DOE’s Public Access Plan

American Chemical Society Meeting: Driving Change: Impact of Funders on the Research Data & Publications Landscape

March 15th, 2016

Carly Robinson, PhD
OSTI Senior Science Advisor/ Product Strategist
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MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: John P. Holdren
  Director

SUBJECT: Increasing Access to the Results of Federally Funded Scientific Research

1. Policy Principles

The Administration is committed to ensuring that, to the greatest extent and with the fewest constraints possible and consistent with law and the objectives set out below, the direct results of federally funded scientific research are made available to and useful for the public, industry, and the scientific community. Such results include peer-reviewed publications and digital data.

Scientific research supported by the Federal Government catalyzes innovative breakthroughs that drive our economy. The results of that research become the grist for new insights and are assets for progress in areas such as health, energy, the environment, agriculture, and national security.

Access to digital data sets resulting from federally funded research allows companies to focus resources and efforts on understanding and exploiting discoveries. For example, open weather
DOE Response – Public Access Plan

Publications
• Ensure public access to “best available version” through Public Access Gateway for Energy & Science (PAGES)
  http://www.osti.gov/pages/
• Requirements effective Oct. 1, 2014

Data
• Office of Science Statement on Digital Data Management, effective Oct. 1, 2014
  http://science.energy.gov/funding-opportunities/digital-data-management/
• DOE Policy for Digital Research Data Management effective Oct. 1, 2015
  http://energy.gov/datamanagement
MEMORANDUM FOR HEADS OF DEPARTMENTAL ELEMENTS
NATIONAL LABORATORY DIRECTORS
DOE TECHNOLOGY CENTER DIRECTORS

FROM: ERNEST J. MONIZ

SUBJECT: Public Access to the Results of DOE-Funded Scientific Research

In a February 22, 2013, memorandum, “Increasing Access to the Results of Federally

Starting on October 1, 2014, and consistent with the process and infrastructure DOE
Laboratories and financial assistance recipients currently use to submit other forms of
scientific and technical information to OSTI, DOE-funded authors will be required to
provide accepted manuscript metadata and links (or the full text of the manuscript
itself) to OSTI. Because the Federal government retains a free license to publish data
first produced under a contract or grant, even if copyrighted, including authors’ final,
peer-reviewed, accepted manuscripts, DOE-funded authors will not be in violation of
any copyright by submitting such accepted manuscripts and metadata to OSTI.
Furthermore, in making the accepted manuscript publicly available to fulfill DOE’s public

Publications: The DOE Public Access Model – Public Access Gateway for Energy & Science\textsuperscript{Beta}

**DOE PAGES\textsuperscript{Beta}**

- Launched Aug. 4, 2014
- Centralized metadata
- Decentralized full-text articles and manuscripts, PAGES and publisher hosting
- Incorporates Dark Archive to ensure long-term preservation and access
- 12-month administrative interval or embargo period

[www.osti.gov/pages](http://www.osti.gov/pages)
Partnership with Publishers Facilitates Public Access to Best Available Version

• OSTI signed agreement to use this “CHORUS Service” on April 15, 2015.

• Through partnership between DOE/OSTI and CHORUS, PAGES will link to publisher-hosted full-text versions of articles when these are made publicly accessible by the publisher. Publishers also submit metadata through CHORUS for DOE-funded publications to OSTI.
  • Publisher participation in CHORUS is voluntary.

• In instances where publishers do not provide public access, PAGES will link to author-submitted full-text accepted manuscript version submitted to OSTI.

• Articles resulting from DOE funding are identified by mining the acknowledgement section of papers. Funding sources are captured in an additional metadata field. ***Proper funding acknowledgement is key.

• PAGES can successfully operate independent of CHORUS because of our collection of accepted manuscript,
1. Radiative and thermodynamic responses to aerosol extinction profiles during the pre-monsoon month over South Asia
Feng, Y.; Kotamarthi, V. R.; Coulter, R.; Zhao, C.; Cadeddu, M.

Aerosol radiative effects and thermodynamic responses over South Asia are examined with a version of the Weather Research and Forecasting model coupled with Chemistry (WRF-Chem) for March 2012. Model results of Aerosol Optical Depth (AOD) and extinction profiles are analyzed and compared to satellite retrievals and two ground-based lidars located in the northern India. The WRF-Chem model is found to underestimate the AOD during the simulated pre-monsoon month and about 83% of the model low-bias is due to aerosol extinctions below ~2 km. Doubling the calculated aerosol extinctions below 850 hPa generates much better agreement with the observed AOD.

