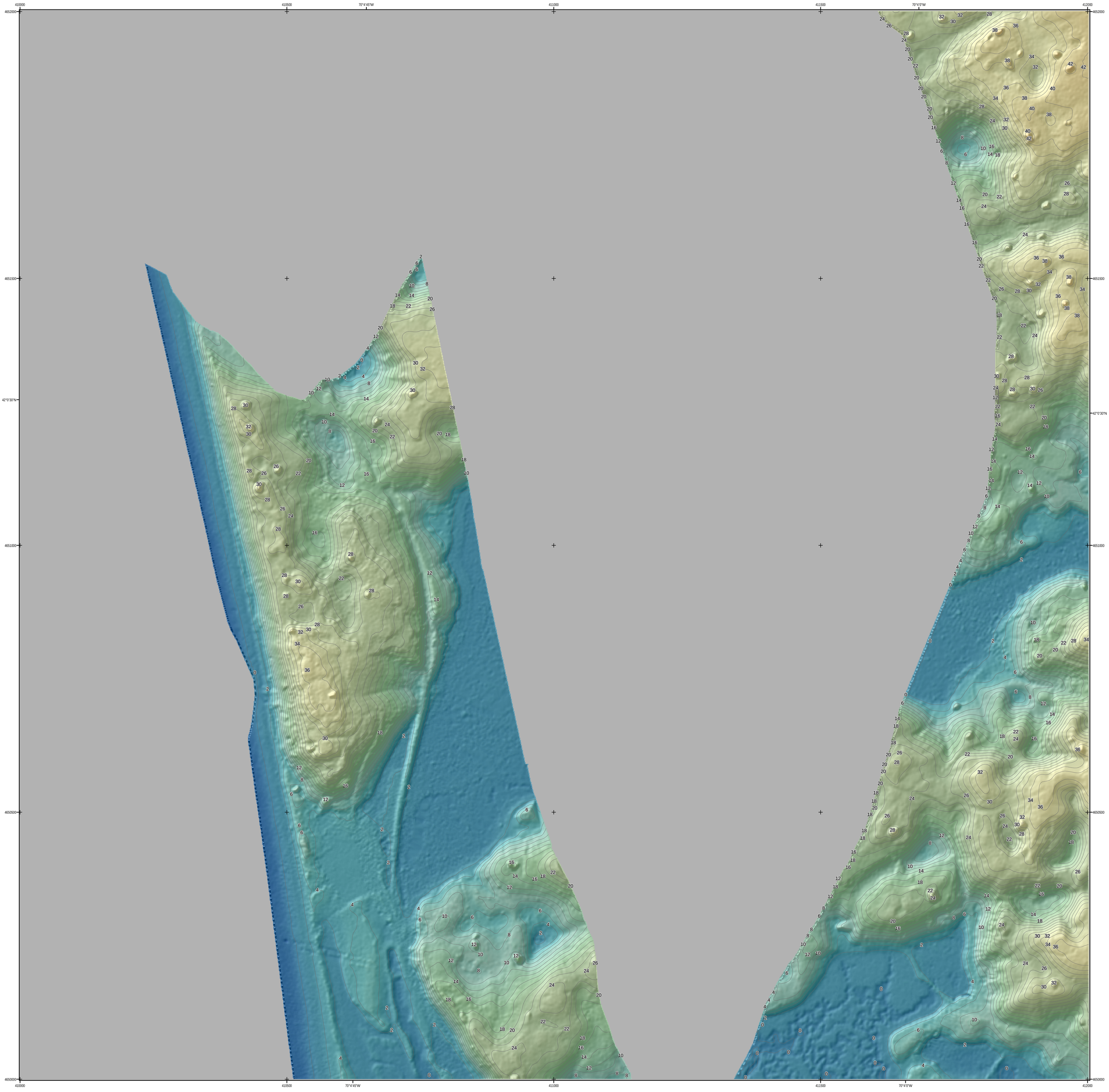
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared in cooperation with the
NATIONAL PARK SERVICE (NPS) AND
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA)

OPEN FILE REPORT 2007-1375
TILE 27 of 90 (BE)

Brock, J.C., Wright, C.W., Patterson, M., Nayegandhi, A., and Travers, L. J., 2007, USGS-NPS-NASA Bare Earth (BE) Topography-Cape Cod National Seashore, U. S. Geological Survey Open File 2007-1375 (On DVD).



Universal Transverse Mercator. 1983 North American Datum-Zone 19 North
Topography mapped using NASA Experimental Advanced Airborne Research Lidar (EAARL) May 2005
This map is not intended for use in navigation.

