



MARINE MAMMAL COMMISSION

13 August 2020

Ms. Jolie Harrison, Chief
Permits and Conservation Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3225

Dear Ms. Harrison:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals (CSA), has reviewed the application submitted by Lamont-Doherty Earth Observatory (LDEO)¹ seeking authorization under section 101(a)(5)(D) of the Marine Mammal Protection Act (the MMPA) to take small numbers of marine mammals by harassment incidental to conducting a marine geophysical survey in the Bering Sea and North Pacific Ocean. The Commission also has reviewed the National Marine Fisheries Service's (NMFS) 28 July 2020 notice announcing receipt of the application and proposing to issue the authorization, subject to certain conditions (85 Fed. Reg. 45389).

Background

LDEO proposes to conduct a geophysical survey in the exclusive economic zone of United States off the Aleutian Islands. The purpose of the survey is to investigate the crust along and across the Andreanof segment of the Aleutian Arc. The survey would be conducted along approximately 3,224 km of tracklines in waters estimated to be 35 m to 7,100 m in depth. LDEO would use the R/V *Marcus G. Langseth* (*Langseth*) to operate a 36-airgun array with a maximum discharge volume of 6,600 in³ and an 18-airgun array with a maximum discharge volume of 3,300 in³ at a tow depth of 9 m. In addition, the *Langseth* would (1) tow an 8-km hydrophone streamer, (2) deploy up to 50 ocean-bottom seismometers (OBSs), and (3) operate a 12-kHz multibeam echosounder, 3.5-kHz subbottom profiler, and acoustic Doppler current profiler continuously during the surveys². The survey would occur on 48 days, with approximately 16 days for geophysical data acquisition.

NMFS preliminarily has determined that the proposed activities could cause Level A and B harassment of small numbers of numerous species or stocks of marine mammals and that any impact on the affected species or stocks would be negligible. NMFS does not anticipate any take of marine mammals by death or serious injury. It also has preliminarily determined that the proposed mitigation measures provide the means of effecting the least practicable impact on the affected species or stocks. Those measures include (1) using protected species observers (PSOs) to monitor

¹ And funded by the National Science Foundation (NSF).

² These devices would not be used during transits.

the Level A³ and B harassment zones⁴ for 30 minutes before, during, and for 60 minutes after the survey, (2) implementing speed and course alterations, and (3) using shut-down⁵ and ramp-up procedures⁶. In addition, LDEO would shut down the airguns immediately if (1) a North Pacific right whale, a large whale⁷ with a calf, or an aggregation⁸ of large whales is observed at any distance or (2) beaked whales are observed within 1.5 km of the *Langseth*. Ramp-up procedures would not be initiated until the animal(s) has not been seen for at least 30 minutes. LDEO would report any injured or dead marine mammal to NMFS's Office of Protected Resources and Alaska Regional Stranding Coordinator.

In addition, NMFS indicated that LDEO conducted outreach to the Aleut Marine Mammal Commission and the Alaska Sea Otter and Steller Sea Lion Commission (85 Fed. Reg. 45410). The Aleut Marine Mammal Commission did not raise any concerns regarding impacts of the survey on subsistence use (85 Fed. Reg. 45410). NMFS also has clarified that the Alaska Sea Otter and Steller Sea Lion Commission did not respond to LDEO's attempts to contact it. Based on the proposed activities and mitigation measures, NMFS has preliminarily determined that the proposed taking would not have an unmitigable adverse impact on the availability of marine mammals for subsistence use by Alaska Natives.

Issues with density and take estimates

Errors in ensonified areas and takes—The Commission informally noted that the Level A harassment takes could not be recreated for any of the species based on the information in Tables D-1 and C-1 in LDEO's application, as the information did not comport. Specifically, the Level A harassment ensonified areas stipulated in Table C-1 were the same for all species and across five functional hearing groups. This would never be the case and is inconsistent with the information in Table D-1. In addition, by using the ensonified areas provided in Table D-1, the same method LDEO used for Level B harassment (dividing the total ensonified area by 16.3 days to estimate the daily ensonified area), and the percentages of survey tracklines included in the *Federal Register* notice (1% for shallow-, 26% for intermediate-, and 73 percent for deep-water depths; 85 Fed. Reg. 45390), the daily ensonified areas for low-frequency (LF) cetaceans, for example, would have been 2 km², 49 km², and 138 km² rather than 3 km², 62 km², and 125 km² as stipulated in Table C-1 for shallow-, intermediate-, and deep-water depths, respectively.

