

**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 of the Cascadia Subduction Zone in the Northeast Pacific Ocean,
Late Spring/Summer 2021**

Award: OCE 1827452

Principal Investigator/Institution: Suzanne Carbotte, Columbia University Lamont-Doherty Earth Observatory (LDEO)

Award: OCE 1827363

Principal Investigators/Institution: Gail Christeson, University of Texas Institute for Geophysics (UTIG)

Co-Principal Investigator/Institution: Shuo Shuo Han, UTIG

Award: OCE 1829113

Co-Principal Investigator/Institution: Juan Pablo Canales, Woods Hole Oceanographic Institution (WHOI)

Project Title: Collaborative Research: Illuminating the Cascadia plate boundary zone and accretionary wedge with a regional-scale ultra-long offset multi-channel seismic study

Award: OCE 1929545

Principal Investigator/Institution: Juan Pablo Canales, Woods Hole Oceanographic Institution (WHOI)

Co-Principal Investigator/Institution: Daniel Lizarralde, WHOI

Project Title: An Open-Access, Controlled-Source Seismic Dataset Across the Cascadia Accretionary Wedge From Multi-Scale Regional OBS and Focused Large-N Nodal Arrays

A Final Environmental Assessment (Final EA) was prepared for the above noted proposed research projects 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 *Marcus G. Langseth* (R/V *Langseth*) and deployment of ocean bottom seismometers and nodes along the Cascadia margin during late spring/summer 2021. R/V *Langseth* is owned and operated by Columbia University’s Lamont-Doherty Earth Observatory (LDEO). The Proposed Action would involve the Principal Investigators (PI) noted above and referred to herein as the “Proposing Institutions”. The Proposed Action was originally proposed for late spring/summer 2020 but was deferred due to logistical issues associated with COVID-19 and unfinalized federal regulatory processes.

The Final EA entitled, “Final Environmental Assessment/Analysis of Marine Geophysical Surveys by R/V *Marcus G. Langseth* of the Cascadia Subduction Zone in the Northeast Pacific Ocean, 2021” (Report # FA0202-01) (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 Authorizations (IHAs) and the Biological Opinions (BiOps)/Incidental Take Statements (ITs) issued by the U.S. National Oceanic and Atmospheric Administration’s National Marine Fisheries Service (NMFS) and U.S. Fish & Wildlife Service (FWS) 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 use two-dimensional (2-D) seismic surveying and Ocean Bottom Seismometers (OBS) and Ocean Bottom Nodes (OBN) to investigate the Cascadia Subduction Zone and provide data necessary to illuminate the depth, geometry, and physical properties of the seismogenic portion and updip extent of the megathrust zone between the subducting Juan de Fuca plate and the overlying accretionary wedge/North American plate. The data will yield new constraints on earthquake and tsunami potential in this heavily populated region of the Pacific Northwest. To achieve the project goals, the researchers propose to conduct 2-D reflection and refraction surveys using R/V *Langseth* along the Cascadia margin offshore Oregon, Washington, and Vancouver Island. The proposed surveys would occur within the Exclusive Economic Zones (EEZ) of Canada and the U.S., including within U.S. and Canadian Territorial Waters. The proposed surveys are illustrated with representative tracklines in the Final EA (Attachment 1, Figure 1). A complementary land-based research effort was also awarded by NSF. Although that project had independent utility and therefore underwent separate environmental review, it would capitalize on proposed R/V *Langseth* marine-based activities and would vastly expand the geophysical dataset available for analysis of the Cascadia margin. The collection of seismic data by R/V *Langseth* would also represent an essential step in the development of potential International Ocean Discovery Program (IODP) activities along the Cascadia margin.

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 *Langseth*, which would tow a 36-airgun array with a discharge volume maximum of 6600 cubic inches (in³) at a depth of 12 meters (m), and a shot interval of 37.5 m (approximately (~)17 seconds). The receiving system would consist of a 15-kilometer (km) long multichannel hydrophone streamer. OBSs and OBNs (OBS/Ns) would be deployed from R/V *Langseth* and/or R/V *Oceanus*; this OBS/N program would leverage the seismic surveys by R/V *Langseth*. As the airgun array is towed along the survey lines, a hydrophone streamer or the OBS/Ns would receive the returning acoustic signals; OBS/Ns 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 *Langseth* continuously throughout the cruise, but not during transit to or from the site. Approximately 6540 km of transect lines would be surveyed in the Northeast Pacific Ocean. Most of the survey (69%) would occur in deep water (>1000 m), 28% would occur in intermediate water (100–1000 m deep), and ~3% would take place in shallow water <100

m deep. Approximately 3.6% of the transect lines (234 km) would be undertaken in Canadian Territorial Waters, with most effort in intermediate waters.

