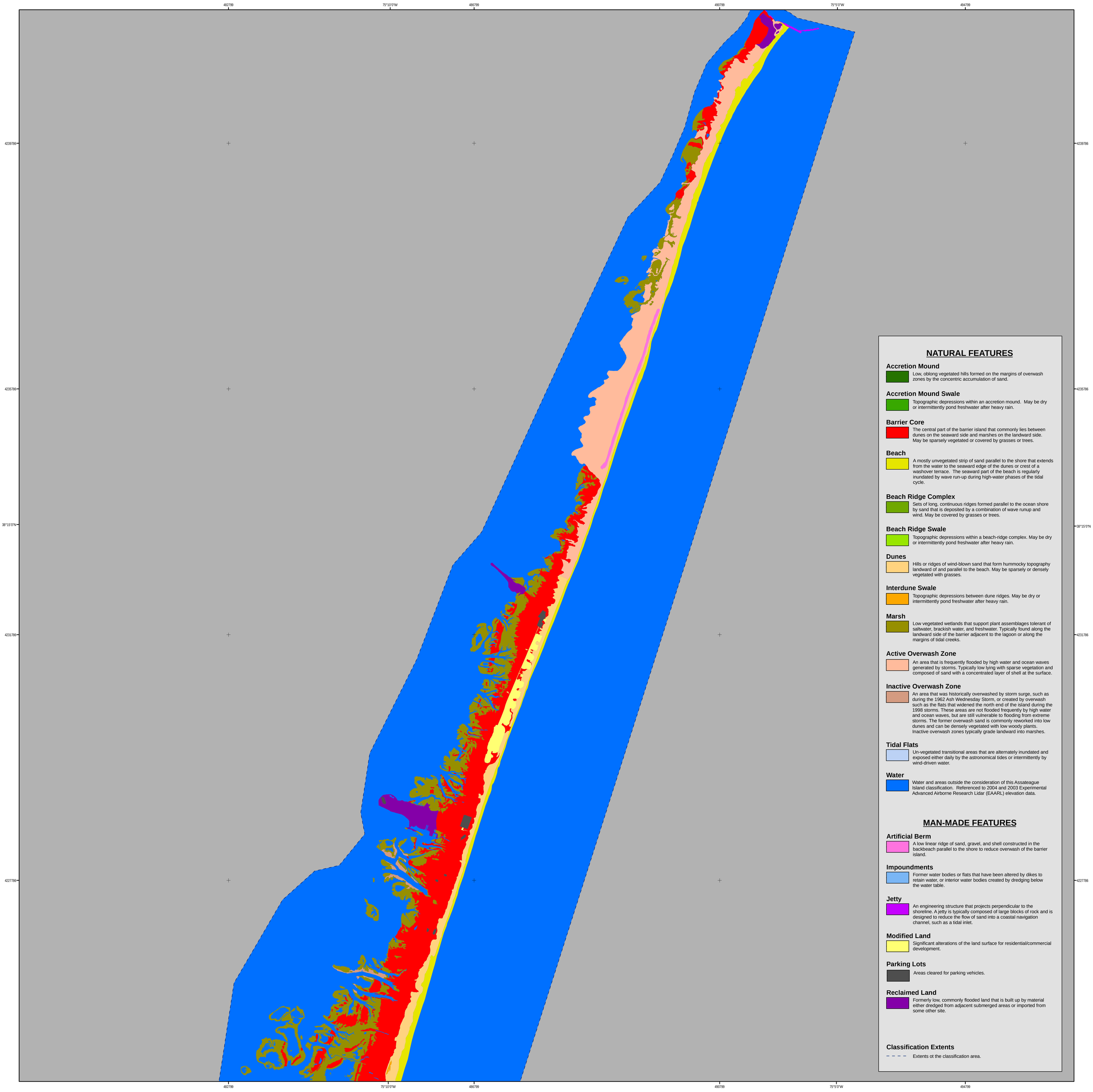
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

OPEN FILE REPORT 2007-1388
TILE 1 OF 3

Morton, R. A., Bracone, J. E., Cooke, B., 2007,
Geomorphology and Depositional Sub-Environments of Assateague Island MD/VA,
U. S. Geological Survey Open File Report 2007-1388 (On DVD).



Universal Transverse Mercator Projection. 1983 North American Datum-Zone 17 North
This map is not intended for use in navigation.