LDEO informally indicated that (1) there were errors in the Level A harassment columns of Table C-1 and that the ensonified areas should not be the same for all functional hearing groups, (2)

³ And a standard exclusion zone of 500 m.

⁴ The Commission informally noted that the Level B harassment zones were not included in the draft authorization. NMFS indicated that the zones would be included in the final authorization.

⁵ The Commission informally noted that condition 4(f)(ii) of the draft authorization indicated that the 30-minute clearance time applied to Risso's dolphins, but the *Federal Register* notice specified a 15-minute clearance time in one instance and a 30-minute clearance time in another (85 Fed. Reg. 45404). NMFS clarified that the clearance time should be 30 minutes. This should be specified consistently in the notice for authorization issuance.

⁶ The Commission appreciates that NMFS has finally held LDEO to the same standard as industry regarding not allowing LDEO to implement power-down procedures or to use the mitigation airgun for the larger array, consistent with the Commission's previous recommendations.

⁷ A sperm whale or mysticete.

⁸ Six or more individuals.

the Level B harassment ensonified areas have since been adjusted to avoid Steller sea lion rookeries⁹ and takes of sea otters, and (3) there were errors in the percentages of the survey trackline within each depth stratum that were used to inform the Level A harassment ensonified areas. LDEO provided revised Tables C-1 and D-1. The Commission notes that discrepancies still exist in the percentages of the survey tracklines in the revised Table C-1. For Level B harassment, the percentages are approximately 2.7 percent in shallow, 28.1 percent in intermediate, and 69.1 percent in deep-water depths. However, for Level A harassment, the percentages range from approximately 0.7–1.4 percent in shallow-, 25.7–26.0% in intermediate-, and 72.4–73.5% in deep-water depths¹⁰. The percentages of the survey tracklines should be the same for Level A and Level B harassment in each of the three depth strata.

Moreover, the Commission informally noted that in some instances the total takes¹¹ in Table 6 of the *Federal Register* notice (or the original Table C-1 and the revised Table C-1) did not equate to the Level A and B harassment takes combined. NMFS has confirmed that the total takes of LF and HF cetaceans and Level B harassment takes of MF cetaceans, otariids, and phocids will be based on the Level A and B harassment takes added together. It is still unclear what the final numbers of Level A and B harassment takes would be. The Commission recommends that NMFS (1) determine what the percentages of the survey tracklines in the three depth strata should be, (2) ensure that the same percentages of survey tracklines are used for Level A *and* B harassment in each of the three depth strata, (3) re-estimate the numbers of Level A and B harassment takes accordingly, and (4) ensure that the total takes of LF and HF cetaceans and Level B harassment takes of MF cetaceans, otariids, and phocids are based on the Level A and B harassment takes added together.

Steller sea lion densities—To estimate Steller sea lion densities, LDEO used data from Department of the Navy (2014), which relied on abundance estimates from stock assessment reports divided by an area¹². The U.S. Navy (the Navy) cited Angliss and Allen (2009) for the combined Steller sea lion abundance estimate. This raises three concerns. The first is that abundance estimates have increased since the 2008 stock assessment report and that the original estimates were based on portions of the eastern stock of Steller sea lions that would not occur in LDEO's survey area. The second concerns the Commission's previous comments on the inappropriateness of the Navy's pinniped densities and its suggestion that the Navy use telemetry data to refine its estimates. Department of the Navy (2019) did incorporate such a method for areas in Southeast Alaska and off the Pacific Northwest. The revised density estimates are orders of magnitude greater than those used previously¹³ and than those proposed for use in LDEO's authorization. Finally, the Commission notes that the density estimates from Department of the Navy (2019) did not originate from areas within critical habitat

⁹ The *Federal Register* notice indicated that this was part of the proposed authorization (85 Fed. Reg. 45390), but apparently it may not have been implemented analytically.

¹⁰ These match the original percentages NMFS stipulated in the *Federal Register* notice (85 Fed. Reg. 45390).

