

Modular Observation Solutions for Earth Systems (MOSES)

DATA POLICY

1. PREAMBLE

This Data Policy outlines the principles adopted by the Helmholtz Association's infrastructure initiative "MOSES" regarding the sharing of data and data products. The objective of this document is to ensure and facilitate full and open access to scientific data and data products according to the superordinate FAIR Principles. This data policy is aligned with the principles on research data management agreed upon by the Helmholtz Association¹. This policy is considered a binding condition for all MOSES-supported activities: By using MOSES equipment or any of the services provided by MOSES-supported activities, users are accepting and agreeing to the practices described in this data policy and its related documents. These documents provide guidance and support for data sharing:

- This is the MOSES Data policy and it covers data and associated products to be publicly shared. It also requires the development of a Data Management Plan (DMP) as part of the central planning document of any MOSES-supported observation activity.
- A MOSES Data Management Plan Guidance, is part of the MOSES Data Management Plan Tool (<https://moses-dmp.gfz-potsdam.de>) and provides details to researchers on what should be included in the Data Management Plan.

2. PRINCIPLES

The data produced by the activities supported by MOSES are considered a public good and they will be made openly available for others to use. MOSES is committed to supporting long-term environmental data management to enable continuing access to these data. This document provides general directives and rules on how to share, re-use and cite all research data in order to:

- Ease collaboration among the participants to the MOSES initiative
- Ensure timely submission of data for the use within the consortium
- Protect researchers' intellectual property rights and rights to publish their results
- Build a homogeneous body of valuable scientific information on results observed within the MOSES network
- Provide the broader scientific community, public authorities and the general public with an easy access to integrated knowledge created by MOSES

3. SCOPE

The MOSES Data Policy covers MOSES-supported activities, mainly event-oriented observation campaigns and test-campaigns and relates to the following kinds of data (1–3) and associated products (4-5) and metadata (6) that is made available through repositories (7):

1. **Measurement Data** is provided by the institutions using equipment of the MOSES facility and comprises the following:
 - a. **raw data** collected with the use of MOSES instruments and yet to be processed

¹ Position paper "Making information resources more usable"

- b. **processed data** is raw data that has undergone certain transformation procedures
- c. **quality controlled data** is processed data that has passed quality assurance procedures such as routine estimation of timing and sensor calibration or visual inspection and flagging of obvious errors

Depending on the application field, these data levels might be further divided into relevant and agreed sub-levels.

2. **Derived Data** are data products generated from measurement data by means of scientific and technical interpretation as well as model data.
3. **Samples and Collections data** is data obtained from sample analysis in the field or laboratory.
4. **External Data** is data obtained from third parties for use in MOSES related research.
5. **Software such as Custom Source Code** and/or **Applications** that were developed in the context of MOSES to aid in data analyses or transformation and are necessary to understand the data. Code and applications must come with related information (metadata) such as adequate documentation and/or within code comments to understand their function and enable their public (re-)use.
6. **Metadata** is a detailed description of a dataset that includes information about the content, quality, structure, accessibility and other characteristics of the data. Detailed and **robust** metadata must document the project, dataset, and services in such a way that data can be transmitted, interpreted, reused, and understood. Use of metadata standards is critical for data discovery, integration, and sharing.
7. **Data repositories** for data provision used in the context of MOSES are data management infrastructures operated and maintained by the Helmholtz Centres or by other data providers: Data may be made available through other discipline-specific and community recognized repositories operated by third parties. However, the continuous availability, provision of data, associated products, and metadata to the whole community in compliance with this data policy has to be ensured by the Helmholtz Centres. Each operator of a data management infrastructure within the MOSES initiative is responsible for continuity of data access to all MOSES partner.

4. PROVISION OF DATA, ASSOCIATED PRODUCTS, AND METADATA

MOSES is committed to the establishment, maintenance, validation, description, distribution, and long-term availability of data. The following directives for data provision shall apply:

- A. **RESPONSIBILITY:** MOSES-supported activities (observation campaigns and test-campaigns) are led and steered by a Principal Investigator(s) (PI(s), lead scientist(s)) accompanied by a specialist(s) that shall be responsible for the provision of data, associated products and metadata as well as their quality, completeness, description and fitness for use.
- B. **DATA AND ASSOCIATED PRODUCTS:** Data and associated products shall be prepared for exchange, e.g. to data repositories by following the standards as defined in the Data Management Plan, as soon as possible but as an overarching objective within **four months** after their acquisition. Exceptions to this objective have to be identified in the campaign's Data Management Plan.
- C. **METADATA:** Robust metadata that fully and accurately describes the dataset and ensures its fitness for use are required for data discovery, and thus, have to be provided to the public as soon as possible but as an overarching objective within **four weeks** after data acquisition period, regardless of whether the data and associated products are affected by an embargo period or not. Use of domain specific metadata

standards is mandatory. Applicable metadata standards for all data types are part of the MOSES Data Management Plan Guidance.

