

**FINDING OF NO SIGNIFICANT IMPACT**  
**FOR THE ISSUANCE OF AN INCIDENTAL HARASSMENT AUTHORIZATION TO**  
**LAMONT-DOHERTY EARTH OBSERVATORY AND ADOPTION OF THE NATIONAL**  
**SCIENCE FOUNDATION FINAL ENVIRONMENTAL ASSESSMENT**

**I. INTRODUCTION**

The National Marine Fisheries Service (NMFS) received an application requesting incidental take of marine mammals from the Lamont-Doherty Earth Observatory (L-DEO) in connection with geophysical surveys analyzed in the National Science Foundation’s (NSF) 2019 Final Environmental Analysis (EA), “*Environmental Analysis of a Marine Geophysical Survey by the R/V Marcus G. Langseth in the Northeast Pacific Ocean, Summer 2019*”. NMFS is required to review applications and, if appropriate, issue Incidental Take Authorizations (ITAs) pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 et seq.). In addition, the National Environmental Policy Act (NEPA), 40 Code of Federal Regulations (CFR) Parts 1500 - 1508, and National Oceanic and Atmospheric Administration (NOAA) policy and procedures<sup>1</sup> require all proposals for major federal actions be reviewed with respect to environmental consequences on the human environment. Therefore, the purposes of this document are twofold. First, this document explains NMFS’s determination to adopt NSF’s Final EA for the NEPA review that NMFS is required for its consideration of whether to issue an Incidental Harassment Authorization (IHA) for the L-DEO Marine Geophysical Survey by the R/V *Marcus G. Langseth* in the Northeast Pacific in 2019. Second, this document explains NMFS rationale for its finding that issuance of the Incidental Harassment Authorization (IHA) for this survey will not significantly impact the quality of the human environment.

NMFS proposes to issue an IHA to L-DEO pursuant to Section 101(a)(5)(D) of the MMPA and 50 Code of Federal Regulations (CFR) Part 216<sup>2</sup>. This IHA will be valid from July 11, 2019 through July 10, 2020 and authorizes takes, by Level A or Level B harassment, of small numbers of marine mammals incidental to L-DEO and other researchers<sup>2</sup> conducting geophysical surveys, with funding from NSF, in areas off the coasts of Oregon and Washington. NMFS’s proposed action is a direct outcome of L-DEO’s request for an IHA for conducting geophysical surveys. Geophysical surveys involves collecting seismic reflection and refraction data that reveal the structure and stratigraphy of the crust and overlying sediment of the seafloor. Geophysical surveys are conducted aboard vessel(s) towing an array of airguns<sup>3</sup> that produce low frequency sound pulses that penetrate deep into the subsurface and are then reflected and recorded by receivers to image deep geological features. The type of active acoustic source (two-dimensional (2-D) deep penetration seismic airgun) has the potential to cause marine mammal harassment in the form of injury or behavioral harassment and, therefore, requires an authorization from NMFS. An authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), and, where relevant, will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses. In addition, the IHA must set forth the permissible

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<sup>1</sup> NOAA Administrative Order (NAO) 216-6A “*Compliance with the National Environmental Policy Act, Executive Orders 12114, Environmental Effects Abroad of Major Federal Actions; 11988 and 13690, Floodplain Management; and 11990, Protection of Wetlands*” issued April 22, 2016 and the Companion Manual for NAO 216-6A “*Policy and Procedures for Implementing the National Environmental Policy Act and Related Authorities*” issued January 13, 2017

<sup>2</sup> University of Texas at Austin Institute for Geophysics (UTIG), the Nevada Seismological Laboratory at the University of Nevada Reno (UNR), and Scripps Institution of Oceanography (SIO) at the University of California San Diego

<sup>3</sup> Data acquisition involves a single vessel towing a single acoustic array. The receiver(s) is towed behind the vessel on a long cable (streamer) or is placed on the ocean bottom (cables or nodes).

methods of taking, other means of effecting the least practicable adverse impact on the species or stock and its habitat, and requirements pertaining to the monitoring and reporting of such takings.

NMFS's issuance of this IHA allowing the taking of marine mammals, consistent with provisions under the MMPA and incidental to an applicant's lawful activities, is considered a major federal action. Therefore, NMFS conducted an environmental review of NSF's 2019 Final EA and determined adopting this EA and preparing a separate Finding of No Significant Impact (FONSI) is appropriate for NMFS's consideration to issue an IHA to L-DEO. This FONSI evaluates the context and intensity of the impacts on marine mammals associated with NMFS's consideration to issue this IHA to L-DEO and documents NMFS's determination to adopt NSF's Final EA pursuant to 40 CFR 1506.3.