¹¹ And Level B harassment takes for MF cetaceans, otariids, and phocids. NMFS did not propose to authorize Level A harassment takes of those functional hearing groups due to the small size of the Level A harassment zones but proposed to authorize the number of Level B harassment takes based on the estimated Level A and B harassment takes added together.

¹² That area was the Navy's Temporary Maritime Activities Area (TMAA) in the Gulf of Alaska scaled based on the area of the Gulf of Alaska's Large Marine Ecosystem. The Navy's TMAA is east of Kodiak Island in the Gulf of Alaska.

¹³ Densities in Western Behm Canal in southeast Alaska increased from 0.098—which is the same density used for LDEO's proposed authorization—to 0.316 sea lions/km² and from 0.0145 to 0.3554 sea lions/km² offshore of the Pacific Northwest coast.

or adjacent to known rookeries¹⁴, such as those in LDEO's survey area, where densities would be even greater.

In addition to these issues, the Commission informally noted that NMFS did not propose to use the uncorrected density estimate¹⁵ of 0.0392 sea lions/km² to estimate Level A and B harassment takes in shallow- and intermediate-waters depths as it had for LDEO's 2019 survey in the Gulf of Alaska. NMFS indicated that it would use that density in those two depth strata and revise the numbers of takes. However, the revised number of takes that NMFS indicated it would use (1,132 takes) does not match the number that LDEO provided in its revised Table C-1 (909 takes¹⁶). The Commission recommends that NMFS ensure that the number of Level B harassment takes of Steller sea lions are correct based on the revised density of 0.0392 sea lions/km² in shallow- and intermediate-water depths and the same revised percentages of survey tracklines for Level A and B harassment in each of the three depth strata.

Uncertainty in density estimates in general—In addition to the issues noted for Steller sea lion densities, LDEO used various datasets to inform its other density estimates (see Table 6 in the *Federal Register* notice), including many that have been used by the Navy for the Gulf of Alaska (Department of the Navy 2014). Some of the densities were based on Rone et al. (2014) and, in some instances, include coefficients of variation that are quite large¹⁷. Using only the mean densities would likely result in an underestimation of takes due to the CVs being so much greater than the mean estimates. The abundance estimates for unidentified large whales also were prorated among blue, fin, and humpback whales within each stratum and incorporated proportionally into each species' density estimate. A high level of uncertainty and variability is inherent in using such proration methods. In addition, Rone et al. (2014) did not correct the density (or abundance) estimates for the proportion of animals missed on the transect line ($g(0)$), which results in an underestimation of densities. Further, some density estimates were based on data from Waite (2003) that included (1) a single sighting and/or (2) $f(0)$ and $g(0)$ values derived from other surveys in the North Pacific¹⁸.

The Commission continues to believe that action proponents should use the best available density estimate plus some measure of uncertainty (e.g., mean plus two standard deviations, mean plus the CV, the upper limit of the confidence interval) when density data are not available for all areas where, or times when, activities may occur¹⁹ or when CVs are large. The Commission made a similar point in its [1 May 2019 letter](#) for LDEO's proposed survey in the Gulf of Alaska. NMFS indicated that it was open to consideration of specific correction factors for use for specific

¹⁴ Which is the case for LDEO's proposed activities.

¹⁵ The original density estimate assumed that only 25 percent of the animals would be at sea at a given time, which is much less than that the 76 percent that is in by Department of the Navy (2019). The Commission does note that unadjusted density is similar to the 2018 abundance estimate of the western stock divided by the Navy's scaled area (which yields a density of 0.040 sea lions/km²), but asserts that the density is still vastly underestimated based on the presumed area of occurrence.

¹⁶ Level B harassment takes for mid-frequency (MF) cetaceans, otariids, and phocids were based on the Level A and B harassment takes combined.

¹⁷ For example, the densities for killer whales were 0.005 (CV=0.60) for the inshore stratum, 0.002 (CV=0.77) for the offshore stratum, 0.002 (CV=0.77) for the seamount stratum, and 0.020 (CV=1.93) for the slope stratum.

¹⁸ Waite (2003) did not provide survey-specific $f(0)$ and $g(0)$ values; therefore, those values originated from other surveys that occurred in the North Pacific.