June 2015, European Geosciences Union

2. Chemical aging of single and multicomponent biomass burning aerosol surrogate particles by OH: implications for cloud condensation nucleus activity

Multiphase OH and O₃ oxidation reactions with atmospheric organic aerosol (OA) can influence particle physicochemical properties including composition, morphology, and lifetime. Chemical aging of initially insoluble or low-soluble single-component OA by OH and O₃ can increase their water solubility and hygroscopcity, making them more active as cloud condensation nuclei (CCN) and susceptible to wet deposition. However, an outstanding problem is whether the effects of chemical aging on their CCN activity are preserved when mixed with other organic or inorganic compounds exhibiting greater water solubility. In this work, the CCN activity of laboratory-generated biomass burning aerosol (BBA) surrogate particles exposed to OH is investigated.

September 2015, Copernicus GmbH

3. Limited effect of anthropogenic nitrogen oxides on secondary organic aerosol formation

Globally, secondary organic aerosol (SOA) is mostly formed from emissions of biogenic volatile organic compounds (VOCs) by vegetation, but it can be modified by human activities as demonstrated in recent research. Specifically, nitrogen oxides (NOₓ = NO + NO₂) have been shown to play a critical role in the chemical formation of low-volatility compounds. We have updated the SOA scheme in the global NOAP (National Center for Atmospheric Research Aerosol-Cloud model) to include this mechanism, and we find that the effect of NOₓ on SOA formation is limited in both polluted and clean regions.

Have feedback or suggestions for a way to improve these results? Let us know!
Aerosol remote sensing in polar regions

Multi-year sets of ground-based sun-photometer measurements conducted at 12 Arctic sites and 9 Antarctic sites were examined to determine daily mean values of aerosol optical thickness $\tau(\lambda)$ at visible and near-infrared wavelengths, from which best-fit values of Angström's exponent $\alpha$ were calculated. Analysing these data, the monthly mean values of $\tau$(0.50 $\mu$m) and $\alpha$ and the relative frequency histograms of the daily mean values of both parameters were determined for winter–spring and summer–autumn in the Arctic and for austral summer in Antarctica. The Arctic and Antarctic covariance plots of the seasonal median values of $\alpha$ versus $\tau$(0.50 $\mu$m) showed: (i) a considerable increase in $\tau$(0.50 $\mu$m) for the Arctic aerosol from summer to winter–spring, without marked changes in $\alpha$; and (ii) a marked increase in $\tau$(0.50 $\mu$m) passing from the Antarctic Plateau to coastal sites, whereas $\alpha$ decreased considerably due to the larger fraction of sea-salt aerosol. Good agreement was found when comparing ground-based sun-photometer measurements of $\tau(\lambda)$ and $\alpha$ at Arctic and Antarctic coastal sites with Microtops measurements conducted during numerous AERONET/MAN cruises from 2006 to 2013 in three Arctic Ocean sectors and in coastal and off-shore regions of the Southern Atlantic, Pacific, and Indian Oceans, and the Antarctic.
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Multi-year sets of ground-based sun-photometer measurements conducted at 12 Arctic sites and 9 Antarctic sites were examined to determine daily mean values of aerosol optical thickness (τ) at visible and near-infrared wavelengths, from which best-fit values of...
This content will become publicly available on June 19, 2016

RACORO continental boundary layer cloud investigations. 2. Large-eddy simulations of cumulus clouds and evaluation with in-situ and ground-based observations

