SCAR report

SCAR Data Policy

Scientific Committee on Antarctic Research

at the

Scott Polar Research Institute, Cambridge, United Kingdom

SCAR Data Policy

Summary

SCAR (see www.scar.org) is charged with initiating, developing and coordinating high quality international scientific research in the Antarctic region, and advising on the role of the Antarctic region in the Earth system. The scientific business of SCAR is conducted by its Standing Scientific Groups in the Physical-, Life- and Geo-Sciences which represent the scientific disciplines active in Antarctic research. These groups share information on disciplinary scientific research being conducted by national Antarctic programmes; identify research areas or fields where current research is lacking; coordinate proposals for future research by national Antarctic programmes to achieve maximum scientific and logistical effectiveness; identify research areas or fields that might be best investigated by a major SCAR Scientific Research Programme; and establish Action and Expert Groups to address specific research topics within the discipline.

SCAR related research data is highly multidisciplinary and disparate. This policy aims to provide a framework for these data to be handled in a consistent manner, and to strike a balance between the rights of investigators and the need for widespread access through the free and unrestricted sharing and exchange of both data and metadata. This policy is compatible with the data principles of SCAR's parent body, ICSU and other relevant international agencies (e.g. WMO), and with the goals of Article III 1 c of the Antarctic Treaty.

Since SCAR coordinates a distributed programme of research, generally implemented through a number of nationally self-managed projects, the principles enshrined in this Data Policy should be applied to data in each SCAR-endorsed Project. In order to be considered part of a SCAR Research Programme, each Project should follow the SCAR Data Policy, submit metadata and linked datasets to the Antarctic Master Directory (AMD - gcmd.gsfc.nasa.gov/Data/portals/amd/) in a reasonable timeframe, and should have an appropriately funded data management plan in place before the Project begins.

Nations affiliated with SCAR are urged to establish a National Antarctic Data Centre (NADC) or assign NADC responsibilities to an existing national institution capable of carrying out NADC obligations. NADCs in collaboration with SCAR Research Projects and Programmes will work towards developing a SCAR Antarctic Data and Information System (ADMS).

The SCAR Standing Committee on Antarctic Data Management (SCADM) is responsible for this Data Policy. Questions about the policy and its implementation should be directed to the SCADM Executive (see http://scadm.scar.org).

Data Definition

SCAR data are those data generated under the auspices of a SCAR-sponsored Research Project. This policy applies specifically to those data. It should be recognized, however, that SCAR researchers will use SCAR-relevant data from non-SCAR sources, such as from existing operational data networks and historical national sources. Wherever possible, data used in SCAR Projects that are not SCAR

generated, should be treated similarly to SCAR data, where copyright permits and it is practical to treat these data according to SCAR Data Policy norms. A small subset of data both generated and used by SCAR may require special policy and access considerations, because they need to be legitimately restricted in some way. Access to these data may be restricted because they are about human subjects, because there may be intellectual property issues, or because there is a situation where release of the data may cause harm to the public or environment (e.g., the location of nesting sites for an endangered species).