¹⁹ Which is the case for LDEO's proposed survey, since many of the density data are from waters off Kodiak Island in spring and summer rather than off the central Aleutian Islands in fall.

circumstances or species in future authorizations and looked forward to further discussion with the Commission on how best to incorporate uncertainty in density estimates in instances where density data are limited (85 Fed. Reg. 27247). It has been more than a year and NMFS has not contacted the Commission regarding this matter. The Commission has been making similar recommendations regarding densities used for LDEO and other NSF-affiliated surveys for more than eight years and NMFS has yet to advance the issue.

The Commission also has repeatedly recommended that NMFS implement a policy or provide other guidance that sets forth a consistent approach for how applicants should incorporate uncertainty in density estimates—an issue that is particularly problematic and persistent for geophysical surveys. NMFS indicated in 2013 that it was evaluating available density information and working on guidance that would outline a consistent approach for addressing uncertainty in specific situations where certain types of data are or are not available (78 Fed. Reg. 57354). However, NMFS has yet to advance this issue either. Until such time that NMFS develops a policy and given that many of the references from which the density data originated include CVs, the Commission recommends that NMFS adjust the density estimates using either CVs or standard deviations²⁰ for LDEO's proposed survey. The Commission reiterates its previous recommendation²¹ that NMFS develop a policy and consistent approach for how LDEO and other NSF-affiliated entities²² should incorporate uncertainty in density estimates that have been extrapolated from other areas or during other times of the years or when the data themselves include high uncertainty.

Many of the following comments and recommendations were included in the Commission's [29 April 2020 letter](#) regarding an LDEO survey off Oregon and Washington. Due to COVID-19, the survey did not occur and it has yet to be rescheduled. As such, NMFS has not issued the final authorization or responded to the Commission's comments and recommendations. The following sections contain additional justification and recommendations that should be considered and responded to accordingly.

Inappropriate modeling methodology

For nearly a decade, the Commission has raised concerns regarding LDEO's model to estimate the extent of the Level A and B harassment zones and the numbers of marine mammal takes. The Commission has provided extensive comments regarding the inappropriateness of that model²³ and LDEO's other 'modeling' approaches²⁴. Many of the issues were detailed in the

²⁰ Or 95 percent confidence intervals that are available for pinniped abundance estimates in NMFS's stock assessment reports.

²¹ See its [24 June 2013 letter](#) and [2 May 2016 letter](#) as examples.

²² U.S. Geological Survey (USGS), Scripps Institution of Oceanography (Scripps), and NSF's Office of Polar Programs.

²³ LDEO uses the Nucleus source model and a simple ray trace-based modeling approach that assumes spherical spreading, a constant sound speed, and no bottom interactions for surveys in deep water (Diebold et al. 2010). LDEO's model is essentially a MATLAB algorithm that truncates the radii at 2,000 m in depth.

²⁴ e.g., assuming that the Level B harassment zone in intermediate water is 1.5 times the Level B harassment zone in deep water, adjusting Level B harassment zones based on simple ratios of tow depth and zone extents, using 'modified' frequency-weighted, farfield source levels (to essentially back-calculate actual source levels based on the distance to the relevant frequency-weighted Level A harassment threshold for a single shot and spherical spreading) to estimate the extents of the Level A harassment zones, etc.

Commission's [21 January 2020 letter](#)²⁵ regarding an NSF survey in the Amundsen Sea, including new recommendations and notation of NMFS's failure to address previous Commission recommendations regarding LDEO's model, which are not repeated herein. The previous letter should be reviewed and considered in concert with this letter. Rather than respond to the Commission's recommendations or include a detailed explanation regarding why the Commission's recommendations were again ignored and not followed, NMFS referenced previous responses that did not address the Commission's actual recommendations and stipulated that it would engage with the Commission separately about the issues (85 Fed. Reg. 5622). It has been more than six months since NMFS provided its responses in the *Federal Register* for NSF's survey in the Amundsen Sea and NMFS has yet to broach this subject with the Commission²⁶.