The proposed surveys would be expected to last for ~40 days, including ~37 days of seismic operations, ~2 days of equipment deployment, and ~1 day of transit. During late spring/summer 2021, R/V *Langseth* would likely leave out of port in Newport, OR, and return to Seattle, WA. Some deviation in the length of the survey and ports of call may be required, depending on logistics and weather; however, seismic operations would only occur in the area noted and timeframe allowable under the IHA. The ensuing analysis (including take estimates) focuses on the time of the survey (late spring/summer); the best available species densities for that time of the year have been used.

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 seismogenic zone along the Cascadia margin 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 and sea turtles of particular concern, 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, ITS, and Letter of Concurrence issued by NMFS and USFWS, the Proposed Action would include operational monitoring and mitigation measures, such as, but not limited to: visual observations, acoustic monitoring, enforcement of exclusion and buffer zones, pre-clearance and ramp ups, shutdowns and power downs, 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 at any distance from the vessel during operations for observances of killer whales, North Pacific right whales, any large whale with a calf, and aggregation of large whales (defined as 6 or more). The shutdown requirement would be waived for small dolphins of the following genera: *Tursiops*, *Delphinus*, *Stenella*, *Lagenorhynchus*, and *Lissodelphis*.

The acoustic source would also be powered down (or, if necessary, shut down) in the event a sea turtle or an ESA-listed seabird were observed diving or foraging within the designated exclusion zone (EZ). Observers would also watch for any impacts the acoustic sources may have on fish. LDEO and its contractors are committed to applying these measures in order to minimize any effects on marine mammals, sea turtles, seabirds, and fish, and other potential environmental impacts. NMFS included vessel strike avoidance measures in the IHA; however, as noted in the Final EA, R/V *Langseth* (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 Guidance¹, per the IHA, NMFS established a fixed operational 500 m exclusion zone and 1,000 m buffer zone for the survey; the IHA also requires a 1,500 m EZ for all beaked whales and dwarf and pygmy sperm whales. The predicted distances for the Level B zones are based on the 160 dB re 1 μ Pa SPL isopleth, per current NMFS policy for Level B harassment. Additional mitigation, monitoring and reporting requirements were identified through compliance with other regulatory processes, such as the Olympic Coast National Marine Sanctuary (OCNMS) permit and Canadian Fisheries Act. For example, in Canadian waters, the designated EZ for shut downs for sperm and beaked whales (any species) is 1500 m and for other marine mammal species and sea turtles is 1000 m. Mitigation, monitoring and reporting requirements were incorporated into the Final EA, the FONSI/DD, and/or the LDEO Science Support Plan; PSOs will take the lead in ensuring compliance with all monitoring and mitigation measures. LDEO has also prepared a communication plan to help keep stakeholders informed of operations; daily notifications will be sent to various groups when operating in particular areas, such as Tribal Usual and Accustomed (U&A) fishing areas.

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, however, NMFS also issued small numbers of Level A take for some marine mammal species for the remote possibility of low-level physiological effects from the Proposed Action. Although considered unlikely, any Level A harassment potentially incurred would be expected to be in the form of some smaller degree of permanent hearing loss due in part to the required monitoring measures for detecting marine mammals and required mitigation measures for power downs or shut downs of the airgun array if any animal is likely to enter the exclusion zones. Neither mortality nor complete deafness of marine mammals is expected to result from the surveys. No long-term or significant effects would be expected on individual marine mammals, sea turtles, seabirds, fish or the populations to which they belong or on their habitats. When operating within the Canadian EEZ, LDEO will follow the guidance provided by Fisheries and Oceans Canada (DFO) (Attachment 1, Appendix I), including the additional monitoring and mitigation measures, to avoid causing any harmful alteration, disruption, or destruction of fish (including marine mammal) habitat, or causing prohibited effects to aquatic species at risk.

