

NOAA COASTAL MAPPING PROGRAM PROJECT COMPLETION REPORT

PROJECT MD0901

Northern Chesapeake Bay, Concord Point to Galloway Point, Maryland

Introduction

NOAA Coastal Mapping Program (CMP) Project MD0901 provides a highly accurate database of new digital shoreline data for a portion of the northern Chesapeake Bay from Concord Point to Galloway Point in the vicinity of Aberdeen Proving Ground Military Installation. 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

CMP Project MD0901 was designed to provide coverage of Aberdeen Proving Ground Military Installation and the surrounding coastal area. Standard aerial acquisition was not possible in this project location due to the stringent restrictions of the military base. CMP Project MD0501 adjoins CMP Project MD0901 to the northeast, northwest, and west.

Field Operations

Routine CMP field operations did not apply for this project based on the origin of the project source data. Existing sources of horizontal control were used for the georeferencing process.

Georeferencing

Project imagery consisted of nine Quickbird standard satellite images with a spatial resolution of 0.6 meters, purchased from DigitalGlobe, Inc. Four mosaics were created using Erdas IMAGINE 9.3 image processing software, consisting of two satellite images each, in addition to a single satellite image.

The mosaicked imagery was also georeferenced using Erdas IMAGINE 9.3 software. Ground control points (GCPs), which were photogrammetrically measured from metric quality aerial photography, were imported into IMAGINE and used to georeference the satellite image and mosaics. Within IMAGINE, the Raster Geometric Correction tool was used with a 1st order polynomial model. Imagery was resampled using the Nearest Neighbor sampling method. The RMS of the residuals for measured check points were used to compute a predicted horizontal circular error at the 95% confidence interval (CE95) of 0.73 meters for mosaic 1; 0.99 meters for mosaic 2; 0.91 meters for mosaic 3; 0.96 meters for mosaic 4; and 0.83 meters for the single satellite image. These CE values were 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. Positional data is referenced to the North American Datum of 1983 (NAD 83).

Compilation

The data compilation phase of this project was initiated by RSD in March 2009. Digital feature data was compiled in ESRI shapefile format from the satellite imagery using ESRI's ArcGIS 9.3 desktop GIS software. Feature attributes were established using 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 MD0901 were determined according to standard Federal Geographic Data Committee (FGDC) practices. Cartographic features were tested to have horizontal accuracies at the 95% confidence level as listed per mosaic in Table 1, along with other information on the satellite images used in the project completion. These predicted accuracies of well-defined points are based on a minimum of twenty (20) check points per image or mosaic that were compared to an independent source of higher accuracy.

Table 1 - Image Sources

Mosaic #	Image Source	Satellite Image Names	Horizontal Accuracy	Acquisition Date/Time	Tide Level*
1	Quickbird	06FEB16161242-S2AS_R1C4-005514060010_01_P002.tif 06FEB16161242-S2AS_R2C4-005514060010_01_P002.tif	4.0 meters	2006-02-16 16:12 GMT	0.1
2	Quickbird	06FEB16161242-S2AS_R2C3-005514060010_01_P002.tif 06FEB16161242-S2AS_R1C3-005514060010_01_P002.tif	4.8 meters	2006-02-16 16:12 GMT	0.2
3	Quickbird	06FEB16161242-S2AS_R1C2-005514060010_01_P002.tif 06FEB16161242-S2AS_R2C2-005514060010_01_P002.tif	4.5 meters	2006-02-16 16:12 GMT	0.3
4	Quickbird	06FEB16161242-S2AS_R2C1-005514060010_01_P002.tif 06FEB16161242-S2AS_R3C1-005514060010_01_P002.tif	4.7 meters	2006-02-16 16:12 GMT	0.3
n/a	Quickbird	06FEB16161242-S2AS_R3C2-005514060010_01_P002.tif	4.3 meters	2006-02-16 16:12 GMT	0.2

* Tide levels are given in meters above MLLW at various substations throughout the project area with corrections applied from the Baltimore, MD reference station at the time of photography. The approximate tide range within the project area is 0.4 meters.

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 June 2010. 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 9.3. The entire suite of project products was evaluated for compliance to CMP requirements.

