Enabling FAIR Data in the Earth, Space, and Environmental Sciences

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AGU’s position statement on data affirms that

“Earth and space sciences data are a world heritage. Properly documented, credited, and preserved, they will help future scientists understand the Earth, planetary, and heliophysics systems.”


Photo Credit: Photo by Rick Meyers on Unsplash
Research habits and digital skills needing most improvement

Data Management Skills Gap Analysis, April 7, 2017
http://bfe-inf.org/document/skills-gap-analysis

What circumstances would motivate you to share your data?

**FAIR Guiding Principles**

**FAIR is...**
- **Findable**
- **Accessible**
- **Interoperable**
- **Reusable**


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**FAIR Data Principles** *(applies to software too)*

- **Findable**
  - Assign persistent IDs (PIDs), provide rich metadata, register in a searchable resource, ...

- **Accessible**
  - Retrievable by their ID using a standard protocol, metadata remain accessible even when data are no longer available...

- **Interoperable**
  - Use formal, broadly applicable languages, use standard vocabularies, qualified references...

- **Reusable**
  - Rich, accurate metadata, clear licenses, provenance, use of community standards...

Enabling FAIR Data Project - Objectives

- FAIR-aligned data repositories add value to research data, provide metadata and landing pages for discoverability, and support researchers with documentation guidance, citation support, and curation.

- FAIR-aligned Earth, space, and environmental science publishers align their policies to establish a similar experience for researchers. Data, software, technology will be available through citations that resolve to repository landing pages. Availability statements are provided.

Data are not placed in the supplemental information.
Current Publisher Signatories… (as of 7 May 2019)

- American Geophysical Union
- Copernicus Publications
- Ubiquity Press
- California Digital Library – CDL
- Wiley
- PANGAEA, Alfred Wegener Institute, Helmholtz Center for Polar and Marine Research (AWI), Center for Marine Environmental Sciences, University of Bremen (MARUM)
- WDC Climate, Deutsches Klimarechenzentrum (DKRZ)
- Science
- Science Advances
- PLOS
- Elsevier
- F1000
- Nature
- Scientific Data
- Taylor & Francis Group
- Hindawi Ltd.

Over 100 signatories to date!


Current Societies/Communities Signatories (as of 7 May 2019)

- American Geophysical Union
- PAGES (Past Global Changes)
- gvSIG Association
- Consortium of Universities for the Advancement of Hydrological Science, Inc (CUAHSI)
- SPARC (The Scholarly Publishing and Academic Resources Coalition)
- World Data System of the International Science Council
- Network for Computational Modeling in the Social and Ecological Sciences
- OSGeo
- Research Data Canada
- Neotoma Paleoecology Database
- Long Term Ecological Research Network

FAIR-Aligned: Researcher Commitment

- Locating trustworthy, community-accepted, FAIR-aligned repositories that support:
  - Documenting data and software (and other research outputs as is possible) to agreed community standards that describe provenance and enable discovery, assessment of reliability, and reuse
  - Persistent identifiers for data and software (and other research outputs as is possible)
  - Licenses for data and software (and other research outputs as is possible) that is as open as possible to enable the widest potential reuse.

- Citing data, software, physical samples, and other research products
- Developing data availability statements
- Preparing and managing data management plans. Make them living documents.

FAIR-Aligned: Publisher Commitment (1 of 2)

- Ensure that data are open and FAIR, and, to the greatest extent possible, openly accessible at the time of publication.

- Direct all core research outputs (data, software, appropriate samples and sample descriptions) to FAIR-aligned repositories.

- Adopt a shared set of author guidelines that support these principles.

- Inform editors and reviewers of the FAIR data principles, and communicate these principles in author and reviewer workshops and training.

- Regularly review and update these data management practices, to align with current developments.
FAIR-Aligned: Publisher Commitment (2 of 2)

• Enable the connections between data citations in references and data, allowing researchers to receive credit for data sharing practices.

• Implement standard identifiers for all authors (e.g., ORCID), author contributions (e.g., CRediT), samples (e.g., IGSN), institutions, funders and grants.

• Develop or point to tools and training resources to help researchers identify appropriate repositories.

• Clarify to researchers through the above instructions and tools the types and minimum expectations for data.

Data Sharing and Citations: New Author Guidelines

**FAIR-Aligned Publishers - Author Guidelines for Data (1 of 2)**

- **Deposit research data in a FAIR-aligned repository**, with a preference for those that explicitly follow the [FAIR Data Principles](#) and demonstrate compliance with international standards for data repositories, (e.g. [CoreTrustSeal](#)).

- **Cite and link to the data** in the article, following the [Joint Declaration of Data Citation Principles](#) and [ESIP Guidelines](#), using the unique, resolvable, and persistent identifiers provided by the repository in which the data are archived.

- **Include a Data Availability Statement** describing how the data underlying the findings of their article can be accessed and reused.

**FAIR-Aligned Publishers - Author Guidelines for Data (2 of 2)**

- **Provide unrestricted access to all data** and materials underlying reported findings for which ethical or legal constraints do not apply.

- A **tool to assist in identifying FAIR-aligned repositories** is available from DataCite and can be found at [https://repositoryfinder.datacite.org](https://repositoryfinder.datacite.org).

- There may be a **need to restrict some access to data** because of fragile environments, endangered species, geopolitical tensions or cultural sensitivities (e.g. indigenous land rights).
Frequently Asked Questions


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Meeting of Societies – NSF Funded (OAC)
Enabling FAIR Data, Sharing our Method, Encouraging Broad Adoption

• June 19-20, 2019
• AGU Building – 2000 Florida Ave, NW, Washington DC
• Target: Natural Sciences and friends

Did I Miss You? Would You Like to Participate?
Things to do:

Want information on the author guidelines for data?  

Want to be on the email list for updates on Enabling FAIR Data and/or COPDESS? Email sstall@agu.org.  [at the moment it is a manual process – keeps costs low]

Want to be a signatory of the Enabling FAIR Data Commitment Statement?  

Want to learn more about data citation, CrossRef schemas, and making sure they are coded correctly?  

And finally…

Thank you.

How can we help you?
References


Questions?

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