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April 26, 2018

Dr. William E. Easterling, Assistant Director, Geosciences
Dr. Richard W. Murray, Division Director, Ocean Sciences
Dr. Lina Patino, Acting Division Director, Earth Sciences
Dr. Scott G. Borg, Deputy Assist. Director, Geosciences
National Science Foundation
2415 Eisenhower Avenue
Alexandria, Virginia 22314

Dear Drs. Easterling, Murray, Patino, and Borg:

We are writing to express our disappointment and deep concern regarding NSF's announcement "Towards a New Approach for the Provision of Marine Seismic Capabilities to the U.S. Research Community" described in the Dear Colleague Letter (DCL) published on April 11, 2018. As elected members of the Board of Directors of IRIS, a consortium with 125 member institutions, we represent a cross-section of the U.S. academic seismology community, and thus our concerns exemplify viewpoints that are widespread amongst scientists in seismology and related disciplines.

Deep penetration marine active-source seismology provides essential and unique information on Earth structure and processes, particularly in regions associated with significant geohazards. The broad recognition of the importance of these capabilities for geohazards is clearly outlined in the interdisciplinary SZ4D report published last year, which articulates the need for marine seismic data to address scientific questions about subduction zones. No other geophysical method is capable of providing equally detailed imaging of faults, fluids, magma chambers, and other crustal and upper mantle structures. Further, such data provide foundational information for a broad spectrum of other ocean-based studies, including identifying drilling sites and extrapolating drilling results, resolving pathways for fluid flow and magmatic plumbing systems, as well as elucidating structures associated with seismicity patterns and seafloor deformation constrained by ocean bottom seismometers and seafloor geodesy.

The marine seismic capabilities provided by the *R/V Marcus G. Langseth* are used by programs across NSF Geosciences, not just by Ocean Sciences. For instance, shoreline-crossing programs, such as MARGINS and GeoPRISMS, as well as some programs funded by Earth Sciences have relied heavily on this facility to achieve their science goals. Consequently, the loss of marine seismic capabilities would negatively impact a wide variety of scientific efforts. This is emphasized by the high number of responses from 'non-experts' to the UNOLS survey, highlighting the need for marine seismology (https://www.unols.org/sites/default/files/Marine_Seismic_Survey_All_Responses_160705.pdf).

Deep penetration marine seismic capabilities are fundamental to earth and ocean sciences, and most leading countries in ocean research maintain such facilities. However, the U.S. currently possesses the best academic capability in the world, provided through the *Langseth*, with its large, well-tuned air gun array and 15-km towable streamer. Other countries aspire to acquire comparable seismic capabilities to that possessed by the U.S.

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Over the last two years, NSF has assured the Earth sciences community that they planned to maintain access to a high quality marine seismic acquisition capability. We are thus surprised and alarmed by the announced outcome of the solicitation on marine seismic capabilities, which would divest of the *Langseth* without a plan for replacement or funds dedicated to creating that replacement. This is a startling reversal from the message NSF had previously given to the community, resulting in a loss of trust between the marine geophysics community and NSF.

The loss of these capabilities and the abrupt termination of proposal submissions will be especially damaging for early career scientists in our community, who have made decisions about their careers and research directions based on the promise of continued access to a deep penetration marine seismic infrastructure. Instead, they will now be required to coordinate access to these capabilities “through industry providers or international/institutional partners,” which heavily slants the funding opportunities towards the few (likely senior) individuals with the necessary connections for establishing such partnerships, and towards studies of interest to industry or partners. Thus, the path described in the DCL will significantly damage the marine seismology community by deterring young scientists from pursuing or continuing in this important field, and discouraging new and innovative projects.

We urge NSF to solidify plans ensuring continued access to marine crustal seismic imaging capabilities for the U.S. research community, without any hiatus or damaging prohibition on active-source marine proposals. Consistent with previous promises, there should not be a timeline for divestment of the *Langseth* until there is replacement strategy in place. Further, we recommend that NSF continue to accept proposals for marine seismic imaging, using either the *Langseth* or a replacement capability, to smooth the transition to a new facility and to enable new PIs to continue to develop projects that undertake cutting-edge science.

Sincerely,

The IRIS Board of Directors:

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