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 Final EA. Due to the location of the Proposed Action, human activities in the area around the survey vessel

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.

would be anticipated to include other research activities, possible Naval activities, vessel traffic, fisheries activities (e.g., commercial, subsistence, recreational), tourism, whaling and sealing. Because the proposed survey would occur mainly in water deeper than 60 m, any recreational diving is unlikely to be impacted. 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/N deployments. Conflicts would be avoided through Notice to Mariners and direct radio communications with fishers during the surveys. In addition, flyers and digital maps of the proposed tracklines and OBS/N deployments would be prepared and distributed to the fishing community to avoid conflicts, including in fishing gear stores in Oregon coastal towns. Survey start date and route plans would be shared with tribal points of contact and vessel operators would notify three days in advance of operating within tribal U&A fishing areas. Considering the limited time that the planned seismic survey would take place close to shore, where most subsistence fisheries activities would occur, and brief period of operations, the proposed project is not expected to have any significant impacts to the availability of subsistence fisheries. 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, or economic impacts to fisheries, 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 Cascadia subduction zone, including earthquake and tsunami hazards. The proposed research would characterize subducting plate and accretionary wedge structure, and properties of the megathrust, along the Cascadia Subduction Zone. This regional characterization would be used to determine whether there are any systematic relationships among upper and lower plate properties, paleorupture segmentation, and along-margin variations in present-day coupling at Cascadia. The data would also be used to characterize down-dip variations along the megathrust that may be linked to transitions in fault properties, from the up-dip region near the deformation front, which is of most interest for tsunamigenesis, to near shore where the downdip transition in the locked zone may reside. Data collected would be made publicly available as a community data set (i.e., available for use by anyone). 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 7 February 2020 thru 7 March 2020 and sent notices to potential interested parties. Comments were received from three entities (Center for Biological Diversity, Oregon Department of Fish and Game, and a private citizen) and were addressed in the Final EA, Appendix E. In summary, concerns raised regarding the project were mainly focused on potential impacts to Southern Resident Killer Whales (SRKW) and fisheries, including space/use conflicts.

NSF sent letters to tribal contacts to notify the tribes of the Proposed Action and NSF’s related environmental compliance review, including the availability of the Draft EA, and also to provide an opportunity to consult. NSF discussed the project with a point of contact from the Quinault Nation. NSF understands the Makah Tribe sent a letter to NSF highlighting some points of

concern about the project; however, the letter was unfortunately not received by NSF. NSF coordinated with the Makah Tribe Natural Resource Policy Analyst on the matter.

Based on comments received during the public comment period, consultations and federal regulatory processes, survey tracklines and OBS/N deployments were adjusted and additional operational restrictions required, including avoidance of anticipated high density areas of SRKW including critical habitat; eliminating operations in most waters <100 m; limiting seismic survey operations to daylight only and incorporating use of a support vessel with additional PSOs in water depths of 100-200 m in waters north of Tillamook Head, OR, and when operating in OCNMS. Proposed activities within the OCNMS would only cumulatively take ~1-2 days, and even less time would be spent within each tribal U&A fishing areas. R/V *Langseth* would move continuously during seismic survey operations. For those areas where there could be overlap with fishing vessels, the vessel operator would work to avoid space/use overlap through heightened and direct communication with fishermen in the area, as noted previously.

NSF coordinated with NMFS to complete the Final EA prior to issuance of an IHA and BiOp/ITS to accommodate NMFS' need to adopt NSF's Final EA as part of the NMFS NEPA process associated with issuing authorizations. NSF had enhanced coordination with NMFS and USFWS throughout the IHA and ESA consultation processes to facilitate this streamlined approach. As already highlighted, based on discussions with federal regulators during MMPA and Endangered Species Act (ESA) processes, refinements to the information in the Draft EA and planned operations 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 with the U.S. Navy to avoid space-use conflicts and security matters. The U.S. Coast Guard will be notified about OBS/N placements. Due to their involvement with the Proposed Action, the U.S. Geological Survey agreed to be a Cooperating Agency.

(a) Endangered Species Act (ESA)

On 22 November 2019, NSF submitted a Letter of Concurrence request to USFWS that the proposed activity may affect but was not likely to adversely affect the *endangered* Hawaiian petrel and short-tailed albatross, and the *threatened* marbled murrelet. On 11 January 2020, USFWS provided a Letter of Concurrence (Attachment 1, Appendix F) that the proposed activity “may affect” but was not likely to “adversely affect” the Hawaiian petrel and short-tailed albatross, but did not concur for marbled murrelet, requesting additional information related to this species. In subsequent discussions with USFWS, they also identified that the Proposed Action could have potential effects on bull trout. On 12 April 2021, USFWS issued a BiOp on these species to NSF noting that the Proposed Action may affect, but is not likely to adversely affect the bull trout and its critical habitat, and that the Proposed Action is likely to adversely affect but is not likely to jeopardize the continued existence of the marbled murrelet (Attachment 1, Appendix F). Mitigation measures for ESA-listed seabirds would include power downs, and if necessary, shut downs for diving or foraging seabirds within the EZ.

