
Open data in global environmental research: Findings from the community

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Established to foster global environmental change research;
Initiated June 2009 by NSF and NERC, building on the work
of the IGFA

(Courtesy JialiangGao www.peace-on-earth.org,
Wikimedia Commons)

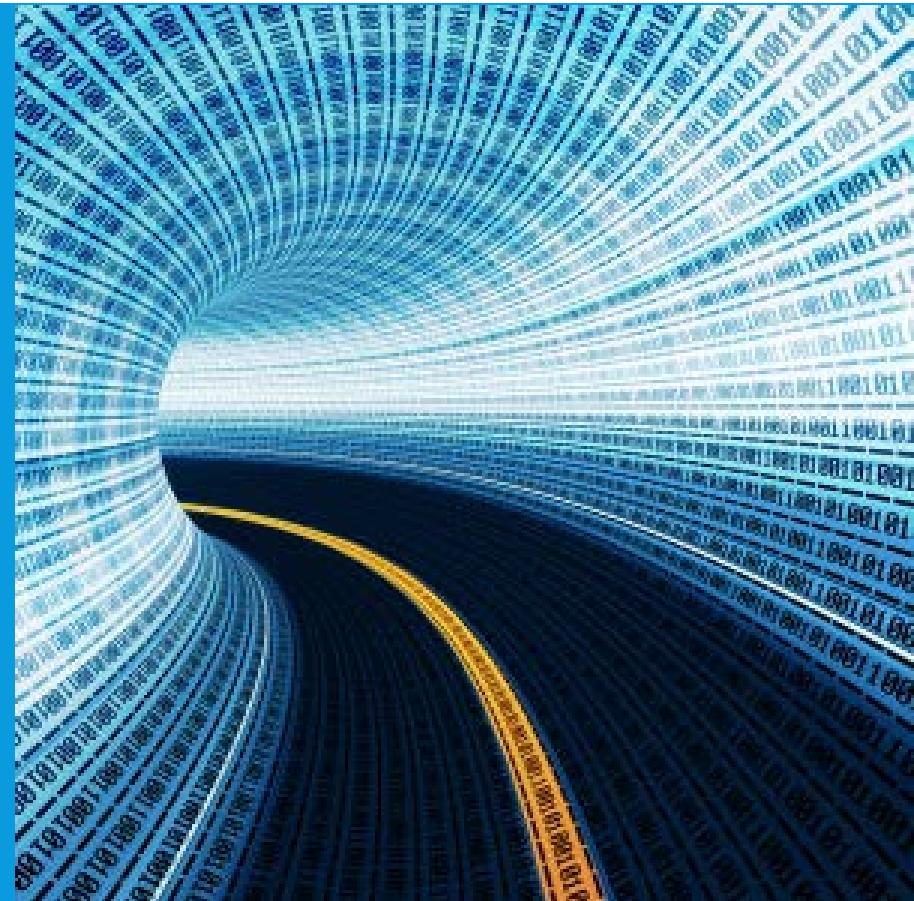
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E-infrastructures and Data Management CRA

“....the need to address global environmental challenges requires a more coordinated approach to the planning, implementation, and management of data, analytics and E-Infrastructures” through international collaboration.



Belmont Forum, New Delhi, February 2013

Work packages

1. Data Integration for Multidisciplinary Research
2. Improved Interface Between the Computation and Data Infrastructures
3. Harmonization of Global Data Infrastructure for Sharing Environmental Data
4. Data Sharing
5. Open Data
6. Capacity Building (spans Work Packages 1–5)

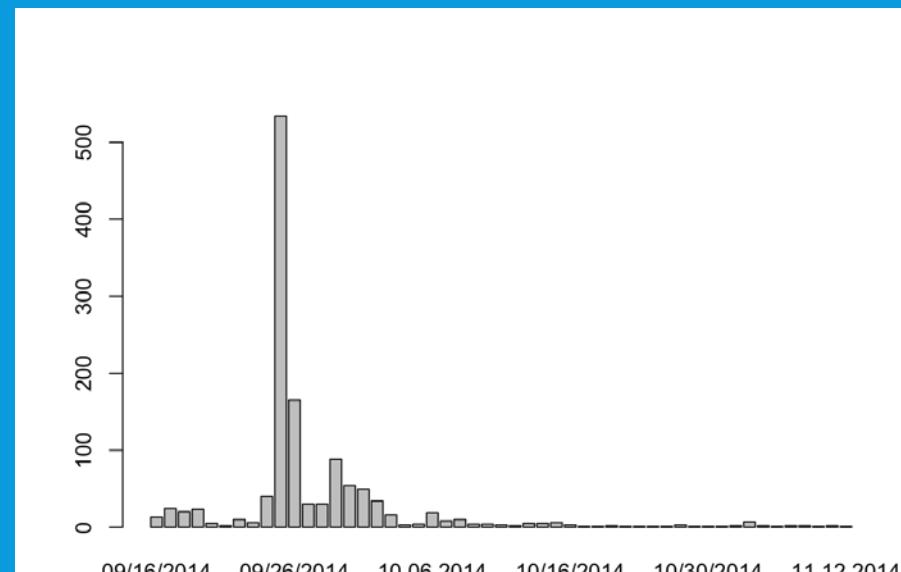
Open Data Survey

The main aim was to learn about

- Key open data initiatives in communities dealing with global environmental change
- Reasons where users' desire to share can be enhanced
- Barriers to open data sharing from a user perspective

Dissemination of the survey

- c 20 disciplinary mailing lists (geosciences, life sciences, social sciences, etc.)
- Copernicus Publications (2014/09/25)

