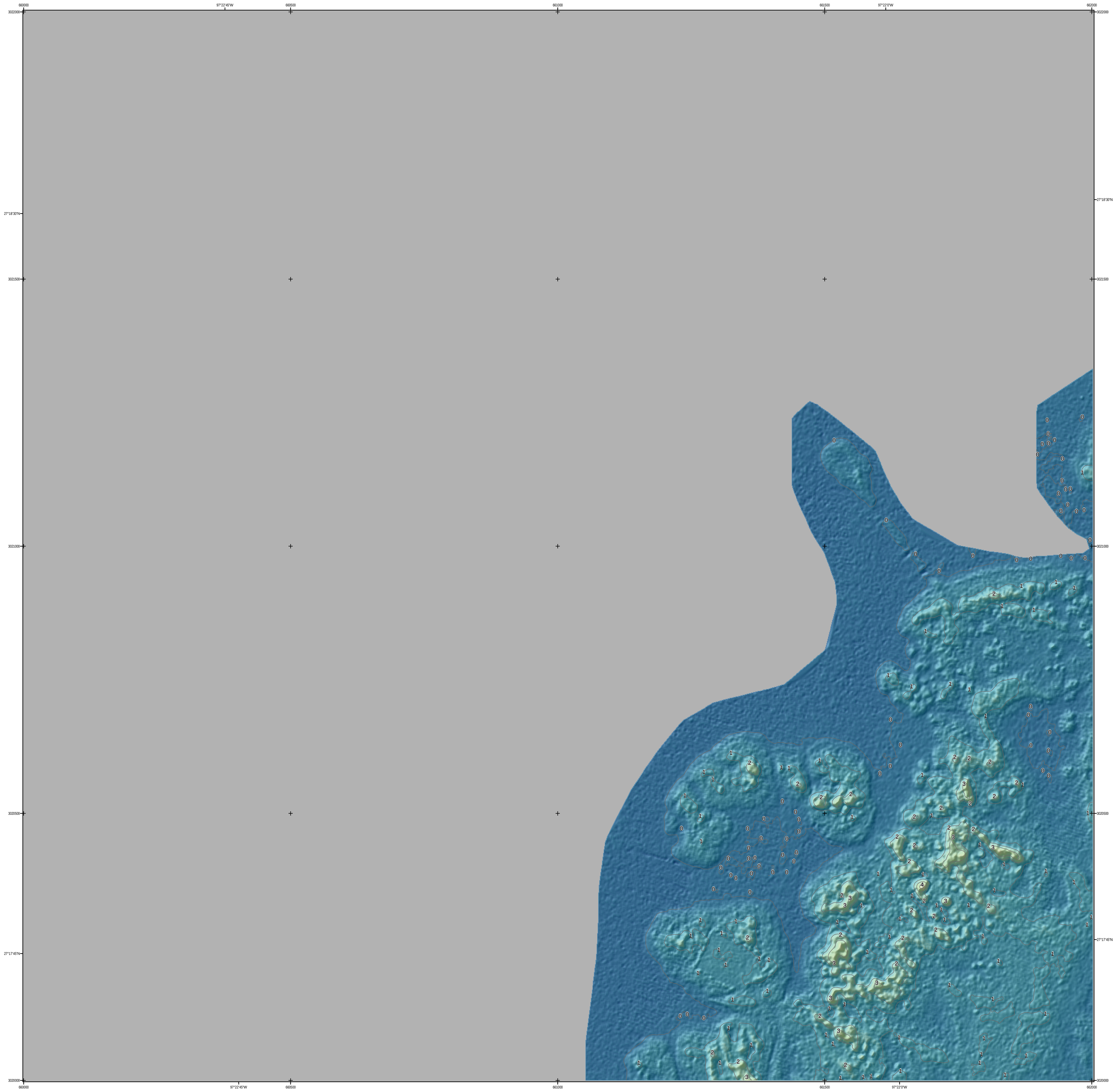
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

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

OPEN FILE REPORT 2007-1431
TILE 29 of 116 (BE)

Brock, J.C., Wright, C.W., Nayegandhi, A., Patterson, M., Wilson, I., and Travers, L.J., 2007,
USGS-NPS-NASA Bare Earth (BE) Topography-Padre Island National Seashore
U. S. Geological Survey Open File Report 2007-1431 (On DVD).



Universal Transverse Mercator. 1983 North American Datum-Zone 14 North
Topography mapped using NASA Experimental Advanced Airborne Research Lidar (EAARL) September/October 2005
This map is not intended for use in navigation.

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 1 METER

NAVD 88 Elevation (meters)

-1 0 2 4 6 8 10 12

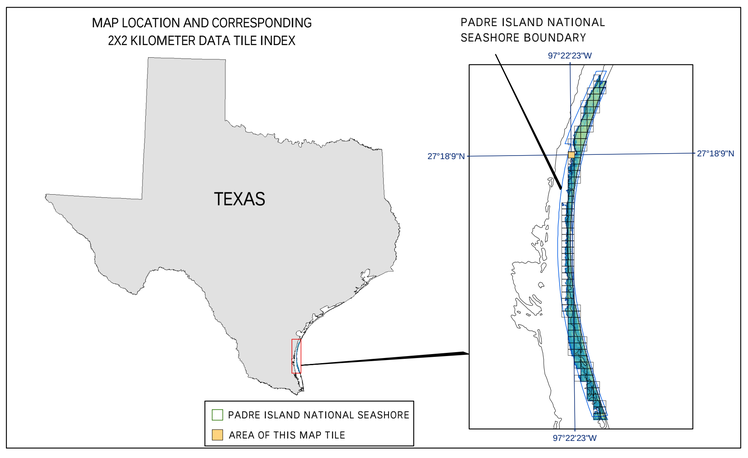
NO DATA

Padre Island National Seashore
USGS-NPS-NASA EAARL Bare Earth (BE) Lidar Topography
Map Tile 660000e_3022000n_14z

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

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

2007



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 September and October of 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 300m altitude AGL, resulting in a 240m 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) St. Petersburg office, 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.

Nayegandhi, A., Brock, J.C., Wright, C.W., OConnell, M.J., 2006, Evaluating a small footprint, waveform-resolving lidar over coastal vegetation communities, Photogrammetric Engineering and Remote Sensing, Vol. 72, No. 12. pp. 1407-1417.