U.S. NATIONAL SCIENCE FOUNDATION
2415 EISENHOWER AVENUE
ALEXANDRIA, VIRGINIA 22314

NSF 24-081

Dear Colleague Letter: Using Long-Term Research Associated Data (ULTRA-Data)

April 23, 2024

Dear Colleague:

With this Dear Colleague Letter (DCL), the U.S. National Science Foundation (NSF) seeks to stimulate and encourage the use and reuse of data from environmental time series research to improve generalizable understanding in fields including (but not limited to) ecology, organismal evolution/adaptation, geoscience, and oceanography.

The collection and comparison of long-term environmental measurements are critical to generate an integrated understanding of how ecosystem components interact, test ecological and evolutionary theories, and support the development and testing of ecological models. To advance the understanding of long-term dynamics of populations, communities, and ecosystems, NSF has made substantial investments in the collection and archiving of long-term data. Projects like Hawaii Ocean Time-series (HOT), Arctic Observing Network (AON), Bermuda Atlantic Time-series Study (BATS), Ocean Observatories Initiative (OOI), Centers for Transformative Environmental Monitoring Programs (CTEMPs), Critical Zone research (CZ), National Ecological Observatory Network (NEON), Long-Term Research in Environmental Biology (LTREB), and Long-term Ecological Research (LTER) sites collect environmental data, make observations, test hypotheses, and in some cases conduct experiments, but few resources are dedicated to accomplishing larger-scale synthesis.

Data collected by long-term projects are often multidisciplinary (including biology, chemistry, geology, and other fields of study) and may cover broad spatial scales in addition to an extended temporal aspect. These data are valuable because they can be used to explore regional, continental, and global scale questions regarding environmental and ecological processes. While all resulting data are publicly accessible, differences in how they are recorded, reported, and accessed, mean significant time and training may need to be invested to harmonize the data for use.

GOALS OF THE DCL

To stimulate research that makes use of long-term datasets, the participating NSF divisions/offices listed below encourage the submission of proposals that:

- Synthesize, compare, and/or combine long- and short-term datasets to advance understanding of ecosystem and environmental dynamics, ecology, and evolution;
- Conduct new modeling activities, including ecological or environmental forecasting;
- Increase the interoperability of data sets that are available from public repositories/databases such as the Community Surface Dynamics Modeling System (CSDMS), the Consortium of Universities for the Advancement of Hydrologic Science (CUAHSI), National Ecological Observatory Network (NEON), Biological & Chemical Oceanography Data Management Office (BCO-DMO), United States Antarctic Program Data Center (USAP-DC), Arctic Data Center, Environmental Data Initiative (EDI), EPA Environmental Dataset Gateway (EDG), Ocean Observatories Initiative (OOI), DataONE, and the Paleobiology Database;
- Propose workshops for both researchers and data scientists on accessing and using long-term data sets, with dissemination of the products to the scientific community (e.g., ESIIL).

NSF seeks to support diverse teams of investigators and institutions in the scientific activities that it funds. Submissions that benefit and involve the full breadth of the research community, including undergraduates, graduate students, postgraduates, and faculty at all institutions of higher education are encouraged.

Programs within the following NSF divisions/offices welcome submission of proposals responsive to this DCL. See the "How to Respond to this DCL" section for additional guidance on identifying a program.

Directorate for Biological Sciences

- Division of Environmental Biology
- Division of Integrative and Organismal Systems

Directorate for Geosciences

- Division of Earth Sciences
- Division of Ocean Sciences
- Office of Polar Programs

HOW TO RESPOND TO THIS DCL

Principal Investigators should contact program officers in the participating areas of NSF listed above about the suitability of submission to an individual program in response to this DCL,

and to discuss the scope and size of potential proposals.

Proposals should follow the guidelines, deadlines (if any), budget limitations (if any), and solicitation-specific criteria of the relevant NSF program(s), once identified. Awards for projects responsive to this DCL will be funded through the relevant NSF program(s).

The proposal title should begin with "ULTRA-Data:" after any *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) and/or solicitation-specific title requirements, if applicable. At the end of the Overview section of the Project Summary, include a sentence indicating that the proposal is being submitted in response to this DCL. Proposals that fail to address the objectives and guidance described in this DCL and in the relevant funding opportunity will be returned without review.

NSF is broadly interested in enabling discovery **through the use and reuse of** existing resources with untapped potential. Proposals responsive to this DCL should be primarily focused on utilizing data from environmental time series. Proposals primarily focused on innovative use of physical specimens and of metadata tracing back to physical specimens may be appropriate for the Innovative Use of Scientific Collections DCL (NSF 24-069), and we encourage PIs to consider that document.

Questions should be directed to program directors in the relevant NSF research program(s); not the signatories to this DCL.

Sincerely,

Susan Marqusee, Assistant Director
Directorate for Biological Sciences

Alexandra Isern, Assistant Director
Directorate for Geosciences