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AQ = Air Quality

IM = Information Management

PO = Physical Oceanography

FE = Fates & Effects

MM = Marine Mammals & Protected Species

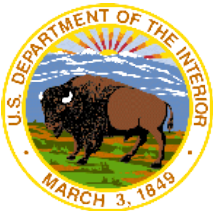
SE = Social & Economic Sciences

HE = Habitat & Ecology



BOEM Information Need:

- Archaeological assessments and archaeological potential not limited to areas of ice gouging.
- Information on ice gouge recurrence rates, gouge width and depth to refine the Arctic effects portion of the fault tree model.
- Collected bathymetry data will support Oil-Spill Risk Analysis (OSRA) through improvements to ocean circulation modeling and ongoing analysis of observational data.
- Regional information for integrative marine spatial planning.



Background:

A) Relationship with Previous Work/Efforts

- Beaufort Sea Cultural Resource Study, 1978 OCS study
- Review of Geological and Geophysical Data and Core Analysis to Determine Archaeological Potential of Buried Landforms, Beaufort Sea. (OCS Study MMS 2007-004)
- Evaluation of Sub-Sea Physical Environmental Data for the Beaufort Sea OCS and Incorporation into a GIS Database (OCS Study MMS 2002-017)
- Ice Gouged Micro-Relief on the Floor of the Eastern Chukchi Sea, Alaska, USGS Open File Report 78-693.
- 1989-1991-Site-Specific Industry Surveys in the Chukchi Sea.



Background:

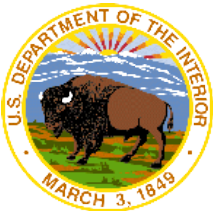
B) Relationship with Concurrent/Future Efforts

- Alaska focused on eastern interior stratified archaeological sites dating to late Pleistocene early Holocene interface.
- Joint Industry Programs (JIP's) have identified multi-year grounded ice from aerial surveys in the Chukchi Sea.
- Industry Ice Profiling Sonar's (IPS) have measured ice drafts of almost thirty meters at the lease sites.



Study's Objectives:

- Assess archaeological potential in areas of active and potential industry activity in the Beaufort and Chukchi seas
- Document ice gouge recurrence rate and physical characteristics,
- Map Holocene and Pleistocene horizons as old as 35,000 years ago
- Synthesize existing geologic, paleoenvironmental, archaeological and historical data
- Incorporate the collected data into the BOEM Geohazard Database



Methods:

- Marine geophysical survey of the sea bed and the shallow sub-seabed in areas of potential industry activity, including potential pipeline routes.
- Historical and newly collected core data
- Compare contemporary and historical ice gouge occurrence



Methods (continued):

- Multibeam bathymetry and side scan sonar to provide ice gouge characteristics (i.e., length, width, incision depth), water depth, and locate shipwrecks on the seabed.
- Sub-bottom profiler will provide detailed information on archaeological features, as well as characteristics of the shallow sub-seabed Pleistocene and Holocene stratigraphy.
- Ice gouges and archaeological features will be acquired in digital GIS format and incorporated into existing databases (geohazard and shipwreck)



Additional *Pertinent* Information

- Archaeological sites unknown in Chukchi and industry seismic data not shared until EP submitted.
- Ice gouge spatial distribution, age, and recurrence rate are unknown for the Chukchi Sea and Beaufort Sea OCS.
- Empirical ice gouge data is required for the BOEM Fault Tree Model to assess the risk from future potential pipeline spills due to ice gouging for the Chukchi and Beaufort seas.
- Ancillary site specific and ice gouge surveys have been completed or are planned by industry both on and off lease, but that information is not available to BOEM environmental analysts to include in environmental reviews.