Regardless of whether NMFS plans to engage with the Commission on this matter, NMFS is required under section 202(d) of the MMPA to provide a detailed explanation for not following any of the Commission's recommendations. As such, the Commission reiterates its recommendations from its [21 January 2020 letter](#) and [29 April 2020 letter](#) and is still awaiting detailed responses, particularly since NMFS issued NSF's authorization more than six months ago and responded to other Commission recommendations at that time. The Commission recommends that NMFS require LDEO to either (1) re-estimate the proposed Level A and B harassment zones and associated takes of marine mammals using (a) both operational (including number/type/spacing of airguns, tow depth, source level/operating pressure, operational volume) and site-specific environmental (including sound speed profiles, bathymetry, and sediment characteristics²⁷ at a minimum) parameters, (b) a comprehensive source model (e.g., Gundalf Optimizer) and (c) an appropriate sound propagation model (e.g., BELLHOP) for the proposed incidental harassment authorization *or* (2) collect or provide the relevant acoustic data to substantiate that its modeling approach is conservative for both *deep-* and *intermediate-*water depths²⁸ beyond the Gulf of Mexico. The Commission also again recommends that NMFS (1) explain why sound channels with downward refraction, as well as seafloor reflections, are not likely to occur during the geophysical survey, (2) specify the degree to which both of those parameters would affect the estimation (or underestimation) of Level B harassment zones in deep- and intermediate-water depths, (3) explain why LDEO's model and other 'modeling' approaches provide more accurate, realistic, and appropriate Level A and B harassment zones than BELLHOP, particularly for deep- and intermediate-water depths, and (4) explain why, if LDEO's model and other 'modeling' approaches are considered best available science, other action proponents that conduct seismic surveys are not implementing similar methods, particularly given their simplicity.

Furthermore, in this instance, LDEO used (1) in-situ data measured off Washington from Crone et al. (2014) to inform the Level B harassment zones for the 36-airgun array in shallow- and intermediate-water depths, (2) in-situ data measured off Washington from Crone et al. (2014) scaled

²⁵ See the Commission's [15 October 2019 letter](#) for additional justification as well.

²⁶ Including during informal communications regarding LDEO's currently proposed authorization and LDEO's previously proposed authorization for the survey off Oregon and Washington from April 2020.

²⁷ Those data can be obtained from the National Geophysical Data Center, Leviticus, and the U.S. Navy Oceanographic and Atmospheric Master Library's databases including Generalized Digital Environmental Model, Digital Bathymetric Database Variable-Resolution, Surface Marine Gridded Climatology.

²⁸ To depths of 1,000 m.

based on simple ratios of array size²⁹ to inform the Level B harassment zones for the 18-airgun array in shallow- and intermediate-water depths, and (3) its simple model to estimate Level B harassment zones for both arrays in deep-water depths. There are numerous flaws with this approach, including—

- Crone et al. (2014) noted that the hydrophone streamer was only able to collect data to approximately 200 m in depth, after which the sound levels became unreliable. As such, the in-situ data are only applicable to a portion of the intermediate-water depths³⁰.
- The in-situ data are only applicable to waters off Washington, they are not applicable to waters west of the Gulf of Alaska and in the Bering Sea. In fact, Appendix B in NSF's Final Programmatic Environmental Impact Statement Overseas Environmental Impact (PEIS)³¹ stated that the summer sound speed profile in the western Gulf of Alaska has a strong sound channel at 70 m depth, which is expected to trap much of the acoustic energy from the airgun array at the surface and to result in ducted propagation and lower transmission loss at that site. The proposed survey considered in the PEIS was assumed to be conducted perpendicular to shore and to cover the shelf, continental slope, Aleutian Terrace, and Aleutian Trench—the same objective as LDEO's currently proposed survey.
- It is not appropriate to use simple ratios from a simplified deep-water model to estimate appropriate Level B harassment zones for arrays of varying size or towed at different depths in shallower waters. The deep-water model does not account for sound speed profiles, bathymetry, water depth, or sediment characteristics, which all affect sound propagation in shallow and intermediate waters.
- LDEO did not substantiate why it used the *maximum* deep-water radii to estimate the scaling factors but did not use those same values as its proposed Level B harassment zones in deep water. The maximum radii stipulated in Appendix A of LDEO's application²⁹ are more than 62 percent greater than the proposed Level B harassment zones for the 36-airgun array and 23 percent greater than the Level B harassment zones for the 18-airgun array. The proposed Level B harassment zones would result in a scaling factor of only 1.6, not 2.09. Moreover, LDEO used the *maximum* radii for both intermediate and shallow water from Crone et al. (2014) as its Level B harassment zones.