## II. BACKGROUND

NSF is the federal agency that supports all fields of science and engineering (except medical sciences), and therefore, funds a variety of research projects across a wide-range of scientific disciplines, including oceanography. NSF does this through grants and cooperative agreements issued to colleges, universities, businesses, scientific research organizations and other federal agencies throughout the United States. NSF does not own and operate research facilities or laboratories but does support National Research Centers, user facilities, certain oceanographic vessels and Antarctic research stations. To support and fund scientific research, NSF established several programs focused on basic and applied science and engineering research, for example, Geosciences. Each of their research programs forms the basis for specific research areas and projects, like the Division of Ocean Sciences-Marine Geology and Geophysics program in which NSF may fund geophysical surveys in support of this program's priorities and objectives. Details about NSF and their research programs is available on the Internet at <https://www.nsf.gov/about/> and [https://www.nsf.gov/about/research\\_areas.jsp](https://www.nsf.gov/about/research_areas.jsp)

NSF has funded marine-related research for over 50 years and identified the need to continue funding marine-related geophysical surveys to enable scientists to collect data essential to understanding the complex Earth processes beneath the ocean floor. NSF funds research based on proposals reviewed under its merit review process and identified as program priorities. Information about NSF processes, procedures and outcomes, including the merit review process and results of NSF-funded research is available on the Internet <https://www.nsf.gov/od/transparency/transparency.jsp>. A few examples of NSF-funded marine-related research includes, but is not limited to:

- Studying source mechanisms, fault locations, and hazard potentials for large earthquakes and tsunamis along faults and segments of tectonic plate boundaries, allowing prioritization of tsunami and earthquake warning systems;
- Imaging to indicate how erosion and sedimentation have impacted and changed the size and shapes of the continental shelves over time;
- Examining the formation and evolution of volcanic islands, mid-ocean ridges, and igneous provinces;
- Studying the evolution and movement of tectonic plates; and
- Mapping the seafloor and its topographic relief and understanding the causes of submarine geologic structures.

NSF is also responsible for environmental reviews of the research they propose to fund associated with investigating the geology and geophysics of the seafloor, and therefore prepares analyses under NEPA for these research activities. Although NSF used to prepare EAs per research cruise, this approach was not conducive to a comprehensive assessment to consider funding multiple geophysical survey activities over larger geographical areas. Therefore, in June 2011, NSF completed a Programmatic Environmental Impact Statement/Overseas Environmental Impact Statement for marine-related research funded by NSF or conducted by the U.S. Geological Survey (USGS) (herein “NSF/USGS 2011 Final PEIS”) and issued a Record of Decision in June 2012.

NSF determined a programmatic<sup>4</sup> approach was appropriate because data obtained from geophysical surveys can occur over large geographical areas, in any given ocean area, and the uncertainty regarding the timing, actual locations of surveys, survey specifics (e.g., equipment and vessels) as well as which research organization will conduct the survey<sup>5</sup>. In addition, NSF and USGS determined a programmatic document would minimize duplication of effort with preparing environmental documentation because USGS conducts the same or similar research activities and as a federal agency, is required to complete environmental reviews under NEPA.

The analysis in the NSF/USGS 2011 Final PEIS supports NSF planning-level decisions associated with their continuing need to fund marine-related research conducted by USGS and other research organizations and establishes the framework and parameters for subsequent analyses based on the programmatic review. While the level of activity proposed may vary from one year to the next, the action alternatives analyzed in the NSF/USGS 2011 Final PEIS represent the average range and level of marine-related research NSF anticipates funding and for which ITAs and other permits or authorizations may be required. NSF collaborated with USGS and NOAA (see explanations below) to prepare the evaluation of potential impacts of geophysical surveys on the human environment, including impacts to marine mammals. Information about NSF’s programmatic approach is in Chapter 1, Section 1.4 of the Final PEIS and the potential effects to marine mammals and the estimates of marine mammal acoustic exposures is in Chapter 3, Sections 3.1- 3.9. A copy of the Final PEIS is available at [https://www.nsf.gov/geo/oce/envcomp/usgs-nsf-marine-seismic-research/nsf-usgs-final-eis-oeis\\_3june2011.pdf](https://www.nsf.gov/geo/oce/envcomp/usgs-nsf-marine-seismic-research/nsf-usgs-final-eis-oeis_3june2011.pdf)

USGS participated in the development of the NSF/USGS PEIS and served as a cooperating agency because the scope of the proposed action and alternatives involved research activities that USGS conducts. USGS is the federal agency that maps public lands, examines geological structures, and evaluates mineral resources. USGS also provides information about the science of natural hazards and conducts scientific research on other natural resources we rely on, such as water resources, and studies the health of ecosystems and the environmental health, including the impacts of climate and land use change. NOAA’s NMFS served as a cooperating agency due to its legal jurisdiction and special expertise for conservation and management of marine mammals. Through its role as a cooperating agency, NMFS did not propose or authorize any action, instead, NMFS provided NSF with technical assistance and input regarding the analysis of impacts for protected resources. This included critical habitat and threatened and endangered species pursuant to the Endangered Species

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4 The concept of “programmatic” NEPA analyses is included in the CEQ Regulations, which addresses analyses of “broad actions” and the “tiering” process. Programmatic NEPA reviews add value and efficiency to the decision-making process when they inform the scope of decisions and subsequent tiered NEPA reviews. Programmatic NEPA analyses can facilitate decisions on agency actions that precede project-specific decisions and action. They also provide information and analysis that can be incorporated by reference in future, tiered NEPA reviews.

