

Marcus Langseth Science Oversight Committee (MLSOC)

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Subject: 0648-XD773- Comment on “Marine Geophysical Survey in the Northwest Atlantic Ocean Offshore New Jersey, June to August, 2015”

Dear Ms. Harrison:

The Marcus Langseth Science Oversight Committee (MLSOC) welcomes the opportunity to comment on the application for an Incidental Harassment Authorization (IHA) for the proposed 3D seismic program on the New Jersey (NJ) Shelf to study sea-level rise. This program utilizes *R/V Marcus G Langseth (R/V Langseth)*, a unique asset of the Federal Academic Fleet with its specially designed capabilities to conduct the proposed 3D seismic program. MLSOC supports the application for an IHA and endorses NMFS commitment to science-based decisions in its regulatory process.

The MLSOC is a committee within the University National Oceanographic Laboratories System (UNOLS) and consists of a diverse group of professionals, including geophysicists, geologists, oceanographers, and marine engineers, who provide advice on the scientific operations of *R/V Langseth*. The committee’s members have extensive experience conducting seismic operations around the world aboard *R/V Langseth* and other seismic vessels, as well as knowledge and experience in mitigation and monitoring identified and/or required under the National Environmental Policy Act (NEPA), the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA). One role of the Committee is to advise both the National Science Foundation (NSF) and the ship operator Lamont-Doherty Earth Observatory (L-DEO) on safe, efficient, cost-effective, and scientifically compelling operations of *R/V Langseth*.

As a U.S. research vessel, *R/V Langseth* operates entirely within the U.S. regulatory process, and, when appropriate, international laws, including for mitigating any potential impacts of sound on the environment. NEPA requires agencies, in this case NSF, to consider the potential environmental impacts of their proposed actions. The Draft Amended Environmental Assessment (EA), the associated application for an IHA, and NMFS’s Notice of Intent to issue an IHA for this 3D seismic experiment on the NJ shelf describe the proposed research program, its potential consequences, possible alternatives, the rationale for why the proposed action is the most efficient and safe program, monitoring plan, and mitigation measures that would minimize any potential adverse impacts. Among the factors considered in developing the research plan were:

- a. Minimum energy source size to accomplish scientific objectives;
- b. Mitigation and shut down procedures for marine species;
- c. Protected Species Visual Observers (PSVO) observations for a standard amount of time, generally 30 minutes prior to the start of the survey to clear a specified area around the vessel, and to monitor marine species occurrence, abundance, and behavior during seismic operations;
- d. Startup of the energy source includes ramp-up procedures over a standard amount of time (generally 30 mins) that serves to alert animals of the activity and allows them to vacate the area if disturbed;
- e. No start-up of the seismic source during poor visibility or at night unless at least one airgun has been operating;
- f. PSVOs, independently contracted biologists, have authority to shut down the seismic source when marine mammals, sea turtles, and diving and foraging endangered/threatened seabirds are detected in or about to enter designated exclusion zones;
- g. Passive Acoustic Monitoring (PAM) and infrared sensors during day and night to complement visual monitoring; and
- h. Additionally, the airguns would be shut down if a North Atlantic right whale were seen at any distance from the vessel.

These factors are similar to and sometimes more stringent than guidelines that are implemented by countries such as:

- U.K. (http://jncc.defra.gov.uk/pdf/JNCC_Guidelines_Seismic%20Guidelines_Aug%202010.pdf),
 Canada (<http://www.dfo-mpo.gc.ca/oceans/management-gestion/integratedmanagement-gestionintegree/seismic-sismique/index-eng.asp>),
 Brazil(http://www.oceanwatchmimos.com/resources/IBAMA_document_Guide%20for%20monitoring%20marine%20biota%20translated_2005_04.pdf),
 Australia (<http://www.environment.gov.au/resource/epbc-act-policy-statement-21-interaction-between-offshore-seismic-exploration-and-whales>),
 New Zealand (<http://www.doc.govt.nz/our-work/seismic-surveys-code-of-conduct/>),
 Denmark(http://www.govmin.gl/images/stories/petroleum/environmental_reports/EIA_Guidelines_to_environmental_impact_assessment_of_seismic_activities_in_Greenland_waters.pdf),
 Norway (<http://www.npd.no/global/engelsk/5-rules-and-regulations/guidelines/guidelines-seismic-surveys.pdf>),

