BOEM ENVIRONMENTAL STUDIES PROGRAM: Ongoing Studies

Region: Alaska

Planning Area(s): Beaufort Sea, Chukchi Sea

Title: ShoreZone–Shoreline Mapping of the North Slope of Alaska (AK-11-07)

BOEM Information Need(s) to be Addressed: ShoreZone mapping is a technique that will provide BOEM with the most comprehensive biological, physical, and geomorphologic data of the Beaufort and Chukchi coastal areas. The BOEM analysts and decision makers will use shoreline mapping information for identifying high priority fish and wildlife habitats in NEPA and ESA (Endangered Species Act) analyses and documentation for Lease Sales, EPPs and DPPs and in post-sale and post-exploration decision making. The data will also provide an improved level of detail for coastal contingency planning, oil spill response activities, and habitat recovery efforts in the context of future offshore oil, gas and mineral development activities upland of Beaufort and Chukchi Seas; and a value added benefit from more accurately append the current Environmental Sensitivity Indices (ESI). This study addresses aspects of USGS Recommendation 3.08.

Total Cost: $481,720 **Period of Performance:** FY 2011-2015

Conducting Organization: Nuka Research and Planning Group

BOEM Contact: Catherine Coon

Description:
Background: The ShoreZone program is a partnership of scientists, GIS specialists, web specialists, nonprofit organizations, and governmental agencies. The multi-agency program offers the opportunity to build a contiguous, integrated coastal resource database that extends from the mouth of the Columbia River through BC, the Gulf of Alaska, Bristol Bay, and now northward to the Arctic Coast (on the order of 100,000 km).

ShoreZone is a powerful coastal habitat classification, mapping, and inventory system that relies on the collection and interpretation of aerial imagery of the intertidal zone, nearshore, and estuarine environments. Aerial video and high resolution still photos are collected by geologists and biologists at extreme low tides. This imagery is georeferenced and then mapped, providing a recording of the physical and biological features of the intertidal zone, nearshore, and estuarine environments, including archaeological resources and manmade features. The digital imagery and associated data are made accessible to the public through the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries website as a collaborative partnership with BOEM.

Coastal video imagery of the North Slope from Barrow to Harrison Bay (1,090 km) and from Flaxman Island to the Canadian border (890 km) was collected in 2001 under an MMS contract (Polaris Applied Sciences Inc. and Environmental Mapping Ltd) for the purpose of Environmental Sensitivity Indices (ESI). This aerial video exists in the form of 11 DVDs and

may be suitable for ShoreZone mapping. The USGS has also collected topographical imagery (LIDAR) in the Arctic in 2009-2010 for shoreline change that can be applied to morphological changes of the tundra. These imagery sets will be described, cataloged, and summarized for historical perspective for BOEM use. This project will provide an additional imagery necessary, combined with a ground verification component through a series of shore stations, to describe the shoreline and the physical and biological features of the intertidal zone, nearshore, and estuarine environments.

Objectives:

- Summarize existing historic coastal video imagery.
- Assess the use of USGS topographic LIDAR for research on shoreline change and how it can apply to coastal inundation of slopes for spill scenarios and shoreline position change of the barrier islands.
- Conduct new video imagery along the Arctic Coast of Alaska.
- Groundtruth imagery with shore stations to verify geomorphic features.Map video imagery using the ShoreZone methodology.
- Develop the completed imagery and mapping package available to BOEM and the public via the NOAA ShoreZone website (http://www.fakr.noaa.gov/maps/szintro.htm).
- Assess the feasibility of extending the project to include a bathymetric LIDAR component.

Methods: The *ShoreZone Coastal Habitat Mapping Protocol for the Gulf of Alaska* will be used to map the imagery collected in the North Slope, Alaska. (http://www.fakr.noaa.gov/habitat/shorezone/goa_protocol.pdf). A new protocol for Coastal Alaska is in progress.

Groundtruthing will occur with a series of shore stations over many separate habitat types (i.e. Inside Lagoons, Lagoon Passes, Barrier Islands) along the Arctic Coast. Across-shore profiles will be measured to describe the geomorphic features at each shore station. Data will provide site-specific details of slope, substrate, and widths on the ground, and help with confirming assumptions made in mapping features observed from the air.

The completed ShoreZone Mapping will provide a comprehensive region-wide database of nearshore habitat and physical attributes and will also be linked to the existing web interface hosted by NOAA 'Nearshore Fish Atlas of Alaska' (http://www.fakr.noaa.gov/habitat/fishatlas/).

Current Status: Ongoing

Final Report Due: March 2015

Publications Completed: None

Affiliated WWW Sites: http://www.boem.gov/akstudies/
http://www.nukaresearch.com/projects/boemreSZP/index.htm

Revised Date: July 2012

ESPIS: Environmental Studies Program Information System
All *completed* ESP studies can be found
here: http://www.data.boem.gov/homepg/data_center/other/espis/espisfront.asp