5 Approximately four to seven NSF-funded marine-related research cruises involving geophysical surveys is conducted annually, across the world’s oceans including the Northeast Pacific, Eastern Tropical Pacific, and Southwest Pacific, Gulf of Mexico, Caribbean Sea, Mid-Atlantic Ridge, North Atlantic, Norwegian Sea, Arctic Ocean, Bering Sea, and Gulf of Alaska, by research organizations and government agencies. However, details and specifics are unknown until proposals are submitted, reviewed and approved under NSF’s merit process. For example, the final determination of specific cruise tracks depends on research objectives of proposals recommended for award during merit reviews, NSF’s research budget for a given fiscal year, and other factors such as vessel availability, and environmental considerations.

Act (ESA), marine mammals pursuant to the MMPA, Essential Fish Habitat (EFH) and fishery resources pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA).

Regarding the current IHA application submitted by L-DEO, NSF completed an EA in June 2019 that tiers to the NSF/USGS 2011 Final PEIS and provides the geophysical survey and site-specific level of analysis addressing potential impacts associated with NSF's proposal to fund L-DEO and other researchers<sup>6</sup> to conduct 2-D and three-dimensional (3-D) geophysical surveys in the Northeast Pacific Ocean. Impacts of the proposed 2-D and 3-D geophysical survey activities to 26 species of marine mammals, including 6 listed as threatened or endangered, estimates of take based on NMFS criteria and identification of mitigation and monitoring measures were the primary focuses of the 2019 Final EA. The analysis in this document also supports the ESA section 7 consultation and the ITA application processes.

While NSF is the federal agency funding marine-related research projects, the USGS and others like L-DEO and Colgate University conduct the marine-related research projects NSF funds. Therefore, as the owner of the *Marcus G. Langseth*<sup>7</sup>, L-DEO, on behalf of itself, NSF and the other researchers, submitted the application for incidental take to NMFS for take of small numbers of marine mammals incidental to conducting 2-D and 3-D geophysical surveys.

### III. PROPOSED ACTION AND ALTERNATIVES SUMMARY

#### A. Applicants (NSF, L-DEO and Other Researchers) Proposed Action

NSF is proposing to fund L-DEO and other researchers (i.e., University of Texas at Austin Institute for Geophysics (UTIG), the Nevada Seismological Laboratory at the University of Nevada Reno (UNR), and Scripps Institution of Oceanography (SIO) at the University of California San Diego) to conduct 2-D and 3-D geophysical surveys in the Northeast Pacific. The surveys will occur outside the U.S. Exclusive Economic Zone off the coasts of Oregon and Washington in water depths ranging from 1,400 to 2,800 meters (m), and take place over up to 35 days, including 19 days of seismic operations, 7 days of equipment deployment and retrieval, 5 days of operational contingency time, 2 days for turns (with no airguns firing) during the 3D survey, and 2 days of transit. The 2D survey will utilize a 36-airgun array with a total discharge volume of ~6,600 in<sup>3</sup> and the 3D survey will utilize an 18-airgun array with a total discharge volume of ~3,300 in<sup>3</sup>. Survey protocols generally involve a predetermined set of survey track lines. The vessel travels down a linear track for some distance until a line of data is acquired, then turns and acquires data on a different track. Representative survey tracklines are shown in Figure 1 of the NSF's 2019 EA for this project, but there may be deviation from these tracklines due to scientific drivers, poor data quality, inclement weather or mechanical issues with the research vessel and/or equipment.

#### B. NMFS's Proposed Action

Sections 101(a)(5)(A) and (D) of the MMPA give NMFS the authority to authorize the incidental but not intentional take of small numbers of marine mammals by harassment, provided certain determinations are made and statutory and regulatory procedures are met. To authorize the incidental take of marine mammals, NMFS evaluates the best available scientific information to

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<sup>6</sup> University of Texas at Austin Institute for Geophysics (UTIG), the Nevada Seismological Laboratory at the University of Nevada Reno (UNR), and Scripps Institution of Oceanography (SIO) at the University of California San Diego

<sup>7</sup> Vessel to be used for the geophysical survey

determine whether the take would have a negligible impact<sup>8</sup> on marine mammals or stocks, will be within small numbers of species or stock abundance and whether the activity would have an unmitigable impact on the availability of affected marine mammal species for subsistence use. NMFS cannot issue ITAs if it would result in more than a negligible impact on marine mammals or stocks or would result in an unmitigable impact on subsistence uses. NMFS must also prescribe the permissible methods of taking and other means of effecting the least practicable impact on the species or stocks of marine mammals and their habitat, paying particular attention to rookeries, mating grounds, and other areas of similar significance. Where applicable, NMFS must prescribe means of affecting the least practicable impact on the availability of the species or stocks of marine mammals for subsistence uses. ITAs will include additional requirements or conditions pertaining to monitoring and reporting.

Since NMFS's issuance of an IHA to L-DEO would authorize take of marine mammals incidental to a subset of the activities analyzed in the NSF Final EA, these components of NSF's proposed action to fund L-DEO and other researchers are the subject of NMFS's proposed action. Therefore, NMFS's issuance of an IHA to L-DEO is a direct outcome of L-DEO's request for an IHA and would authorize take of marine mammals incidental to a subset of the activities analyzed in the NSF 2019 Final EA and specified in the application submitted by L-DEO.