LDEO and NMFS attempted to allay any general concerns regarding use of the Crone et al. (2014) data by stating that those data produce results consistent with LDEO's typical approach for assuming that the intermediate-water radii are 1.5 times that of the deep-water radii (8,233 m based on in-situ measurements vs. 8,444 m based on the simple scaling assumption for the 36-airgun array³²; 85 Fed. Reg. 45398). However, the agency and action proponent failed to recognize that the same relationship is not evident for the 18-airgun array. By using LDEO's typical approach of assuming that the intermediate-water radii are 1.5 times that of the deep-water radii, the Level B

²⁹ LDEO calculated a scaling factor based on the *deep-water* modeling results for the 36- and 18-airgun arrays—deep-water modeling yielded *maximum* radii of 9,149 m for the 36-airgun array and 4,391 m for the 18-airgun array, resulting in a scaling factor of 2.09. LDEO specified the radii to be 5,629 m for the 36-airgun array and 3,562 for the 18-airgun array in deep water (see Table 4 in the *Federal Register* notice; 85 Fed. Reg. 45398).

³⁰ Which range from 100 to 1,000 m.

³¹ PEIS for marine seismic research funded by NSF or conducted by USGS.

³² 1.5 x 5,629 m (see Table 4 in the *Federal Register* notice).

harassment zone would have been 5,343 m³³. That zone is greater than the proposed Level B harassment zone of 3,939 m for intermediate-water depths *and* the Level B harassment zone of 5,263 m for shallow-water depths (Table 4 of the *Federal Register* notice). This example highlights the shortcomings of LDEO's continued use of modeling approaches and assumptions that are not rooted in science. NMFS does not allow action proponents that are conducting pile-driving activities, let alone geophysical or seismic surveys, to use similarly unsubstantiated assumptions that involve ratios of source levels or Level B harassment zones based on different pile sizes or water depths or to apply the Level B harassment zones measured at one site to another site³⁴. NMFS should not be doing so for surveys funded by the country's preeminent Federal science agency.

Given the Commission's aforementioned concerns, the Commission remains unconvinced that the Level B harassment zones proposed for use in the current survey are accurate. Fortunately, LDEO will again be using 50 OBSs, which are better equipped than the hydrophone streamer to determine the extents of the various Level B harassment zones in intermediate- and deep-water depths. The Commission therefore recommends that NMFS require LDEO to (1) analyze the data recorded on the OBSs to determine the extents of the Level B harassment zones in shallow-, intermediate-, and deep-water depths and specify how the in-situ zones compare to the Level B harassment zones specified in the final authorization, (2) justify why it did not use the maximum radii as its Level B harassment zones in deep water for both the 36- and 18-airgun array as it did for intermediate and shallow water, and (3) if the justification is inconsistent with the approach taken for intermediate and shallow water, revise the Level B harassment zones in deep water based on the maximum radii and re-estimate the numbers of takes accordingly.

Monitoring measures

NMFS indicated in a previous *Federal Register* notice that LDEO had complied with all requirements (e.g., mitigation, monitoring, and reporting) of previous incidental harassment authorizations (85 Fed. Reg. 19580). As noted in the Commission's [29 April 2020 letter](#), [1 July 2019 letter](#) regarding a survey off Oregon and Washington in 2019 (which should be reviewed in conjunction with this letter) and other letters, this is not the case. Measure 6(a)viii in the final incidental harassment authorization for LDEO's 2019 survey off Oregon and Washington required LDEO to estimate the number of exposures, including an estimate of those that were not detected in consideration of both the characteristics and behaviors of the species of marine mammals that affect detectability, as well as the environmental factors that affect detectability³⁵. However, LDEO's monitoring report again documented only those animals that were observed and therefore were considered taken—it did not include animals that would have been present within the Level B harassment zones but beyond detection range of the observers³⁶ or animals that would have been taken at night.

In NMFS's response to the Commission's ongoing recommendation for the 2019 survey

³³ 1.5 x 3,562 m (see Table 4 in the *Federal Register* notice).

³⁴ NMFS does allow for such assumptions at two different sites in the inland waters of Washington, let alone between Washington and the western Aleutian Islands.

³⁵ A requirement NMFS has included for multiple years.

