

Advancements in scientific data searching, sharing and retrieval

Author(s):

Ranjeet Devarakonda
Oak Ridge National Laboratory
PO Box 2008 MS 6407,
Oak Ridge, TN 37831 USA
Email: devarakondar@ornl.gov

Giri Palanisamy
Oak Ridge National Laboratory
PO Box 2008 MS 6407,
Oak Ridge, TN 37831 USA
Email: palanisamyg@ornl.gov

Bruce E. Wilson
Oak Ridge National Laboratory
PO Box 2008 MS 6407,
Oak Ridge, TN 37831 USA
Email: wilsonbe@ornl.gov

James M. Green
Information International Associates
Oak Ridge, TN 37831 USA
Email: jgreen@iiaweb.com

Summary:

In the recent years, there has been significant advancement in scientific data management and retrieval techniques, particularly in terms of standard formats and protocols for data and metadata. The Oak Ridge National Laboratory Distributed Data Archive Center for biogeochemical dynamics (ORNL DAAC) is among the organizations building advanced toolsets for advancing the practices of scientific data management and retrieval. One such toolset, Mercuryⁱⁱⁱ, is a web-based metadata harvesting, data discovery and access system, built for researchers to search for, share and obtain biogeochemical data required to understand how the Earth System operates and to predict several related aspects, including impacts of climate change. Originally developed for a single National Aeronautics and Space Administration (NASA) funded project, Mercury is now used in a dozen different projects across three US federal agencies. Mercury renders various capabilities including metadata management, harvesting/searching, data sharing, and also software reusability.

The Open Archive Initiative Protocol for Metadata Handling (OAI-PMHⁱⁱⁱ) is a standard that is seeing increased use as a means for exchanging structured metadata. OAI-PMH implementations must support Dublin Core as a metadata standard, with other metadata formats as optional. We have developed tools which enable Mercury to consume metadata from OAI-PMH services in any of the metadata formats we support (Dublin Core, Darwin Core, FCDC CSDGM, GCMD DIF, EML, and ISO 19115/19137). We are also making ORNL DAAC metadata available through OAI-PMH for other metadata tools to utilize. This paper describes Mercury capabilities with multiple metadata formats, in general, and, more specifically, the results of our OAI-PMH implementations and the lessons learned.

References:

ⁱ Devarakonda R, Palanisamy G, Wilson BE, Green J; (2010) "Mercury: reusable metadata management, data discovery and access system" Earth Science Informatics DOI: [10.1007/s12145-010-0050-7](https://doi.org/10.1007/s12145-010-0050-7)

ⁱⁱ Devarakonda R, Palanisamy G, Green J, Wilson, B E (2009) Mercury: Reusable software application for Metadata Management, Data Discovery and Access, Eos Trans. AGU 90(52), Fall Meet. Suppl., Abstract #IN11C-1060

ⁱⁱⁱ Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH): Accessed April 2010, Available at: <http://www.openarchives.org/pmh/>