On 8 November 2019, NSF submitted a formal ESA Section 7 consultation request, including the Draft EA, to NMFS for the proposed activity. NMFS conducted tribal outreach efforts consistent with *Secretarial Order (#3206): American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act*, to help inform their consultation on this action. Letters were sent to tribes with potential interest in the consultation. On 17 February 2021, NMFS held a webinar to discuss the project, including participation from representatives of tribes, NSF, and OCNMS. Per the request of the tribal representative attendees, an additional meeting focused on potential tribal fisheries interactions was held on 6 April 2021; NSF participated in the meeting.

On 3 March 2021, NOAA received a letter from the Makah Tribal Council outlining their general support of the project but making several requests, including that NSF (1) notify Makah Fisheries Management when the survey start date is finalized with route plans and anticipated dates of surveys within the Makah U&A fishing area, as well as three days in advance of reaching the Makah U&A fishing area; (2) adopt the enhanced mitigation measure to restrict seismic survey operations to daylight hours and include a second observer vessel within the Makah U&A fishing area regardless of depth to better ensure that ESA-listed marine mammals are identified and avoided; and (3) identify opportunities to monitor for acoustic impacts associated with the seismic surveys and make this data available to Makah Fisheries Management. NOAA, with input from NSF, provided a response to the Makah Tribe on 21 April 2021. The Makah Tribe also requested government to government consultation with NOAA; however, later communicated that a consultation meeting with NOAA Fisheries was not needed. NMFS issued a BiOp and ITS on 19 May 2021 (Attachment 2).

(b) Marine Mammal Protection Act (MMPA)

An IHA application was submitted on 8 November 2019 by LDEO 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 7 April 2019, NMFS issued in the Federal Register a notice of intent to issue an IHA for the survey and a 30-day public comment period. Public comments were received from several entities during that process, including the Center for Biological Diversity, Ecojustice, and Deep Green Wilderness; NMFS considered the comments and will provide responses as required per the IHA process. NMFS issued an IHA for the proposed activity on 19 May 2021 (Attachment 3).

An IHA application was submitted on 20 December 2019 by LDEO on behalf of itself, NSF, and the researchers, to USFWS, under the U.S. MMPA, for “taking by harassment” (disturbance) of small numbers of marine mammals during the proposed seismic survey. NSF had additional dialog and correspondence with USFWS regarding the IHA application, including providing additional supplemental information. On 1 March 2021, USFWS issued in the Federal Register a notice of intent to issue an IHA for the survey and a 30-day public comment period (Attachment 1, Appendix D). Public comments were received from three entities during that process, including from the Marine Mammal Commission; USFWS considered the comments and will provide responses as required per the IHA process. USFWS issued an IHA for the proposed activity on 20 April 2021 (Attachment 1, Appendix D).

(c) Coastal Zone Management Act (CZMA)

On 20 December 2019, NSF submitted a determination that the Proposed Action was consistent to the maximum extent practicable with the enforceable policies of Oregon’s Coastal Zone Management Program. On 4 March 2020, the Oregon Department of Land Conservation and Development confirmed presumed concurrence with the NSF determination that the proposed activity is consistent to the maximum extent practicable with the enforceable policies of Oregon’s Coastal Zone Management Program (CZMP) (Attachment 1, Appendix G). During this process, some concerns were raised related to potential space-use conflicts with fishers; however, as noted in the Draft EA Section 4.1.2.4 and 4.1.5, NSF anticipates limited space-use conflict with fishers. Enhanced outreach efforts and coordination with members of the fishing industry have occurred to help further reduce any potential space use conflicts.

On 8 January 2020, NSF submitted a determination that the Proposed Action was consistent to the maximum extent practicable with the enforceable policies of Washington’s CZMP. On 23 March 2020, the State of Washington Department of Ecology, pursuant to the Coastal Zone Management Act of 1972 as amended, concurred with NSF’s determination that the proposed work is consistent with Washington’s

CZMP, and that NSF demonstrated that the Proposed Action is consistent with the CZMP's enforceable policies found in Washington's Ocean Resource's Management Act and the Ocean Management Guidelines (Attachment 1, Appendix G).