A 60-hour case study of continental boundary layer cumulus clouds is examined using two large-eddy simulation (LES) models. The case is based on observations obtained during the RACORO Campaign (Routine Atmospheric Radiation Measurement [ARM] Aerial Facility [AAF] Clouds with Low Optical Water Depths [CLOWD] Optical Radiative Observations) at the ARM Climate Research Facility's Southern Great Plains site. The LES models are driven by continuous large-scale and surface forcings, and are constrained by multi-modal and temporally varying aerosol number size distribution profiles derived from aircraft observations. We compare simulated cloud macrophysical and microphysical properties with ground-based remote sensing and aircraft observations. The LES simulations capture the observed transitions of the evolving cumulus-topped boundary layers during the three daytime periods, and generally reproduce variations of droplet number concentration with liquid water content (LWC), corresponding to the gradient between the cloud centers and cloud edges at given heights. The observed LWC values fall within the range of simulated values; the observed droplet number concentrations are commonly higher than simulated, but differences remain on par with potential estimation errors in the aircraft measurements. Sensitivity studies examine the influences of bin microphysics versus bulk microphysics, aerosol advection, supersaturation treatment, and aerosol hygroscopicity. Simulated macrophysical cloud...
Strain-Dependence of the Structure and Ferroic Properties of Epitaxial NiTiO$_3$ Thin Films Grown on Different Substrates

Polarization-induced weak ferromagnetism has been predicted a few years back in perovskite MTIO$_3$ (M = Fe, Mn, and Ni). We set out to stabilize this metastable perovskite structure by growing NiTiO$_3$ epitaxially on different substrates and to investigate the dependence of polar and magnetic properties on strain. Epitaxial NiTiO$_3$ films were deposited on Al$_2$O$_3$, Fe$_2$O$_3$, and LiNbO$_3$ substrates by pulsed laser deposition and characterized using several techniques. The effect of substrate choice on lattice strain, film structure, and physical properties was investigated. Our structural data from X-ray diffraction and electron microscopy shows that substrate-induced strain has a marked effect on the structure and crystalline quality of the films. Physical property measurements reveal a dependence of the weak ferromagnetism and lattice polarization on strain and highlight our ability to control the ferroic properties in NiTiO$_3$ thin films by the choice of substrate. Our results are also consistent with the theoretical prediction that the ferromagnetism in acentric NiTiO$_3$ is polarization induced. From the substrates studied here, the perovskite substrate LiNbO$_3$ proved to be the most promising one for strong multiferromagnetism.

Authors: Varga, Tamás; Droubay, Timothy C.; Bowden, Mark E.; Kovarik, Libor; Hu, Dehong; Chambers, Scott A.

Publication Date: 2015-01-01

OSTI Identifier: 1210103

Type: Published Article
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Abstract

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Data: DOE Policy for Digital Data Management

- Office of Science Statement on Digital Data Management, effective Oct. 1, 2014

DOE Policy for Digital Research Data Management

Office of Science Statement on Digital Data Management

Office of Energy Efficiency and Renewable Energy

Advanced Scientific Computing Research

... Biological and Environmental Research

All sponsoring research offices are implementing DMP requirements by Oct. 1, 2015. Some may have additional guidance and requirements online.

Some sub-office programs may have additional guidance and requirements online.
DOE Policy for Digital Research Data Management

The Department of Energy (DOE) is responsible for advancing the energy, environmental, and nuclear security of the United States; promoting scientific and technological innovation in support of that mission; sponsoring basic research in the physical sciences; and ensuring the environmental cleanup of the nation’s nuclear weapons complex.

This policy is part of the implementation of the Department’s Public Access Plan and has been developed with input from a variety of stakeholders in its research mission.

Here, data management involves all stages of the digital data lifecycle including capture, analysis, sharing, and preservation. The focus of this statement is Data Sharing and Data Preservation of Digital Research Data.

This policy applies to Unclassified and Otherwise Unrestricted Digital Research Data produced in whole or in part by Department of Energy federal employees, National Laboratory and other Management and Operating (M&O) contractor employees, financial assistance awardees, other grantees, and other contractor entities where the data are produced with complete or partial DOE funding, unless otherwise prohibited by law, regulation, agreement terms and conditions, or policy.

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  - Requirements
  - Guidance (including Suggested Elements for a Data Management Plan)
**DOE Policy for Digital Research Data Management**

**Principles**

- 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.
DOE Policy for Digital Research Data Management

- Requirements apply to proposals for research funding

- Requirements apply to proposals submitted for new, renewal, and some supplemental research funding

- Requirements apply to proposals regardless of the PI’s institution

- Requirements do not apply to applications to use DOE scientific user facilities.

