



# OCS Scientific Committee Meeting May 2012

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# Modeling of the ecosystem dynamics in the Alaskan Arctic Ocean

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<p>**PO = Physical Oceanography      FE = Fate &amp; Effect      BIO = Biology            PS = Protected Species          SE = Social &amp; Economic      OT = Other</p>			





## Modeling of the ecosystem dynamics in the Alaskan Arctic Ocean

### **BOEM Information Need:**

BOEM needs to identify the causes leading to environmental changes, including forcing agents and feedback processes. This integrated perspective will aid in identifying sensitive a) processes b) geographical areas c) trophic levels. Identification of these causes and areas of elevated productivity is important when preparing environmental documents, and regulations.

**Date Information is Required: FY2013**

**HQ**

**Tentative Ranking: 6**

## **A) Relationship with Previous Work/Efforts**

This study will build on previously BOEM- and ONR-funded modeling efforts in this area. There are no high-resolution coupled models, including ecosystem modeling, in this area.

Model tuning and validation will be based on historical biochemophysical observations.

Interested agencies: ONR, NOAA

## Background:

### **B) Relationship with Concurrent/Future Efforts**

Coordination will be sought with ongoing studies in an attempt to reproduce, rather than validate, present day conditions of physical, chemical and biological variables. In particular, this effort will be coordinated with the observational study described in the next presentation.

## Study's Objectives:

- Determine sensitivities and resiliencies to environmental change.
- Provide an estimate of the climatological errors that can be expected (for different variables) from simulations like this one.
- Provide a quantitative and qualitative description of the impacts of anthropogenic forcing on the overall oceanic state of the Alaskan Arctic Ocean. Specifically, evaluate the impact of constant atmospheric forcing, a constant chlorophyll concentration, and a constant temperature on the sensitivity of the different food chain components to (natural and anthropogenic) change. Compare the relative contributions of different physical and biochemical contributions to the carbon budget. Evaluate the impact of trends in physical, chemical, and biological variables in the Chukchi and Bering Seas against observations in the overlapping time window.

## Study's Methods:

Using a state-of-the-art high resolution coupled (ocean, atmosphere, sea ice, biogeochemistry) model, produce a hindcast simulation covering the 1990 to 2012 timeframe

- Questions?