### C. Alternatives Considered by NSF

NSF analyzed two alternatives in their Final EA, the proposed action and the No Action alternative. These alternatives include NMFS consideration to grant or deny permit applications pursuant to the MMPA (i.e., conducting the geophysical surveys with issuance of an associated IHA or not conducting the geophysical surveys and the IHA is not issued).

Under the Proposed Action, NSF would fund L-DEO and other researchers to conduct the geophysical surveys using the *Langseth* in the Northeast Pacific. The purpose of conducting this geophysical survey is to create a detailed 3-D image of the main and satellite magma reservoirs that set the Axial volcano's framework, image the 3-D fracture network and how they influence the magma bodies, and to connect the subsurface observations to the surface features. Detailed explanations concerning the survey objectives, protocols, equipment and locations along with how geophysical surveys are conducted is in Section 2.1 on pages 1-9 of the 2019 Final EA.

Under the "No Action" alternative, NSF would not fund L-DEO to conduct the 2-D and 3-D geophysical surveys in the Northeast Pacific and L-DEO and the other researchers would not conduct these surveys. The consideration and analysis of this alternative is included for presenting a comparative analysis to the action alternatives, in accordance with 40 CFR 1502.14. Additional explanations concerning the no action Alternative is in Section 2.2 on page 9 of the Final EA.

### D. Alternatives Considered by NMFS

In accordance with NEPA and CEQ Regulations, NMFS is also required to consider a reasonable range of alternatives to a Proposed Action. Since NMFS is adopting NSF's Final EA, it reviewed this document to determine whether it met this requirement. NMFS determined NSF's analysis of alternatives in their Final EA is adequate for purposes of NEPA and the CEQ regulations and, therefore, chose not to supplement this EA by developing and evaluating additional alternatives.

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<sup>8</sup> NMFS defines "negligible impact" as "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival." (50 CFR § 216.103)

However, based on the statutory framework explained in Section III, paragraph B above, NMFS considers two alternatives, a no action alternative in which NMFS denies the L-DEO application and an action alternative in which it grants the application and issues an IHA to the L-DEO. Thus, the alternatives analysis in Section 4 in NSF's Final EA support NMFS's alternatives described below.

No Action Alternative: For NMFS, denial of an MMPA authorization constitutes the NMFS No Action Alternative, which is consistent with our statutory obligation under the MMPA to grant or deny ITA requests and to prescribe mitigation, monitoring, and reporting with any authorizations. Under NMFS's No Action Alternative, NMFS would not issue the IHA to L-DEO, and NMFS assumes L-DEO would not conduct the 2-D and 3-D geophysical surveys as described in their application and NSF's 2019 Final EA. The No Action Alternative served as a baseline in the EA against which the impacts of the Preferred Alternative were compared and contrasted.

Action Alternative: NMFS issues the IHA to L-DEO authorizing take of marine mammals incidental to the subset of activities described under NSF's preferred alternative (Section 2.1 in the Final EA, with the mitigation and monitoring in Section 2.1.3 of the 2019 Final EA and in NMFS's proposed IHA under "Summary of Requests" and "Description of Specified Activities" and the "Mitigation" and "Monitoring and Reporting" sections of the IHA.

#### **IV. ENVIRONMENTAL REVIEW**

NMFS independently reviewed NSF's 2019 Final EA and concludes that impacts evaluated by NSF are substantially the same as the impacts of NMFS' issuance of an IHA for the take of marine mammals incidental to the geophysical surveys funded by NSF but conducted by L-DEO and the other researchers. In particular, the Final EA contains an adequate evaluation of the direct, indirect and cumulative impacts on marine mammals, including species listed under the ESA and the marine environment. The Final EA also addresses NOAA's required components for adoption because it meets the requirements for an adequate EA under the CEQ regulations and NOAA policy and procedures. For example, the Final EA includes:

- a discussion of NSF's proposed action and purpose and need for the action and a discussion of the MMPA authorization process necessary to support implementation of the action;
- evaluation of a reasonable range of alternatives to the proposed action, including a no action alternative, and alternatives to mitigate adverse effects to marine mammals;
- a description of the affected environment including the status of all marine mammals species likely to be affected;
- a description of the environmental impacts of the proposed action and alternatives, including direct, indirect and cumulative impacts on marine mammals and projected estimate of incidental take;
- identification and evaluation of reasonable mitigation measures to avoid or minimize adverse impacts to marine mammals; and
- a listing of agencies consulted.

NMFS also determined NSF/USGS 2011 Final PEIS to be comprehensive in analyzing the broad scope of marine-related research, including geological surveys, and that this initial evaluation of direct, indirect and cumulative impacts on the marine environment was adequate to support NMFS's consideration for issuance of ITAs to potential, future applicants (*e.g.*, L-DEO) through tiering and incorporation by reference. NMFS also determined that any subsequent issuance of ITAs

for geological surveys is within the scope of the analysis in the NSF/USGS 2011 Final PEIS. For example, the evaluation of the alternatives addressed impacts over a larger geographical area than what is analyzed by NMFS for any given ITA, the analysis encompasses many of the same factors NMFS historically considered when reviewing applications for ITAs for NSF-funded research involving geophysical surveys (i.e. marine mammal exposures, intensity of acoustic exposure, monitoring and mitigation measures).

