Supporting researchers to share, discover, and use data

1. Data in the Lab
2. Linking Articles and Data Repositories (and Doing More than Just Linking)
3. Supporting Data in Scientific Publications
4. Research Data Working Groups and Industry Standards

Raw research data should be made freely available to all researchers (STM Brussels Declaration, 2007)
1. Data in the Lab

Pilot project with Carnegie Mellon:

- Capture the data directly from the experiment
- Easy to use tool to organize data, add metadata in the lab
- Back-end system to integrate data for analysis, sharing & discovery

Integrated solution from data capture to data sharing
2. Linking Articles and Data

Links to primary data stored at domain-specific data repositories

Linking schemes with 40+ data repositories
(and doing a bit more than just linking)

Data visualization tool connects articles and data – pulling in data from PANGAEA for this article and showing to the reader.

Authors have uploaded data to PANGAEA, submitted article for publication to Marine Geology journal.

Abstract

The modern Atlantic Ocean, dominated by the interactions of North Atlantic Deep Water (NADW) and Antarctic Bottom Water (AABW), plays a key role in redistributing heat from the Southern to the North Hemisphere. In order to reconstruct the evolution of the relative NADW/AABW transition, reflected by the calcite lysocline.
3. Supporting Data in Scientific Publications

Supplementary data tables offered inline at the point of reference
In-article data visualization tools for research data submitted as supplementary material with the article (e.g. fMRI data)
4. Research Data Working Groups and Industry Standards

- **Joint Declaration of Data Citation Principles**: best-practices to cite data in articles for better linking and credit
- **Research Data Alliance & ICSU World Data System**: Tackling a broad range of interconnected issues around Data Publication
Appendix
Data citations

• Systematic way to link articles and data using persistent id’s
• Mechanism to give credit & attribution for data
• Help to search for data, and discover from articles
• Recent community effort: Joint Declaration of Data Citation Principles

References

Barnett et al., 2013  C.L. Barnett, N.A. Beresford, L.A. Walker, M. Baxter, C. Wells, D. Copplestone
Element and radionuclide concentrations in representative species of the ICRP’s reference animals and plants and associated soils from a forest in North-west England
NERC — Environmental Information Data Centre (2013) http://dx.doi.org/10.5285/e40b53d4-5699-4557-bd55-10d196e6e9ea

Beresford, 2010  N.A. Beresford
The transfer of radionuclides to wildlife (Editorial)
Radiat Environ Biophys, 49 (2010), pp. 505–508

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Linking Articles and Data: PANGAEA

Links are bidirectional, so data page at PANGAEA also links out to the article.
Linking Articles and Data adds value

- Increase visibility, discoverability, and usage
- Provide context, avoid misinterpretation and incorrect usage
- Ensure long-term availability of useful content and context
- Coordinate submission process and deposit mechanism

Do you think it is useful to link underlying research data with formal literature?

- Yes: 85%
- No: 15%

Researcher survey, 1202 respondents (PARSE.insight 2010)
Data is important, but hard to access

Researcher survey, 3824 respondents (Publishing Research Consortium, 2010)
Data storage is very fragmented

Researcher survey, 1202 respondents (PARSE.insight 2010)
Linking data by URL’s is not reliable

49% of hard-coded URL links are broken in articles published in 2000 (and even higher % before that)

From: Pepe et al., https://authorea.com/users/3/articles/288/_show_article