Applications of Digital Object Identifiers to data sets at the NASA Goddard Earth Sciences Data and Information Services Center (GES DISC)

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DOI provides a well-defined mechanism to attach a permanent identifier to data

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Abstract

The DOI® System provides an Internet resolution service for unique and persistent identifiers of digital objects. Thus far Digital Object Identifiers (DOIs) have been applied to select data sets at the NASA Goddard Earth Sciences Data and Information Services Center (GES DISC) including data products from projects under the NASA MEaSUREs Program and the Earth Observing System (EOS) Aqua Atmospheric Infrared Sounder (AIRS). DOIs are acquired and registered through EZID, California Digital Library and DataCite. GES DISC hosts a data set landing page associated with each DOI; each page provides information on and access to the data including a recommended data citation when using the product in research or applications.

This work includes participation with the Earth science community (e.g., Earth Science Information Partners (ESIP) Federation) and the NASA Earth Science Data and Information System (ESDIS) Project to identify, establish and implement best practices for assigning DOIs and managing support information, including metadata, for earth science data sets.

Future work includes (1) coordination with NASA mission Science Teams and other data providers on the assignment of DOIs for other GES DISC data holdings, particularly for future missions such as Orbiting Carbon Observatory -2 and -3 (OCO-2, OCO-3) and projects (MEaSUREs 2012), (2) construction of landing pages that are both human and machine readable, and (3) pursuing the linking of data and publications using tools such as the Thomson Reuters Data Citation Index.

DOI used as permanent identifier

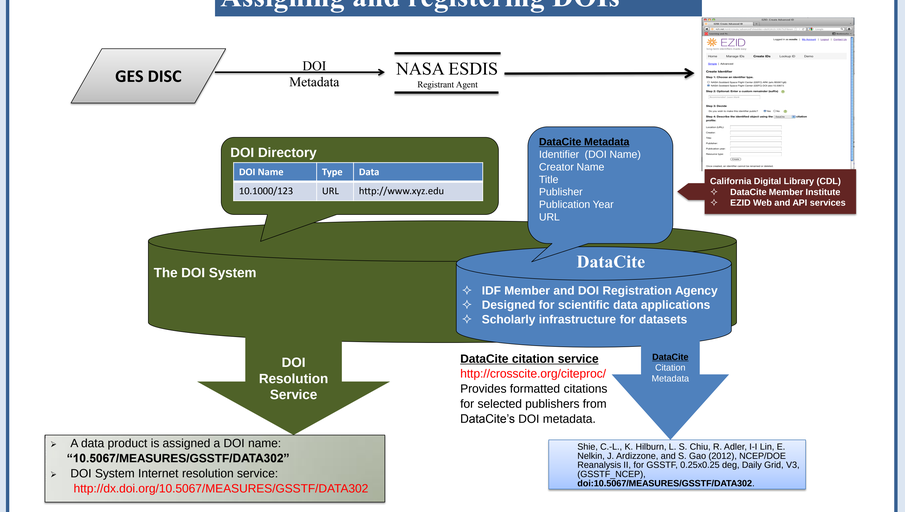
- DOI consists of a two-part alphanumeric string
- doi:[prefix]/[suffix]
  - Prefix pre-assigned by the DOI System
    - 10 identifies the DOI Registry
    - 5067 identifies the Registrant Agent (NASA ESDIS)
  - Suffix is a alphanumeric string indicating mission or program

    10.5067/AQUA/AIRS/DATA201
    10.5067/AURA/HIRDLS/DATA314
    10.5067/MEASURES/GSSTF/DATA301
- DOI specification follows conventions established by the NASA ESDIS Project
- DOI is assigned to data set series (data collection)
  - Associated with all granules in a collection
- New products and versions are assigned new DOIs

