BOEM
Bureau of Ocean Energy Management

# OCS Scientific Committee Meeting
# May 2013

| Page Number | Discipline | Ranking | Study Title |
|---|---|---|---|
| 41 | SE | 1 | Subsistence Mapping of Wainwright, Point Lay, and Point Hope |
| 43 | FE | 2 | Physical and Chemical Analyses of Crude and Refined Oils: Laboratory and Mesoscale Oil Weathering |
| 45 | MM | 3 | Data Interface Tools to Support Environmental Analyses: Interpretation of Existing Marine Mammal Data |
| 47 | HE | 4 | Genomics of Arctic Cod: A Sentinel Species in a Changing Environment |
| **49** | **PO** | **5** | **Cook Inlet Circulation Model Calculations** |
| 51 | PO/HE | 6 | Ecological Processes in Lower Cook Inlet and Kachemak Bay: A Partnership in Monitoring |
| 53 | HE | 7 | Benthic Invertebrate Habitats in Cook Inlet |
| 55 | MM | 8 | Polar Bear Habitat Use, Ecology, and Population Status in the Chukchi Sea |
| 57 | PO/SE | 9 | Integrated Seabed Surveys in the Arctic Ocean: Bathymetry, Archaeological Resources, and Ice Gouge Magnitude and Recurrence Rates |
| 61 | MM | 10 | Baleen Whale Distribution, Abundance, and Ecology in Cook Inlet and Shelikof Strait |

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

**Alaska OCS Region**

**Tentative Ranking: 5**

# Cook Inlet Circulation Model Calculations

## BOEM Information Need:

- The results of the study will be used by BOEM to create the OSRA estimates of oil spill trajectories. Existing ocean models have been shown to have skill in estimating the near surface currents. This study will result in a time series of simulated currents and wind fields. These simulated currents will be compared to field projects that have been conducted in the Cook Inlet and will be used in the OSRA calculations.

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# Cook Inlet Circulation Model Calculations

## Background:

## A) Relationship with Previous Work/Efforts

- The circulation of the Cook Inlet has been studied through previous model simulations, with funding by NOAA, BOEM, USACE, and others. The models were subjected to many sensitivity calculations and skill was assessed by teams of oceanographers.
- Many field programs that may provide observational data for assimilation and validation have also been conducted in this area.

# Cook Inlet Circulation Model Calculations

## Background:

## B) Relationship with Concurrent/Future Efforts

- Observations from planned BOEM field studies, as well as ongoing research, will be used for assimilation and model validation, if available.

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# Cook Inlet Circulation Model Calculations

## Study's Objectives:

- The objective is to obtain up-to-date simulations of the circulation of the Cook Inlet for use in the Oil Spill Risk Analysis. The simulations must have significant skill in reproducing the near-surface currents, compared to drifting buoy data, fixed current meters, ADCPs, and other data sets. The results of the model will provide environmental variability input into the Oil Spill Risk Analysis calculations.