## V. PUBLIC INVOLVEMENT

During the development of the NSF/USGS PEIS/OEIS, the public had opportunities to comment on the scope of the PEIS/OEIS during the scoping period in 2005 and during the public comment period for the Draft PEIS/OIES on October 8, 2010 – November 22, 2010. The details concerning public involvement and public comments associated with the NSF/USGS PEIS/OEIS is in Chapter 1, Section 1.9 of the 2011 Final PEIS/OEIS. NMFS also posted NSF's 2019 Draft EA for the Northeast Pacific 2-D and 3-D geophysical surveys on our website on June 10, 2019.

In addition to the public process described above for NSF, NMFS relied substantially on the public process pursuant to the MMPA to develop and evaluate environmental information relevant to an analysis under NEPA. NMFS made the IHA application and a draft of the proposed IHA available for public review and comment and, separately, published notice of the proposed IHA in the Federal Register (FR) on June 10, 2019 (84 FR 26940). There, NMFS alerted the public it intended to use the MMPA public review process for the proposed IHA to solicit relevant environmental information and provide the public an opportunity to submit comments. In addition, we indicated that we believed it was appropriate to adopt NSF's 2019 Final EA and provided a link to/a copy of NSF's draft EA along with the proposed IHA.

During the public comment period for the proposed IHA, NMFS received comments from the Marine Mammal Commission (MMC) and from the public. We considered all comments received in response to the publication of the proposed IHA and used these comments to inform our analysis under the MMPA and to develop mitigation, monitoring and other conditions for the final IHA. NMFS's responses to specific comments is within the Final IHA notice of issuance available for review on NMFS's website: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-research-and-other-activities>.

## VI. ANALYSIS SUMMARY

The environmental consequences to the marine environment and protected resources are important to the evaluation leading to the decision to issue any given ITA. In particular, because NMFS's action is specific to authorizing incidental take of marine mammals, the key factors relevant to, and considered in a decision to issue any given ITA, are related to NMFS's statutory mission under the MMPA. The information in the following subsections discusses key factors considered in the analysis in the EA along with the evaluation and reasons why the impacts of our issuance of an IHA to L-DEO will not significantly impact the quality of the human environment.

### A. Environmental Consequences

In the Final EA, NSF presented the baseline environmental conditions and impacts for affected resources in the Northeast Pacific. The affected environment and environmental consequences is in Section 3.1-3.7, pages 12-37 and 4.1, pages 37-71. Since the anticipated impacts of NMFS's issuance of an IHA to L-DEO is predominantly to marine mammals, which, if affected, would be

through the introduction of sound into the marine environment during geophysical surveys, the analysis in the NSF Final EA specifically describes and addresses potential acoustic impacts to marine mammals, such as masking, stress, and behavioral response (Section 4.1.1 of the Final EA). NSF assessed impacts to marine mammals through both acoustic exposure estimates and a qualitative assessment based on a review of literature primarily on acoustic impacts to marine mammals (Section 4.1.1.1 of the Final EA).

## B. Significance Evaluation

The CEQ Regulations state that the significance of an action be analyzed in terms of both “context” and “intensity” and lists ten criteria for intensity. The Companion Manual for NAO 216-6A requires consideration of CEQs context and intensity criteria (40 CFR 1508.27(a) and 40 CFR 1508.27(b)) along with six additional factors for determining whether the impacts of a proposed action are significant. Each criterion is discussed below with respect to NMFS issuance of an IHA to L-DEO and is considered individually as well as in combination with the others. In addition, NMFS relied on the analysis in NSF’s 2019 Final EA, incorporating certain material by reference per 40 CFR 1502.21 in the evaluation discussed below. NSF’s Final EA and other information and documentation are available on NMFS website: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-research-and-other-activities>.

*1. Can the proposed action reasonably be expected to cause both beneficial and adverse impacts that overall may result in a significant effect, even if the effect will be beneficial?*

**Response:** NMFS’s issuance of an IHA to L-DEO is not expected to cause either beneficial or adverse impacts resulting in any significant effects. NMFS is proposing to authorize take incidental to a geophysical survey for marine mammal species expected to occur in the survey area in the Northeast Pacific. Airguns emit low-frequency noise into the water column, which has the potential to behaviorally disturb marine mammals and, for some species, cause auditory injury. In addition, noise can mask the detection or interpretation of important sounds. Given their reliance on sound for basic biological functioning (e.g., foraging, mating), marine mammals are the species most vulnerable to increased noise in the marine environment, although marine mammal prey (e.g., fish and squid) may be impacted in some of the same ways. However, NMFS only expects intermittent, localized impacts on marine mammals and their habitat because survey duration will be limited to less than 20 days and only cover a portion of the Northeast Pacific Ocean. In addition, the prescribed mitigation and monitoring required for L-DEO and the other research partners will protect and lessen the potential for adverse effects to marine mammal species and their habitat. While NMFS predicts potential for direct adverse effects to individuals, it does not anticipate population-level effects that would rise to the level of significance. Effects to marine mammal populations is expected to be negligible to minor. Moderate impacts to a very limited number of animals could occur and would likely include a small degree of auditory injury in the form of PTS. Negligible impacts would occur to the majority of animals affected in the form of behavioral disturbance, including temporary avoidance of the affected area or decreased foraging (if such activity were occurring).

