

STUDY TITLE: ShoreZone Mapping of the North Slope of Alaska
REPORT TITLE: ShoreZone Mapping of the North Slope of Alaska Final Report
CONTRACT NUMBER: M11PC00037
SPONSORING OCS REGION: Alaska
APPLICABLE PLANNING AREA: Beaufort Sea, Chukchi Sea
FISCAL YEARS OF PROJECT FUNDING: FY 2011-2015
COMPLETION DATE OF REPORT:
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CUMULATIVE PROJECT COST: \$561,621
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KEY WORDS: ShoreZone, coastal mapping, ground station, North Slope

BACKGROUND: The North Slope of Alaska lies on the north side of Brooks Range and includes extensive coastlines along the Chukchi Sea and Beaufort Sea. These shorelines are fundamentally different from most of the coastline in the US as they are consolidated by permafrost and subject to periglacial processes, including cryogenic processes onshore and nearshore seasonal pack ice formation.

These coasts are highly dynamic and undergoing some of the fastest retreat rates in North America. Proposed offshore oil development activities in the Chukchi Sea coast and existing offshore drilling islands along the Beaufort Sea coast pose environmental risks for these coasts. Environmental concerns include increased air and sea traffic, accidental oil spills, and potential port developments.

BOEM requires up-to-date, digital mapping that can be used to systematically assess these environmental risks. The ShoreZone coastal habitat mapping system provides an attribute-rich, geographic information system (GIS) that can be used to delineate habitats for habitat modeling of a wide variety of coastal species and communities. Associated web-posted imagery plus web-accessible spatial data describing coastal habitats allows easy access by both researchers and regulators.

OBJECTIVES: The overall goal of the project was to complete ShoreZone mapping for the North Slope for the purpose of facilitating the assessment of offshore oil development risks and to inform other coastal zone management initiatives. The primary project objectives were to (1) use existing videographic and photographic imagery to complete ShoreZone classifications; and (2) collect field data to verify mapping interpretation, to identify species and community assemblages associated with various mapped habitat types, and to collect new coastal imagery to fill gaps in existing videography where possible.

DESCRIPTION: Nuka Research and Planning Group, LLC and partners Coastal & Oceans Resources and Archipelago Marine Research Ltd. mapped 5,894 km of shoreline using the ShoreZone mapping protocol and ground station surveys for verification. Forty-two shore stations were documented. The following activities were completed:

1. Collate and classify existing coastal video imagery for the Chukchi and Beaufort Sea coastlines.
2. Identify gaps in the existing imagery coverage and collect new imagery to fill those gaps.
3. Update the existing Gulf of Alaska ShoreZone mapping protocols to accommodate morphologies and biotic assemblages that occur on the Arctic coasts.
4. Interpret existing coastal imagery following the North Slope ShoreZone protocol to build a searchable biophysical GIS dataset to characterize coastal morphologies, substrates and habitats of the North Slope shoreline.

5. Conduct a ground station survey to verify mapping interpretations and to add detail (e.g., across-shore profiles, species assemblages of biobands) to mapping units.
6. Collect sediments samples that can be added to an existing statewide baseline dataset on intertidal hydrocarbons.
7. Make the mapping datasets widely available via the existing NOAA ShoreZone website.

SIGNIFICANT CONCLUSIONS: Most of the mapped shoreline is dominated by sediment shorelines (54%) where wave redistribute sediments into sand flats, beaches, and barrier islands. Periglacial shore types, where the presence of permafrost significantly affects the coastal morphology, make up 37% of the shoreline. Estuaries (3%), lagoons (5%), and rock (1%) make up a much smaller percentage of the shoreline.

Tundra and salt marsh are the most common biobands mapped. Other types of biobands occur along less than 10% of the coastline. The biobands mapped are all within the “marine limit” and may be flooded during storm surges, especially salt marsh.

STUDY RESULTS: For this project, the study results are represented by the work products delivered (see below).

STUDY PRODUCTS: The following deliverables were produced:

1. Geodatabase with digital shape files for shoreline units mapped, video footage, and biological and physical data (<http://alaskafisheries.noaa.gov/shorezone/default.htm>)
2. Expanded “Alaska ShoreZone Coastal Habitat Mapping Protocol”
3. Field Guide used for North Slope field work
4. Validation Report
5. Posters for Alaska Marine Science Symposium 2013 and 2014

REFERENCES:

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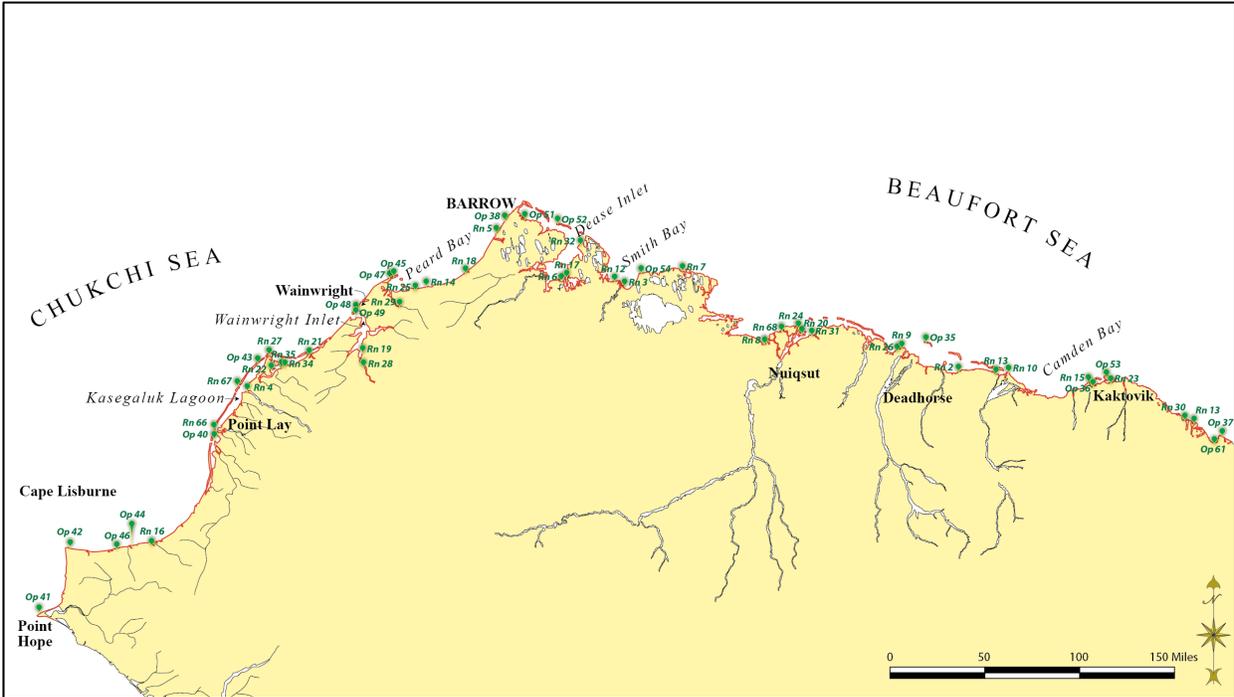


Figure 1. Map of study area and potential ground station sites