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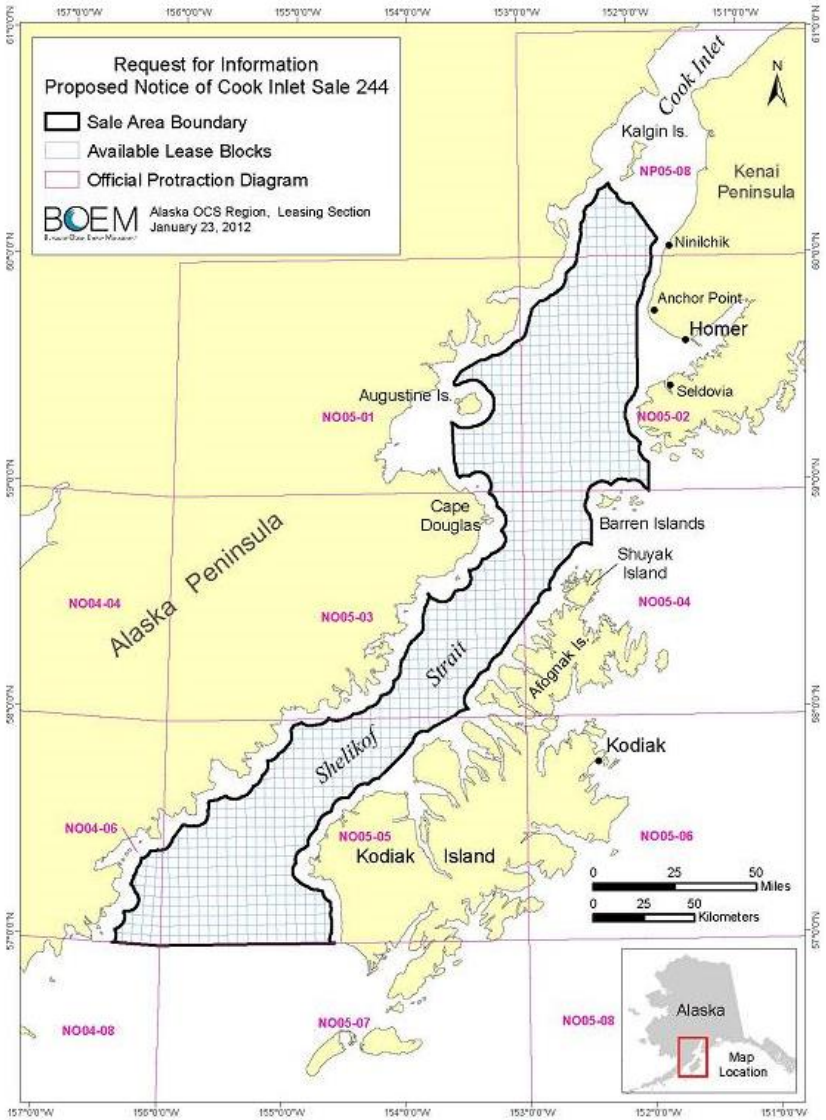
# Cook Inlet Circulation Model Calculations

## Methods:

- This study will adapt an existing community ocean model to produce a high-resolution hindcast of the current fields in Cook Inlet, using data assimilation methods whenever practical. The hindcast period will be determined by data availability, but not less than 5 years. The tidal current must be accurately reproduced. The wind forcing will be derived from the products of an atmospheric model. Skill assessment comparisons against historical field observations, i.e. current meters and drifting buoy velocities, will be performed.

# Cook Inlet Circulation Model Calculations



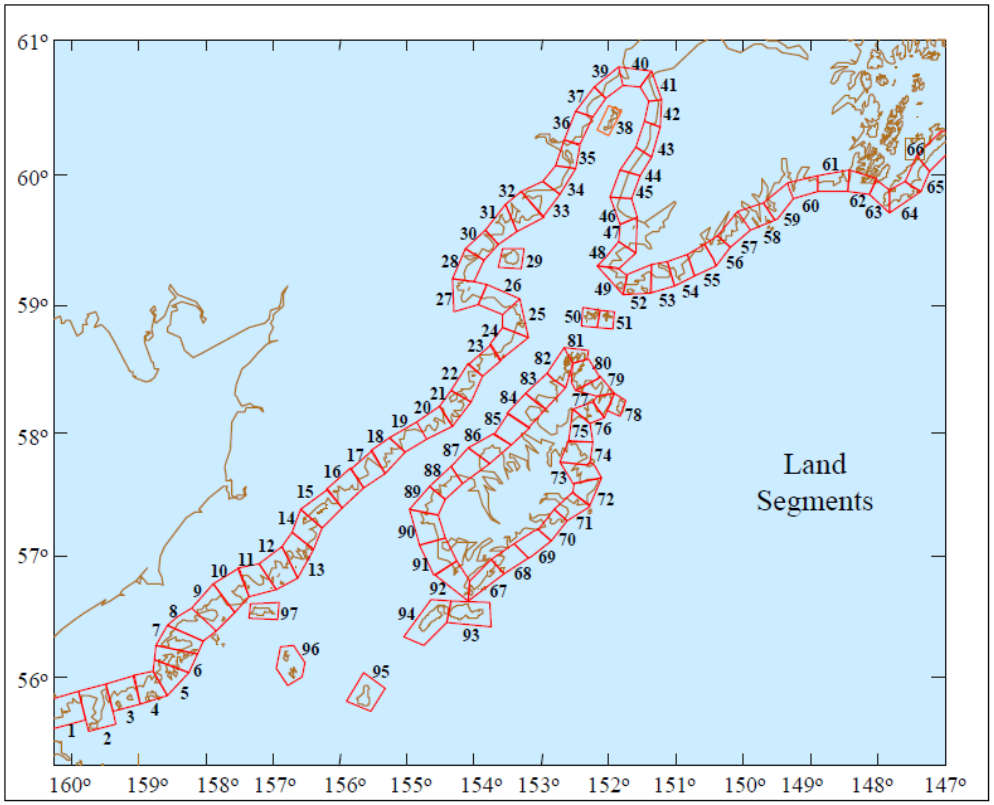




Figure 5. Study Area Coastline Divided into 97 Land Segments, Cook Inlet Planning Area, OCS Lease Sales 191 and 199.