Project Description
This Lidar-derived topographic map was produced as a collaborative effort between the U.S. Geological Survey (USGS) Coastal and Marine Geology Program, the Northeast Coastal and Barrier Network of the National Park Service (NPS) Inventory and Monitoring Program, the South Florida/Caribbean Network of the NPS Inventory and Monitoring Program, and the National Aeronautics and Space Administration (NASA) Wallops Flight Facility. The aim of the partnership that created this product is to develop advanced survey techniques for mapping barrier island geomorphology and habitats, and to enable the monitoring of ecological and geological change within National Seashores. This product is based on data from an innovative airborne Light Detection and Ranging (LiDAR) instrument under development at the NASA Wallops Flight Facility, the NASA Experimental Advanced Airborne Research Lidar (EAARL).

Data Description
The laser soundings used to create this map were collected during May 4, 2005 by the NASA EAARL system mounted on a Cessna 310 aircraft. The EAARL uses a "waveform-resolving" green laser capable of mapping submarine and subaerial (land) topography in a single overflight. The EAARL system is typically flown at 300 m altitude AGL, resulting in a 240 m swath for each flightline. Data collection occurred with approximately 50% overlap between flightlines, resulting in about one laser sounding per square meter. The data were processed by the USGS FISC (Florida Integrated Science Center) office, St. Petersburg, FL to produce 1-meter resolution raster images that can be easily ingested into a Geographic Information System (GIS). The data were organized as 2 km by 2 km data tiles in 32-bit floating-point integer GeoTiff format. Contour line and hillshade layers were generated from the Lidar data tile and incorporated into this map product.

Further Reading
Brock, J.C., and Sallenger, A., 2001, Airborne topographic Lidar mapping for coastal science and resource management: U.S. Geological Survey Open File Report 01-46, p. 4.

Brock, J.C., Wright, C.W., Nayegandhi, A., Clayton, T., Hansen, M., Longenecker, J., Gesch, D., and Crane, M., 2002, Initial results from a test of the NASA EAARL Lidar in the Tampa Bay Region: Transactions of the Gulf Coast Association of Geological Societies, v. 52, p. 89-98.

Wright, C.W. and Brock, J.C., 2002, EAARL: A Lidar for mapping shallow coral reefs and other coastal environments, *in* the Proceedings of the Seventh International Conference on Remote Sensing for Marine and Coastal Environments, Miami, May 20-22, 2002: Ann Arbor, MI, Veridian International Conferences, 1 computer optical disc.

SCALE 1:2500

0.1 0.05 0 0.1 0.2 0.3 MILES

0.1 0.05 0 0.1 0.2 0.3 KILOMETERS

NORTH AMERICAN VERTICAL DATUM OF 1988

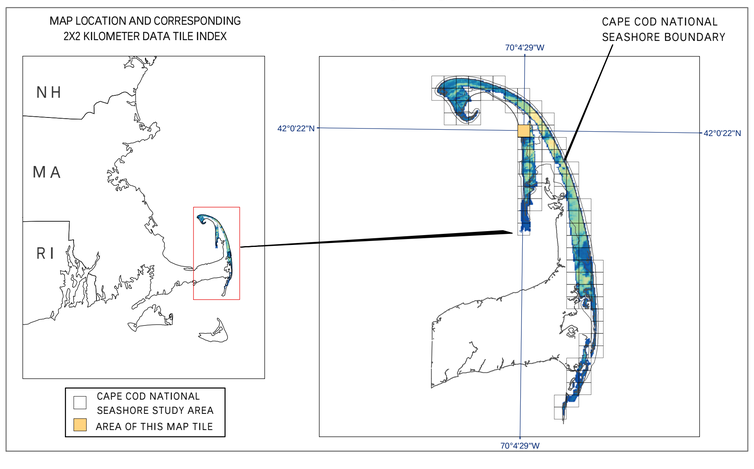
CONTOUR INTERVAL 2 METERS

NAVD 88 Elevation (meters)

-3 0 10 20 30 40 50 60 NO DATA

Cape Cod National Seashore
USGS-NPS-NASA EAARL Bare Earth (BE) Lidar Topography
Map Tile 410000e_4652000n_19z

By John C. Brock[1], C. Wayne Wright[2], Matt Patterson[3], Amar Nayegandhi[4], and Laurinda J. Travers[5]

[1] U. S. Geological Survey, FISC, St. Petersburg, FL
[2] NASA Wallops Flight Facility, Wallops Island, VA
[3] NPS South Florida/Caribbean Network Inventory and Monitoring Program, Miami, FL
[4] ETI Professionals, Contracted to USGS, St. Petersburg, FL
[5] Eckerd College, Contracted to USGS, St. Petersburg, FL

2007