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# OCS Scientific Committee Meeting
# May 2014


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# Alaska OCS Region Proposed Studies

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**Discipline Codes**

AQ = Air Quality
IM = Information Management
PO = Physical Oceanography
FE = Fates & Effects
MM = Marine Mammals & Protected Species
SE = Social & Economic Sciences
HE = Habitat & Ecology

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# Very High-resolution Regional Circulation Model of Beaufort Sea Nearshore Areas

## BOEM Information Need:

**BOEM uses coupled ice-ocean circulation model results as input to oil-spill trajectory analysis. Model results with higher spatial resolution are needed to adequately resolve the barrier islands within Stefansson Sound and the lagoons and other coastal features along the Beaufort Sea and more fully represent associated ocean circulation processes.**

## Date Information is Required:

**Results are needed to support oil-spill trajectory analysis associated with a Development and Production Plan for the Liberty prospect expected to be submitted in December 2014.**

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# Very High-resolution Regional Circulation Model of Beaufort Sea Nearshore Areas

## Background:

### A) Relationship with Previous Work/Efforts

- **Idealized Process Model Studies of Circulation in the Landfast Ice Zone of the Alaskan Beaufort Sea (OCS Study BOEMRE 2011-056):** **Results showed profound differences between circulation on an ice-covered shelf and an ice-free shelf.**

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# Very High-resolution Regional Circulation Model of Beaufort Sea Nearshore Areas

## Background:

### B) Relationship with Concurrent/Future Efforts

- **Adaptation of Arctic Circulation Model:** Completed a 20-year hindcast simulation over the entire Arctic Ocean. Model exhibits significant skill in reproducing observed features of circulation and sea ice dynamics in both the Chukchi and Beaufort seas. However, spatial resolution in the Chukchi and Beaufort is approximately 4-5 km, which is insufficient to resolve the barrier islands and associate fine-scale circulation features.

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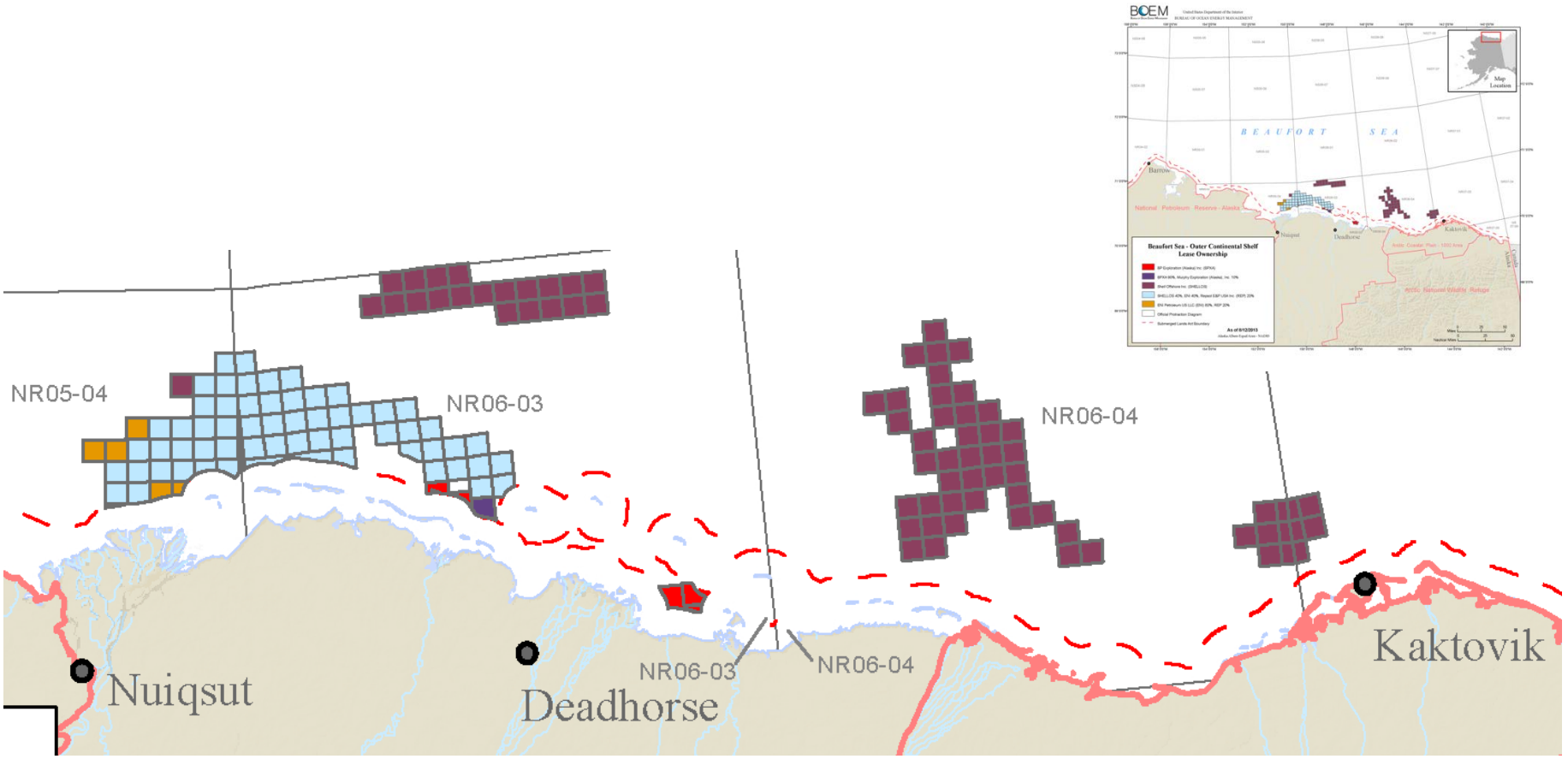
# Very High-resolution Regional Circulation Model of Beaufort Sea Nearshore Areas

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# Very High-resolution Regional Circulation Model of Beaufort Sea Nearshore Areas

## Study's Objectives:

- **Adapt and maximize the utility of an existing regional 3-D coupled ice-ocean circulation hindcast model.**
- **Obtain ten to twenty years of relevant modeled fields, such as gridded wind, surface water and ice velocity, ice cover, and other modeled fields as appropriate.**
- **Evaluate and optimize model performance relating to under-ice currents and behavior of plumes from the Mackenzie River and other rivers, including effects on melting ice.**

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# Very High-resolution Regional Circulation Model of Beaufort Sea Nearshore Areas

## Study's Methods:

**A coupled ice-ocean model will be modified to maximize utility in the Beaufort Sea nearshore areas. The model will possess grid-spacing that is sufficiently fine to resolve the barrier islands and coastal features and accurately represent associated circulation processes. Conduct the standard suite of sensitivity testing and validation of the model and results.**

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