
Plan Overview

A Data Management Plan created using DMPTool

Title: Carbon Capture Multidisciplinary Simulation Center

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Funder: United States Department of Energy (DOE) (energy.gov)

Funding opportunity number: 42877

Grant: DE-NA0002375

Template: Department of Energy (DOE): Generic

Project abstract:

The Carbon Capture Multidisciplinary Simulation Center (CCMSC) was established to demonstrate positive societal impact of extreme computing by deployment of low-cost, low-carbon energy solution for power generation. The overall strategy includes collaboration with our industrial partner, General Electric Power, with an inter-disciplinary focus on development of high-performance computing technology. Three teams contribute to the overarching predictive science: the computer science team, the physics team and the validation/UQ team.

Last modified: 06-21-2019

Grant number / URL: DE-NA0002375

Copyright information:

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Carbon Capture Multidisciplinary Simulation Center

Data sharing and preservation

Data management plans should describe whether and how data generated in the course of the proposed research will be [shared](#) and [preserved](#) and, at a minimum, describe how data sharing and preservation will enable [validation](#) of results, or how results could be validated if data are not shared or preserved.

Data Sharing and Preservation

Two types of data are generated, shared and preserved as part of this research program: 1) simulation data, and 2) experimental data.

1) **Simulation Data:** The primary data artifacts of the research will be implementations of new algorithms and methodologies in software. The Uintah repository and the Arches Solid Fuel Combustion Application will house that software and will be released as open-source code with basic documentation. This open-source software repository is hosted by the Scientific Computing and Imaging Institute (SCI) at the University of Utah.

2) **Experimental Data:** All experimental and analytical data from this project, whether captured or generated by the center or by project collaborators, will be submitted to the Department of Energy Energy Data Exchange (EDX) for sharing and preservation. Data will become available to the public once all research results are published and/or any center intellectual property produced under this research project is protected sufficiently. Results will also be published in standard peer-reviewed journals to ensure the widest possible dissemination of our results.

Data used in publications

Data management plans 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](#) published in the DOE Policy for Digital Research Data Management. The published article should indicate how these data can be accessed.

Data Used in Publications

Secondary data artifacts will pertain to the digital research data needed to validate published research findings: the input files, input data, and metadata (e.g., number of processors, threads, etc.) used to generate any published data; instructions or scripts that enable others to reproduce simulations; instructions or scripts required for data analysis; and, data analysis results used to produce tables, plots, and charts in publications. These secondary data will be submitted as an appendix to every journal article submitted. The hope is that journals will find ways to share these data with the published articles. However, the center will maintain a web-based library of all journal articles and will preserve and share these appendices.

Data management resources

Data management plans 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 DOE Scientific User Facilities, researchers should consult the [published description of data management resources](#) and practices at that facility and reference it in the DMP.

Data Management Resources

The timeline for preserving and sharing data will be no less than three years after the research results are published. The resources for curating these data as described in this DMP are available within the Center at the University of Utah, at the DOE (EDX), and presumably at the organizations owning the scientific journals.

Confidentiality, security and rights

Data management plans 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, agreement terms and conditions, and DOE orders and policies.

Confidentiality, Security and Rights

The UofU has agreed to release intellectual property rights on this project. All research software will be distributed as open-source.

This project will make use of computational resources from DOE at the University of Utah (UofU) and at the DOE Lawrence Livermore National Laboratory (LLNL). In compliance with federal, state, and local statutes and regulations, UofU and LLNL have established standards and policies regarding the transmittal, storage, and destruction of data to protect confidentiality, personal privacy, Personally Identifiable Information, U.S. national interests, proprietary interests, and intellectual property rights. All participants in this program will conduct all work in accordance to these standards. In some cases some proprietary analysis software may be used. In these instances, raw data will not be supplied, but the available summary data tables will supply a sufficient representation of the data to allow validation of the results.

The UofU storage resources are managed by the Center for High Performance Computing (CHPC). The housing, electrical power, and manpower associated with this support is contributed by the University. It includes maintenance of the hardware, automatic backup, redundant and off-site backup storage, security with user authentication, user access and user removal.