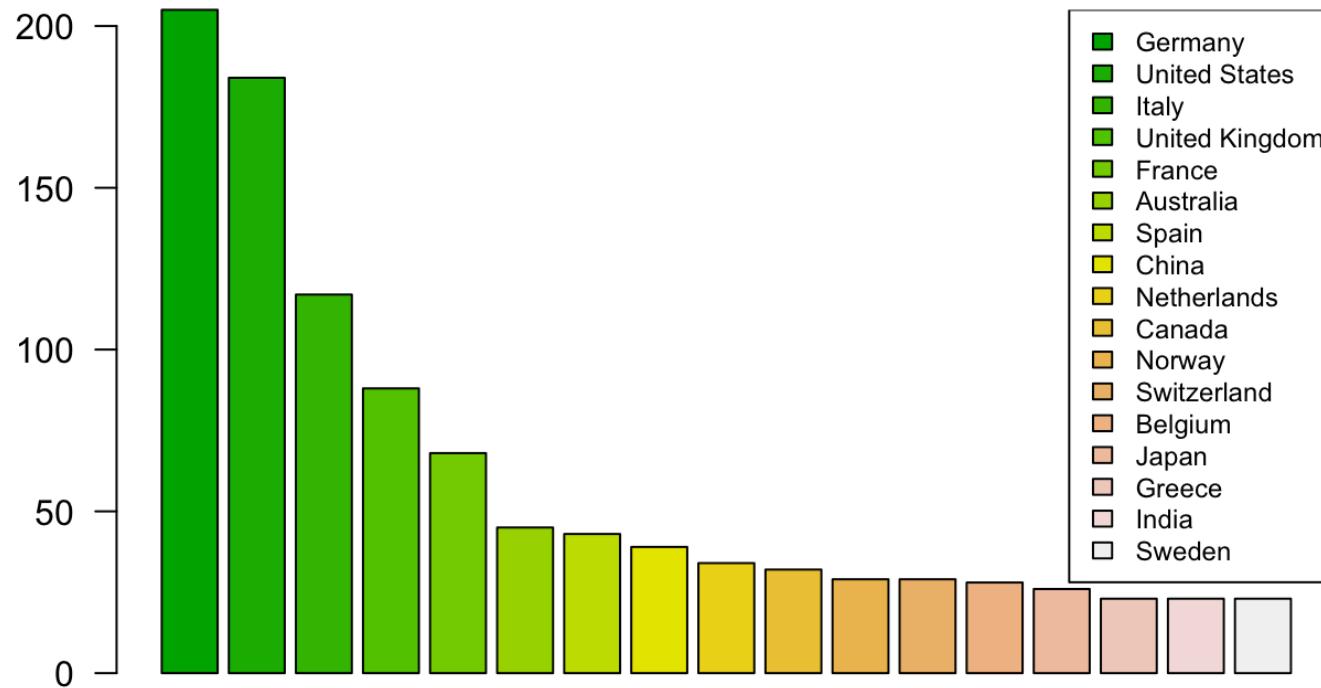


Open Data Survey: Responses

- 16 September – 12 November 2014
- 1330 responses (1253 used for analysis) from 80 countries
- 70.1% (878) academic, 17.9% (224) government, 5.6% (70) non-profit institutions, 2.6% (32) business, 0.3% (4) media, 3.6% (45) other roles
- 82.3% (1025) data users, 57.6% (718) data providers, 25.3% (315) data managers (multiple answers allowed), 5.3% (66) other roles
- Data published at: doi: [10.5281/zenodo.16384](https://doi.org/10.5281/zenodo.16384)
- Schmidt B, Gemeinholzer B, Treloar A (2016) Open Data in Global Environmental Research: The Belmont Forum's Open Data Survey. PLoS ONE 11(1): e0146695. doi:10.1371/journal.pone.0146695

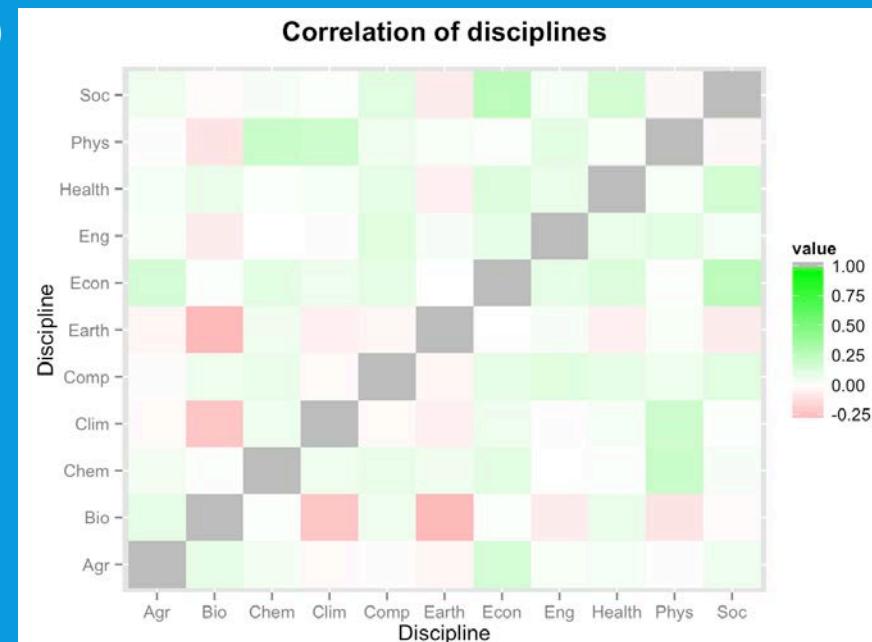
Countries with more than 20 answers

Which country are you from?