SCALE: 1:21,552

1 0.5 0 1 2 3 MILES
1 0.5 0 1 2 3 KILOMETERS

Geomorphology and Depositional Sub-Environments of Assateague Island Maryland, Virginia

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2007

Project Description
The U.S. Geological Survey is studying coastal hazards and coastal change to improve our understanding of coastal ecosystems and to develop better capabilities of predicting future coastal change. One approach to understanding the dynamics of coastal systems is to monitor changes in barrier-island sub-environments through time. This involves examining morphological and topographic change at time scales ranging from millennia to years and space scales ranging from tens of kilometers to meters. Of particular interest are the processes that produce those changes and determining whether or not those processes are likely to persist into the future. In these analyses of hazards and change, both natural and anthropogenic influences are considered. Quantifying past magnitudes and rates of coastal change and knowing the principal factors that govern those changes are critical to predicting what changes are likely to occur under different scenarios, such as short-term impacts of extreme storms or long-term impacts of sea-level rise. Assateague Island MD/VA was selected for detailed mapping of barrier island morphology and topography because the island offers a diversity of depositional sub-environments that are representative of other barrier islands along the middle Atlantic coast. The geomorphology and sub-environment map emphasizes the origins of the surficial features and it also serves as a basis for documenting which sub-environments are relatively stable, such as the barrier island core, and those that are highly dynamic, such as the beach and active overwash zones.

Data Description
This classification was referenced and mapped using 1999 Digital Orthophoto Quadrangles (DOQ), 0.25 meter pixel resolution orthorectified aerial photography from 2003, historical aerial photographs, 2003 and 2004 Experimental Advanced Airborne Research Lidar (EAARL), and a 1993 Assateague Island data file showing a preliminary survey of island vegetation. Spatial variability of shape boundaries vary between 1 and 7 meters due to the variability between the data sources. Each geomorphic layer is stored in a standard format shapefile viewable in any GIS software.

Further Reading

Biggs, R. B., 1970, The origin and geologic history of Assateague Island, Maryland and Virginia, *in* Assateague Ecological Studies Final Report, part 1: University of Maryland Natural Resources Institute, Contribution no. 446, p. 8-41.
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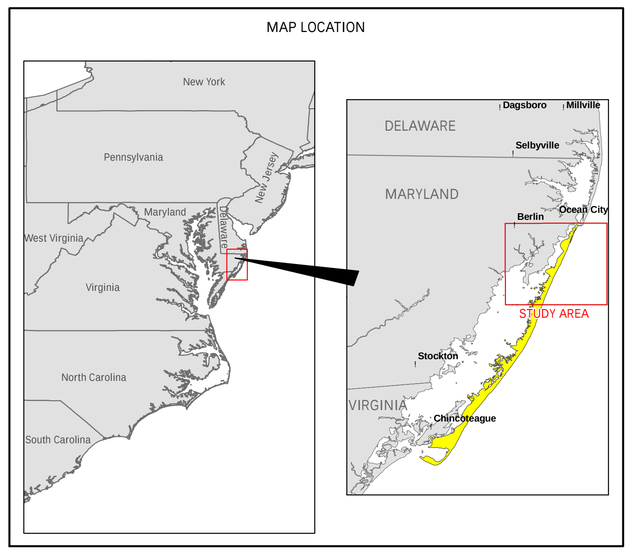
Halsey, S. D., 1978, Late Quaternary geologic history and morphologic development of the barrier system along the Delmarva Peninsula of the Mid-Atlantic bight: unpublished PhD. Thesis, University of Delaware, 592 p.
Morton, R. A., 2002, Factors controlling storm impacts on coastal barriers and beaches -- A preliminary basis for real-time forecasting: Journal of Coastal Research, v. 18, p. 486-501.
Morton, R. A., Guy, K.K., Hill, H.W., and Pascoe, T., 2003, Regional morphological responses to the March 1962 Ash Wednesday storm: Proceedings Coastal Sediments '03, 11p.
Pendleton, E.A., Williams, S.J. and Thieler, E.R., 2004, Coastal vulnerability assessment of Assateague Island National Seashore (ASIS) to sea-level rise: U.S. Geological Survey Open-File Report 2004-1020, Web Only. URL: pubs.usgs.gov/of/2004/1020/.

MAP LOCATION