[6450-01-P]

DEPARTMENT OF ENERGY

A Unified Data Framework for DOE Biological and Environmental Research

AGENCY: Office of Biological and Environmental Research (BER), Office of Science, Department of Energy (DOE).

ACTION: Request for information.

SUMMARY: The Biological and Environmental Research (BER) Program, as DOE's coordinating office for research on biological systems, bioenergy, environmental science, and Earth system science, is seeking input on the need and the structure of a unified data framework that links or integrates existing data activities within BER. Information produced in response to this request may be used by the BER Advisory Committee (BERAC) to help inform and recommend to BER a strategy for next-generation data management and analysis within a unified framework.

DATES: Written comments and information are requested on or before October 31, 2023.

ADDRESSES: Interested persons may submit comments by email only. Comments must be sent to *BERACRFI@science.doe.gov* with the subject line "BER unified data".

FOR FURTHER INFORMATION CONTACT: Requests for additional information may be submitted to Dr. Tristram O. West, (301) 903-5155, *Tristram.west@science.doe.gov*.

SUPPLEMENTARY INFORMATION:

A charge was issued from the Director of Office of Science on October 13, 2022, to the BER Advisory Committee (BERAC) to (1) review the existing and anticipated capabilities in data management and supporting infrastructures that are relevant to the breadth of BER science and (2) recommend a strategy for next-generation data management and analysis within a unified framework. The Director's charge letter may be found here: *https://science.osti.gov/ber/berac/Reports/Current-BERAC-Charges*. Information collected through this request for information, in addition to other informational sources, may be used by

BERAC to recommend strategies to further integrate and strengthen BER's data infrastructure in support of BER research. It may also be used by the BERAC in fulfilling its October 13, 2022, charge from the Director of the Office of Science to recommend a strategy for next-generation data management and analysis within a unified framework.

Request for Information:

The objective of this request for information is to gather current and future science questions within BER's mission space that would require a more integrated data infrastructure for data access, processing, and use ***spanning more than one*** research area. Current BER research areas are provided online: *https://science.osti.gov/ber/Research*. Supported research includes Atmospheric Science; Earth and Environmental System Modeling; Environmental Science; Bioenergy and Bioproducts; and Plant and Microbial Genomics. Current data archives and activities that support BER research areas include, but are not limited to, ARM *https://www.arm.gov/*, ESS-DIVE *https://ess-dive.lbl.gov/*, ESGF *https://esgf.llnl.gov/*, KBase *https://www.kbase.us/*, NMDC *https://microbiomedata.org/*, MSD-LIVE *https://msdlive.org/*, and JGI *https://jgi.doe.gov/*.

Information is specifically requested on how a more unified data infrastructure may better facilitate current or future science questions, and what components or technologies are needed to develop a more unified data infrastructure. Answers or information related, but not limited, to the following questions are specifically requested:

1. Do you conduct research in one of the BER research areas (i.e., Atmospheric Science; Earth and Environmental System Modeling; Environmental Science; Bioenergy and Bioproducts; or Plant and Microbial Genomics) and, if so, which area(s)? Please limit additional detail on your area(s) of research interest to a brief paragraph.
2. What new or existing research areas might benefit from improvements in data availability or access across research areas, potentially enabling scientific breakthroughs – and why?

3. What data improvements, including those of accessibility and integration, could facilitate new or existing research or scientific breakthroughs?
    a. Are there current data sets that should be linked or integrated into existing data infrastructure to facilitate existing or new research? If so, which data sets should be so linked or integrated and why?
    b. Are there current barriers to accessing or integrating data from (a) different DOE sources (*e.g.*, ARM, JGI, ESS-DIVE, MSD-LIVE) or from (b) different sources separately maintained by DOE and another Federal agency? If so, what are those barriers and how might they be addressed to allow for improved data access and integration?
    c. What data infrastructure improvements would best support model-experiment feedbacks; facilitate data synthesis and analysis for multi-disciplinary research; and enable application of advanced statistical techniques, including artificial intelligence and machine learning? Please include a brief explanation as to how each identified improvement would support each of these listed tasks.
    d. What current barriers need to be addressed in developing a unified infrastructure to promote greater use by a more diverse community of users, with a focus on improving diversity, equity, and inclusion within data usage and application?

While the questions provided above can help guide thinking on this topic, any input is welcome that may assist BERAC in developing a next-generation data infrastructure in support of BER mission science. The information provided through this request will assist in developing specific strategies that the DOE Office of Science may implement.

Confidential Business Information

Pursuant to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via email two well-marked copies: one copy of the document marked "confidential" including all the information believed

to be confidential, and one copy of the document marked "non-confidential" with the information believed to be confidential deleted. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

Signing Authority

This document of the Department of Energy was signed on April 3, 2023, by Asmeret Asefaw Berhe, Director, Office of Science pursuant to delegated authority from the Secretary of Energy. The document with the original signature and date is maintained by DOE. For administrative purposes only, and in compliance with requirements of the Office of the Federal Register, the undersigned DOE Federal Register Liaison Officer has been authorized to sign and submit the document in electronic format for publication, as an official document of the Department of Energy. This administrative process in no way alters the legal effect of this document upon publication in the *Federal Register*.

Signed in Washington, DC, on April 12, 2023.

Treena V. Garrett,
Federal Register Liaison Officer,
U.S. Department of Energy.

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