



SOUTHERN OCEAN OBSERVING SYSTEM

SOOS Data Policy

02/2022

Citation

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1. Definitions

Data: A set of values, symbols, or signs (recorded on any type of medium) that describe one or more properties of an entity.

For example, the numbers generated by a sensor, values derived from a model or analysis, text entered into a survey, or the raw text of a document. Generally speaking, data are used to quantitatively or qualitatively describe one or more persons or objects. Research data provide the evidence base for supporting or refuting ideas in a scientific manner.

Data Management Plan: A document describing how an individual collection of data will be managed, described, and stored, the standards the data conform to, and how data will be handled and protected during and after the completion of the project.

Information: Products derived from data that lead to a greater understanding of an entity.

For example, the interpretation of a range of data from an array of conductivity sensors that inform us about the ocean's salinity range, or the narrative text of a report on algal blooms that informs the reader regarding their timing.

Metadata: Metadata are information that describe the data source, and the time, place, and conditions under which the data were created.

Metadata inform the user of how, when, where, why, and by whom data were generated. Metadata allow the data to be traced to a known origin and known quality. Metadata can be used for discovery and identification of data collections; to provide information on structural aspects of the data, and to provide administrative information on aspects such as ownership and licensing.

Southern Ocean Data: Data for which the geographic coverage overlaps with the Southern Ocean.

Broadly, the SOOS regions cover waters south of 40°S, with SOOS's focus being on areas covered by the SOOS Regional Working Groups.

2. Background

The International Science Council (ISC, formerly ICSU and ISSC) is the parent body of the Scientific Committee on Antarctic Research (SCAR) and the Scientific Committee on Oceanic Research (SCOR). In turn, SCAR and SCOR are the parent bodies of the Southern Ocean Observing System (SOOS). In its *Assessment on Scientific Data and Information* in 2004, ISC observed that “science has long been best served by a system of minimal constraints on the availability of data and information”, and that a strong public domain for scientific data and information promotes greater return on investment in research, stimulates innovation and enables more informed decision-making. Thus, one of the fundamental recommendations of the assessment is that “ICSU should continue to actively promote the principle of full and open access to scientific data”. A comprehensive set of further recommendations is offered on interoperability, long-term accessibility, sound management of intellectual property rights, ensuring data integrity, professional data and information management, and the use of metadata.

The SOOS Data Management Sub-Committee is responsible for developing a SOOS data policy and promoting best data management practices among data centres, data managers, and scientists working in the Southern Ocean.

3. Purpose

That publicly funded research data, including nearly all research data from the Southern Ocean, should be regarded as public assets and managed in a way that will maximise their benefit to society has become an almost universal presumption of global scientific organisations, governments and funding agencies. It is essential that these data be properly curated to ensure their long-term integrity, accessibility, and to maximise their value for a broad range of uses.

This policy aims to provide a framework for balancing the rights and responsibilities of data creators, users, research institutions and funders, to support the free and unrestricted sharing of data and its associated metadata. It is based on the work of Tronstad *et al.* (2021) in developing a set of recommendations for polar data policies. The SOOS data policy was developed in tandem with the data policy of SCAR’s Standing Committee of Antarctic Data Management (in prep.).

The purpose of this document is to identify roles and requirements relating to the management of data and information collected in the Southern Ocean. As SOOS acts through the cooperative collaboration of many nations, institutions, and scientific disciplines, this policy aims to promote best practices amongst SOOS-aligned activities. This policy primarily relates to publicly funded research, but, where commercially acquired data is shared with the public, the guidance in this policy should apply.

This policy is thus explicitly written as a set of norms and expectations for projects and institutions that contribute to the SOOS mission. Where disagreement exists between this document and official national or program-specific data policies, the national or programmatic policies will have precedence.