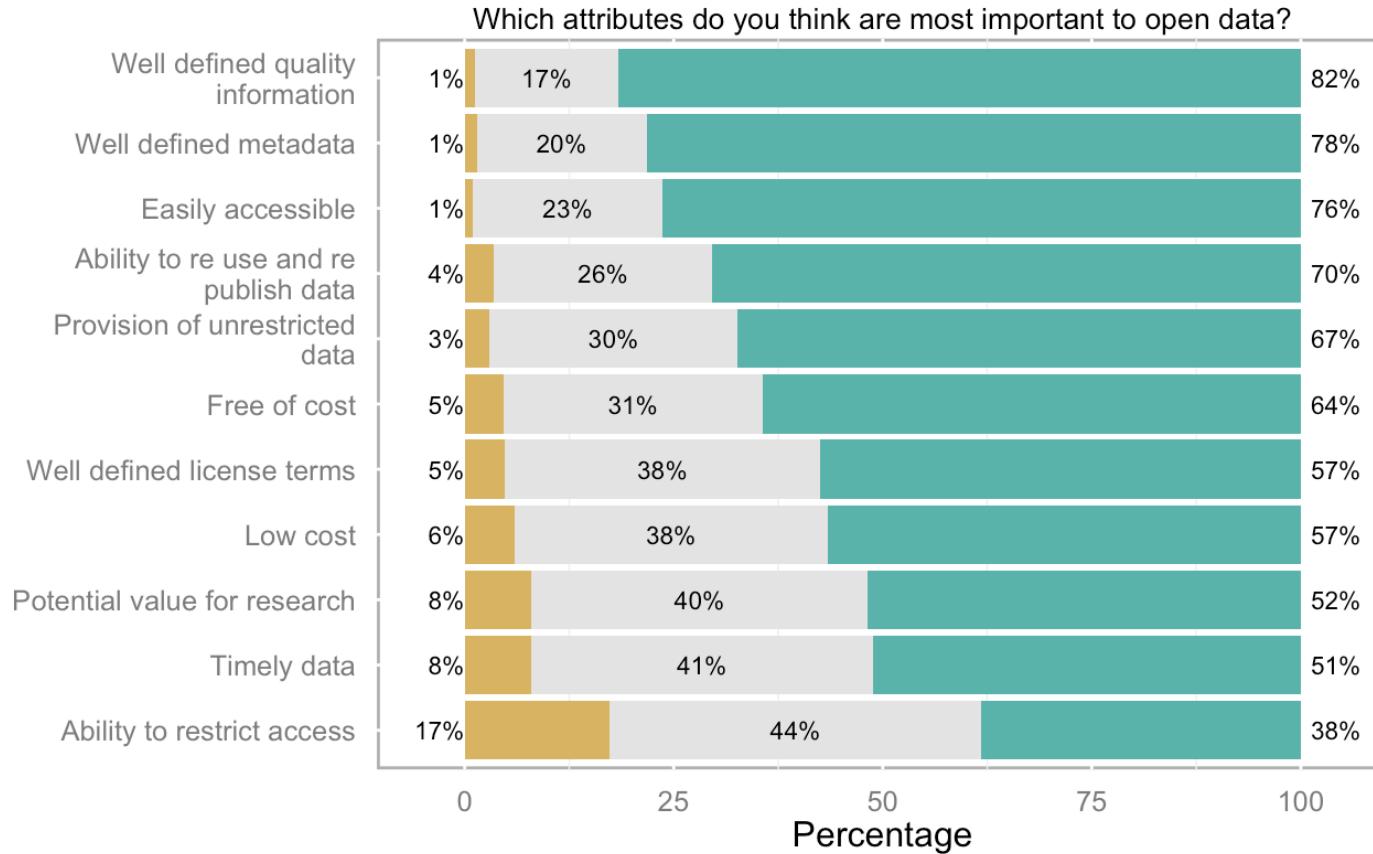


Responses by discipline (N=1253, multiple answers allowed)

- earth and environmental sciences (68.7%, 846 answers)
- climate and atmospheric sciences (31.3%, 386 answers)
- biological sciences (20.6%, 258 answers)
- physical sciences (12.9%, 162 answers)
- engineering (7.1%, 88 answers)
- computer sciences (6.9%, 85 answers)
- social sciences (5.4%, 66 answers)
- agricultural and veterinary sciences (4.3%, 53 answers)
- chemical sciences (4.1%, 50 answers)
- other discipline (3.2%, 40 answers)
- health sciences (1.8%, 22 answers)
- economics (1.7%, 21 answers)

