

Data and Outputs Management Annex (Version 2.0)

Introduction

The Belmont Forum supports multi-national and transdisciplinary collaborative research, bringing together natural sciences, social sciences and the humanities, as well as stakeholders to co-create knowledge and solutions for sustainable development. The Belmont Forum Challenge is to support international transdisciplinary research providing knowledge for understanding, mitigation, and adaptation to global environmental change.

To meet this challenge, the Belmont Forum emphasizes open sharing of research data and other digital outputs to stimulate new approaches to the collection, reuse, analysis, validation, and management of data and information, thus increasing the transparency of the research process and robustness of the results.

Research data and other digital outputs include, but are not limited to:

- Quantitative and qualitative digital information and objects created during or reused in research activities such as experiments, analyses, surveys, interviews, measurements, instrumentation, observations, video, audio, physical sampling, and computer simulations;
- All metadata information describing the data and digital outputs, its acquisition (including model description and related metadata for simulations), and other details for the use and the reuse of the data;
- Secondary data resulting from data reduction, transformation, analyses, and results, together with the associated code, software, workflows, and provenance information; and
- Stakeholder-oriented digital outputs such as maps (including GIS layers), decision support tools, tutorials, videos, local language resources, lesson plans, curricula, policy memos, and whitepapers.

Each project awarded through a Collaborative Research Action is required to develop and implement a Data and Outputs Management Plan to ensure ethical approaches and compliance with the [Belmont Forum Open Data Policy and Principles](#).

Belmont Forum Data and Outputs Management Planning Process

It is important to consider data management issues from the inception of a project in order to plan and budget appropriately for data curation, management, and sharing. This section explains the expectations for Data and Outputs Management Plans at the stages of Expressions of Interest/Pre-Proposal, Full Proposal, and Awarded Projects.

Expressions of Interest/Pre-Proposal Stage - Preliminary Data and Outputs Management Information

In the Data and Outputs Management section, please address the following questions:

1. What types of datasets and other digital outputs of long-term value do you expect that the project will produce or reuse? "Long-term" means those outputs that will or may be of value to others within your research community and/or the wider research, innovation, and stakeholder communities. Data and digital outputs of long-term value should meet the FAIR principles; i.e., they should be findable, accessible, interoperable, and reusable.
2. Which member of your team will be responsible for developing, implementing, overseeing, and updating the Data and Outputs Management Plan?

3. How have you accounted for the costs required to manage the data and other outputs to ensure long-term availability?

Full Proposal - Proposed Data and Outputs Management Approach

Responses should be in PDF format uploaded as a supplemental document in the application portal. Please address the following questions (those repeated from the earlier stage should be elaborated on as appropriate):

1. What datasets and other digital outputs of **long-term value** do you expect that the project will produce?
2. How will you ensure that any **data security, privacy, and intellectual property restrictions** associated with datasets and digital outputs will be honored and preserved in derivative outputs?
3. How do you intend to **manage these data and other digital outputs** during the project to ensure their long-term value is protected?
 - For example, where will the data be held during the project, who will have access, and will a specialised data manager be part of the project team?
4. How and by whom will the data and other digital outputs be **managed after the project ends** to ensure their long-term availability?
 - For example, will the outputs be published with a Digital Object Identifier (DOI) and/or be placed in a recognised, trustworthy long-term repository or data centre, and when will this take place?
5. What **supporting documentation and other information** do you plan to make publicly available to support the longer-term reuse of the data and digital outputs?
6. Do you expect there will be any **restrictions** on how the data and other digital outputs can be accessed, mined, or reused?
 - Belmont Forum policy is that the data should be as open as possible to commercial and non-commercial users, though with managed access where appropriate and necessary, for example, if there are sensitive data involving human subjects.
7. How have you accounted for the **costs** required to manage the data and digital outputs to ensure long-term availability?

Awarded Projects - Full Data and Outputs Management Plan

A full Data and Outputs Management Plan for an awarded Belmont Forum project is a living, actively updated document that describes the data management life cycle for the data and other digital outputs to be collected, reused, processed, and/or generated. As part of making research data findable, accessible, interoperable, and reusable (FAIR), the Plan should elaborate on the information provided at the full proposal stage, and include the following additional information:

1. Standards to be used for data and metadata format and content (where existing standards are absent or deemed inadequate, this should be documented along with any proposed solutions or remedies);
2. Policies for broad access and sharing including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, or other rights or requirements;
3. Policies and provisions for mining, reuse, re-distribution, and the production of derivatives; and
4. Contact information for the person(s) responsible for updating the Data and Outputs Management Plan as needed to comply with these guidelines.

A more detailed Data and Outputs Management Plan template for funded Belmont Forum projects will be made available at the Award Stage.

Additional Resources and Guidance

Project-specific Data and Outputs Management Plans should follow the [Belmont Forum Open Data Policy and Principles](#), and adhere to relevant standards and community best practices, which vary by subject and disciplinary area. Research data and other digital outputs should be open by default and publicly available, possibly after a short period of exclusivity, unless there are legitimate reasons to constrain access. Data and digital outputs must be discoverable through machine readable catalogues and search engines. Data and other digital outputs with acknowledged long-term value should be curated, preserved, protected from loss, and remain accessible and usable for future research in sustainable and trustworthy repositories.

To enable research data and other digital outputs to be discoverable, understandable, and effectively reused by others, including those outside the discipline of origin, sufficient metadata must be provided and made openly available. Data and digital outputs must also be curated and their quality and veracity controlled with agreed standards and protocols. Published results must include information on how to access the supporting data and other research materials, including how they have been processed. Researchers must ensure that metadata created to support research datasets and other digital outputs retained for the long-term is sufficient to allow other researchers a reasonable understanding of those materials, thereby minimising unintentional misuse, misinterpretation, or confusion.

In the development of data infrastructures, it is important to leverage existing resources, platforms, standards, and recognized practices together with a clear sustainability plan. Projects that propose to develop data infrastructures are requested to work closely with and support relevant international networks, infrastructures, and standards organisations. They should make use as much as possible of existing certified national or international data repositories; for example, those certified by the CoreTrustSeal or those brokered by the Group on Earth Observations (GEO). Projects should also coordinate with, and make use of, products and practices developed by recognized research and operational data policy and sharing organisations such as the Research Data Alliance (RDA), Committee on Data for Science and Technology (CODATA), and the ICSU-World Data System (WDS). For a more comprehensive list of repositories that may be appropriate for your data and other digital outputs, see also [re3data.org](#) and [FAIRsharing.org](#).

Version History

Ver sion	Revised on	Lead Author(s)	Notes
1.0	1 October 2016	R. Samors	First draft based on requirements of several funders.
1.2	8 November 2016	R. Samors & M. Thorley	Version shared with 2016 Belmont Forum Plenary.
1.3	1 March 2017	C. Seltzer & M. Thorley	Added budget question.
1.4	29 June 2017	C. Seltzer & M. Thorley	Combined contextual justification and more specific guidance documents. Differentiated expectations for different stages of the proposal and award process.
1.5	18 January 2018	C. Seltzer	Added context and incorporated cyber security considerations.
2.0	8 February 2018	C. Seltzer	Broadened scope to include “other digital outputs” in addition to data.