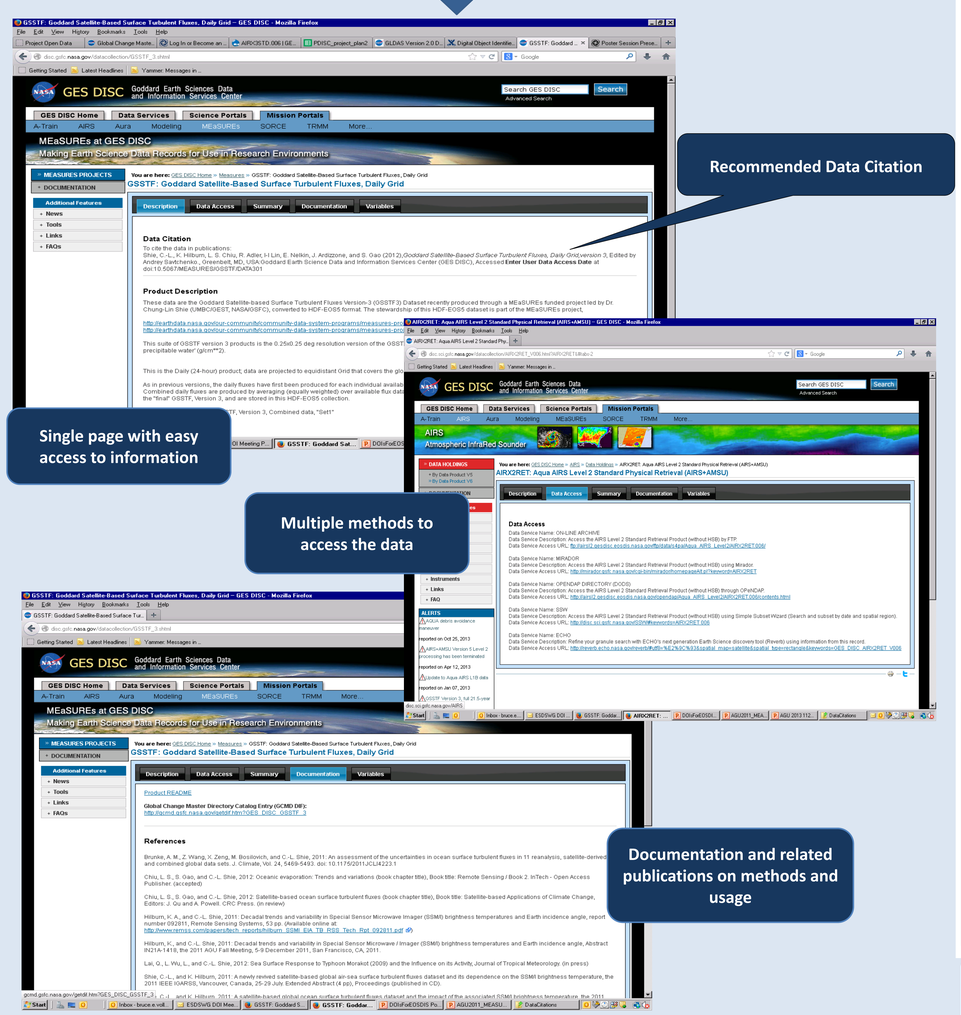
Data with registered DOIs

- NASA MEaSURES 2006 Projects
  - Reprocessing and Goddard Satellite-based Surface Turbulent Fluxes (GSSTF) Data Set for Global Water and Energy Cycle Research [13]
  - Creating a Long Term Multi-Sensor Ozone Data Record [18]
  - Consistent Long-Term Aerosol Data Records over Land and Ocean from SeaWiFS [7]
  - GOZCARDS: Global Ozone Chemistry and Related Trace Gas Data Records for the Stratosphere [11]
  - Earth Surface and Atmosphere Reflectivity Since 1979 from Multiple Satellites (TOMS, SBUV, SBUV-2, OMI, SeaWiFS, NPP, and NPOESS) [4]
  - A Multi-Sensor Water Vapor Climate Data Record Using Cloud Classification [3]
- EOS Aqua Atmospheric Infrared Sounder (AIRS) Version 6 [40]
- EOS Aura High Resolution Dynamics Limbs Sounder (HIRDLS) Version 7 [19]

Assigning and registering DOIs



DOIs resolve to Data Set Landing Pages



Embedded DOIs in product

→ **The product data files contain two file level attributes for the DOI**

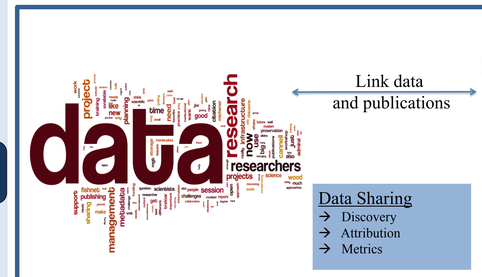
DOI Attribute Name
identifier_product_doi = 10.5067/AQUA/AIRS/DATA201

DOI Attribute Name Authority
identifier_product_doi_authority = http://dx.doi.org/

→ **The associated metadata in EOSDIS catalog repositories also contain a Product Specific Attribute (PSA) for the DOI (e.g., to enable applications).**

→ **Help to preserve product integrity in the community**

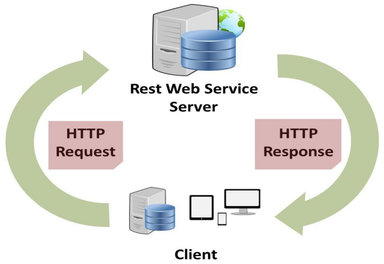
Next steps



References

1. Shie, C.-L., K. Hilburn, L. S. Chiu, R. Adler, I-I Lin, E. Nelkin, J. Ardizzone, and S. Gao (2012),*Goddard Satellite-Based Surface Turbulent Fluxes. Daily Grid, version 3*, Edited by Andrey Savtchenko., Greenbelt, MD, USA:Goddard Earth Science Data and Information Services Center (GES DISC), Accessed **2 May 2013** at doi:10.5067/MEASURES/GSSTF/DATA301
2. AIRS Science Team/Joao Texeira (2013),*Aqua AIRS Level 3 Daily Standard Physical Retrieval (AIRS+AMSU),version 006*, Greenbelt, MD, USA:NASA Goddard Earth Science Data and Information Services Center (GES DISC), Accessed **15 May 2013** at doi:10.5067/AQUA/AIRS/DATA301
3. Weiss, A. K., Staehelin, J., Appenzeller, C., and Harris, N. R. P.: Chemical and dynamical contributions to ozone profile trends of the Payerne (Switzerland) balloon soundings, J. Geophys. Res., 106, 22685–22694, doi:10.1029/2000JD000106, 2001

Machine readable landing pages



DOI assignments for additional data sets

- **MEaSUREs 2012 Projects**
- **OCO-2**
- **OCO-3**
- **MERRA2**

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