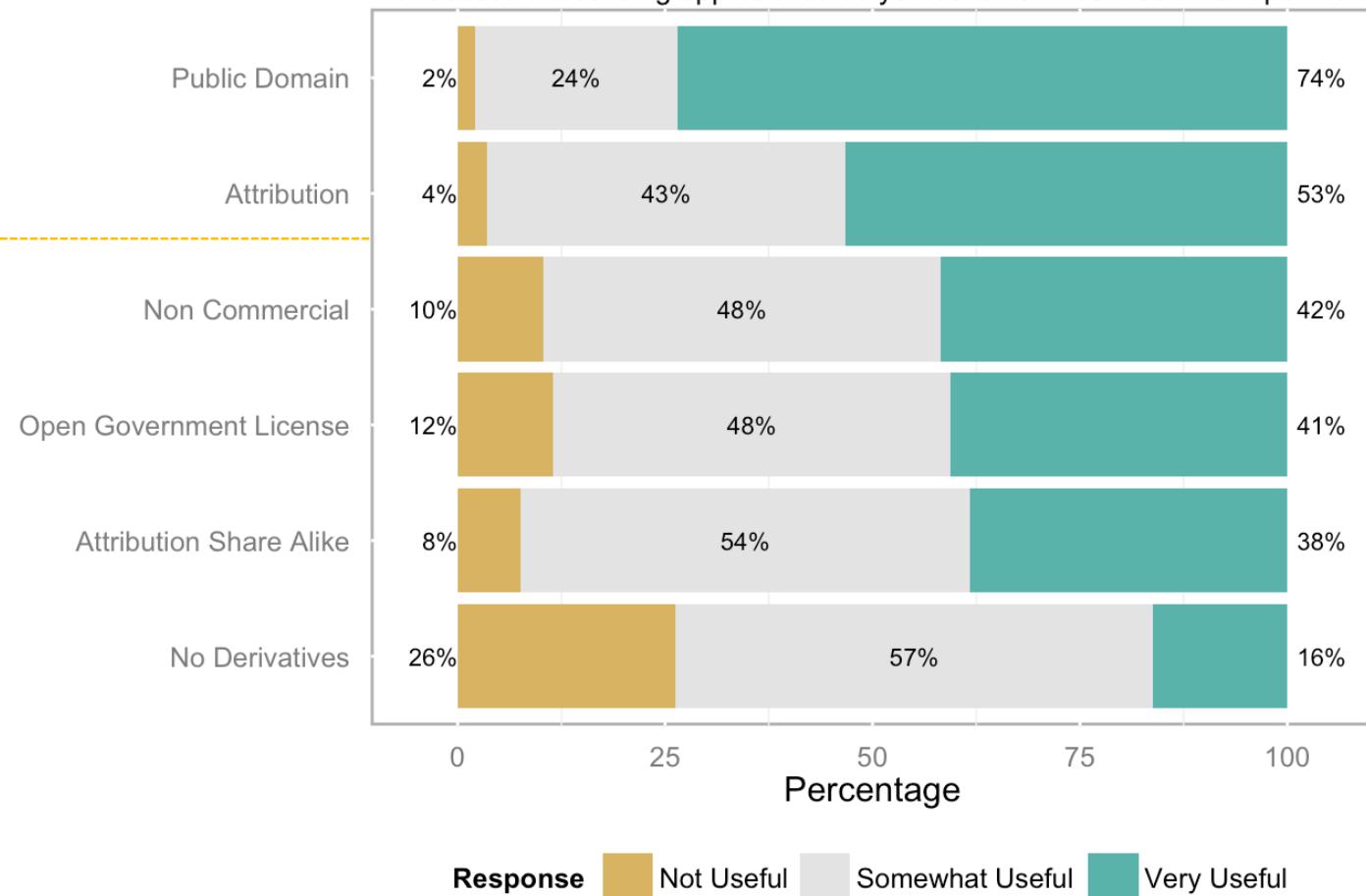


What properties do they expect for open data?

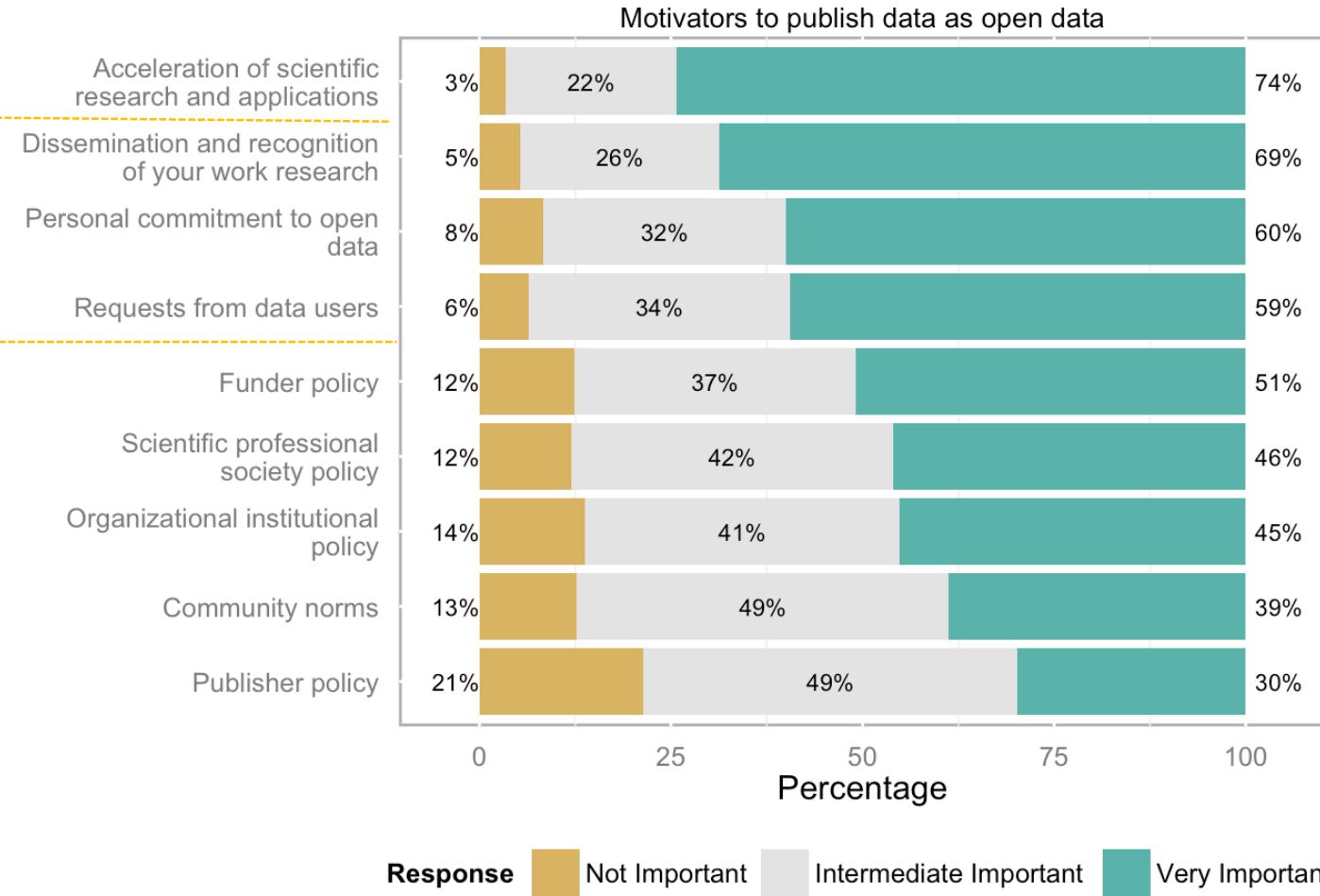


Access and licensing conditions

What access or licensing approaches do you consider most useful for open data?

