**Department of Energy (DOE)**

**Office of Science**

**Biological and Environmental Research (BER)**

**Climate and Environmental Sciences Division Research (CESD)**

**[**Replace Header with ‘Data Management Plan’ prior to submission]

**Data types and sources**

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**Guidance:**

The sections in the template outline are based on Suggested Elements of a DMP provided by DOE (<http://science.energy.gov/funding-opportunities/digital-data-management/suggested-elements-for-a-dmp/>), but DMPs are not required to follow this template. For the data types and sources suggested element, a brief, high-level description of the data to be generated or used through the course of the proposed research and which of these are considered digital research data necessary to validate the research findings may be included.

\*Requirement #1: DMPs should describe whether and how data generated in the course of the proposed research will be shared and preserved. If the plan is not to share and/or preserve certain data, then the plan must explain the basis of the decision (for example, cost/benefit considerations, other parameters of feasibility, scientific appropriateness, or limitations discussed in the Protection section). At a minimum, DMPs must describe how data sharing and preservation will enable validation of results, or how results could be validated if data are not shared or preserved.

Detailed instructions can be found on the Office of Science Statement on Digital Management page. <http://science.energy.gov/funding-opportunities/digital-data-management/suggested-elements-for-a-dmp/>

Check with your specific program to see if there are specific program requirements.

The term digital data encompasses a wide variety of information stored in digital form including: experimental, observational, and simulation data; codes, software and algorithms; text; numeric information; images; video; audio; and associated metadata. It also encompasses information in a variety of different forms including raw, processed, and analyzed data, published and archived data.

This statement focuses on digital research data, which are research data that can be stored digitally and accessed electronically. Research data are defined in regulation (2 CFR 200.315 (e), continuing the definition from 2 CFR 215 (OMB Circular A-110) as follows:

 “Research data is defined as the recorded factual material commonly accepted in the scientific community as necessary to validate research findings, but not any of the following: preliminary analyses, drafts of scientific papers, plans for future research, peer reviews, or communications with colleagues. This 'recorded' material excludes physical objects (e.g., laboratory samples). Research data also do not include:

(A) Trade secrets, commercial information, materials necessary to be held confidential by a researcher until they are published, or similar information which is protected under law; and

(B) Personnel and medical information and similar information the disclosure of which would constitute a clearly unwarranted invasion of personal privacy, such as information that could be used to identify a particular person in a research study.”

**Content and format**

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**Guidance:**

A statement of plans for data and metadata content and format including, where applicable, a description of documentation plans, annotation of relevant software, and the rationale for the selection of appropriate standards. (Existing, accepted community standards should be used where possible. Where community standards are missing or inadequate, the DMP could propose alternate strategies that facilitate sharing, and should advise the sponsoring program of any need to develop or generalize standards.)

DMPs should reflect relevant standards and community best practices for data and metadata, and make use of community accepted repositories whenever practicable.

**Sharing and preservation**

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**Guidance:**

A description of the plans for data sharing and preservation.

\*Requirement #2: DMPs should provide a plan for making all research data displayed in publications resulting from the proposed research open, machine-readable, and digitally accessible to the public at the time of publication. This includes data that are displayed in charts, figures, images, etc. In addition, the underlying digital research data used to generate the displayed data should be made as accessible as possible to the public in accordance with the principles stated above. This requirement could be met by including the data as supplementary information to the published article, or through other means. The published article should indicate how these data can be accessed.

\*Requirement #3: DMPs should consult and reference available information about data management resources to be used in the course of the proposed research. In particular, DMPs that explicitly or implicitly commit data management resources at a facility beyond what is conventionally made available to approved users should be accompanied by written approval from that facility. In determining the resources available for data management at Office of Science User Facilities, researchers should consult the published description of data management resources and practices at that facility and reference it in the DMP.

View information about the data management resources available at the Office of Science User Facilities. <http://science.energy.gov/funding-opportunities/digital-data-management/resources-at-sc-user-facilities/>

The section on sharing and preservation should include, when appropriate:

\* the anticipated means for sharing and the rationale for any restrictions on who may access the data and under what conditions;

\* a timeline for sharing and preservation that addresses both the minimum length of time the data will be available and any anticipated delay to data access after research findings are published;

\* any special requirements for data sharing, for example, proprietary software needed to access or interpret data, applicable policies, provisions, and licenses for re-use and re-distribution, and for the production of derivatives, including guidance for how data and data products should be cited;

\* any resources and capabilities (equipment, connections, systems, software, expertise, etc.) requested in the research proposal that are needed to meet the stated goals for sharing and preservation. (This could reference the relevant section of the associated research proposal and budget request);

\* cost/benefit considerations to support whether/where the data will be preserved after direct project funding ends and any plans for the transfer of responsibilities for sharing and preservation;

\* whether, when, or under what conditions the management responsibility for the research data will be transferred to a third party (e.g. institutional, or community repository);

\* any other future decision points regarding the management of the research data including plans to reevaluate the costs and benefits of data sharing and preservation.

**Protection**

[Enter content here, and then remove the Guidance prior to submission]

**Guidance:**

A statement of plans, where appropriate and necessary, to protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; and avoid significant negative impact on innovation, and U.S. competitiveness.

\*Requirement #4: DMPs must protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; avoid significant negative impact on innovation, and U.S. competitiveness; and otherwise be consistent with all applicable laws, regulations, and DOE orders and policies. There is no requirement to share proprietary data.