*2. Can the proposed action reasonably be expected to significantly affect public health or safety?*

**Response:** The issuance of this IHA to L-DEO to authorize take of marine mammals is not likely to have the potential for this kind of effect because the proposed geophysical survey will take place across a broad area of a relatively remote, ocean area and is unlikely to overlap with activities conducted by the public. NMFS only authorizes the take of marine mammal species associated with

this survey, which does not involve the public or expose the public directly (e.g., chemicals, diseases) or indirectly (e.g., food sources) to hazardous or toxic materials in a way that would be linked to the quality of the environment and well-being of humans.

*3. Can the proposed action reasonably be expected to result in significant impacts to unique characteristics of the geographic area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?*

**Response:** Authorizing the harassment of marine mammals through this IHA has no foreseeable impact to unique areas, such as historic or cultural resources, parkland, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas. To the extent, the harassment authorized under the IHA impacts ecologically critical areas, this impact is not substantial. NMFS only anticipates marine mammals might be displaced temporarily and will not permanently vacate any areas, due to the harassment authorized in this IHA. We expect natural processes and the environment to recover from any such displacement. No established Biologically Important Areas for marine mammals are found in the survey area. Significant impacts in the survey area is not expected; underwater noise associated with airgun usage has no impact on physical habitat features and it will be temporary and localized. Individual ecologically critical areas would be subject to noise only as the survey ship traverses across or near these locations.

*4. Are the proposed action's effects on the quality of the human environment likely to be highly controversial?*

**Response:** The effects of issuing an IHA to L-DEO on the quality of the human environment are not likely to be highly controversial. Although there is some lack of agreement within the scientific and stakeholder communities about the potential effects of noise on marine mammals, there is not a substantial dispute about the size, nature, or effect of our proposed action. For several years, we have assessed and authorized incidental take for multiple geophysical surveys conducted within the same year and have developed relatively standard mitigation and monitoring measures, all of which have been vetted during past public comment periods. The scope of this action is not substantially different from past geophysical surveys, is not unusually large or substantial, and would include the same or similar mitigation and monitoring measures required in past surveys. Previous projects of this type required marine mammal monitoring reports, which we have reviewed to ensure that the authorized activities have a negligible impact on marine mammals.

To allow other agencies and the public the opportunity to review and comment on the action, NMFS published a notice of the Proposed IHA in the Federal Register on June 10, 2019 (84 FR 26940). In response to the notice of the Proposed IHA, NMFS received comments from the Marine Mammal Commission, and we fully considered all comments in preparing the IHA and the Final EA. None of the comments indicated that the proposed activities or the effects of the activities on the quality of the human environment were likely to be highly controversial. We have determined, based on the best available scientific literature, the limited duration of the project, and the low-level effects to marine mammals, that the issuance of an IHA would have a negligible impact on the affected species or stocks of marine mammals.

*5. Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?*

**Response:** The potential risks associated with marine geophysical surveys are neither unique nor unknown nor is there significant uncertainty about impacts. We have issued authorizations for

similar activities or activities with similar types of marine mammal harassment in the Atlantic, Pacific, and Southern Oceans and the Mediterranean Sea, and conducted NEPA analyses on those projects. The scope of this action is not substantially different from past geophysical surveys and is not unusually large or substantial, and would include the same or similar mitigation and monitoring measures required in past surveys. Therefore, we expect any potential effects from the issuance of our IHA to be similar to prior activities, which are not likely to be highly uncertain or involve unique or unknown risks.

*6. Can the proposed action reasonably be expected to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?*

**Response:** The issuance of this IHA to L-DEO is not expected to set a precedent for future actions with significant effects nor represent a decision in principle regarding future considerations. The issuance of an IHA to take marine mammals incidental to the proposed activities is a routine process under the MMPA. To ensure compliance with statutory and regulatory standards, NMFS's actions under section 101(a)(5)(D) of the MMPA must be considered individually and be based on the best available information, which is continuously evolving. Issuance of an IHA to a specific individual or organization for a given activity does not guarantee or imply that NMFS will authorize others to conduct similar activities. Subsequent requests for incidental take authorizations would be evaluated upon their own merits relative to the criteria established in the MMPA and 50 CFR Part 216 on a case-by-case basis. The survey has no unique aspects that would suggest it would be a precedent for any future actions.

*7. Is the proposed action related to other actions that when considered together will have individually insignificant but cumulatively significant impacts?*

**Response:** The EA and the documents it references analyzed the impacts of the issuance of an IHA for the take of marine mammals incidental to the conduct of marine geophysical surveys in light of other human activities within the study area. The proposed action of L-DEO conducting the marine geophysical survey in the Northeast Pacific and our action of issuing an IHA to L-DEO for the incidental take of marine mammals are interrelated. Additional activities that may have separate insignificant impacts on marine mammals in and near the survey area are described in Section 4.1.5 of the EA and include past and future research activities, naval activities, vessel traffic, fisheries interactions, whaling and harvesting, and tourism. The limited duration of the proposed seismic survey (approximately 19 days of seismic operations) would be expected to result in only a negligible or minor increase in overall disturbance effects on marine animals and would result in no increase in serious injuries or mortality to marine mammals. The proposed 2-D and 3-D marine geophysical surveys are not expected to result in cumulatively significant impacts when considered in relation to other separate actions with individually insignificant effects.