³⁶ Or animals missed by observers, including animals underwater.

that LDEO use the method developed years ago by the Commission³⁷ to better estimate the numbers of marine mammals taken by Level A and B harassment during geophysical activities (plus accounting for nighttime takes), NMFS indicated that it agreed that reporting of the manner of taking and the numbers of animals incidentally taken should account for all animals taken, including those animals that are not detected and how well animals are detected based on the distance from the observer, to the extent practicable (84 Fed. Reg. 35076). NMFS stated that it appreciated the Commission's recommendations and *further required* that LDEO provide an estimate of take, including marine mammals that were not detected in their reporting for this survey, as it has in previous actions (84 Fed. Reg. 35076). In the absence of a new procedure, NMFS recommended that LDEO use the Commission's method for marine geophysical surveys, which was attached to the Commission's comment letter (84 Fed. Reg. 35076).

It is apparent that LDEO does not intend to comply with this requirement unless it is specifically included in the final authorization. In fact, for the currently proposed authorization, NMFS has *removed* all requirements in section 6(a) of the draft authorization³⁸ for LDEO to report any takes, whether observed *or* extrapolated. This about-face could be due to the Commission's previous recommendation that, if LDEO and other NSF-affiliated entities do not comply with all of the requirements set forth in final incidental harassment authorizations, NMFS refrain from issuing any further authorizations to them until such time that the monitoring reports include all of the required information. Regardless of NMFS's intentions for LDEO's authorization, NMFS requires all action proponents to report observed takes, as well as extrapolated takes in circumstances when the Level B harassment zones extend beyond the visible range of PSOs³⁹. LDEO and other NSF-affiliated entities should be held to the same explicit standard.

Until such time that a better method is developed or LDEO and other NSF-affiliated entities derive geophysical survey-specific $f(0)$ values, the Commission recommends that NMFS include in the final authorization the requirement that LDEO use the Commission's method⁴⁰ as described in the Addendum to its 1 May 2019 letter *and* apply relevant corrections for airgun activity in daylight and during nighttime (including dawn and dusk) to better estimate the numbers of marine mammals taken by Level A and B harassment in the incidental harassment authorization. The Commission further recommends that NMFS require LDEO to specify in the final monitoring report (1) the number of days on which the airgun array was active and (2) the percentage of time and total time the array was active during daylight vs nighttime hours (including dawn and dusk). The Commission included the latter recommendations in its 1 July 2019 letter. NMFS did not

³⁷ An approach NMFS asked the Commission to develop. The Commission's CSA member with expertise in distance sampling, abundance and density estimation, and statistics developed the method that was provided to NMFS in summer 2016. NMFS also agreed to use the approach to better estimate the numbers of marine mammals taken by Level A and B harassment during geophysical activities in the Atlantic Ocean (83 Fed. Reg. 63361) and proposed to use it for geophysical activities in the Gulf of Mexico (83 Fed. Reg. 29287). The Commission understands that LDEO more than a decade ago did use $f(0)$ and $g(o)$ values to adjust the numbers of animals reported to be taken.

³⁸ Estimates of the number and nature of exposures that occurred above the harassment threshold based on PSO observations, including an estimate of those that were not detected in consideration of both the characteristics and behaviors of the species of marine mammals that affect detectability, as well as the environmental factors that affect detectability (see condition 6(a)(iv) in the draft authorization for the 2020 survey of Oregon and Washington³⁸ that was postponed).

³⁹ Including those takes that may occur at night. See the reporting requirements in the final authorization for the City of Juneau as one example, <https://www.fisheries.noaa.gov/webdam/download/102816952>.

⁴⁰ Which accounts for Beaufort sea state and could be used for low-visibility conditions as well.

follow or even mention those recommendations in the *Federal Register* notice for authorization issuance (84 Fed. Reg. 35076). The Commission expects NMFS to address these recommendations for this authorization, since LDEO has yet to provide the associated information in any of its previous monitoring reports. In addition, many of the monitoring requirements regarding the data to be collected under section 5(d)(ii) through (iv) are not required to be reported in the monitoring report in section 6(a) of the draft authorization. The Commission recommends that NMFS require LDEO to include in its monitoring report all data to be collected under section 5(d)(ii), (iii), and (iv) through specific stipulations in section 6(a) of the final authorization. Furthermore, if LDEO and other NSF-affiliated entities do not comply with all of the requirements set forth in final incidental harassment authorizations, the Commission recommends that NMFS refrain from issuing any further authorizations to LDEO and other NSF-affiliated entities until such time that the monitoring reports include all of the required information.

