BOEM ENVIRONMENTAL STUDIES PROGRAM: Ongoing Studies

Region: Alaska

Planning Area(s): Beaufort Sea

Title: Epifaunal Communities in the Central Beaufort Sea (AK-08-12-07)

BOEM Information Need(s) to be Addressed: Information from this study will be used by Alaska OCS Region staff to acquire a better understanding of the benthic community of the Central Beaufort Sea. This will be used in preparing future, Beaufort Sea exploration and development EISs and in reviewing oil-spill-contingency plans for OCS and coastal facilities.

Total Cost: $50,139 plus Joint Funding **Period of Performance:** FY 2011-2013

Conducting Organization: CMI, UAF

BOEM Contact: Kate Wedemeyer

Description:

Background: One of BOEM's target science interests is to learn more about the current spatial use patterns in the Beaufort Sea by potentially sensitive organisms, such as the epibenthics. Currently little is known about the epibenthic communities in the central Beaufort Sea. This proposed project is piggybacking an existing BOEM project that will characterize fish communities in the targeted area of the central Beaufort Sea. The study will characterize the epibenthic invertebrates in this area and relate these communities to the fish communities and to various physical drivers, such as sediment grain size, bottom temperature and salinity.

Objectives:

- Characterize the epibenthic communities in the central Beaufort Sea (between 147° and 150° west longitude)
- Compare these communities to those found in the adjacent Chukchi Sea.
- Compare these communities to those found in other areas around the Beaufort Sea.
- Determine whether epibenthic communities are distributed in patches or all species evenly distributed throughout the study area.
- Determine which species are most important in determining community structure in terms of abundance and biomass.
- Determine the current population structure of the most dominant species; i.e., size frequency, abundance, biomass and male to female sex ration.
- Identify how the community varies with environmental (depth, grain size, temperature, salinity) or fish community parameters.
- Compare how these epibenthic communities and the patterns found within them compare to the communities in the Chukchi Sea and in other areas of the Beaufort Sea.

Methods: In conjunction with the Central Beaufort Fish Survey, five to ten transects will be conducted perpendicular to shore and between 10 and 100 m water depth. This sample plan will use a stratified, random sampling technique, with the strata based on water depth and distance from shore. Within each transect, replicate stations will be sampled for fish and epibenthic invertebrates using a fine mesh plumb-staff beam trawl deployed by an A-frame. Trawl catches will be sorted and placed into larger taxonomic groups and epibenthic species lists will be compiled by station during the cruise to create a presence/absence database. Voucher specimens also will be prepared by station for organisms that cannot be identified in the field. Voucher specimens of unknown species will be fixed and shipped to UAF for further taxonomic identification. In addition to a species list for each station, target organisms from the trawls will be selected for a more detailed community examination. Target organisms will include species that are trophically important or exhibit relatively high abundance and/or biomass. In similar Chukchi Sea studies, these taxa included various crabs, echinoderms, and gastropods. The community examination will include measures of abundance, biomass, and population size structure. In addition, for crabs we will examine the size at which females become gravid, the overall size frequency of all gravid females, and the percentage of females in the population that are gravid. Environmental data including vertical profiles of temperature and salinity will also be collected. A non-parametric multivariate approach will be used to analyze the data, including similarity, multidimensional scaling, community structure and importance of individual species, groups of species and physical factors.

Current Status: Ongoing

Final Report Due: March 2013

Publications Completed:

Ravelo, A. 2012. Epibenthic Community Variability on the Alaskan Beaufort Sea Continental Shelf. Oral Presentation. Alaska Marine Science Symposium. Anchorage AK.

Gradinger, Konar. 2012 Central Beaufort Sea Epibenthic Community. CMI Annual Review Meeting, UAF Fairbanks.

Affiliated WWW Sites: http://www.boem.gov/akstudies/
http://www.sfos.uaf.edu/cmi/

Revised Date: December 2012

ESPIS: Environmental Studies Program Information System
All *completed* ESP studies can be found
here: http://www.data.boem.gov/homepg/data_center/other/espis/espisfront.asp