4. Policy Statement

- 4.1. SOOS expects that Southern Ocean data will be made accessible in a full, free, and open manner for all users in keeping with Section III.1.c. of the Antarctic Treaty (1959), excepting cases where data must be limited for ethical, cultural, or legal reasons. While the Antarctic Treaty only applies to regions south of 60°S, SOOS believes that its principles of free and open sharing of scientific investigations and data should apply to the entire Southern Ocean. Thus, Southern Ocean data should be “as open as possible, as closed as necessary”, which may also be phrased as “ethically open”.
- 4.2. Distribution and reuse of Southern Ocean data should be free of charge, delivered at no more than the cost of reproduction and delivery. With modern digital communication technologies, the distribution costs for modest data volumes have largely been eliminated, and typically do not justify any cost recovery on the distributor side. The costs of open data processes should be regarded as an intrinsic part of the cost of doing the research, and supported appropriately. However, the management and handling of very large data volumes (“big data”) may incur significant costs and such costs cannot be funded as part of the original research activity or through the operating budget of the data centre. In these circumstances, some cost recovery may be justified even under a free and open access data policy.
- 4.3. Southern Ocean data are expected to be published as soon as practicable following collection, in near real-time if possible, unless access is limited on the basis of §4.1, or a request is made to embargo the data to support reasonable ethical, cultural, legal, operational (including data processing, quality control, and documentation), or scholarly requirements. For Southern Ocean data, a maximum embargo limit should be provided, along with documented reasons for the embargoed status.
- 4.4. To the greatest extent practicable, Southern Ocean data are expected to be made findable, accessible, interoperable and reusable (FAIR) (Wilkinson *et al.* 2016), subject to §4.1.
- 4.5. Southern Ocean data are expected to be accompanied by complete metadata, compliant with an appropriate international standard (e.g. ISO-19115, DIF10, or DarwinCore). Complete metadata must contain sufficient information to understand, access, and

replicate the data set to a level of quality, accuracy, and precision specified in the metadata. The metadata must also contain information to support appropriate attribution.

- 4.6. Southern Ocean data are expected to be assigned a persistent and globally unique identifier (PID) to facilitate unequivocal identification, attribution, data citation, provenance tracking, linking data with scientific results, and tracking distribution and impact of data collections.
- 4.7. Southern Ocean data are expected to be labelled as reusable by attaching a rights waiver, a public domain statement, or an internationally recognised data license to the data. Data licenses should be non-restrictive, specifying that the data may be reused, with no requirement more onerous than an acknowledgement of the data's source – for example, the Creative Commons Open Attribution Licence (CC-BY). Where possible, the rights waiver or license should be assigned by the owner or source of the data, and these parties should be identified in accompanying metadata.
- 4.8. Users of Southern Ocean data should formally acknowledge data authors and sources, using equivalent citation practices to those used for scientific publications.
- 4.9. Data centres that host Southern Ocean data are expected to adhere to best practices in curating and preserving data for the long term, including the TRUST principles (Lin *et al.* 2020), and to publish those data in the most FAIR way possible, subject to §4.1.
- 4.10. All SOOS-endorsed science projects that expect to produce data will be required to develop a Data Management Plan. Data Management Plans will be reviewed by the SOOS International Project Office and/or the SOOS Data Management Sub-Committee.
- 4.11. Data providers are responsible for any quality assurance and quality control required to meet community standards. Data users are responsible for ensuring that the data they use is fit-for-purpose.
- 4.12. Data providers are responsible for ensuring that data submitted to data centres are suitable for publication in accordance with their specified license.
- 4.13. To support the long-term preservation and curation of data (especially §4.9), it is important that science funders and research institutions ensure that long-term resourcing be available to support data management beyond the lifespan of individual projects. This will include costs for hardware and software, as well as supporting staff with specialist skills in data preservation, data curation, as well as the necessary infrastructure to support the effective delivery of data services.

5. References

[The Antarctic Treaty 1959](#)

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Lin, D., Crabtree, J., Dillo, I., Downs, R., Edmunds, R., *et al.* (2020): The TRUST Principles for digital repositories. *Scientific Data* 7, 144. <https://doi.org/10.1038/s41597-020-0486-7>

International Council for Science (2004): ICSU Report of the CSPR Assessment Panel on Scientific Data and Information. [ISBN 0-930357-60-4](#)

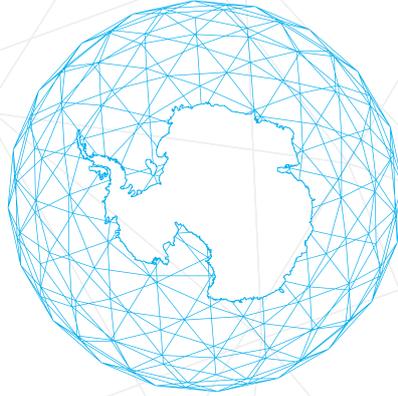
SCAR Standing Committee on Antarctic Data Management: SCAR Data Policy (in prep.)

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Wilkinson, M., Dumontier, M., Aalbersberg, I., Appleton, G., Axton, M. *et al.* (2016): The FAIR Guiding Principles for scientific data management and stewardship. *Scientific Data* 3, 160018. <https://doi.org/10.1038/sdata.2016.18>

6. Feedback

Questions and feedback relating to this document should be sent to data@soos.aq.



SOOS

SOUTHERN OCEAN
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SOOS is an initiative of the Scientific Committee on Oceanic Research and the Scientific Committee on Antarctic Research



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