Figure 1 below conceptually illustrates the different classes of data typically used by SCAR Projects.
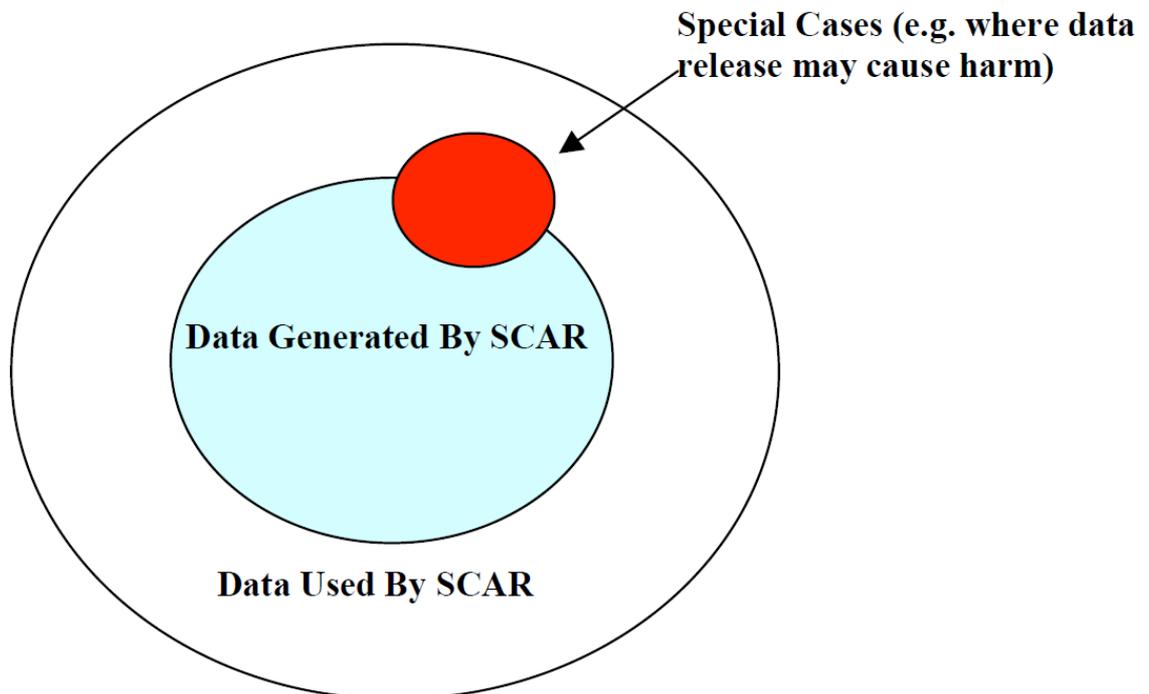
Figure 1. Graphical definition of "SCAR data" (inner blue circle), "SCAR-related data" (outer circle), and Special Cases (red circle).

Data Availability and Exchange

In accordance with

- the Twelfth WMO Congress, Resolution 40 (Cg-XII, 1995)
- the Thirteenth WMO Congress, Resolution 25 (Cg XIII, 1999)
- the ICSU 1996 General Assembly Resolution
- the ICSU Assessment on Scientific Data and Information (ICSU 2004b)
- Article III-1c from the Antarctic Treaty
- the Intergovernmental Oceanographic Commission Data Exchange Policy

and in order to maximize the benefit of data gathered under the auspices of SCAR Projects, the SCAR Executive Committee (EXCOM) requires that SCAR data, including operational data delivered in real time, are made available fully, freely, openly, and on the shortest feasible timescale.

The only exceptions to this policy of full, free, and open access are:

- where human subjects are involved, confidentiality must be protected;
- where data release may cause harm, and where specific aspects of the data may need to be kept protected (for example, locations of nests of endangered birds).

ICSU (2004b) defines "Full and open access" as equitable, non-discriminatory access to all data preferably free of cost, but some reasonable cost-recovery is acceptable. WMO Resolution 40 uses the terms "Free and unrestricted" and defines them as non-discriminatory and without charge. "Without charge", in the context of this resolution means at no more than the cost of reproduction and delivery without charge for the data and products themselves.

Metadata are essential to the discovery, access, and effective use of data. All SCAR data should be accompanied by a full set of metadata that completely documents and describe the data. In accordance with the ISO standard Reference Model for an Open Archival Information System (OAIS) (CCSDS 2002), complete metadata may be defined as all the information necessary for data to be independently understood by users and to ensure proper stewardship of the data. Regardless of any data access restrictions or delays in delivery of the data itself, all SCAR Projects should promptly provide basic descriptive metadata of collected data to the Antarctic Master Directory (AMD) system.

Data Preservation

Recognizing that the true value of scientific data is often realized long after these data have been collected, and to ensure the lasting legacy of SCAR Projects, it is essential to facilitate long-term preservation and sustained access to SCAR data. All SCAR data should be archived in their simplest, useful form and be accompanied by a complete metadata description. SCADM national contacts (http://scadm.scar.org/index.php?id=368) can help Projects identify appropriate long-term archives and data centres, but it is the responsibility of individual SCAR Projects to make arrangements with long-term archives to ensure the preservation of their data. It must be recognized that data preservation and access should not be an afterthought and needs to be considered when data collection plans are developed. SCADM should work with the relevant national institutions, NADCs, and other organizations to ensure the preservation of SCAR-related data.

