National Science Foundation
Geosciences Directorate
Division of Ocean Sciences
Alexandria, Virginia

FINDING OF NO SIGNIFICANT IMPACT (FONSI) PURSUANT TO THE NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) AND EXECUTIVE ORDER 12114 AND DECISION DOCUMENT (DD)

Marine Geophysical Survey by R/V *Sikuliaq* in the Arctic Ocean, Summer 2021

Award: OCE 1916575
Principal Investigator/Institution: Bernard Coakley, University of Alaska, Geophysics Institute

Project Title: An integrated geophysics cruise to map the northern edge in the Chukchi Borderland and the adjacent Canada Basin - constraints on basin history and crustal structure

A Final Environmental Assessment (Final EA) was prepared for the above noted proposed research project funded by the National Science Foundation (NSF) (Proposed Action). The Proposed Action would involve marine geophysical surveys (or "seismic surveys") to be conducted on board Research Vessel *Sikuliaq* (R/V *Sikuliaq*) in the Arctic Ocean in summer 2021. R/V *Sikuliaq* is owned by NSF and operated on our behalf through an existing Cooperative Agreement with the College of Fisheries and Ocean Sciences at the University of Alaska Fairbanks. The Proposed Action would involve the Principal Investigator (PI) noted above and referred to herein as the "Proposing Institution".

The Final EA entitled, "Environmental Assessment/Analysis of a Marine Geophysical Surveys by R/V *Sikuliaq* in the Arctic Ocean, Summer 2021" (Report # FA0221-A) (Attachment 1), was prepared by LGL Limited environmental research associates (LGL) on behalf of NSF and analyzed the potential impacts on the human and natural environment associated with the Proposed Action pursuant to the National Environmental Policy Act (NEPA) and Executive Order 12114, "Environmental Effects Abroad of Major Federal Actions". The Final EA tiers to the *Programmatic Environmental Impact Statement/Overseas Environmental Impact Statement for Marine Seismic Research Funded by the National Science Foundation or Conducted by the U.S. Geological Survey* (June 2011) and the *Record of Decision* (June 2012) (jointly referred to herein as the PEIS). This Finding of No Significant Impact/Decision Document (FONSI/DD) also incorporates by reference the analyses and conclusions set forth in the Incidental Harassment Authorization (IHA), the Biological Opinion (BiOp)/Incidental Take Statement (ITS), and Essential Fish Habitat (EFH) determination issued by the U.S. National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) and the U.S. Fish & Wildlife Service (FWS) Letter of Concurrence for this Proposed Action. The conclusions from the Final EA, and other federal regulatory processes, were consistent with the conclusions of the PEIS and were used to inform the Division of Ocean Sciences (OCE) management of potential environmental impacts of the survey. OCE has reviewed and concurs with the Final EA findings. The Final EA is incorporated into this FONSI/DD by reference as if fully set forth herein.

Project Objectives and Context

The primary goals of the seismic surveys are to measure the depth of the ocean and image the sediments and structures of the Northern Chukchi Borderland and central Canada Basin to better understand the history of these two features. To achieve the project goals, the Principal Investigator proposes to conduct 2-

D reflection and refraction surveys using R/V *Sikuliaq*. The surveys are proposed to occur within the U.S. Exclusive Economic Zones (EEZ) and international waters, ranging in water depths of 200 to 4000 m. The proposed surveys are illustrated with representative tracklines in the Final EA (Attachment 1, Figure 1).

Summary of Proposed Action and Alternatives

The procedures of the Proposed Action would be similar to those used during previous 2-D seismic surveys and would use conventional seismic methodology. The survey would involve one source vessel, R/V *Sikuliaq*, which would tow an array of two or six 520 in3 G-airguns with a maximum total discharge volume of ~3120 in^3. The receiving system would consist of a 1- to 3-kilometer (km) long multichannel hydrophone streamer or ocean bottom seismometers (OBSs). As the airgun array is towed along the survey lines, a hydrophone streamer or the OBSs would receive the returning acoustic signals; OBSs would store the data internally for later analysis. In addition to the operations of the airgun array, a multibeam echosounder (MBES) and sub-bottom profiler (SBP) would be operated from R/V *Sikuliaq*. Most of the survey (80%) would occur in deep water (>1000 m), and 20% would occur in intermediate water (100–1000 m deep). The survey would occur greater than 300 km north of Utqiaġvik and the majority of the survey would occur outside of the EEZ, in international waters.

