



Canadian Space Agency  
Agence spatiale  
canadienne



# Geospace Observatory (GO) Canada

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## *Data Policy*

## 1 Introduction

Geospace Observatory (GO) Canada is an array of ground-based instruments for remote-sensing geospace and a coordinated research program designed to advance understanding of the geospace system. GO generates large and diverse volumes of space data and information that must be effectively managed to achieve the objectives of the program and to maximize the value of the data for scientific research and space weather forecasting.

This policy is intended to be compatible with the data principles and policies of partner agencies, and Canadian government departments. The scope of this policy, however, is limited to the GO program and is subject to higher-level policies of the Canadian Space Agency (CSA). The GO Data Policy applies to all projects funded through the GO program; compliance with the policy is a condition of funding. The activities of each project are consistent with the GO Data Policy and are expressed in a data management plan.

The CSA's Sun-Earth System Sciences group is the author of the GO Data Policy. Questions about the policy and its implementation should be directed to the GO Project Officer of the Sun-Earth System Sciences group at [solar-terrestrial@asc-csa.gc.ca](mailto:solar-terrestrial@asc-csa.gc.ca).

## 2 Objectives

The purpose of the GO Data Policy is to ensure that high-value data are accessible both now and in the future. The value of the data is measured against GO program objectives for the benefit of the users: geospace scientists, space weather forecasters, and the general public. Taken together, high-value GO data require:

- high-quality data;
- data that are well-documented;
- open data formats;
- data that are openly accessible;
- data that are rapidly accessible; and
- data that are easy-to-use.

Equally important are stable preservation and accessibility of GO data throughout their lifecycle. In addition to ensuring that the data are available for future use, these objectives also enable citations to data. Citations are essential for recognition of data providers as important contributors to the advancement of science.

## 3 Data

For the purposes of this policy, data are defined as: the digital information output by an instrument, the products generated by processing the information, and the associated metadata. Intellectual property is specifically excluded from this definition.

This policy applies to the data generated by projects endorsed by the CSA as GO projects. GO projects include those supported through the CSA's GO program as well as projects supported by partner agencies

and other Canadian government departments that contribute to the objectives of the GO program. It should be recognized, however, that GO projects may use related data from outside sources, such as from space-based instruments. Such data are outside of the domain of this policy, but the principles of access and preservation of high-value data are encouraged to be applied in those cases.

## 4 Data Access

In order to maximize the value of data gathered under the auspices of the GO program, all data are made fully, freely, and openly available on the shortest feasible timescale. This policy follows international policy and practice, notably,

- the Twelfth World Meteorological Organization (WMO) Congress, [Resolution 40 \(1995\)](#), and
- the International Council for Science (ICSU) [Assessment on Scientific Data and Information \(2004\)](#),

and is in accordance with

- the [Canadian Policy on Information Management \(2007\)](#), and
- the [Government of Canada Open Data License Agreement \(2011\)](#).

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

- where data release may cause harm, specific aspects of the data may need to be kept protected (for example, the accuracy of instrument locations may need to be reduced in some documents in order to avoid vandalism); or
- where pre-existing data are subject to access restrictions (for example, data acquired under restrictive policies that will be made available alongside data collected in compliance with this policy).

The ICSU Assessment on Scientific Data and Information defines “full and open access” as equitable, non-discriminatory access to all data preferably free of cost, although some reasonable cost-recovery for distribution of the data is acceptable. WMO Resolution 40 uses the term “free and unrestricted” and defines this as non-discriminatory and without charge. “Without charge”, in the context of this resolution, means a charge that is no more than the cost of reproduction and delivery and without charge for the data themselves.

Metadata are essential to the discovery, access, and effective use of data. All GO data include a full set of metadata that completely document and describe the data. As described in the [Reference Model for an Open Archival Information System \(OAIS\)](#), a complete set of metadata contains all the information necessary for the data to be independently understood by users and to ensure proper stewardship of the data.

The data associated with each GO instrument array are made available through a data “landing page”. This is a web page at a stable URL through which the data may be accessed, both by people and by automated systems. It provides links to the data as well as contextual information to facilitate use of the data. It also serves as a publishing record for the data and may be used as an endpoint for citations to the data.

Regardless of any delays in delivery of the data themselves, all GO projects funded by the CSA promptly provide basic descriptive metadata of collected data (no more than one week after acquisition by the instrument) in an internationally recognized, standard format to a CSA-approved catalogue or registry.

## **5 Data Preservation**

Recognizing that the significance of scientific data is often realized long after they have been collected, and to ensure the lasting legacy of the GO program, it is essential to ensure long-term preservation of and sustained access to GO data throughout its life. GO data are preserved in their simplest, useful, machine readable form and are accompanied by a complete metadata description. Associated metadata records include descriptions of quality control procedures and processing that have been applied to the data.

## **6 Data Citation**

To recognize the important role of data providers and to facilitate repeatability of observations in keeping with the scientific method, users of GO data are required to acknowledge the sources of the Data and copyrighted products (analogous to article authors). Where possible, this acknowledgment should take the form of a formal citation to the data, such as when citing a book or journal article. If a formal citation to the data is not possible, the acknowledgement should instead cite a recommended journal article. The GO program will encourage journals to require formal citation of the data used in articles they publish.