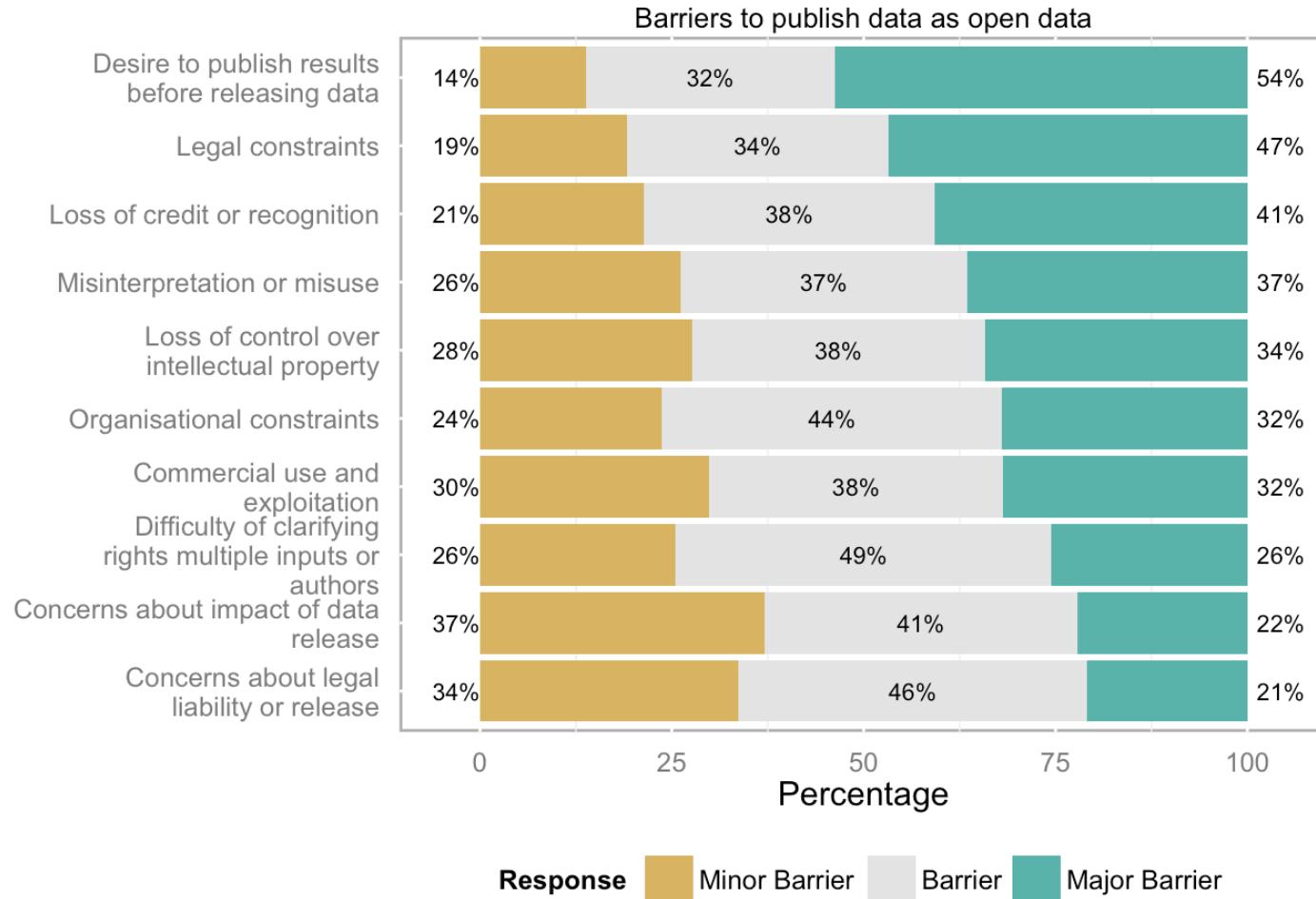


Motivators to publish data as open data

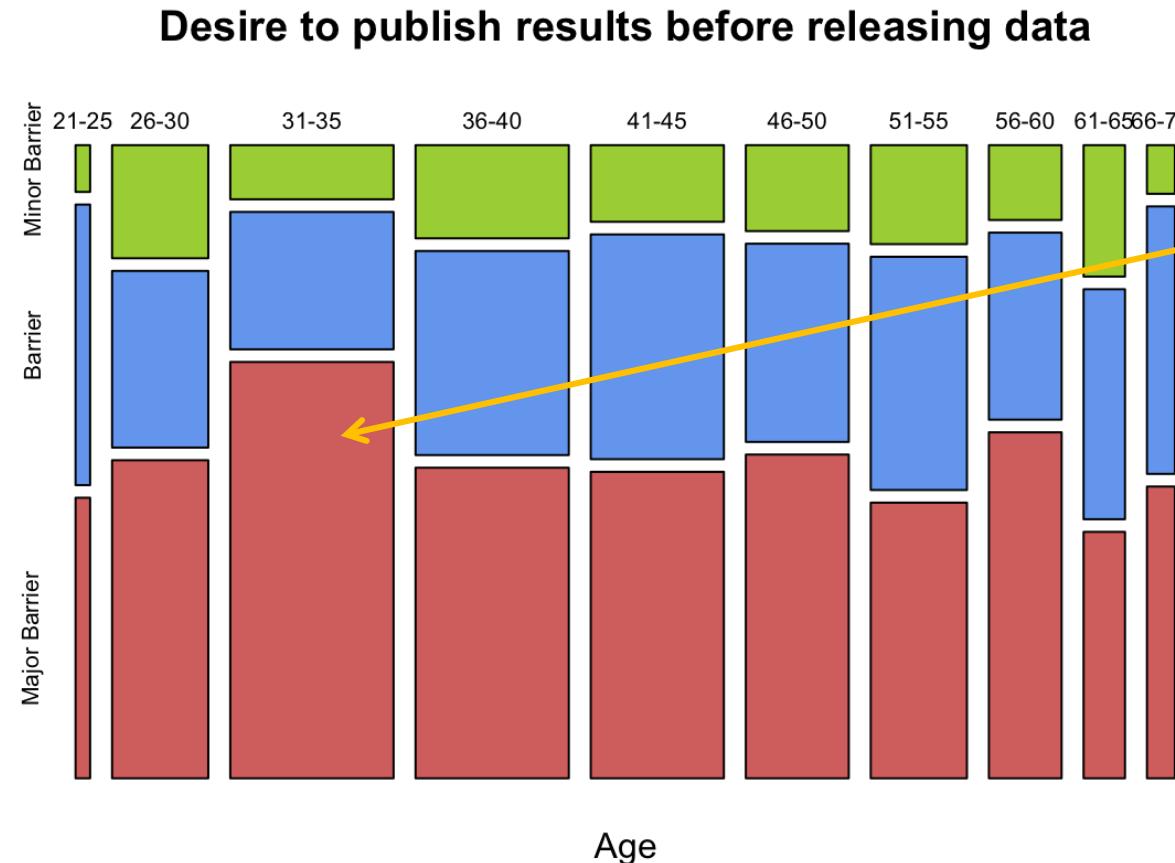


Data managers who contributed to the survey were significantly more committed to open data than all other data professionals ($p<0.001$).

Barriers to publish data as open data