The proposed study would be expected to last for ~45 days, including ~30 days of seismic operations, ~8 days of transit to and from the survey area, and 7 days for equipment deployment/recovery. R/V *Sikuliaq* would likely leave out of and return to port in Nome, AK, during summer (August/September) 2021. Some deviation in the length of the survey and ports of call may be required, depending on logistics, weather, and restrictions due to COVID-19; however, seismic operations would only occur in the area noted and timeframe allowable under the IHA and other relevant documentation. The schedule is mainly constrained by the ice-minimum (~15 September) and consideration of subsistence activities in the region that would occur closer to shore.

Another alternative to conducting the Proposed Action would be the "No Action" alternative (i.e., the proposed research operations would not be conducted). The "No Action" alternative would result in no disturbance to marine species attributable to the Proposed Action, but geological data of considerable scientific value and relevance to increasing our understanding of the origin of the Chukchi Basin would not be collected. The purpose and need for the proposed activity would not be met through the "No Action" alternative.

Summary of environmental consequences

The Final EA includes analysis on the affected environment (Chapter III) and the potential effects of the Proposed Action on the environment (Chapter IV). Potential impacts of the Proposed Action on the environment would be primarily a result of the operation of the airgun array. The potential effects of sounds from airguns on marine species, including mammals, are described in detail in Attachment 1 (Chapter IV and PEIS Chapters 3 & 4) and might include one or more of the following: tolerance, masking of natural sounds, behavioral disturbance, and at least in theory, temporary or permanent hearing impairment, or non-auditory physical or physiological effects. It is unlikely that the Proposed Action would result in any cases of temporary or especially permanent hearing impairment, or any significant non-auditory physical or physiological effects. Some behavioral disturbance is expected if animals are in the general area during seismic operations, but this would be localized, short-term, and involve limited numbers of animals. The potential effects from the other proposed acoustic sources were also considered; however, they would not be likely to have a significant effect on the environment (Attachment 1, Chapter IV; and PEIS Chapter 3).

The Proposed Action includes an extensive monitoring and mitigation program to further minimize potential impacts on the environment. Mitigation efforts include pre-cruise planning activities and operational activities (Attachment 1, Chapters II and IV; and PEIS Section 2.4.1.1). Pre-cruise planning mitigation activities included consideration of energy source optimization/minimization; survey timing

(i.e., environmental conditions: seasonal presence of animals and weather); and calculation of mitigation zones.

The operational mitigation program would further minimize potential impacts to marine species that may be present during the conduct of the proposed research to a level of insignificance. As detailed in Attachment 1 (Chapters II and IV), the IHA and BiOp/ITS issued by NMFS, and Letter of Concurrence issued by USFWS, the Proposed Action would include operational monitoring and mitigation measures, such as, but not limited to: visual observations; enforcement of exclusion and buffer zones; pre-clearance and ramp ups, shutdowns and power downs of the airguns; monitoring and reporting. The fact that the airgun array, as a result of its design, directs the majority of the energy downward, and less energy laterally, would also be an inherent mitigation measure. The acoustic source would be shut down for any large whale with a calf and aggregation of large whales (defined as 6 or more) observed at any distance from the vessel during operations. The acoustic source would also be powered down (or, if necessary, shut down) in the event any ESA-listed seabirds were observed diving or foraging within the designated exclusion zone (EZ); use of downward-pointing deck lighting and curtains/shades used in cabins at night would further reduce any impacts to ESA-listed seabirds. Observers (and vessel crew) would monitor for ESA-listed seabirds and any impacts the acoustic sources may have on fish. UAF and its contractors are committed to applying these measures in order to minimize any effects on marine mammals, seabirds, and fish, and any other potential environmental impacts.

NMFS included vessel strike avoidance measures in the IHA, including a 500 m separation distance for bowhead whales and whales that cannot be confirmed as a species other than a bowhead whale; however, as noted in the Final EA, R/V *Sikuliaq* (and other vessels in the U.S. Academic Research Fleet) have no history of marine mammal strikes. Although NSF calculated predicted distances to the Level A thresholds based on current NMFS Technical Acoustic Guidance[1], per the IHA, NMFS established a fixed operational 500 m exclusion zone (EZ) and 1,000 m buffer zone (BZ) for the survey (100m EZ and 200 m BZ for the lower energy source level). The IHA also requires a 1,500 m EZ for bowhead whales (500 m EZ for the lower energy source level). The predicted distances for the Level B zones are based on the 160 dB re 1 µPa SPL isopleth, per current NMFS policy for Level B harassment. In addition, PSOs would monitor for polar bear and, in the unlikely event encountered, would implement power downs and shutdowns at the 500 m EZ. Mitigation, monitoring and reporting requirements were incorporated into the Final EA and the FONSI/DD; PSOs would take the lead in ensuring compliance with all monitoring and mitigation measures.

