

North End Restoration Project Annual Report: 2008
Courtney Schupp, Assateague Island National Seashore
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Overview

The North End Restoration Project is a comprehensive restoration plan that focuses on restoring Assateague Island to as natural a condition as possible, mitigating the sediment starvation of Assateague Island caused by the 1934 stabilization of the Ocean City Inlet. Project partners are the U.S. Army Corps of Engineers (USACE), Assateague Island National Seashore (ASIS), the state of Maryland, Maryland Department of Natural Resources, Worcester County Maryland, and the Town of Ocean City Maryland.

The project has two phases. The first, or “short-term,” phase of the restoration program was designed to provide a one-time infusion of sand to replace a portion of the sediment lost over the past 60 years due to the effects of the jetties; that phase was completed in 2003. The second phase, the “long-term sand management” component, began in January 2004 and addresses the ongoing and future effects of the jetties by re-establishing a “natural” sediment supply for northern Assateague that reflects historic, pre-inlet rates.

This report documents the efforts made in 2008 to evaluate and restore the island’s North End as part of the long-term sand management phase of the project. The report does not serve as a synthesis of project performance to date, but rather lists the major events, collected datasets, and documents created in 2008 and related to the North End Restoration project.

Team Meetings

A small-group meeting of NPS and USACE employees was held at USACE-Baltimore Headquarters on January 24, 2008, to plan the transition of the project to new managers upon the imminent retirement of Greg Bass, USACE Project Manager. New points of contact were established for information on dredging locations and volumes (Bob Blama), sediment grain size analysis (Jim Snyder), and overall or general project questions (Mary Dan, Project Manager, and Dennis Seibel, former supervisor of Greg Bass). Other topics discussed included multibeam survey delays due to weather; potential changes in sand placement location; dredge schedule; development of the Corps E-Coastal Geodatabase; and status of fall 2007 grain size analysis. Pending projects with OCTI are for modeling wave climate to determine the nodal point; updating the sediment budget; and assembling weather data. Also discussed at the meeting, and resolved in the following week, was to extend the existing multibeam survey scope of work to cover the nearshore area along the 13-km North End.

The Team met on March 12, 2008 to share information on total bypassing and backpassing volumes during the fall 2007 dredging cycle, March 2008 bathymetry of the ebb tidal delta, nearshore profile changes along the North End since sand bypassing began, a proposal to create multiple flow paths in the constructed berm, breaching model calculations, status of vegetation monitoring, and prediction of bathymetric changes related to south jetty tightening and to a new Route 50 bridge. The Team also chose borrow sites for the upcoming dredging cycle.

The Team meeting initially scheduled for October 2008 was postponed due to a number of scheduling conflicts among Team members. Because dredging activities were scheduled to begin in October, a conference call among available Team members was held October 1, 2008, to determine the locations for dredging and placement. Greg Bass created a presentation for discussion among Team members. The call participants concluded that because material was available in the Inlet, Borrow Area A, and Borrow Area C (primary for this bypassing), those areas would be dredged, and that borrow Area B would not be used for the fall bypassing effort. They also concluded that in the event that Borrow Area C was exhausted, then the expanded area of Borrow Area C2 would be used. (Information excerpted from an e-mail from Nate West, USACE-Baltimore, 10/6/08.)

The Team met on November 6, 2008 to share information on the total bypassing and backpassing volumes during the spring 2008 dredging cycle, the ongoing fall 2008 bypassing, an updated version of the ERDC breaching model, the in-progress modification of the constructed berm, updates on Threatened and Endangered Species activities, and to review FY09 activities and opportunities for cost savings. The North End Archive DVD (covering the time period 1994 through August 2008) was approved for distribution among team members. DVDs were mailed to requesting Team members in November.

Dredging

Bathymetry of the tidal deltas and inlet was surveyed between January and March 2008, and nearshore bathymetry of the northern 13 km of Assateague Island was surveyed in May 2008. This bathymetry survey followed the January 2008 decision to expand the survey area and decrease the frequency of surveys in order to capture a fuller picture of the nearshore system.

Two rounds of dredging delivered an estimated total of 88,902 m³ to ASIS in 2008. Details of the dredging dates, along with volume sources and destinations, can be found in Table 1.

Pre-Dredging Survey	Dredging	EDD Shoal Area A (cubic meters)	EDD Shoal Area B (cubic meters)	EDD Shoal Area C (cubic meters)	Flood Shoal (cubic meters)	Flood Shoal (cubic meters)	Inlet Throat (cubic meters)	Other (cubic meters)	Total (cubic meters)	To ASIS	To OC	Post-Dredging Survey
1/16/08 thru 3/2/08	4/1/08 to 5/14/08	3066	8043	21698	596	5921	4121		44822	40885	2561	None
	10/5/08 to 11/14/08	2133	1460	26515	1888	11262	822		44080	44080	0	None

Table 1. Dates of bathymetry surveys and dredging, and sources and destinations of dredged volumes.