**Alaska OCS Region**

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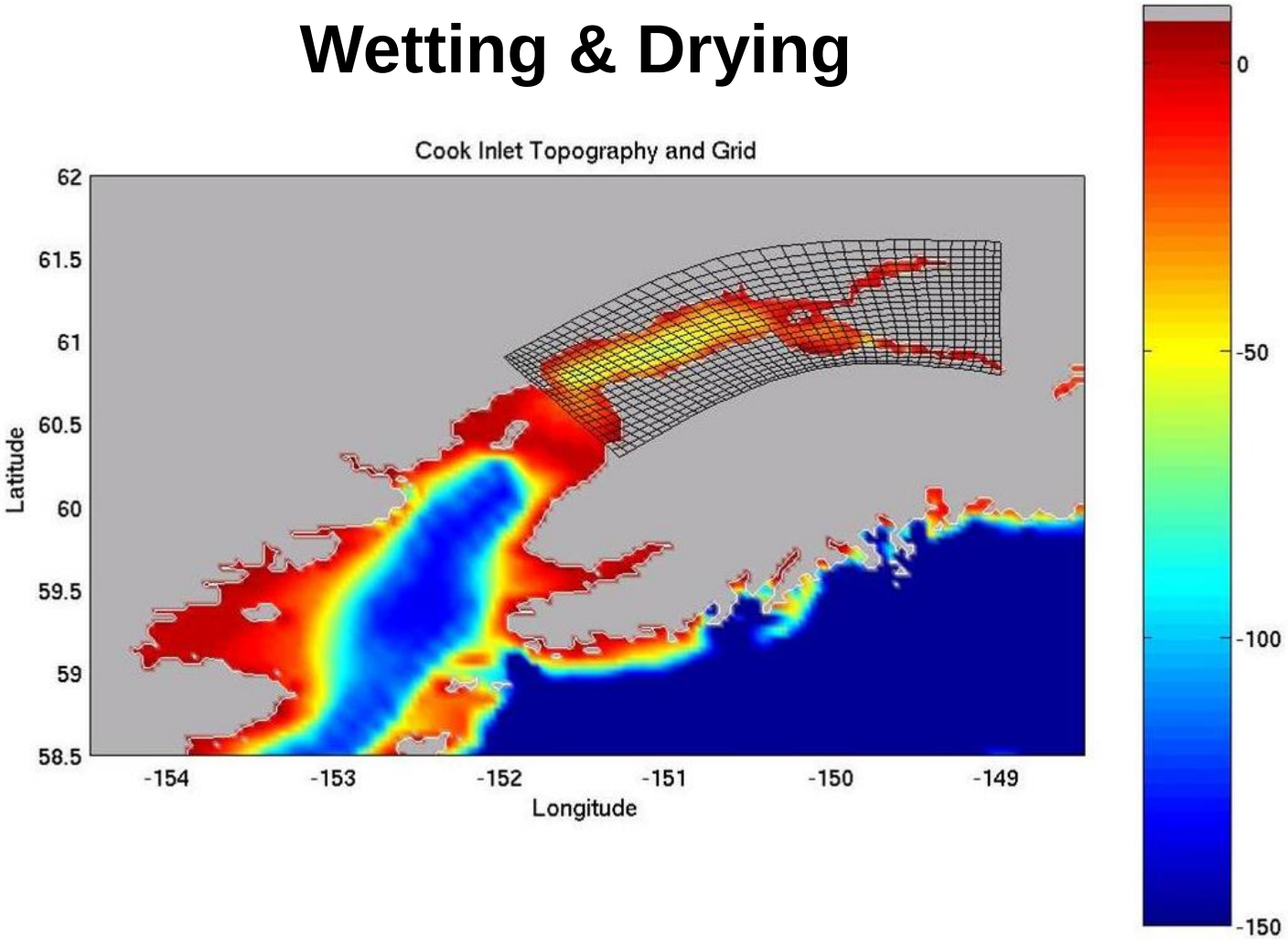
# Cook Inlet Circulation Model Calculations

## Wetting & Drying




**Alaska OCS Region**

**Tentative Ranking: 5**