The monitoring and mitigation strategies proposed for the NJ survey are reasonable, and are consistent with these internationally accepted standards. The proposed monitoring and mitigation measures are based on standards set in the *Programmatic Environmental Impact Statement/Overseas Environmental Impact Statement for Marine Seismic Research Funded by the National Science Foundation or Conducted by the U.S. Geological Survey* (NSF/USGS PEIS – link provided below) which included public input, expert review, and are precautionary because of the uncertainties associated with impacts of man-made sound on animals and unknowns about the behavior, abundances, and distributions of marine animals.

There is often public confusion regarding the potential impacts to marine mammals from seismic surveys, in particular, the distinction between injury and disturbance because the U.S MMPA uses the term “take” to describe both situations. The IHA application for the NJ research program is an application only to “incidentally” disturb animals, not to injure animals. The proposed monitoring and mitigation described in a – h above is designed to minimize potential disturbance to marine mammals, as well as to avoid the possibility of injury.

The size of the proposed airgun array is modest, but has been determined to be sufficient to meet the research goals. The proposed 2015 NJ research program was proposed *and approved* originally in 2014 to use either 700 in³ or 1400 in³ airgun arrays, but the survey was terminated prematurely because of mechanical failures aboard the vessel. Hence the current IHA application is to conduct work that *was already approved* through the regulatory processes (i.e., all necessary federal regulatory authorizations were issued for the survey in 2014). The data collected in 2014 demonstrated that the smaller of the two airgun arrays was adequate to meet the scientific research goals. Therefore, the 2015 IHA application was changed to only use the smaller 700 in³ airgun array, following the standard set forth in the NSF/USGS PEIS for pre-survey planning to identify and propose the lowest practicable source level to achieve science goals. For comparison, industry airgun arrays can be a factor of 10 larger in volume. The NJ survey represents innovative cruise planning to minimize any potential impacts while acquiring the necessary data for the scientific program.

The 2015 IHA application contained new information with regard to the proposed exclusion and mitigation zones that was not available for the 2014 application. Specifically, scientists at Lamont-Doherty Earth Observatory (L-DEO) have analyzed actual received sound levels from the *R/V Langseth* acoustic source collected via hydrophone streamers in shallow water depths, similar to water depths that occur on the New Jersey shelf. Their results showed that the mitigation radii based on models (i.e., the radii generally used in establishing exclusion and mitigation zones in the IHA permit) were 2-3 times larger than the radii measured in situ (Crone et al., 2014). The authors noted “Conservative mitigation radii are preferred to those that are underestimated; however, excessively conservative radii can result [*in*] the over-counting of takes, and may cause unnecessary power-downs and shutdowns like those that plagued the 2012 COAST project on the *R/V Langseth*, and lead to large unnecessary losses of survey data” (Crone et al., 2014, p. 3805). These new results do not undermine model results, but rather are consistent with, and confirm the assessment in the IHA application that the radii are in fact very conservative.

For the permit issued for this survey in 2014, NMFS enlarged the exclusion and mitigation zones by requiring an additional 3 dB buffer, shifting the >190 dB exclusion zone to >187 dB, the >180 dB exclusion zone to > 177 dB, etc. Because the dB scale is logarithmic, the 3 dB increase was equivalent to a 50 % increase to the operational mitigation zone. Additional analysis by L-DEO on data collected during 2014 activities of *R/V Langseth*, and provided to NMFS, again clearly demonstrates that the proposed mitigation radii are substantially more conservative than actual received in situ sound levels. We encourage NMFS to accept the site-specific modeling analysis conducted by L-DEO and not require a scientifically unwarranted 3 dB buffer beyond the already conservative modeled exclusion zone radii.