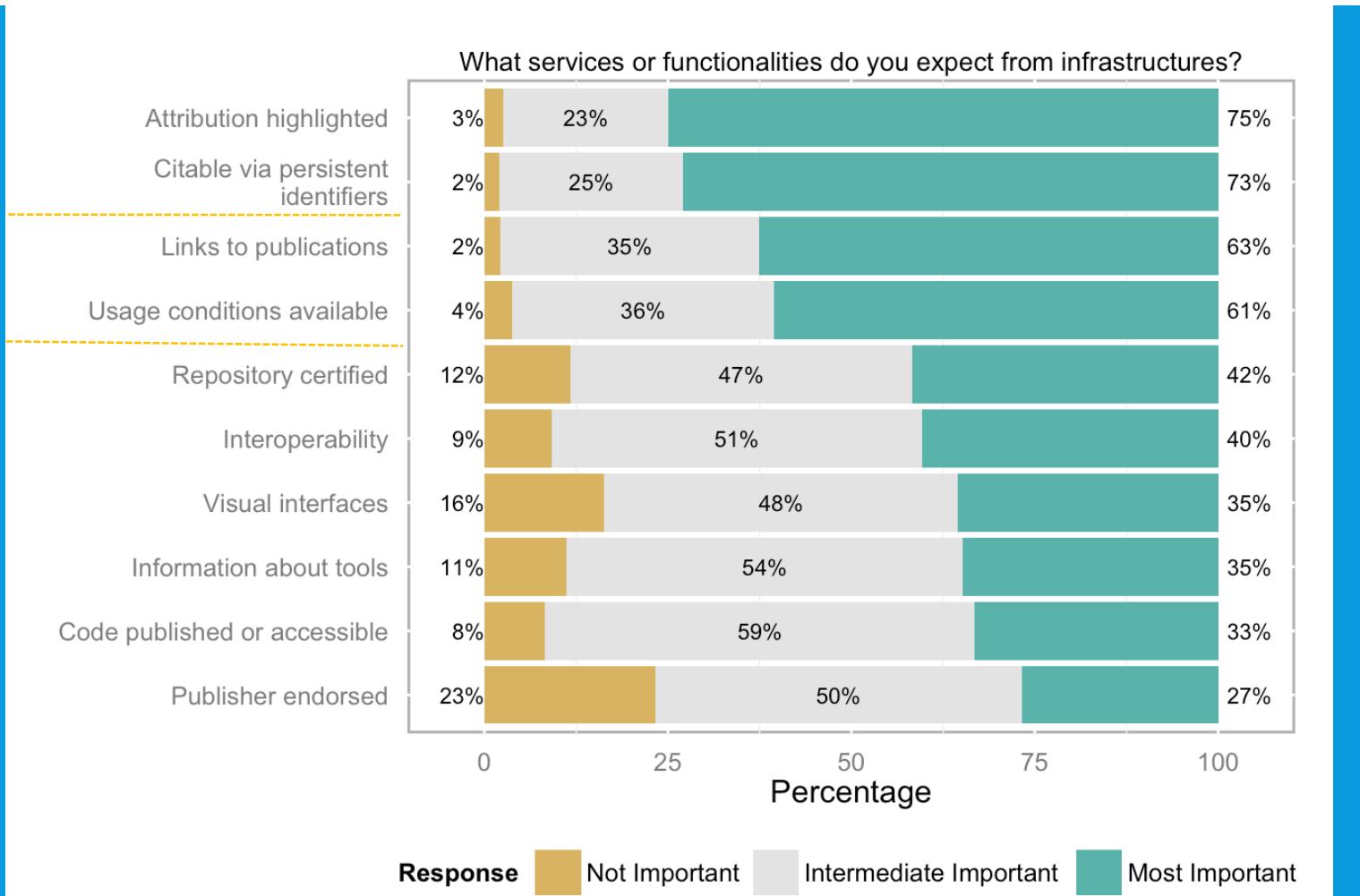


Some barriers relate with age / career stage



31–35 year-olds expressed a significantly higher desire to publish results before releasing data.

Infrastructure expectations



Discovery of data

How do you normally discover data?