With the planned monitoring and mitigation measures, unavoidable impacts to marine species that could be encountered would be expected to be minimal, and limited to short-term, localized changes in behavior and distribution near the seismic vessel. At most, effects on marine mammals may be interpreted as falling within the U.S. Marine Mammal Protection Act (MMPA) definition of Level B Harassment for those species managed by NMFS. No long-term or significant effects would be expected on individual marine mammals, seabirds, fish or the populations to which they belong or on their habitats.

The results of the cumulative impacts analysis in the PEIS indicated that there would not be any significant cumulative effects to marine resources from the proposed NSF-funded marine seismic research, including the combined use of airguns, MBES, SBP, and acoustic pingers. However, the PEIS also stated that cruise-specific cumulative effects analysis would be conducted, "allowing for the identification of other potential activities in the area of the proposed seismic survey that may result in cumulative impacts to environmental resources." The potential cumulative effects of the Proposed Action were evaluated in Section 4.1.6 of the

[1] 2018 Revision to: Technical guidance for assessing the effects of anthropogenic sound on marine mammal hearing (version 2.0). Underwater thresholds for onset of permanent and temporary threshold shifts. Office of Protected Resources, NMFS, Silver Spring, MD.

Final EA. Due to the location of the Proposed Action, human activities in the area around the survey vessel would be anticipated to include other research activities, possible Naval activities, vessel traffic, and fisheries activities. Fisheries activities within the region and potential impacts are described in further detail in the Final EA, Chapters III and IV. Fisheries activities would not be precluded in the survey area; however, a safe distance would need to be kept to avoid possible entanglement with the towed airgun array and OBS deployments. Conflicts would be avoided through direct radio communications with fishers during the surveys. Very few interactions, if any, between the proposed surveys and fishing operations are expected to occur in the offshore survey area; commercial fishing is not permitted by the U.S. Arctic Fishery Management Plan for Fish Resources of the Arctic Management Area, and subsistence fishing is likely to occur much closer to shore. Considering the distance the planned seismic survey would take place to shore, where most subsistence activities would occur, and brief period of operations, the proposed project is not expected to have significant impacts to the availability of subsistence resources. No fish kills or injuries were observed during any previous NSF-funded seismic survey activities. Given the brief duration of the proposed survey and the temporary nature of potential environmental impacts, no cumulative effects would be anticipated. After review, the combined effects of the project and other potential human activities in the area are not anticipated to result in significant impacts on the environment.

The "No Action" alternative would remove the potential of the limited direct and indirect environmental consequences as described. However, it would preclude important scientific research from going forward that would contribute to our understanding of the Chukchi Basin. The "No Action" alternative would result in a lost opportunity to obtain important scientific data and knowledge relevant to the geosciences and to society in general. The collaboration, involving PIs and students, would be lost along with the collection of new data, future interpretation of these data and introduction of new results into the greater scientific community. Loss of NSF support often represents a significant negative impact to the academic infrastructure, including the professional and academic careers of the researchers, students, ship technicians and crew who are part of the U.S. Academic Research Fleet. The "No Action" alternative would not meet the purpose and need of the Proposed Action.

Public Engagement and Coordination with Other Agencies and Processes

NSF posted a Draft Environmental Assessment (Draft EA) on the NSF website for a 30-day public comment period from 28 May 2021 thru 29 June 2021 and sent notices to potential interested parties. NSF also sent letters to Alaskan tribal contacts to provide notification of the Proposed Action and related environmental compliance review, including the availability of the Draft EA, and to provide an opportunity to consult. No comments or responses were received in response to the NSF outreach efforts.

Dr. Coakley presented the Proposed Action to the Alaska Eskimo Whaling Commission (AEWC) at the July 2020, October 2020, and February 2021 Triannual Meetings. As specifically noted, during the meetings, daily email communications with interested community members would be made from the vessel. Communication may include notice of any unusual marine mammal observations during the Proposed Action. Any potential space use conflicts would be further avoided through direct communication with subsistence fishers/hunters during the surveys; however, due to the significant distance from shore, no direct interaction with subsistence fishers/hunters would be anticipated. The plan is to have all the gear on board and be southbound to Nome prior to the beginning of fall whaling in Utqiaġvik.

