

Environmental Studies Program: Ongoing Studies

Study Area(s): Beaufort Sea

Administered By: National Program

Title: Cumulative Effects of Arctic Oil Development – Planning and Designing for Sustainability (ArcSEES; NT-13-x11)

BOEM Information Need(s) to be Addressed: BOEM needs information on the effects of oil and gas infrastructure and climate change to support future planning and decision-making. NSF's Arctic Science, Engineering and Education for Sustainability (ArcSEES) program is a multi-year, interdisciplinary program, supported by an international partnership among BOEM, NSF, USGS, USFWS, EPA, and a consortium of French agencies, that seeks to evaluate the sustainability of the Arctic's human-environmental system and to provide community-relevant sustainability pathways and engineering solutions. BOEM's participation in the ArcSEES program will facilitate a better understanding the complex feedbacks that control the overall evolution of the Arctic system for timescales ranging from a few days to several years. Findings from this and other ArcSEES projects will support NEPA analyses for potential future lease sales, review of EPs, DPPs and other reviews for BOEM decision-making and mitigation.

BOEM Contribution: \$300,000
plus Joint Funding

Period of Performance: FY 2013-2019

Conducting Organization: NSF, ArcSEES

BOEM Contact: [Dr. John Primo](#)

Description:

Background: Further development of oil and gas resources and associated infrastructure in the Arctic is possible, and BOEM, other agencies, and the private sector need more information on the infrastructural effects of such activity, and particularly on the thawing of permafrost. This vital component of the arctic ecosystem plays a substantial role in supporting system processes; including subsistence activities in the region.

Additional information is needed so that current international initiatives related to the Arctic may better address cumulative effects of extensive networks of infrastructure needed for resource development. This is important as local people are directly impacted by the effects of oil and gas development and associated infrastructure. The opening of arctic lands and seas to transportation and development is occurring against a backdrop of sea-ice loss, dwindling resources elsewhere in the world, and competing geopolitical interests. It is inevitable that considerably more infrastructure than presently exists will be required to develop these areas.

Objectives: The overarching goal of this study is to better understand the cumulative environmental and social effects of developing oil and gas resources in the Arctic, and to support the creation of a comprehensive adaptive planning approach toward

infrastructural development. In doing so, the study aims to meet the following objectives:

- An enhanced understanding of the infrastructure-related permafrost/landform/vegetation succession in terrain undergoing thermokarst formation
- The creation of an arctic infrastructure action group to develop adaptive management strategies that address the unique issues related to networks of infrastructure in arctic permafrost environments
- The development of future arctic scientists with an understanding of the effects of industrial development and the potential for adaptive management

Methods: This study will include an examination of infrastructure and landscape change at multiple scales, an evaluation of adaptive management planning for infrastructure in northern Alaska and cumulative effects studies associated with the Iñupiat village of Nuiqsut. The study will also support several workshops bringing a diversity of scientists and local people together to develop adaptive management strategies that address issues related to the effects of infrastructure development in arctic permafrost environments. Lastly, training for students on arctic systems and on issues related to industrial development and adaptive management will be administered through a college course.

Current Status: Ongoing

Publications Completed:

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- BurnSilver, S., Magdanz, J., Stotts, R., Berman, M., and Kofinas, G.. "Economies Persistent or Transitional? Evidence Using Social Networks from Arctic Alaska," *American Anthropologist*, v.118, 2016, p. 121. doi:DOI: 10.1111/aman.12447
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Affiliated WWW Sites: <http://www.boem.gov/akstudies/>
http://www.nsf.gov/awardsearch/showAward?AWD_ID=1263854
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