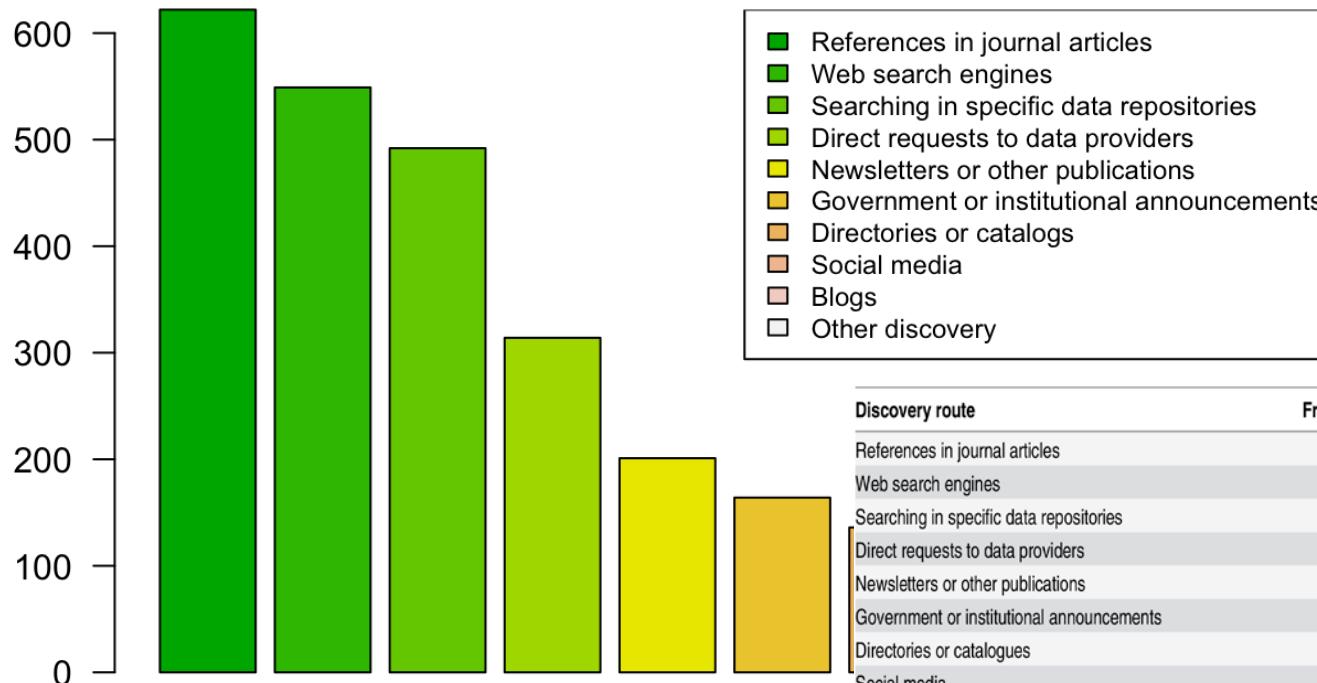


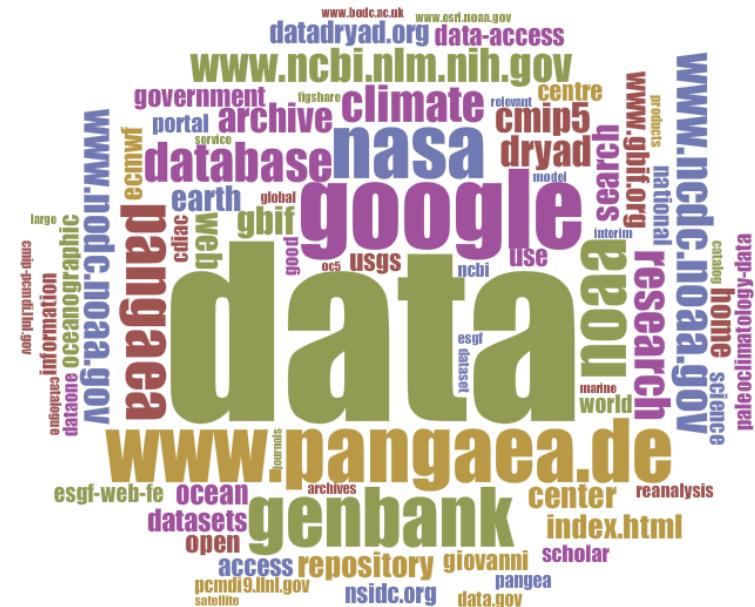
Table shows frequencies and valid percentages for each discovery route, multiple answers were allowed (n = 779).

Data repositories: Lead examples

- For data discovery and use

e.g. Pangaea, Google / general search engines, Dryad, a range of repositories managed by NASA and the National Oceanic and Atmospheric Administration (NOAA), the Global Biodiversity Information Facility (GBIF, a network of repositories), Genbank, government data, Figshare, journals, etc. – but also: many smaller repositories (e.g. projects), personal websites

>> About 100 repositories are currently added to re3data (out of c 300)



What do they value in data repositories?

„Good for heterogenous datasets, also long-tail“

„easy to obtain quality data“

„large data files, managing copies close to computing“

„great to have automatic DOIs“

„visualization interface“

„independent, trustful, recommended by several publishers“

„The site and tools are terrible, but the data is important“

„well-defined data quality and metadata“

„sound international reputation“

„highest quality with excellent links to other databases“

What is missing?

- “For me, **long-tail research datasets** are most important, and I would therefore like to see more repositories supporting these (i.e. institutional ones)”
- “Every discipline in the natural sciences needs to be able to **access its heritage data** (those in analogue forms) which cannot presently be accessed electronically (observations are still, and only, in their virgin forms on paper, forms, books, photographs, unreadable early mag tapes, etc.).”
- “Some types of data **still lack community standards** that would allow creation of open data resources.”
- “the open publication of **source codes or scripts** of simulation programs or analytical / numerical solutions is extremely important”

Conclusions & recommendations

Based on the findings of the survey, we have made the following recommendations to the Belmont Forum:

- that funders should make open data archiving mandatory, to take into account the main motivators revealed by the survey,
- to strengthen support and training activities,
- to further facilitate interoperability between data infrastructures, and
- to support the long-term sustainability of archives and data infrastructures.