NSF coordinated with NMFS to complete the Final EA prior to issuance of the IHA and BiOp in order to facilitate adoption of the NSF Final EA as part of the NMFS NEPA process. NSF had enhanced coordination with NMFS throughout the IHA and ESA consultation processes to facilitate this streamlined approach. As already highlighted, based on discussions with federal regulators during MMPA and ESA processes, minor refinements to the information in the Draft EA were made. The new information included

in the Final EA, however, did not alter the overall conclusions of the Draft EA and remained consistent with the PEIS.

Compliance with other federal statutes and regulatory processes are summarized below and in further detail in the Final EA, Section 4.1.8. In addition to these processes, efforts were made to coordinate in advance of operations with the U.S. Navy to address security matters.

(a) Endangered Species Act (ESA)

After meeting with FWS staff on 5 February 2021 and discussing the Proposed Action, on 25 February 2021, NSF submitted a formal ESA consultation request. NSF requested formal consultation for the threatened polar bear because we anticipated that the proposed survey may have an incidental adverse effect on this species. We also requested concurrence that the proposed activity may affect but was not likely to adversely affect the threatened Steller's and spectacled eiders, and the endangered short-tailed albatross. After review, USFWS concluded in a Letter of Concurrence (Attachment 1, Appendix C) dated 7 June 2021, the proposed action was not likely to adversely affect listed eiders, short-tailed albatross or polar bears, and that it would not adversely affect designated polar bear critical habitat.

On 12 February 2021, NSF submitted a formal ESA Section 7 consultation request, including the Draft EA, to NMFS for the proposed activity. On 10 August 2021, NMFS issued a BiOp and ITS (Attachment 2).

(b) Marine Mammal Protection Act (MMPA)

An IHA application was submitted to NMFS on 12 February 2021 by UAF on behalf of itself, NSF, and the researchers, to NMFS, under the U.S. MMPA, for "taking by harassment" (disturbance) of small numbers of marine mammals during the proposed seismic survey. On 28 May 2021, NMFS issued in the Federal Register a notice of intent to issue an IHA for the survey and a 30-day public comment period. NMFS issued an IHA for the proposed activity on 11 August 2021 (Attachment 3).

An IHA application was also submitted on 23 February 2021 to USFWS for "taking by harassment" of small numbers of polar bears and walrus. However, after discussions with USFWS, it was determined that an IHA was not necessary, as no walrus or polar bears were expected to occur in the region during the proposed seismic survey (Attachment 1, Appendix D).

(e) Essential Fish Habitat (EFH)

EFH was identified to occur within the proposed survey area. Although NSF anticipated no significant impacts to EFH, as the Proposed Action may affect EFH, in accordance with the Magnuson-Stevens Fishery Conservation and Management Act, NSF requested consultation with NMFS on 29 March 2021. On 2 June 2021, NMFS concurred with NSF's determination that proposed activities may affect but would have no adverse effects on EFH from the Proposed Action (Attachment 1, Appendix E).

Conclusion and Decision

NSF has reviewed and concurs with the conclusions of the Final EA (Attachment 1) that implementation of the Proposed Action will not have a significant impact on the environment. Consequently, implementation of the Proposed Action will not have a significant direct, indirect or cumulative impact on the environment within the meaning of NEPA or EO 12114. Because no significant environmental impacts will result from implementing the Proposed Action, an environmental impact statement is not required and will not be prepared. Therefore, no further study under NEPA or EO 12114 is required.

As described above, NSF's compliance with the ESA, MMPA, and EFH is completed.

In sum, NSF concludes that implementation of the Proposed Action will not result in significant impacts after full consideration of the IHA, BiOp/ITS, and EFH determination issued by NMFS, USFWS Letter of Concurrence, Final EA, PEIS, and the entire environmental compliance record. Accordingly, on behalf of NSF, I authorize the issuance of a Finding of No Significant Impact for the Proposed Action, the marine seismic survey proposed to be conducted on board Research Vessel *Sikuliaq* in the Arctic Ocean during the effective time period of the IHA, and hereby approve the Proposed Action to commence.

Bauke Houtman 16 August 2021

Bauke (Bob) Houtman Date
Integrative Programs Section Head
Division of Ocean Sciences

Attachment 1: Environmental Assessment/Analysis of a Marine Geophysical Survey by R/V *Sikuliaq* in the Arctic Ocean, Summer 2021
Attachment 2: NMSF Biological Opinion/Incidental Take Statement
Attachment 3: NMFS Incidental Harassment Authorization