POTENTIAL CMI STUDIES, MMS ALASKA ENVIRONMENTAL STUDIES PROGRAM

Region: Alaska

Planning Area(s): Beaufort Sea

Title: Under-Ice Marine Fish Survey: Pilot Survey in the Beaufort Sea

MMS Information Need(s) to be Addressed: An MMS study jointly-funded by industry, and Canada DFO could address information needs on the marine fish presence in areas of increasing oil and gas activities along the Alaskan Arctic coastline in the ice-covered season. New information will support NEPA analysis and documentation for Beaufort Sea Lease Sales, Draft Production Plans, permitting, and development of related mitigation.

Period of Performance: 3 years

Description:

Background

A 2007 MMS sponsored "Under-Ice marine Fish Sampling Workshop" recommended a 2009 under-ice survey to replicate summer/fall sample locations of the 2008 open water season survey.

Scientists from both Alaska and Canada must evaluate the potential effects of oil and gas development activity, including oil spills, on Beaufort Sea marine fish. These activities extend from initial exploration to development of infrastructure to production to transportation of oil and gas, including analysis of possible oilspills. Beaufort Sea marine fish surveys must obtain fundamental and current fish resource information necessary to regulate environmentally sound offshore oil and gas development. Data at the most basic level in the Beaufort Sea, e.g., fish distribution data, are not only spotty but also outdated. Fish assemblages and populations in other marine ecosystems off Alaska have undergone observable regime-shifts in diversity and abundance over the last 20-30 years. Furthermore, the delineation of important marine mating, spawning, rearing, feeding and migration habitats in the Beaufort Sea is simply non-existent.

In the Beaufort Sea, little is known about the biology and ecology of many marine fish species inhabiting the area. The highest priority information needs are thus the most basic: what species are present, their distribution, and their abundance.

As offshore oil development radiates out to deeper and more widespread areas additional fisheries information is required. Important species to evaluate include poorly documented marine fish and important seasons to evaluate include the sparsely documented ice-covered and break-up periods. Important fish distribution and abundance parameters include the geographically undelineated marine spawning, rearing, feeding and migration habitats.

In addition to needing basic fish distribution data, environmental information is also necessary to assess potential effects of offshore development. Beaufort Sea life history strategies, foraging, population dynamics and other aspects of marine fish behavior and ecology are largely, unknown. To address these information needs, the survey will be conducted from ice-based camps off shore of the bottom-fast ice in the central Beaufort Sea between 147 ^{o} and 150^{o} W. longitude and in the Canadian Beaufort Sea 50 miles northwest of the Mackenzie River delta.

Given the predicted increase in marine transportation across the Arctic Ocean as a result of longer ice-free seasons, these investigations will have relevance beyond offshore oil and gas development in the Beaufort Sea.

Due to the logistical and cost considerations, a Beaufort Sea marine fish survey must be especially cognizant of efficient methodology. Remote sensing and other recent technology promise both efficiency and new capabilities. Industry has expressed interest in co-sponsoring the study. Considerable potential also exists for efficiencies with ongoing studies and cooperative funding including:

a. Ongoing MMS Beaufort open water season survey and Canada DFO Mackenzie delta surveys

b. DIDSON sonar equipment and possibly acoustic technicians through the Alaska Department of Fish and Game and the US Fish and Wildlife Service

c. National Underwater Research Program grant program

d. National Oceans Partnership Program (NOPP)

Objectives

1. Conduct under-ice marine fish survey of Alaskan and Canadian Beaufort Sea areas likely to experience offshore oil and gas development.
2. Recommend monitoring methodology to provide time-series and data trend information to support environmentally sound offshore oil and gas exploration and development decisions; serve as a proto-type fisheries component of future MMS or other ocean observing systems.

Methods

1. Attach time-lapse camera to stationary Beaufort Sea moorings and conduct sampling by local residents through the winter of year one to identify seasonality and habitat to establish dates and locations intensive high tech under-ice survey.
2. Based on local resident sampling, mooring, and open-water survey results, conduct intensive under-ice survey transect using DIDSON sonar, video, ROV, or scuba diver, electronic tags.
3. Collect concurrent physical, chemical, biological, and other environmental data necessary to evaluate and test the significance of other independent variables that potentially affect fish presence and distribution
4. Conduct under ice diver survey of Arctic cod in three under-ice habitats. Establish Arctic cod abundance measure by calculating amount of each under-ice habitat type through AUV or ROV survey.
5. Conduct statistical hypothesis testing including open water survey and develop sampling statistics and variance estimators and recommending future time-series sampling methodology.

Date information is required: Interim reports on the species detected will be available for writing the Affected Environment in interim years. Final report is needed at end of third year for the completion of the NEPA analysis.