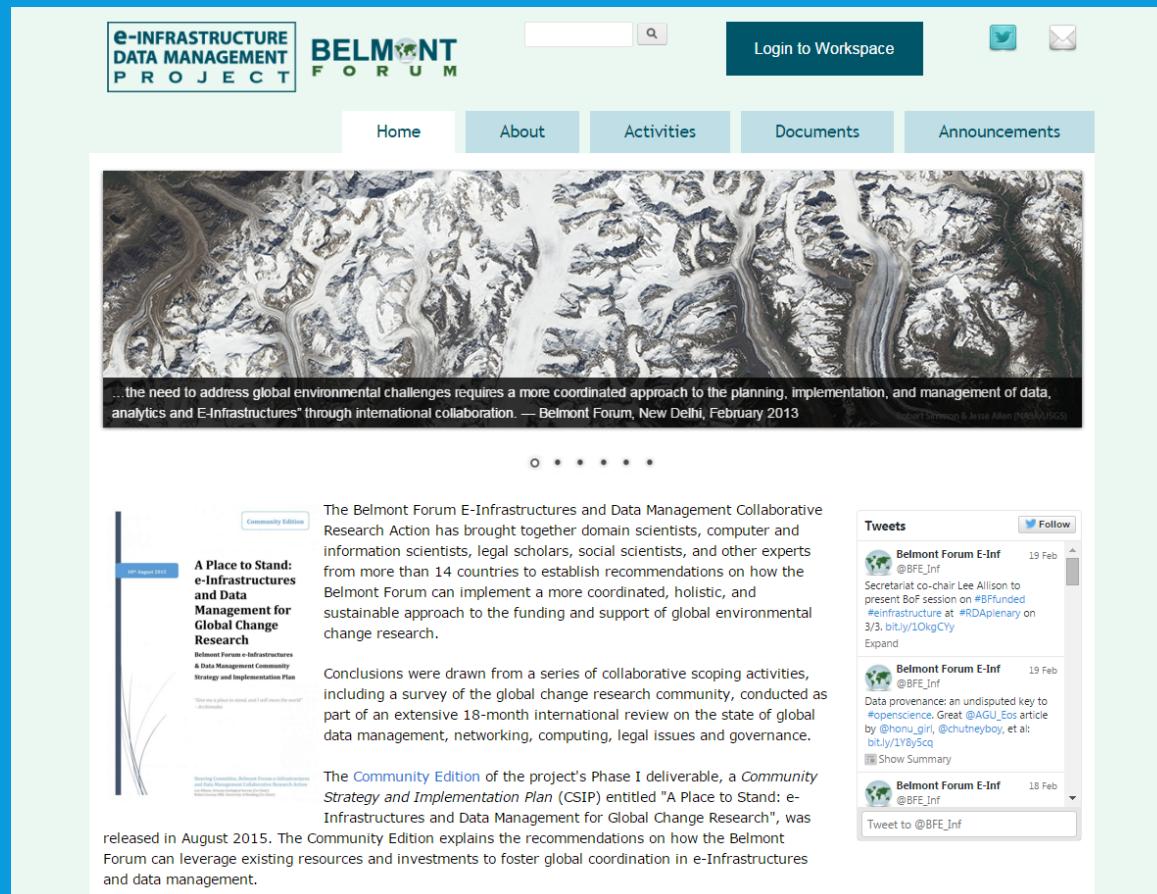
Thank you for your attention!

www.bfe-inf.org

Acknowledgements:

- To my co-authors Birgit Gemeinholzer, University of Giessen, and Andrew Treloar, ANDS
- Slides 2-3 by Belmont Forum colleagues
- All members of the Open Data WG

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The screenshot shows the Belmont Forum website with the following details:

- Header:** Includes the "e-INFRASTRUCTURE DATA MANAGEMENT PROJECT" logo, the "BELMONT FORUM" logo, a search bar, and a "Login to Workspace" button.
- Navigation:** A horizontal menu with tabs: Home, About, Activities, Documents, and Announcements.
- Image:** A large satellite image of a mountainous region with glacial features.
- Text:** A quote: "...the need to address global environmental challenges requires a more coordinated approach to the planning, implementation, and management of data, analytics and E-Infrastructures" through international collaboration. — Belmont Forum, New Delhi, February 2013
- Community Edition Report:** A thumbnail image of the report cover titled "A Place to Stand: e-Infrastructures and Data Management for Global Change Research". The cover features the Belmont Forum logo and the text "Community Edition".
- Text (from report):** The Belmont Forum E-Infrastructures and Data Management Collaborative Research Action has brought together domain scientists, computer and information scientists, legal scholars, social scientists, and other experts from more than 14 countries to establish recommendations on how the Belmont Forum can implement a more coordinated, holistic, and sustainable approach to the funding and support of global environmental change research.
- Text (from report):** Conclusions were drawn from a series of collaborative scoping activities, including a survey of the global change research community, conducted as part of an extensive 18-month international review on the state of global data management, networking, computing, legal issues and governance.
- Text (from report):** The Community Edition of the project's Phase I deliverable, a *Community Strategy and Implementation Plan* (CSIP) entitled "A Place to Stand: e-Infrastructures and Data Management for Global Change Research", was released in August 2015. The Community Edition explains the recommendations on how the Belmont Forum can leverage existing resources and investments to foster global coordination in e-Infrastructures and data management.
- Twitter Feed:** A sidebar showing recent tweets from the Belmont Forum E-Inf account, including mentions of AGU Eos articles and RDA sessions.