## **7 Responsibilities**

### **7.1 GO Projects**

All GO projects PIs are responsible for:

- applying the data management principles, standards and practices outlined in this policy to their data; and
- identifying data management requirements and issues to the CSA.

### **7.2 Canadian Space Agency**

The CSA is responsible for the implementation of the GO program. As such, it is responsible for:

- providing interpretive advice on this policy;
- enabling the distribution of information pertaining to data management to GO projects, program managers and other interested parties;
- assisting GO projects and data repositories to collaborate effectively; and
- promoting a culture of open data-sharing and information-sharing nationally and internationally between all participants in the GO program.

## 8 Data Rights and Rules for Data Use

The terms for distribution and use of the GO data govern both the production and distribution of scientific datasets by GO projects, as well as use of the GO data by the science community and general public.

These terms are summarized below:

- The data are open to all scientists and the public (Users).
- There are no proprietary periods associated with the data.
- Users shall have timely access to the data. The definition of “timely” shall be indicated for each dataset.
- Users shall acknowledge the source of the data. The required acknowledgement shall be provided on the relevant data landing page.
- Users shall cite the data when writing articles that make use of the data and that are intended for submission to a peer-reviewed publication. The required citation shall be provided on the relevant data landing page.
- Users are encouraged to provide the relevant GO project PI(s) with copies of their manuscripts upon their submission for consideration of publication. On publication the citation should be transmitted to the GO project PI and any other providers of data.
- Users are encouraged to make tools of general utility and/or value-added data products widely available to the community. Users are encouraged to collaborate with the relevant GO project PI(s) and to notify the CSA of such utilities or products.

These terms are subject to change as the policies of the CSA and its partners change

## 9 Appendix – Example Implementation

The following is a brief example illustrating how a GO project could implement the data policy. The comments in square brackets [...] indicate the policy criteria addressed.

All project data are made accessible via ftp [*open access: full, free, and unrestricted access*] through a hierarchy of folders, structured by date [*easy-to-use*]. Low-resolution data are available five minutes after acquisition, high-resolution data are available within two months of acquisition when custodians ship disks to the project centre [*rapid access*]. The data are stored as CDF formatted files [*open format*] with descriptive and unique file names [*well-documented*]. The data are described using the SPASE metadata standard [*well-documented; open format*]; all metadata are available within one day of acquisition [*rapid access*].

All project data, metadata, and documentation are available through a data landing page at [http://university.ca/GO\\_project/data](http://university.ca/GO_project/data)<sup>1</sup> and are updated daily [*well-documented; open access; rapid access; easy-to-use*]. We are committed to providing access to these data through this landing page until 2025 [*stable, long-term access; citable*]; the landing page includes instructions on how to cite the data [*citable*].

A customized version of the GO Canada Data Rights and Rules for Data Use is provided on the landing page, with links to the original at the GO Canada website.

## 10 References

Canadian Policy on Information Management, Government of Canada, July 2007. <http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=12742>

ICSU Report of the CSPR Assessment Panel on Scientific Data and Information, International Council for Science (ICSU), December 2004. [http://www.icsu.org/publications/reports-and-reviews/priority-area-assessment-on-scientific-data-and-information-2004/PAA\\_Data\\_and\\_Information\\_report.pdf](http://www.icsu.org/publications/reports-and-reviews/priority-area-assessment-on-scientific-data-and-information-2004/PAA_Data_and_Information_report.pdf)

IPY 2007-2008 Data Policy, ICSU/WMO Joint Committee for the International Polar Year (IPY), April 2008. [http://classic.ipy.org/Subcommittees/final\\_ipy\\_data\\_policy.pdf](http://classic.ipy.org/Subcommittees/final_ipy_data_policy.pdf)

Open Data License Agreement, Government of Canada, November 2011. <http://www.data.gc.ca/default.asp?lang=En&n=46D15882-1>

Reference Model for an Open Archival Information System (OAIS), Consultative Committee for Space Data Systems (CCSDS), Recommended Practice CCSDS 650.0-M-2, June 2012. <http://public.ccsds.org/publications/archive/650x0m2.pdf>

WMO Resolution 40: WMO Policy and Practice for the Exchange of Meteorological and Related Data and Products Including Guidelines on Relationships in Commercial Meteorological Activities, World Meteorological Organization (WMO) Congress, October 1995. [http://www.wmo.int/pages/about/Resolution40\\_en.html](http://www.wmo.int/pages/about/Resolution40_en.html)

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<sup>1</sup> Examples: <http://dx.doi.org/10.3334/ORNLDAAAC/1025>, [http://nsidc.org/data/mod10\\_12.html](http://nsidc.org/data/mod10_12.html), [http://cera-www.dkrz.de/WDCC/ui/Compact.jsp?acronym=dphase\\_mpeps](http://cera-www.dkrz.de/WDCC/ui/Compact.jsp?acronym=dphase_mpeps), and <http://lasp.colorado.edu/lisird/fism/>.