BOEM
BUREAU OF OCEAN ENERGY MANAGEMENT

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Headquarters

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Page #	Break-out	Title	Rank
??	P1	Cook Inlet Circulation Model Calculations	
??	P1		
??	P3	California Ocean Model	
??	P1		

**PO = Physical Oceanography FE = Fate & Effect BIO = Biology
PS = Protected Species SE = Social & Economic OT = Other

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BOEM Information Need:

The results of the study will be used by BOEM to create the OSRA estimates of oil spill trajectories. The 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. These simulated currents will be compared to other field projects that have been conducted in the Cook Inlet, as well as the use in the OSRA calculations

Date Information is Required:

Estimated Fall of 2013

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Tentative Ranking:__

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. Many field programs have also been conducted in this area. Ocean currents in Cook Inlet are forced by winds and river runoff, as well as having very large tidal amplitude and extreme tidal currents. The Alaska Coastal Current that flows into Lower Cook Inlet and continues out through Shelikof Strait is an important element of the nearshore circulation of the northern Gulf of Alaska. Sea ice forms in Cook Inlet, but its effect on the overall circulation pattern has not been studied in detail.

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Background:

B) Relationship with Concurrent/Future Efforts

The existing models were subjected to many sensitivity calculations and skill was assessed by teams of oceanographers. The conclusion of these studies was that the models have significant skill in simulating the ocean surface currents.

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Study's Objectives:

The objective is to obtain 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, ADCP's, 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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Study's Methods:

The method is to use an existing, high-resolution, numerical ocean model to hindcast the current fields in the Cook Inlet, using data assimilation method, 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.