Nations affiliated with SCAR are urged to establish a National Antarctic Data Centre (NADC) or assign NADC responsibilities to an existing national institution capable of carrying out NADC obligations. Providing NADC obligations can be met, a SCAR member country could organise for its Antarctic data to be hosted through a virtual facility formed from the collaboration of several national institutes. Under these circumstances a lead institution must be nominated for the purposes of contact and coordination. The responsibilities of an NADC should include:

- assistance to users in using the AMD and preparing metadata,
- collation of all data generated through national Antarctic science projects,
- provision of data archiving services that permit the long-term re-use of data,
- publication of data from national Antarctic science programs to one or more SCAR-endorsed data access networks, and
- active participation as a node in the ADMS (involving input into the development of network infrastructure standards and conformance with community data standards and protocols).

For an NADC to participate fully as a node in the ADMS it should have, as a minimum a:

- Portal on the AMD, (http://gcmd.nasa.gov/KeywordSearch/amd/nadc_portals.html),
- publicly accessible web site providing access to national Antarctic data,
- published operational plan describing how data is managed and archived to permit re-use,
- publicly accessible national Antarctic data policy complementary to the SCAR Data Policy, and
- commitment and the capability to publish data to SCAR-endorsed data distribution networks.

An operationally active representative from the NADC should be considered for nomination to participate in SCADM.

Development and ongoing enhancement of the SCAR ADMS should be under-pinned by a Data Strategy and an implementation roadmap.

Data Management Planning

All SCAR-endorsed Projects should be required to prepare a Data Management Plan which outlines how any data captured, modelled or acquired will be managed both during the life of the project and beyond. All Data Management Plans should articulate the resources required to implement the plan and outline where data will be hosted for long-term curation. A Data Management Plan template is attached to the SCAR Data and Information Strategy, which demonstrates the types of issues to be considered in such a Plan (see SCAR DIMS Appendix 2).

Data Acknowledgment Norms

To recognize the valuable contributions of data providers (generally scientists who collect, synthesise, model or prepare analysed data) and to facilitate repeatability of research results, users of SCAR data should formally acknowledge data authors (contributors) and sources. Where possible, this acknowledgment should take the form of a citation, such as when citing a book or journal article. Some journals already require the formal citation of data used in articles that they publish. However, most current journals do not, but as a professional courtesy all data consumers operating under the auspices of SCAR Projects, should formally acknowledge the datasets that they use in their research.

References

The Antarctic Treaty. 1959. Available at http://www.ats.aq/

CCSDS (Consultative Committee for Space Data Systems). 2002. *Reference Model for an Open Archival Information System (OAIS)*. CCDSD 650.0-B-1. Blue Book. Issue 1. Washington, DC: CCSDS Secretariat. [Equivalent to ISO 14721:2002]. Available at http://public.ccsds.org/publications/archive/650x0b1.pdf

Intergovernmental Oceanographic Commission Oceanographic Data Exchange Policy. 2003.Available at http://www.iode.org/contents.php?id=200

ICSU (International Council for Science). 2004b. *ICSU Report of the CSPR Assessment Panel on Scientific Data and Information.* Available at http://www.icsu.org/1_icsuinscience/DATA_Paa_1.html

Resolution of the International Council of Science (ICSU) General Assembly (24-27 September 1996). Available at http://globalchange.gov/policies/icsu-1996.html

SCAR Data and Information Management Strategy (DIMS), 2009-2013 (SCAR Report 34). Available at http://www.scar.org/publications/reports/

World Meteorological Organization Congress, Resolution 40 (Cg-XII, 1995): *WMO Policy and Practice for the Exchange of Meteorological and Related Data and Products Including Guidelines on Relationships in Commercial Meteorological Activities* Available at http://www.nws.noaa.gov/im/wmocovr.htm

World Meteorological Organization Congress, Resolution 25 (Cg XIII, 1999). *Exchange of Hydrological Data and Products*. Available at http://www.wmo.ch/web/homs/documents/english/res25eng.html