- DOE sponsored research activities at the DOE National Laboratories for which a DOE-approved DMP does not already exist will be required to develop a DMP. In most cases, the DMP will be requested as part of the next peer review organized by the DOE sponsoring research office.
DOE Policy for Digital Research Data Management

Requirements

1. DMPs 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.
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. The published article should indicate how these data can be accessed.
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 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.
DOE POLICY FOR DIGITAL RESEARCH DATA MANAGEMENT: RESOURCES AT DOE SCIENTIFIC USER FACILITIES

OFFICE OF SCIENCE

ADVANCED SCIENTIFIC COMPUTING RESEARCH (ASCR)

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<th>FACILITY</th>
<th>HOST INSTITUTION</th>
<th>DATA MANAGEMENT RESOURCES</th>
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<tbody>
<tr>
<td>National Energy Research Scientific Computing Center (NERSC)</td>
<td>LBNL</td>
<td>Link</td>
</tr>
<tr>
<td>Argonne Leadership Computing Facility (ALCF)</td>
<td>ANL</td>
<td>Link</td>
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<tr>
<td>Oak Ridge Leadership Computing Facility (OLCF)</td>
<td>ORNL</td>
<td>Link</td>
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<tr>
<td>Energy Sciences Network (ESnet)</td>
<td>LBNL</td>
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BASIC ENERGY SCIENCES (BES)

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<tr>
<th>FACILITY</th>
<th>TYPE</th>
<th>HOST INSTITUTION</th>
<th>DATA MANAGEMENT RESOURCES</th>
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<tbody>
<tr>
<td>Advanced Light Source (ALS)</td>
<td>Light Source</td>
<td>LBNL</td>
<td>Link</td>
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<tr>
<td>Advanced Photon Source (APS)</td>
<td>Light Source</td>
<td>ANL</td>
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<td>Linac Coherent Light Source (LCLS)</td>
<td>Light Source</td>
<td>SLAC</td>
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<tr>
<td>National Synchrotron Light Source II (NSLS-II)</td>
<td>Light Source</td>
<td>BNL</td>
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<tr>
<td>Stanford Synchrotron Radiation Light Source (SSRL)</td>
<td>Light Source</td>
<td>SLAC</td>
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<tr>
<td>High Flux Isotope Reactor (HFIR)</td>
<td>Neutron Source</td>
<td>ORNL</td>
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<td>Spallation Neutron Source (SNS)</td>
<td>Neutron Source</td>
<td>ORNL</td>
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<tr>
<td>Center for Functional Nanomaterials</td>
<td>Nanoscale Science Research Center</td>
<td>BNL</td>
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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, agreement terms and conditions, and DOE orders and policies.
DOE POLICY FOR DIGITAL RESEARCH DATA MANAGEMENT: SUGGESTED ELEMENTS FOR A DATA MANAGEMENT PLAN

The Principal Investigator or other appropriate research lead should determine which data should be the subject of the Data Management Plan (DMP) and, in the DMP, propose which data should be shared and/or preserved in accordance with the Requirements of this policy.

The following list of elements for a DMP provides suggestions regarding the data management planning process and the structure of the DMP:

- Data Types and Sources
- Content and Format
- Sharing and Preservation
- Protection
- Rationale
DOE Data ID Service

http://www.osti.gov/home/doe-data-id-service

The DOE Office of Scientific and Technical Information (OSTI) offers a service for registering datasets to help increase access to digital data from DOE-funded scientific research. Through the DOE Data ID Service, OSTI assigns persistent identifiers, known as Digital Object Identifiers (DOIs), to datasets submitted by DOE and its contractor and grantee researchers and registers the DOIs with DataCite to aid in citation, discovery, retrieval, and reuse.

DOIs can be used to search for datasets on a number of OSTI’s scientific and technical information database products. OSTI assigns and registers DOIs for datasets for DOE researchers as a free service to enhance the Department of Energy’s management of this important resource.

OSTI, the only U.S. government member of DataCite, can assign DOIs to other federal agencies’ datasets on a cost-reimbursable basis. For information about this interagency service, please contact DOE Data ID Service.

DOE Data ID Service Fact Card (664.74KB pdf)

About
- DOE Data ID Service
- DOE Data ID Service Background
- DOE Data ID Service Benefits

How to Use the DOE Data ID Service
- For Grantees – Submit metadata to OSTI
  Login not required
- For Individual Lab Researchers – Submit

Find Datasets in:
- DOE Data Explorer
- SciTech Connect
- Science.gov
Thank you!

Questions?