

MMS ENVIRONMENTAL STUDIES PROGRAM: ONGOING STUDIES

Region: Alaska

Planning Areas: Beaufort Sea, Chukchi Sea, Hope Basin, Cook Inlet

Title: Review and Monitoring Ambient Artificial Light Intensity in the OCS and the Potential for Effects on Resident Fauna (AK-04-10)

MMS Information Needs to be Addressed: Information from this study will be used for evaluating the effects of exploration and development on various protected or endangered species, including: spectacled eider, Steller's eider, Bowhead whale, Beluga whale, polar bears, ringed-seals, and several other cetaceans and pinnipeds. If ambient light is found to have effects on these, or other, local fauna, mitigation measures can be designed and initiated through stipulations in future development- or production-oriented EISs or permits. Information from this study may be used to update the extant lighting protocols recommended for offshore oil and gas development.

Total Cost: \$147,000

Period of Performance: FY 2004-2008

Conducting Organization: Golder & Associates

MMS Contact: [Chief, Alaska Environmental Studies Section](#)

Description:

Background A stipulation in a final Beaufort Sea final EIS in 2003 required that all structures associated with offshore drilling must be lighted in order to avoid avian mortality. But light radiating outward from structures must be minimized. Other industrial support facilities such as the buildings and storage areas at West Dock, structures at Endicott Spur Drilling Island, structures and work areas on Northstar Island and support vessels and supporting facilities are already brightly lighted. More lighted structures can be expected as OCS development proceeds.

Little study has been made of the introduction of artificial light into the formerly dark habitat of numerous species of marine invertebrates, fish, water birds, and mammals. These include a number of protected marine mammals that live in, or migrate through, potentially artificially lighted habitat. At a recent interagency coordination meeting the issue of potential conflict between lighting strategies and other non-avian marine life was raised. The proposed study will address the issue of artificial light in the dark arctic by conducting a literature review and possibly thereafter a light monitoring program. The study will lay groundwork for studies of ecological effects of increasing artificial lighting at several trophic levels.

Objectives

1. Review the literature and evaluate the theoretical basis of artificial lighting effects on the physiology, reproductive biology, and/or behavior of key predators and their forage species in the Beaufort Sea area.
2. Plan and/or initiate long-term, meso-scale monitoring to measure and document general levels of ambient light in the Beaufort Sea OCS: (a) Design appropriate sampling methods

and regime and (b) measure and document light in specific OCS development areas at various distances from sources, including new sources as they are created.

3. Initiate relevant ecological studies of Arctic marine systems in the vicinity of artificial light sources to estimate any effects of artificial light on the system's trophic processes, and productivity, and behaviors.

Methods All activities will be coordinated with ongoing industry studies as appropriate.

Phase I:

1. Conduct a comprehensive literature review. Prepare an annotated bibliography and summary report on the potential effects of artificial ambient lighting on relevant taxa.
2. Hold a facilitated scientific meeting to make recommendations on the justification for, and design of, a monitoring program. Recommendations for specific studies, defined under Objective 3, will also be recorded.

Phase II:

1. If justified, initiate a meso-scale monitoring study to document the intensity of artificial ambient lighting as per Objective 2, above.
2. Refine design and initiate focused ecological studies, as per Objective 3.

Current Status:

A final report is being prepared. The contractor submitted a draft of the literature review in November 2007 and held the required scientific meeting in January 2008.

Final Report Due: June 30, 2008

Publications Completed: None

Affiliated WWW Sites: <http://www.mms.gov/alaska/>

Revised Date: March 2008