In addition, only one of the last six monitoring reports involving geophysical surveys conducted by LDEO and other NSF-affiliated entities has been posted on NMFS's website. This does not allow for transparent review by the public or the Commission of whether LDEO and other NSF-affiliated entities have fulfilled the basic monitoring and reporting requirements set forth by NMFS under section 101(a)(5)(D)(ii)(III) of the MMPA. Moreover, the information contained in monitoring reports can be used to inform future activities. The Commission recommends that NMFS post all final monitoring reports on its website as soon as they are available.

Unauthorized taking

As noted for other recent authorizations⁴¹, NMFS has relaxed the reporting measures that would be required to be implemented when unauthorized taking (i.e., an injury or death attributed to LDEO's activities, including by vessel strike) occurs. LDEO's authorization would require that it only report the unauthorized taking. This is in stark contrast to NMFS's approach for the recent proposed authorization for Dominion Energy Virginia, in which it would require Dominion to report *and* cease activities in the event of a vessel strike⁴². When unauthorized taking occurs, action proponents should cease the associated activities until NMFS determines what additional measures are necessary to minimize additional injuries or deaths. To that end, the authorizations must include clear, concise, explicit measures to minimize any ambiguity of what action proponents should do in those circumstances. Furthermore, standard mitigation and reporting measures regarding injuries and deaths should be consistent amongst authorizations. The Commission recommends that NMFS include in all draft and final incidental harassment authorizations the explicit requirements to cease activities if a marine mammal is injured or killed during the specified activities, including by vessel strike, *until* NMFS reviews the circumstances involving any injury or death that is likely attributable to the activities *and* determines what additional measures are necessary to minimize additional injuries or deaths.

⁴¹ See the Commission's [10 February 2020 letter](#) for a more extensive rationale regarding this matter.

⁴² See condition 6(c)(ii) in the final authorization (<https://www.fisheries.noaa.gov/webdam/download/106874057>). The condition specifies that activities must not resume until NMFS is able to review the circumstances of the prohibited take. NMFS will work with Dominion to determine what measures are necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. Dominion may not resume its activities until notified by NMFS.

Proposed one-year authorization renewals

The Commission has raised ongoing concerns regarding NMFS's renewal process over the past few years⁴³. NMFS responded generally to those concerns just recently. The Commission has not yet had time to consider fully whether and how it plans to respond. As such, for purposes of this letter, the Commission recommends that NMFS refrain from issuing a renewal for any authorization unless it is consistent with the procedural requirements specified in section 101(a)(5)(D)(iii) of the MMPA.

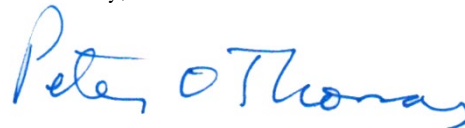
Ongoing concerns

The Commission has repeatedly expressed concern over errors, inconsistencies, and omission's in applications, *Federal Register* notices, and proposed authorizations involving LDEO and other NSF-affiliated surveys. All of the proposed authorizations involving LDEO and other NSF-affiliated surveys in the last two years have included incorrect densities or group sizes, errors in the estimated numbers of Level A and/or B harassment takes, and incomplete, incorrect, or inconsistent mitigation, monitoring, or reporting requirements in the proposed authorizations. Some of those authorizations also included incorrect extents of the Level A and B harassment zones and/or ensonified areas, as denoted herein.

Full and transparent public review has not occurred, as the public is unaware of the various issues raised by the Commission. The Commission has repeatedly recommended that NMFS conduct a more thorough review of applications and *Federal Register* notices to ensure not only accuracy, completeness, and consistency, but also to ensure that they are based on best available science, prior to submitting them to the *Federal Register* for public comment. If NMFS publishes another LDEO or NSF-affiliated proposed authorization with an inadequate or incomplete review, the Commission will recommend denial of the authorization outright or that NMFS refrain from issuing the authorization until the issues are addressed, the authorization is revised and republished, and the public is able to comment on a complete and accurate proposed authorization.

Please contact me if you have questions concerning the Commission's recommendations.

Sincerely,



Peter O. Thomas, Ph.D.,
Executive Director

⁴³ Some of which can be reviewed in the Commission's [10 February 2020](#) letter.

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