*8. Can the proposed action reasonably be expected to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources?*

**Response:** The issuance of this IHA is not expected to adversely affect districts, sites, highways, structures or objects listed in or eligible for listing in the National Register of Historic Places nor cause loss or destruction of significant scientific, cultural and historical resources because NMFS's action is limited to the issuance of an IHA to incidentally harass marine mammals. In addition, NSF determined the conduct of this geophysical survey would not impact cultural resources including traditional fisheries or any shipwrecks.

*9. Can the proposed action reasonably be expected to have a significant impact on endangered or threatened species, or their critical habitat as defined under the Endangered Species Act of 1973?*

The proposed 2-D and 3-D geophysical surveys may have the potential to adversely affect the following marine mammal species listed as threatened or endangered under the Endangered Species Act (ESA; 16 U.S.C. 1531 *et seq.*): the blue whale, sei whale, fin whale, sperm whale, humpback whale (Mexico DPS and Central America DPS), and Guadalupe fur seal. A Biological Opinion was issued on July 10, 2019 under section 7 of the ESA concluded that L-DEO's project was not likely to jeopardize the continued existence of any ESA-listed species and would not destroy or adversely modify critical habitat.

To reduce the potential for disturbance from the activities, L-DEO and the other research partners would implement several monitoring and mitigation measures for marine mammals, which are outlined in Section 2.1.3 of the Final EA. Taking these measures into consideration, we expect that the responses of marine mammals from the Preferred Alternative would primarily be in the form of temporary displacement from the area and/or short-term behavioral changes, as well as a limited amount of permanent threshold shift (PTS) in a small number of marine mammals, falling within the MMPA definition of "Level B harassment" and "Level A harassment." We do not anticipate that take by serious injury or mortality would occur, nor have we authorized take by serious injury or mortality. NMFS's predicted estimates for Level A harassment take for some species are likely overestimates of the injury that will occur, as NMFS expects that successful implementation of the required visual and acoustic mitigation measures would avoid Level A take in some instances. In addition, NMFS expects that some individuals would avoid the source at levels expected to result in injury. We anticipate that any PTS incurred would be in the form of only a small degree of PTS, and not total deafness. Thus, we expect that impacts would be at the lowest level practicable due to the incorporation of the proposed mitigation measures.

*10. Can the proposed action reasonably be expected to threaten a violation of Federal, state, or local law or requirements imposed for environmental protection?*

**Response:** The issuance of this IHA to L-DEO would not violate any federal, state, or local laws for environmental protection. NMFS compliance with environmental laws and regulations is based on NMFS's action and the nature of the applicant's activities. NMFS complied with the MMPA's requirements in issuing this IHA. NMFS also consulted under section 7 of the ESA to determine if the issuance of this IHA would likely jeopardize the continued existence of listed species or result in an adverse modification of critical habitat. The consultation concluded that issuance of an IHA would not jeopardize any listed species or destroy or adversely modify critical habitat. NSF and L-DEO fulfilled its responsibilities under the MMPA for this action and will be required to obtain any additional federal, state and local permits necessary to carry out the proposed geophysical survey activities.

*11. Can the proposed action reasonably be expected to adversely affect stocks of marine mammals as defined in the Marine Mammal Protection Act?*

**Response:** To assess potential impacts of the proposed action on marine mammal stocks, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. L-DEO calculated the number animals exposed to sound levels greater than 160 dB, which is the threshold for Level B harassment. The numbers of marine

mammals that we propose for authorized take would be considered small relative to the relevant populations (less than seven percent for all stocks) for the species for which abundance estimates are available.

Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities. The proposed activity is temporary and of relatively short duration. Potential adverse effects on prey species would also be temporary and spatially limited. No mortality is anticipated or authorized. Furthermore, alternate areas of similar habitat value for affected marine mammals would be available allowing animals to temporarily vacate the survey areas to avoid exposure to sound.

For these reasons, impacts resulting from this activity are not expected to adversely affect the marine mammal species or stocks as defined in the MMPA

*12. Can the proposed action reasonably be expected to adversely affect managed fish species?*

**Response:** NSF described EFH and HAPC locations within the action areas in Sections 3.6 and 3.7 as well as impacts to fish species and fisheries in Sections 4.1.2.2 and 4.1.2.3. NSF concluded that there could be changes in behavior and other non-lethal, short-term, temporary impacts, and injurious or mortal impacts on a small number of individuals within a few meters of a high-energy acoustic source, but that there would be no significant impacts on fish populations. NSF also concluded that seismic surveys could cause temporary, localized reduced fish catch to some species, but that effects on commercial and recreation fisheries would not be significant. Furthermore, in decades of geophysical surveys carried out by the *Langseth* and its predecessor, the R/V *Ewing*, there have never been observations of seismic sound-related fish injuries or mortality.