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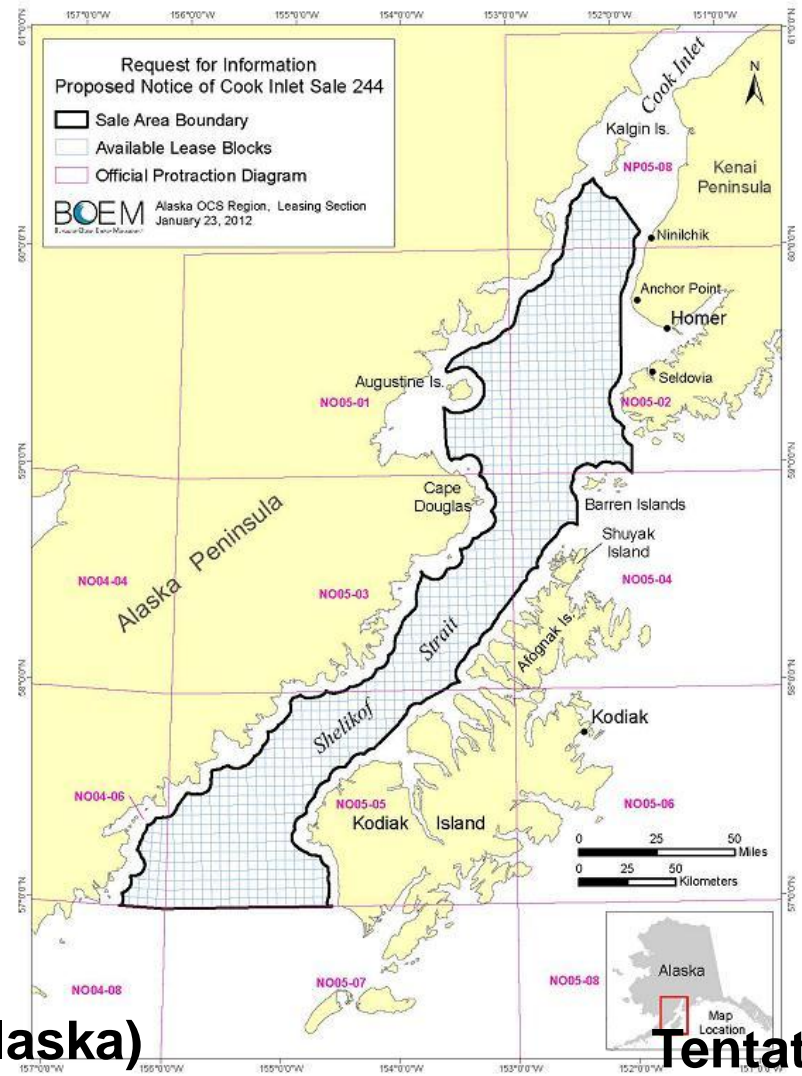
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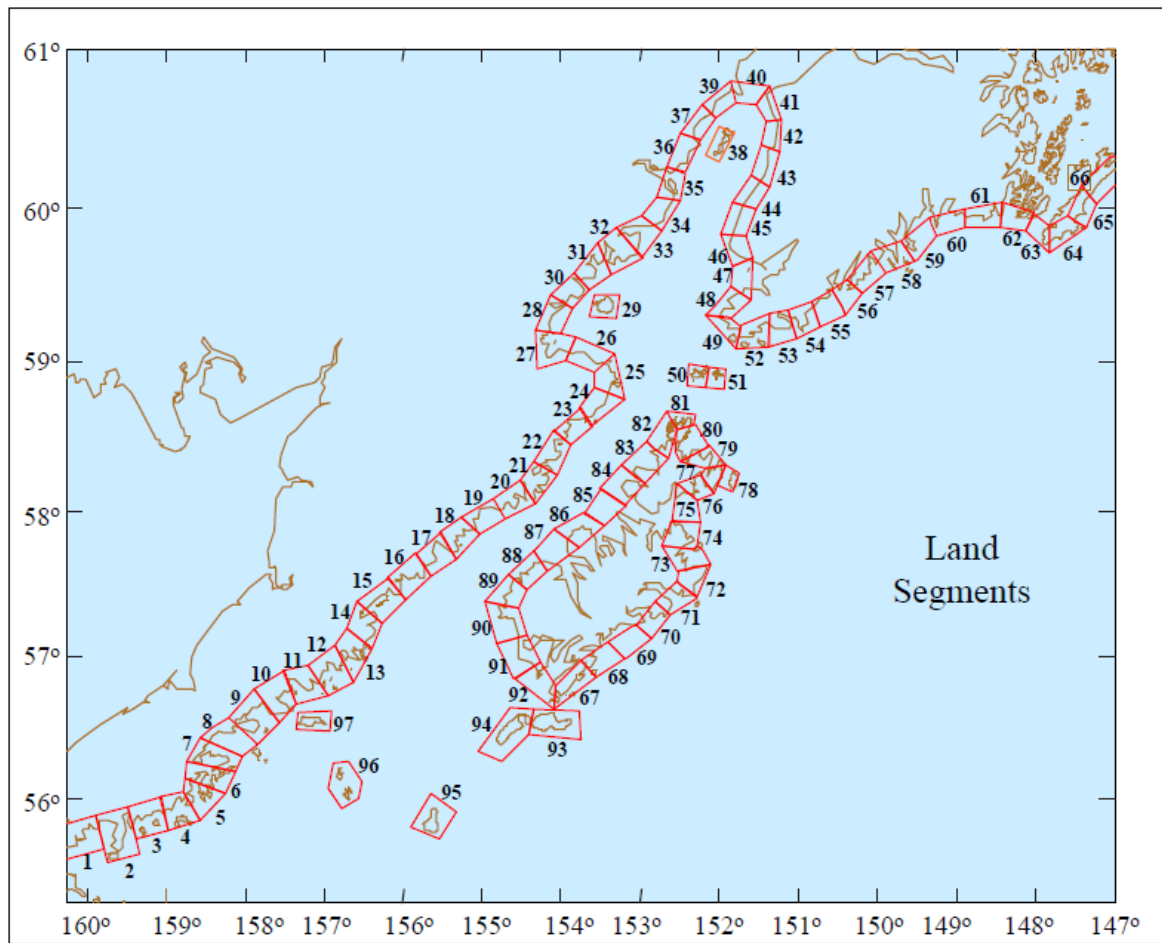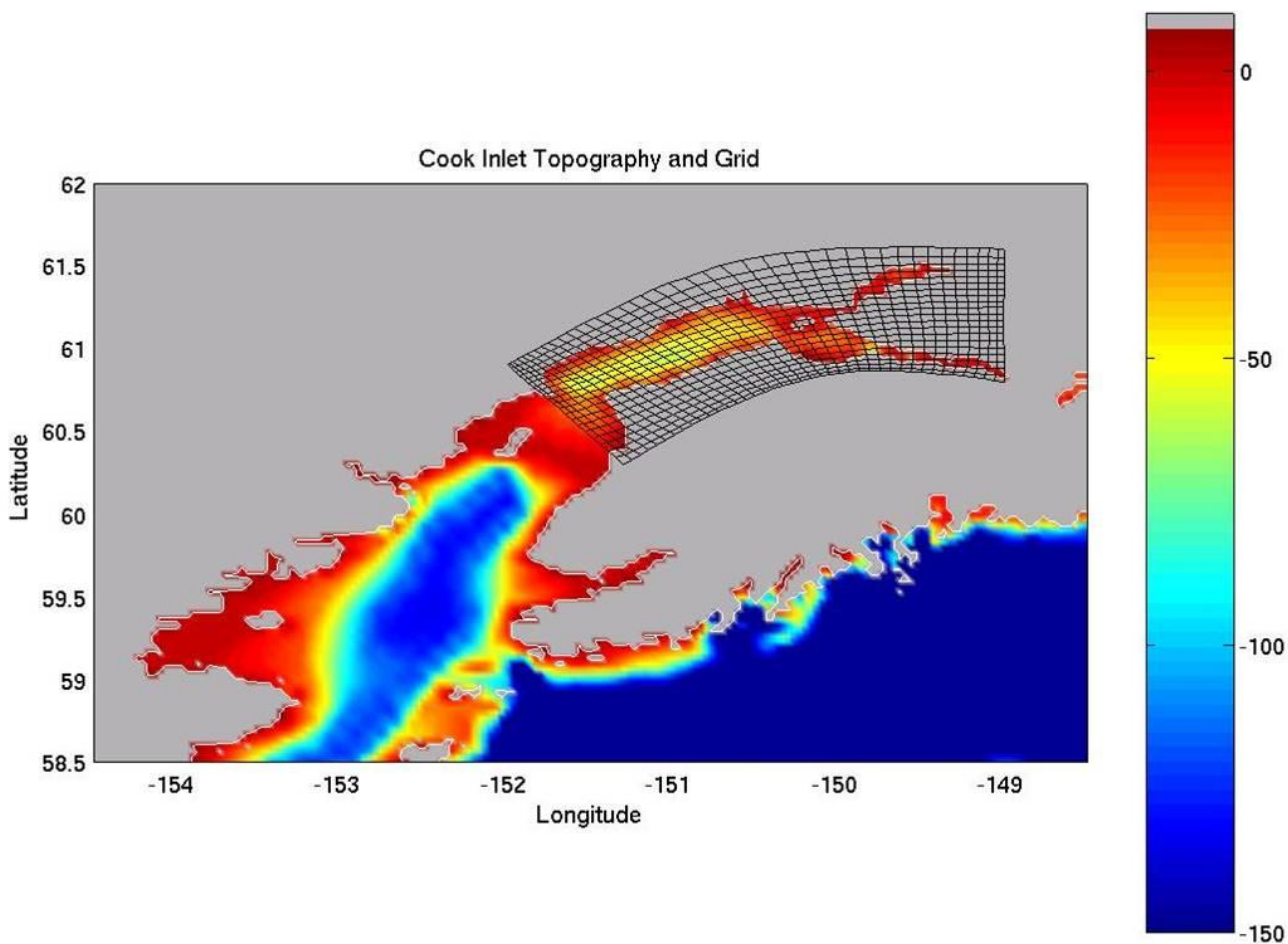
OSRA Modeling Domain

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

OSRA Modeling Domain, Wetting & Drying

Cook Inlet Topography and Grid

Addition *Pertinent* Information

- The calculated ocean model fields will be delivered, or be accessed, so that oil spill trajectory calculations can be performed.

- This study could be performed as an Inter-agency Agreement or a Cooperative Agreement.

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