

Lidar for Science and Resource Management

<http://ngom.usgs.gov/dsp/index.php>

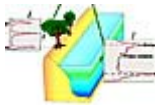
The Lidar for Science and Resource Management (LSRM) project, sponsored by the USGS [Coastal and Marine Geology Program](#) (CMGP) is supporting the creation of new capabilities for the synoptic remote sensing of coastal-marine and terrestrial environments based on aircraft and satellite sensors. These coastal remote-sensing, mapping, and point-monitoring tools constitute a unique integrated package of instrumentation and software that may be deployed in support of appropriately timed and scaled zoning decisions by management authorities in order to conserve and sensibly exploit nearshore coastal and marine ecosystems.

Read: [Project Overview & Objectives](#)

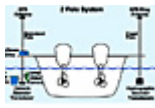
Technology



EAARL Sensor - The Experimental Advanced Airborne Research Lidar (EAARL) is an airborne lidar system that provides unique capabilities to survey coral reefs, nearshore benthic habitats, coastal vegetation, and sandy beaches. [Read more...](#)



ALPS Software – The Airborne Lidar Processing System (ALPS) software, developed in an open-source programming environment on a Linux platform, enables the exploration and processing of data acquired by the EAARL system in an interactive or batch mode. [Read more...](#)

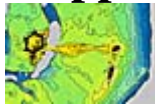


ATRIS Sensor – The Along Track Reef Imaging System (ATRIS) is a boat-mounted instrument that acquires continuous, georeferenced, digital-still images of shallow-marine substrates. [Read more...](#)



ADAPT software – The ATRIS Data Analysis and Processing Tool (ADAPT) is a custom software package designed to complement the ATRIS system. ADAPT's graphical user interface (GUI) provides easy access to the imagery and associated data collected on an ATRIS mission. [Read more](#)

Mapping



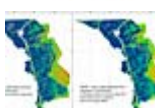
Lidar Topography Mapping in NPS Parks – Lidar data acquired by the USGS in collaboration with NPS are being used to inventory and monitor marine benthic communities, barrier island geomorphology and vegetated habitats along coastlines for National Parks. [Read more...](#)



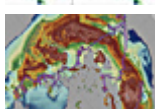
Barrier Island Volumetric Change Analysis – Lidar-based volumetric change analysis along barrier islands provides a valuable tool in quantifying morphologic change following major storm events. [Read more...](#)



Lidar-based vegetation metrics – As a full-waveform digitizing lidar, the small-footprint EAARL waveforms can be used to generate accurate estimates of vertical canopy structure in coastal vegetation communities. [Read more...](#)



Vegetation Delineation – Lidar-based vegetation metrics at 5-m-resolution of bare-Earth (BE), canopy heights (CH), canopy-reflection ratio (CRR), and height of median energy (HOME) were used as input to a model-based approach to delineate coastal vegetation communities. [Read more...](#)



Coral reef applications – Special emphasis has been placed on the use of aircraft lidar and multi-spectral imaging to map coral reef ecosystem geomorphology, topographic roughness, and habitats at spatial scales finer than 2 meters. [Read more...](#)



NPS Benthic Mapping Protocol Development – The USGS is collaborating with NPS to develop a benthic mapping protocol for the inventory and mapping of the benthic resources associated with each coastal park unit. [Read more...](#)