

Note: The language below is intended to be an annex to the call text to guide applicants regarding data management, data sharing and open science.

Document 5: Open Science and Fair Data

Open Science

In accordance with the principles of Open Science, Biodiversa+ projects must also comply with full and immediate Open Access for scientific publications. This implies publishing in full and immediate Open Access journals or publishing platforms, or full and immediate open access via a trusted Open Access Repository. The open access publishing platform Open Research Europe can especially be used. When using the repository option, Partners should ensure that electronic copies of published articles are machine-readable and openly licensed, including bibliographic metadata. Information should be provided about all the other scholarly objects, tools and instruments that are needed to validate the conclusions of the publication.

Biodiversa+ and the Belmont Forum have developed a guide on data management, open data and the production of data management plan. This guide is available here: <https://www.biodiversa.eu/research-funding/guides-capacity-building/>. You can also find more information on [Science Europe website](#).

Why Data Management Plans (DMPs) are required.

Biodiversa+ supports transnational transdisciplinary research with the goal of providing knowledge in the context of this call related to biodiversity and ecosystem protection across land and sea.

To meet this challenge, Biodiversa+ emphasises open sharing of research data and 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. However, Biodiversa+ fully recognises that there are legitimate reasons to constrain access, for example, when an individual's privacy would be at risk from sharing data containing (or derived from) personally identifiable information.

For this call, the participating Funding Organisations consider that the development and implementation of project-specific Data Management Plans is an essential to enable the sharing of research data.

Research data and 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, and computer simulations;
- All metadata describing the data and digital outputs, their acquisition (including model description and related metadata for simulations and workflows), 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;

- 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; and
- Descriptions of, and metadata relating to, physical samples connected with the call - but not the actual physical samples.

Each project awarded through this call is required to develop and implement a Data and Digital Outputs Management Plan to ensure ethical approaches and compliance with the [FAIR Data Principles](#) (Findable, Accessible, Interoperable, and Reusable).

Biodiversa and the Belmont Forum developed a [guide on data management, open data, and the production of Data Management Plan](#).

Project should adhere to relevant standards and community best practices, which may vary by subject and disciplinary area. Data and Digital Outputs Management Plans should also comply with public access policies and applicable national / regional laws for the respective Funding Organisations supporting this call. Research data and digital outputs should be open by default, and publicly accessible, 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, information systems and search engines. To enable data and digital outputs (including models, workflows, software and methods, etc.) with acknowledged long-term to be discoverable, accessible, understandable, interoperable and effectively reused by others (including those outside the discipline of origin and the context of acquisition), sufficient metadata must be provided and made openly accessible. Data and digital outputs must be curated, including maintaining integrity, quality and veracity, using internationally or community agreed standards and protocols. Data and digital outputs must be preserved, protected from loss and remain accessible and usable for future research in sustainable and trustworthy repositories.

Resulting publications must list where or how to locate the underlying supporting data and other research materials, including agreed persistent identifiers, processing details and any workflows, software, and code. Academic journals may also set specific requirements for Data Accessibility Statements to be included within published research results (primary research articles). Researchers should 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 and trust 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 recognised practices together with a clear sustainability plan. Projects that propose to develop data infrastructures are asked to work closely with, and support relevant international networks, infrastructures, and standards organisations. They should make as much use as possible of existing certified domain, regional, national or international data repositories (for further information, possible resources include, but are not limited to, re3data.org, CoreTrustSeal, Group on Earth Observations (GEO) FAIRsharing.org, etc.). Projects should also coordinate with, and make use of, the products and practices developed by recognised research and operational data policy and sharing organisations such as the Committee on Data for Science and Technology (CODATA), the Research Data Alliance (RDA), and the ICSU-World Data System (WDS).

For assistance in developing data and digital outputs management plans, project leaders are encouraged to first consult with relevant domain repositories, librarians and information specialists at their respective institutions. When appropriate repositories have been identified for depositing and sharing data and digital outputs, staff at these repositories can provide additional guidance on the preparation of data and digital outputs management plans, as well as processes for fulfilling specific requirements for organising and formatting data and metadata.

Applicants are strongly recommended to follow these guidelines when developing their data management plan, at the pre-proposal and full proposal phases. Teams must agree to cooperate with Biodiversa+ who will provide a support to the funded projects to further develop their Data Management Plans and ensure that they comply with these guidelines.

A data management workshop will indeed be organised at the beginning of the funded projects to exchange best practices related to data management, present hands-on advices, and work with the funded projects on how they can improve their data management plans (DMPs) and practices related to open data.

At least the Project Partner Coordinator of each funded projects is expected to participate to this workshop. The data manager of the project (if different from the Project Partner Coordinator) should also attend this workshop.

Data Management Planning Process

It is important to consider data management issues from the inception of a research project submitted to this call, in order to plan and budget appropriately for data sharing, management and curation. This section explains the expectations for Data Management Plans (DMPs) at the stages of pre-proposals, full proposals, and Awarded Projects.

Pre-proposals - Preliminary Data Management Information

Please refer to the [document 2](#) “Pre-proposal application form” – section “Preliminary Data Management Information”

Full proposals - Proposed Data Management Plan Approach

Please refer to the [document 3](#) “Full proposal application form” – section “Description of the project”

Awarded Projects - Full Data Management Plan

Awarded projects will be requested to provide a data management plan at the beginning of their project. They'll also have to report on updates made in their data management plan in their mid-term and final reports.

Please note that your Funding Organisation may also have specific requirements related to data management and data open access.

A full Data and Digital Outputs Management Plan (DMP) for an awarded 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 as open as possible, findable, accessible, interoperable and re-usable (FAIR), the DMP for a funded project should elaborate on the information provided at the Full proposal stage, and include the following additional information:

1. Agreed 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;
4. Contact information for the person(s) responsible for updating the DMP as needed to comply with these guidelines, and
5. A list of anticipated trustworthy, long-term repositories or data centres that will be used to ensure preservation of access to data and digital outputs following completion of the project.

Applicants are advised to include the full costs of implementing the data management plan in their proposed project budget.