Comparisons of the largest scale NOAA nautical charts the satellite imagery and compiled project data resulted in creation of the Chart Evaluation File (CEF). The following nautical charts were used in the comparison process:

- 12274, Head of Chesapeake Bay, MD, 1:40,000 scale, 35th Edition
- 12278, Chesapeake Bay Approaches to Baltimore Harbor, 1:40,000 scale, 76th Ed.
- 12280, Chesapeake Bay, 1:200,000 scale, 8th Edition

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 GC10762 file contents, attached to PCR

Remote Sensing Division Electronic Data Library

- Project database
- GC10762 in shapefile format
- Digital copy of the PCR in Adobe PDF format
- CEF in shapefile format

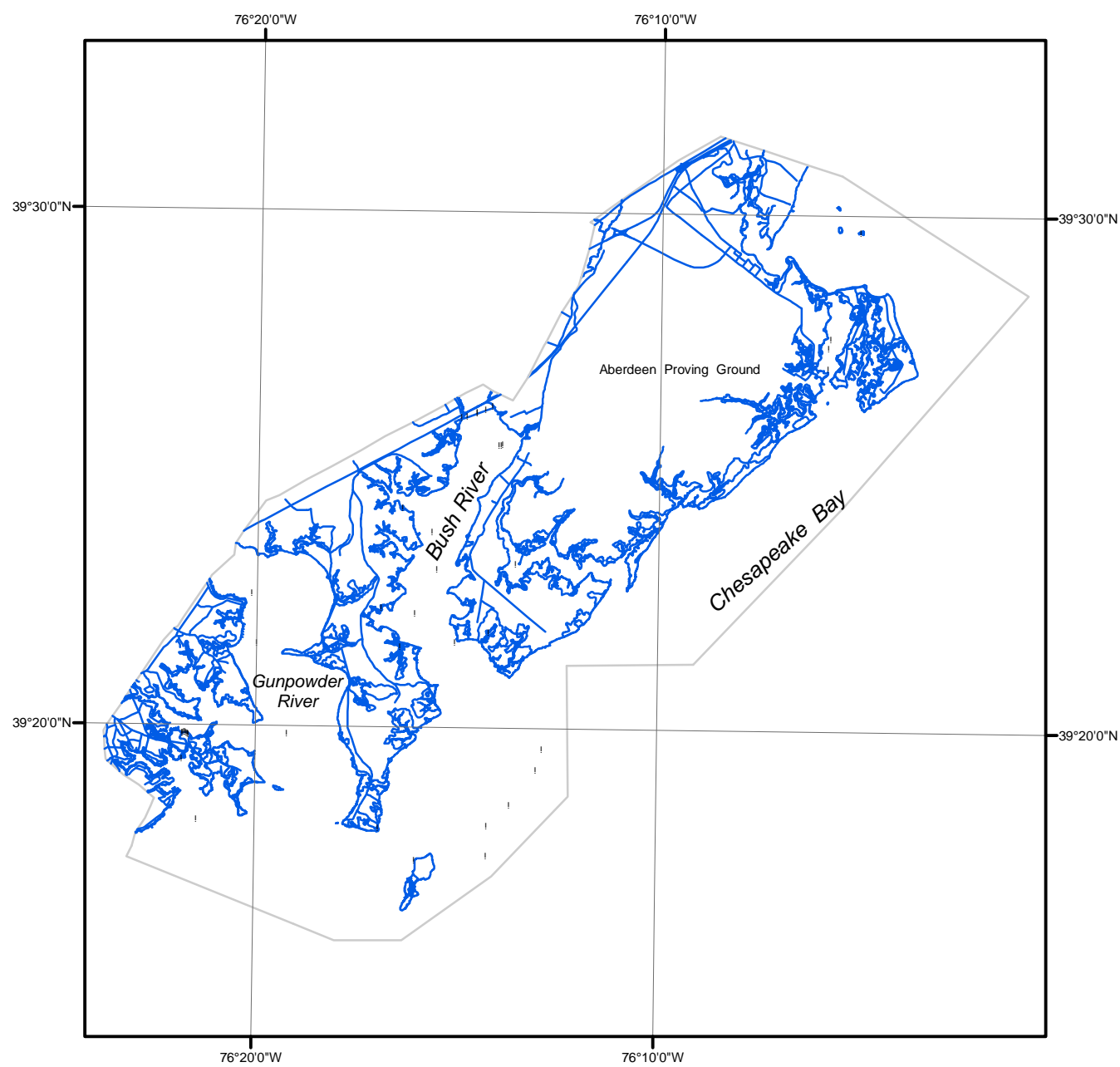
NOAA Shoreline Data Explorer

- GC10762 in shapefile format
- Metadata file for GC10762
- Digital copy of the PCR in Adobe PDF format

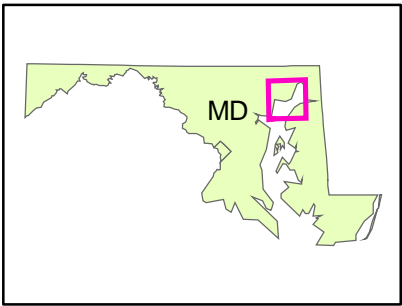
End of Report

NORTHERN CHESAPEAKE BAY, CONCORD PT TO GALLOWAY PT

MARYLAND



Overview



MD0901

GC10762