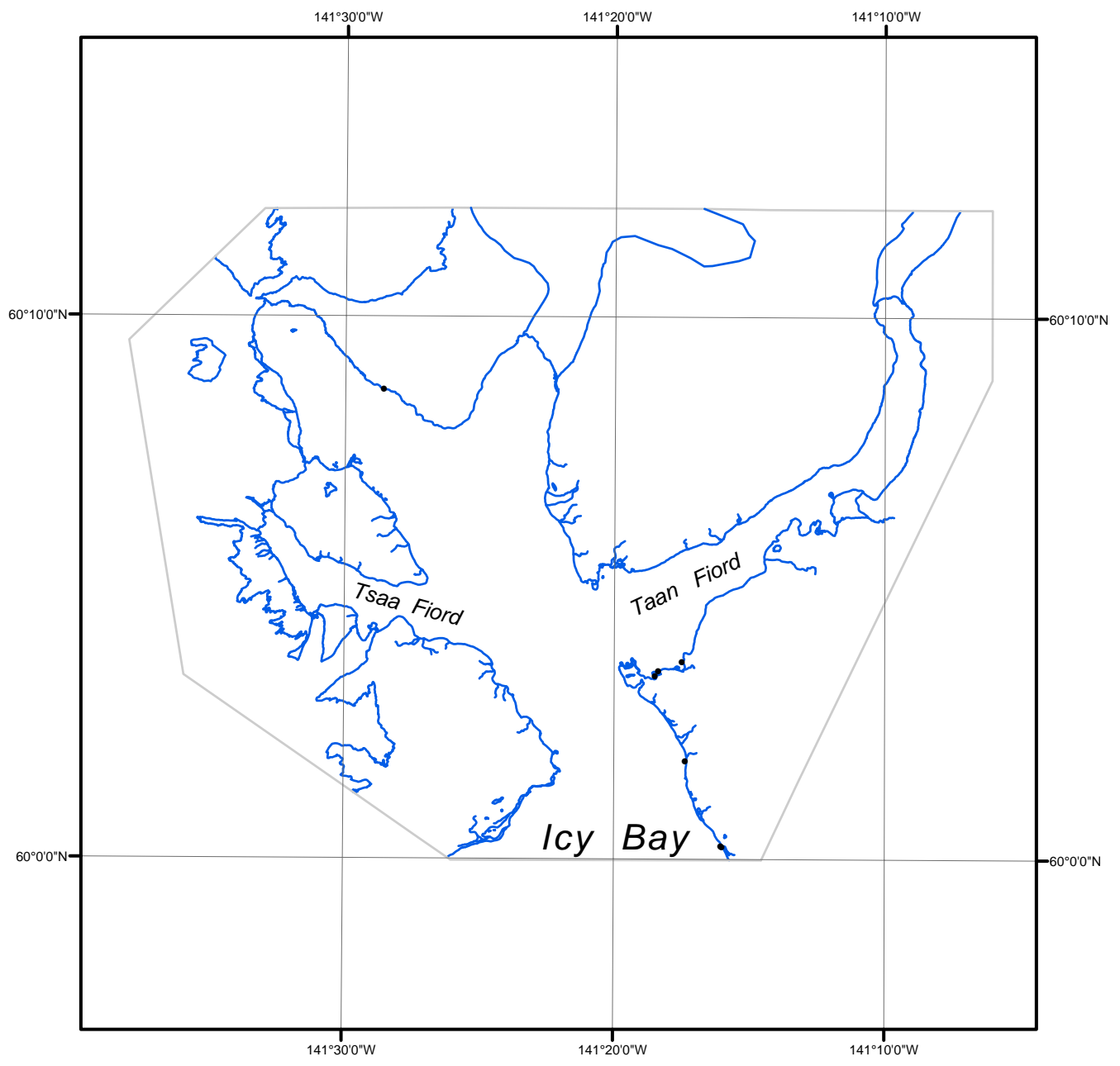
- Digital copy of the PCR in Adobe PDF format
- CEF in shapefile format

#### **NOAA Shoreline Data Explorer**

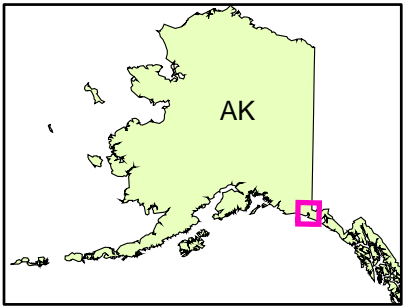
- GC10698 in shapefile format
- Metadata file for GC10698
- Digital copy of the PCR in Adobe PDF format

**End of Report**

ICY BAY  
ALASKA



Overview



AK0802

GC10698