*13. Can the proposed action reasonably be expected to adversely affect essential fish habitat as defined under the Magnuson-Stevens Fishery Conservation and Management Act?*

**Response:** No EFH exists in the survey area, as discussed in Section 3.6 of the EA. We do not expect the issuance of an IHA for the take of marine mammals incidental to the conduct of geophysical survey activities would cause substantial damage to the ocean and coastal habitats and/or essential fish habitat because our IHA is limited to the take of marine mammals incidental to 2-D and 3-D geophysical survey activities. Similarly, the mitigation and monitoring measures required by the IHA for L-DEO's proposed activities are limited to actions that minimize take of marine mammals and improve monitoring of marine mammals, and do not alter any aspect of the activity itself.

*14. Can the proposed action reasonably be expected to adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems?*

**Response:** We do not expect the issuance of an IHA for the take of marine mammals incidental to marine geophysical survey activities would cause substantial damage to the marine habitats, coastal habitats, or deep coral ecosystems. The Northeast Pacific Ocean Seamounts complex, including the survey area, supports abundant populations of deepwater corals. The IHA is limited to the take of marine mammals incidental to survey activities and does not authorize the activity itself, thus it is limited to activities that do not have an effect on ocean and these habitat types. Mitigation and monitoring measures required by the IHA for L-DEO's proposed activities are limited to actions that minimize take of marine mammals and improve monitoring of marine mammals, and do not alter any aspect of the activity itself.

15. Can the proposed action reasonably be expected to adversely affect biodiversity or ecosystem functioning (e.g., benthic productivity, predator-prey relationships, etc.)?

**Response:** We do not expect issuing an IHA to L-DEO for 2-D and 3-D geophysical surveys to have a substantial impact on biodiversity or ecosystem function within the affected environment. Any harassment authorized by the IHA would be limited to temporary behavioral responses (such as brief masking of natural sounds) in marine mammals and temporary changes in animal distribution. These effects would be short-term and localized and will not have a substantial impact on biodiversity or ecosystem function. Current research indicates that some fish species and other marine mammal prey (e.g., squid, zooplankton) can be affected by ocean noise, though the degree of impact depends on many environmental and biological conditions. Any potential impacts to fish is expected to be temporary and localized, and result in short-term displacement, at most.

The current research noted above did indicate that impacts to marine mammal habitat, in the form of effects to marine mammal prey species, is possible. For example, one recent study investigated zooplankton abundance, diversity, and mortality before and after exposure to airgun noise, finding that the exposure resulted in significant depletion for more than half the taxa present and that there were two to three times more dead zooplankton after airgun exposure compared with controls for all taxa. However, in order to have significant impacts on species such as plankton, the spatial or temporal scale of impact must be large in comparison with the ecosystem concerned. Therefore, while the effect observed in this study is of concern, it would likely warrant greater concern particularly where repeated noise exposure in an area is expected (which it is not here) and, given questions about these findings, further study is warranted. Additional studies have shown that some fish and invertebrate species may experience displacement or behavioral changes from acoustic exposure from airgun surveys, such as temporary displacement or cessation in vocalization. However, impacts associated with sound in the water are expected to be sporadic, temporary and localized given a mobile sound source over a broad area. Thus, short-term minor adverse effects are likely to occur but are not expected to rise to the level of significance. There are no known impacts from airgun surveys on deep coral ecosystems. As noted, we do not anticipate any physical interactions from survey gear/equipment on the environment, and do not expect that noise production from the surveys would impact coastal ecosystems at all, given the required mitigation measures.

16. Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?

**Response:** The issuance of an IHA to L-DEO does not have the potential to introduce or spread non-indigenous species because it does not encourage or require the *R/V Langseth* to conduct long-range vessel transit that would lead to the introduction or spread of non-indigenous species. The *Langseth* complies with all international and U.S. national ballast water requirements to prevent the spread of a non-indigenous species.

## VII. CONDITIONS – MITIGATION, MONITORING AND REPORTING

NMFS does not authorize the geophysical surveys proposed by NSF, L-DEO and the other researchers, however, NMFS does authorize the incidental take of marine mammals under its jurisdiction in connection with these activities and prescribes, where applicable, the methods of taking and other means of effecting the least practicable impact on the species and stocks and their habitats. NMFS's issuance of this IHA is thus conditioned upon reporting requirements and the

implementation of mitigation and monitoring designed to reduce impacts to marine mammals to the level of least practicable impact. These conditions, summarized below and described in detail in the IHA in Section 4, and include:

- Visual mitigation monitoring;
- Passive acoustic monitoring;
- Establishment of an exclusion zone and buffer zone;
- Power down and shutdown procedures;
- Ramp-up procedures;
- Vessel strike avoidance measures;
- Sensitive habitat measures;
- Documentation of the number and species of marine mammals exposed and behavior and responses of marine mammals; and
- Submission of a monitoring report to NMFS.

### VIII. DETERMINATION

Based on the information presented herein along with analysis in the 2019 Final EA prepared by NSF and the application submitted by L-DEO, it is hereby determined the issuance of the IHA to L-DEO will not significantly impact the quality of the human environment. In addition, we have addressed all beneficial and adverse impacts of the action to reach the conclusion of no significant impacts. Accordingly, the preparation of an Environmental Impact Statement for this action is not necessary.



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Donna S. Wieting  
Director, Office of Protected Resources,  
National Marine Fisheries Service

JUL 10 2019

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Date