Personally Identifiable Information

For proposals with Human Subjects Research (HSR), including research involving Personally Identifiable Information (PII), an appropriate research protocol will need to be approved by the appropriate DOE Institutional Review Board (IRB) or an external IRB with an approved federal wide assurance. Follow the instructions of the research solicitation to determine whether or not the data management aspects of this protocol should be included in the DMP. At a minimum, the DMP should acknowledge the type of HSR and/or PII involved and give a projected timeline for IRB approval. Information regarding DOE requirements for HSR and research involving PII, including how to obtain IRB approval, can be found at this link: DOE Human Subjects FAQ. [http://humansubjects.energy.gov/FAQ/researchers.htm#\_What\_are\_DOE’s](http://humansubjects.energy.gov/FAQ/researchers.htm#_What_are_DOE's)

**Rationale**

[Enter content here, and then remove the Guidance prior to submission]

**Guidance:**

A discussion of the rationale or justification for the proposed data management plan including, for example, the potential impact of the data within the immediate field and in other fields, and any broader societal impact.

\*Requirement #1: DMPs should describe whether and how data generated in the course of the proposed research will be shared and preserved. If the plan is not to share and/or preserve certain data, then the plan must explain the basis of the decision (for example, cost/benefit considerations, other parameters of feasibility, scientific appropriateness, or limitations discussed in the Protection section). At a minimum, DMPs must describe how data sharing and preservation will enable validation of results, or how results could be validated if data are not shared or preserved.

Principles related to the management of digital research data:

\* Effective data management has the potential to increase the pace of scientific discovery and promote more efficient and effective use of government funding and resources. Data management planning should be an integral part of research planning.

\* Sharing and preserving data are central to protecting the integrity of science by facilitating validation of results and to advancing science by broadening the value of research data to disciplines other than the originating one and to society at large. To the greatest extent and with the fewest constraints possible, and consistent with the requirements and other principles of this Statement, data sharing should make digital research data available to and useful for the scientific community, industry, and the public.

\* Not all data need to be shared or preserved. The costs and benefits of doing so should be considered in data management planning.

**Additional Guidance on data sharing, repositories and embargoes.**

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**Guidance:**

Biological and Environmental Research (BER) has additional requirements and guidance for the Subprogram: Climate and Environmental Sciences Division Research (CESD), including Atmospheric System Research, Environmental System Science and Climate and Earth System Modeling. Program specifics are listed below.

Digital Research Data

The term digital data encompasses a wide variety of information stored in digital form including: experimental, observational, and simulation data; codes, software and algorithms; text; numeric information; images; video; audio; and associated metadata. It also encompasses information in a variety of different forms including raw, processed, and analyzed data, published and archived data. See full definition. <http://science.energy.gov/funding-opportunities/digital-data-management/#Glossary>

**Biological and Environmental Research (BER) Climate and Environmental Sciences Division Research (CESD), including Atmospheric System Research, Environmental System Science and Climate and Earth System Modeling.**

Research data obtained through public funding are a public trust. As such, these data must be publicly accessible. To be in compliance with the data policy of the U.S. Global Change Research Program of full and open access to global change research data and the Office of Science Statement on Digital Data Management, the required Data Management Plan (DMP) must include a description of the researcher's data sharing plans if the proposed research involves the acquisition of data in the course of the research that would be of use to the climate research and assessment communities. This includes data from extensive, long-term observations and experiments and from long-term model simulations of climate that would be costly to duplicate. The DMP must describe plans for sharing the data that are to be acquired in the course of the proposed research, particularly how the acquired data will be preserved, documented, and quality assured, and where it will be archived for access by others. Data of potentially broad use in climate change research and assessments should be archived, when possible, in data repositories for subsequent dissemination.

Relevant CESD-funded data repositories include:

* CDIAC for Terrestrial Ecosystem Science-related projects <http://cdiac.ornl.gov/>
* ARM archive for Atmospheric System Research-related projects <http://www.archive.arm.gov/armlogin/login.jsp>
* Regional and Global Climate Model-related projects <http://www-pcmdi.llnl.gov/ipcc/about_ipcc.php>
* Carbon flux measurements must be contributed to the AmeriFlux Network data <http://ameriflux.lbl.gov/data/data-policy/>

The repository where the researcher intends to archive the data should be notified in advance of the intention, contingent on a successful outcome of the application review. If data are to be archived at the researcher's home institution or in some other location, the application must describe how, where, and for how long the data will be documented and archived for access by others.

Researchers are allowed an initial period of exclusive use of the acquired data to quality assure it and to publish papers based on the data, but they are strongly encouraged to make the data openly available as soon as possible after this period. NOTE: The Office of Science Digital Data Policy Statement on Digital Data Management requires that “all research data displayed in publications resulting from the proposed research (be) digitally accessible at the time of publication.” In this context, research data is defined as the data required to validate the published results. The exclusive use period for additional research data is defined to be one year after the end of the data acquisition period for the proposed performance period of the award but exceptions to extend this period may be justified for unique or extenuating circumstances.

BER User Facilities:

<http://science.energy.gov/user-facilities/user-facilities-at-a-glance/ber/>

* ARM Data Product Registration and Submission: <http://www.arm.gov/data/docs/product-registration>
* EMSL Data Management Policy: <http://www.emsl.pnnl.gov/emslweb/data_policy>
* JGI Data Release Policy: <http://jgi.doe.gov/collaborate-with-jgi/pmo-overview/policies/>