Constructed Berm Alteration

As approved during the March 2008 Team meeting, seven new flowpaths were created across the constructed berm in October and November 2008 to replicate the natural topography evident elsewhere on the north end. A 1% slope extended from the natural berm westward 300 feet; a shallower slope then connected that point westward to the easternmost edge of the vegetation. Methods and locations are documented by Schupp (2008). In the southernmost flowpath, sand was initially piled on the back side of the berm, raising the island elevation in that location. The majority of sand from the other six flowpaths was pushed seaward of the high water line.

Pre-construction elevation surveys were completed on October 21, 2008, using ATV-mounted RTK-GPS, and extended from the ocean water westward into the high marsh to cover the anticipated paths of future overwash sand deposition. Alterations were completed between October 28 and November 21, 2008. Post-construction elevation surveys were completed by November 21, 2008.

Constructed Berm Behavior

During the northeaster on May 11-12, 2008, when recorded wave heights were 4.5 feet above MLLW, the berm experienced overwash across the two large pathways that were created in early 2007, and in two of the small notches created in 2005. The post-overwash elevations were surveyed in these four locations on May 15, 2008. Some photographs were also taken to document the several inches of sand that were deposited on top of vegetation behind the berm, and the one small area (8 inches wide by 3 feet long) where the overwash scoured into the sand deep enough to uproot a small amount of vegetation.

In late September 2008, significant overwash crossed the island in many locations, necessitating a weeklong closure of both the OSV zone and the beach parking lot in Virginia. However, no portion of the constructed berm experienced overwash during this time period.

The berm experienced some overwash in the middle of the October-November berm alteration efforts. Two of the flowpaths had been created, and one more started, before November 5, 2008; those three areas all experienced overwash during a period of high tides and wind on November 6, 2008. An elevation survey of the three areas was done before construction, immediately after construction (by November 5), and following the overwash event, thereby documenting the volume changes due to construction and those due to overwash. One new flowpath overwashed just before December 1, and four new flowpaths overwashed just before December 15, 2008.

Vegetation Manipulation

Several infestations of alien plants in the area of the constructed berm were monitored and treated. Treated species included *Carex kobomugi*, *Miscanthus sinensis*, and *Artemisia stelleriana*. For details on locations and species, refer to Chase et al. (2008).

Assateague State Park Modifications

The seaward side of the maintained dune, and the associated dune fencing, were damaged in the northeaster on May 12, 2008.

Datasets

Many spatial datasets were collected in conjunction with the North End Restoration Project, and most are available on the NPS Data Store <http://science.nature.nps.gov/nrddata/>. This year's activities resulted in the following relevant datasets:

- Post-overwash elevation surveys of two pathways in berm that overwashed May 12, 2008
- Pre-construction elevation surveys of proposed locations for 14 new flowpaths through constructed berm, November 2008
- Post-construction elevation surveys of 7 new flowpaths, November 2008
- Post-overwash elevation surveys of 2 new flowpaths, November 10, 2008
- Post-overwash elevation surveys of 1 new flowpath, December 1, 2008
- Post-overwash elevation surveys of 2 new flowpaths, December 15, 2008
- Sediment Bypassing borrow and placement locations, Spring 2008 (points shapefile)
- Sediment bypassing borrow and placement locations, Fall 2008 (points shapefile)
- Sediment bypassing sample grain sizes, Spring 2008
- Sediment bypassing sample grain sizes, Fall 2008
- Nearshore bathymetry profiles, November 2008
- Nearshore bathymetry including entire tidal delta and inlet, March 2008
- Topographic profiles, April 2008 (points shapefile)
- Topographic profiles, October 2008 (points shapefile)
- High water shoreline position, February 2008 (points and line shapefiles)
- High water shoreline position, May 2008 (points and line shapefiles)
- High water shoreline position, July 2008 (points and line shapefiles)
- High water shoreline position, October 2008 (points and line shapefiles)
- Wave data as measured at the USACE Off-Shore Wave Gauge
- Weather data from the ASIS Remote Automatic Weather Station
- Environmental and weather data from the NOAA Offshore Buoy 44009
- Tide data from NOAA Tide gauges at Ocean City Inlet and Lewes, DE
- Piping plover nest locations and reproductive success
- Delineation of vegetation types (related to piping plover mobility)
- Seabeach Amaranth locations

Documentation and Data Synthesis

Documentation and data synthesis of the North End Restoration efforts have taken several forms:

- Pearl, T. and Kumer, J. *2008 Piping Plover Annual Report*. NPS Internal Report.
- Sherry, E. *2008 Meteorological Monitoring Program Annual Report*. NPS Internal Report.
- Sturm, M. January 2008. *Assateague Island National Seashore Low Salt Marsh Monitoring Report*. NPS Internal Report.
- Chase, J., Ryder, M., and Sturm, M. 2008. *Assateague Island National Seashore Alien Plant Management Program 2008 Report*. NPS Internal Report.
- Schupp, C. March 10, 2008. *Proposal to Create Flow Paths through the Constructed Berm at Assateague Island National Seashore*. (Distributed via e-mail to North End Restoration Team members.)
- Schupp, C. June 18, 2008. *Summary and Illustration of Proposal to Create Flow Paths through the Constructed Berm*. (Distributed to NPS maintenance staff in preparation for alterations.)