- D. **DATA MANAGEMENT PLAN:** A written Data Management Plan (DMP) consistent with the MOSES Data Management Plan Template and following the MOSES Data Management Plan Guidance must be included as part of the central planning document for a campaign or a similar MOSES activity. This description of all data, associated products, and metadata that is of interest for in- and outside the MOSES initiative, will be created by the data owners or responsible individuals.
- E. **DATA PROVISION:** Release of data, associated products, and metadata during and/or at the conclusion of the campaign into the public domain is the de facto policy; requests of campaign members to limit or delay public access to products must be negotiated with and approved by the campaign PI(s) and documented in the campaign's Data Management Plan, as a general rule prior to the beginning of the campaign.
- F. **EMBARGOS:** Requests to delay public access should not extend past **one year** from the conclusion of the campaign unless agreed to and approved by the MOSES Steering Committee. The Steering Committee can grant an extension of this period by up to one additional year. This procedure should also be identified in the campaign's Data Management Plan.
- G. **RESTRICTIONS:** When data, associated products, and metadata are transferred to data repositories, data and associated products deemed sensitive or privileged must be identified and appropriately labeled (tagged) by the data owner. These data should also be identified in the campaign's Data Management Plan.
- H. **STANDARDS AND FORMATS:** Campaign members are required to preserve and transfer their data and data products in commonly accepted standards. The use of open standards and widely-recognized formats is strongly encouraged.
- I. **PROPRIETARY OR RESTRICTED THIRD-PARTY DATA:** Campaign members making use of proprietary data or restricted project data from partners or third parties must make clear in the central campaign planning document what information, data, and conclusions can and cannot be released to the public upon conclusion of the campaign.
- J. **PROPRIETARY OR RESTRICTED SOFTWARE:** Data and associated products that rely on licensed software for access, evaluation, and use must be identified in the central campaign planning document, and proprietary formats and software must be documented in the metadata. Such data must be extracted from the proprietary software and submitted in a non-proprietary, delimited "plain-text" format with documentation of character encoding. Applicable data types will be listed in the MOSES Data Management Plan Guidance.
- K. **DISCOVERY:** MOSES data will be provided to public discovery services making it possible to find, discover, and access MOSES related data and data products on the basis of corresponding metadata through the MOSES Data Portal which is to be developed during the implementation phase. This service can connect to available additional services, e.g., for downloading, viewing, and data transformation. Helmholtz Centres that provide data, data products, and metadata for download may require user registration for these services.

5. ACCESS TO DATA, ASSOCIATED PRODUCTS, AND METADATA

The following rules for data apply:

- A. **ACCESSIBILITY, COMPATIBILITY AND INTEROPERABILITY:** Contributing Helmholtz Centres shall provide and grant access to their repositories via appropriate

and standard-compliant web services and interfaces exposing all MOSES data, associated products, and metadata.

- B. **METADATA:** All metadata made available by the MOSES-participating Helmholtz Centres will be released into the public domain and accompanied by a licence, i.e., CC0 1.0.
- C. **DATA AND ASSOCIATED PRODUCTS:** All data and associated products made available by the MOSES-participating Helmholtz Centres shall be accompanied by a licence, e.g., Creative Commons License (CC-BY) v. 4.0 or a comparable later version or a comparable, different and compatible Open Content license.
- D. **THIRD-PARTY CONTRIBUTIONS:** Data, data products, and metadata originally provided to MOSES by a third-party may have their own access and licence conditions which restrict how or when this data is made available to others.
- E. **LIABILITY AND WARRANTY:** Helmholtz Centres providing access to repositories under MOSES take no responsibility for the timeliness, accuracy, completeness or quality of the data, data products, and metadata provided. Helmholtz Centres providing access to repositories under MOSES are in no event liable for damages of any kind incurred or suffered as a result of the use or non-use of the information provided. MOSES expressly reserves the right to alter, amend or remove data, data products, and metadata, whole and in part, without prior notice or to discontinue publication for a period of time or even completely.
- F. **CITATION:** All those who use data provided by MOSES are required to acknowledge the source of data. Details are to be given in the Data Management Plan.
- G. **TERMS OF USE:** Terms of Use for data end users will be provided through the MOSES Data Portal and the respective repositories.

6. DATA PROTECTION

Personal data that is data characterizing an individual human being (e.g., data with private/personal material or family details that lead back to the individual), is processed in accordance with the EU General Data Protection Regulation (GDPR) and the Federal Data Protection Act (Bundesdatenschutzgesetz), shall be kept confidential and will not be forwarded to third parties. Data may only be used and processed in a research framework if pseudonymised or anonymised. If this is not possible or meaningful for the particular research question, the data must be stored by separating characteristics of personal and material circumstances which could be attributed to an identified or identifiable person. Personal data may only be used in publications with the written consent of the persons concerned (data subjects).

If a partner processes personal data within the scope of the purposes of the cooperation agreement, but solely determines the means for processing such data, this partner is also solely responsible within the meaning of the EU Data Protection General Order (GDPR) and the Federal Data Protection Act (BDSG-neu). The processed data and results will then only be shared anonymously with the partners of the cooperation.

If several partners jointly determine the means of processing personal data, they act as joint controllers within the meaning of Article 26 GDPR. They then determine their respective responsibilities for compliance with the obligations of the GDPR. The contact point for data subjects shall be the data protection officer of the UFZ.

7. COMPLIANCE AND REVIEW

Compliance with this data sharing policy is required. Exceptions to this policy sought by members of a MOSES observation campaign or similar activity must be agreed to and approved by the respective campaign PI(s) and must be fully documented in the central

campaign planning document and the Data Management Plan. The campaign PIs inform the MOSES Steering Committee about exceptions and data access limitations on an annual base or in case of conflicts that need to be settled by the Steering Committee.

The degree of adherence to this policy is observed in the daily work of the institutional data managers and checked by the MOSES Data Management Team.

8. STATEMENT OF AGREEMENT

This Data Policy was developed by the MOSES Data Management Team and has been approved by the MOSES Steering Committee at 02.12.2021.