(d) National Marine Sanctuary Act (NMSA)/Olympic Coast National Marine Sanctuary (OCNMS)

On 19 December 2019, LDEO submitted a permit application to OCNMS for activities that would occur within the Sanctuary. A Sanctuary Resource Statement (SRS) was submitted to the Office of National Marine Sanctuaries (ONMS) on 16 March 2020 by NSF and NMFS. After the survey originally scheduled for 2020 was deferred, the permit was updated for the spring/summer 2021 timeframe and resubmitted to OCNMS on 15 June 2020. As part of the permit process, OCNMS also sought input on the application from the Hoh, Makah, Quileute tribes, and Quinault Nation. On 19 May 2020, the Quileute Tribe submitted comments on the permit application to OCNMS. In particular, the Tribe stated that they did not support the abandonment of any equipment in the marine environment, including the OBS anchors. No OBSs or anchors would be deployed within the Quileute Tribal U&A fishing area. Based on this input, however, NSF modified the originally proposed plan to use within the Sanctuary steel anchors for the OBSs to concrete anchors, which while still cannot be retrieved, should degrade faster and mainly to sand.

After requesting additional information in January 2021, a revised SRS was submitted on 22 January 2021. ONMS found, on 27 January 2021, that the SRS was sufficient to make an injury determination. In their final determination dated 12 March 2021, ONMS made two alternative recommendations to further minimize injury and protect sanctuary resources: (1) limit operations in OCNMS to daylight hours only regardless of depth, and (2) use of the secondary support vessel aiding in marine mammal observations throughout the entire sanctuary (Attachment 1, Appendix H). On 19 March 2021, NSF notified ONMS/OCNMS the alternative recommendations were accepted and understood no further consultation with ONMS/OCNMS was necessary prior to conducting the Proposed Action. OCNMS issued the permit on 2 April 2021 (Attachment 1, Appendix H).

(e) Essential Fish Habitat (EFH)

EFH and Habit Areas of Particular Concern (HAPCs) were identified to occur within the proposed survey area. Although NSF anticipated no significant impacts to EFH and HAPC, as the Proposed Action may affect EFH and HAPC, in accordance with the Magnuson-Stevens Fishery Conservation and Management Act, NSF requested consultation with NMFS on 14 November 2019. In discussions with NMFS, it was determined to incorporate the EFH process into the ESA consultation. On 19 May 2021, NMFS issued its BiOp which included information and determination on EFH (Attachment 2).

(f) Canadian Department of Fisheries and Oceans (DFO)

An application for a Species at Risk permit application per the Species at Risk Act (SARA) was submitted on 19 December 2019. After discussion with DFO staff, the Species at Risk application was revised and resubmitted along with a Canadian Fisheries Act Request for Review on 18 December 2020. After consultation with DFO, all proposed transect lines and their associated 160-dB ensonified area were moved out of Canadian critical habitat for SRKW. On 6 April 2021, DFO issued a Letter of Advice with measures to follow to avoid causing the death of fish (including marine mammals) and/or harmful alteration, disruption, or destruction of fish habitat, or causing prohibited effects to SARA species, any part of their critical habitat or the residences of their individuals (Attachment 1, Appendix I).

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, CZMA, NMSA/OCNMS, EFH, and the Canadian Fisheries Act is completed.

In sum, after full consideration of the Final EA, the PEIS, the IHAs and ITSs issued by NMFS and USFWS, the Letter of Concurrence from USFWS, the CZMA and EFH determinations, NMSA SRS determination and OCNMS permit issued, DFO Letter of Advice, and the entire environmental compliance record, NSF concludes that implementation of the Proposed Action will not result in significant impacts. 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 *Marcus G. Langseth* and OBS/N deployments along the Cascadia subduction zone during the effective time period of the IHAs, and hereby approve the Proposed Action to commence.

Bauke Houtman

20 May 2021

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

Date

Attachment 1: Final Environmental Assessment/Analysis of Marine Geophysical Surveys by R/V *Marcus G. Langseth* of the Cascadia Subduction Zone in the Northeast Pacific Ocean, 2021

Attachment 2: NMSF Biological Opinion/Incidental Take Statement

Attachment 3: NMFS Incidental Harassment Authorization