Part of the rationale for mitigation and monitoring, including ramp-ups, is that animals are given the opportunity and will move away from a sound that might disturb them. During the 2014 *R/V Langseth* program conducted by the U.S. Geological Survey along the U.S. Atlantic margin to survey natural hazards and the extended continental shelf, the IHA permit authorized 11,367 takes to “incidentally” disturb individual animals protected under the Marine Mammals Protection Act and the Endangered Species Act. Only three unidentified dolphins were observed as potentially exposed to airgun sounds within the mitigation zone (> 160 dB) during the survey, resulting in a power down for 12 minutes out of 357.2 hours that the source was active. This very small number is evidence that mitigation and monitoring do work to minimize exposure and potential harm. Additionally, it demonstrates conservative, precautionary approaches to estimating take calculations can result in significantly overestimating potential impacts to marine species and can instead mislead the public as to the level of impacts that may result from acoustic sources.

Acoustic sources are essential and irreplaceable tools for the collection of data for scientific research in the oceans. Seismic methods are the only tool available for peering directly into the seafloor and

acquiring the data necessary to advance understanding of the impact of climate change on the ocean's margins, plate tectonics, submarine landslides, and offshore faulting. Seismic data are also used to map nearshore and coastal changes from storms such as superstorm Sandy so that resource managers can identify areas of greatest risk to future erosion and coastal modification from these extreme events.

The proposed NJ shelf program fits wholly within this framework and will provide invaluable data on sea level history by imaging former coastlines, rivers, and estuaries now buried beneath the sediments of the shelf. Whereas oil and gas exploration requires larger seismic sources to image deep targets, the NJ shelf program is focused on shallow sediments where no oil or gas deposits occur.

If modest seismic research programs such as that proposed for the NJ shelf using *R/V Langseth* are not permitted, the future of this unique national asset and the innovative research that it enables will be lost. The U.S. will have no way to investigate and study marine geologic features of critical interest to or potential geohazards along our coastlines, such as earthquakes, tsunamis, and landslides. Further, this means government officials will not be able to make informed policies to better protect its citizens, for example from earthquake or tsunami hazards, especially along populated coastline areas. If the *R/V Langseth* cannot operate in its own national waters to complete programs relevant to U.S. national interests, what role will science play in policies that safeguard public safety, resilience, and stability?

NSF and L-DEO have followed the appropriate IHA process and have conformed to the associated requirements. Based on the information and analysis provided by NSF and L-DEO, the proposed activities meet the criteria established for issuance of an IHA. Therefore, the MLSOC urges NMFS to approve this application for an IHA.

R/V Langseth, and its predecessor, *R/V Ewing*, completed more than a decade's worth of academic/government seismic programs with the highest standards of mitigation and monitoring and without the dire, unfounded results purported by opponents of the activities (e.g., no marine mammal mass strandings or disruption to fishing). Contrary to public statements made that there is "near-unanimous" opposition to the proposed NJ survey (<http://www.capemaycountyherald.com/article/government/washington+dc/106173-lobiondo+reaffirms+opposition+allow+drilling+new+jersey>), there is in fact significant support from the scientific community, such as the members of MLSOC and other members of the public, for the IHA to be issued for the proposed activity and for the survey to be conducted. As a consequence of past seismic research activities, academic scientists have provided significant contributions to society through results which have enhanced our understanding of the Earth, Earth processes, and geohazards. Additionally, observations made by the PSVOs aboard seismic expeditions are contributing to better understanding of the distribution and behavior of marine mammals and sea turtles. We encourage NMFS – as a science based agency – to use science to make informed decisions, perform its regulatory duties, and issue IHAs in an appropriate and timely manner.

Respectfully submitted,



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Crone, T.J., Tolstoy, M., and Carton, H., 2014, Estimating shallow water sound power levels and mitigation radii for the R/V Marcus G. Langseth using an 8 km long MCS streamer: Geochemistry, Geophysics, Geosystems, 15, 3793-3807, 10.1002/2014GC005420, (<http://onlinelibrary.wiley.com/doi/10.1002/2014GC005420/epdf>).

NSF/USGS PEIS can be found at https://www.nsf.gov/geo/oce/envcomp/usgs-nsf-marine-seismic-research/nsf-usgs-final-eis-oeis_3june2011.pdf