
**Geographic information —
Preservation of digital data and
metadata —**

Part 2:
**Content specifications for Earth
observation data and derived digital
products**

*Information géographique — Archivage des données numériques et
des métadonnées —*

*Partie 2: Spécifications de contenu pour les données d'observation de
la Terre et les produits numériques dérivés*

ISO 19165-2:2020

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*.

A list of all parts in the ISO 19165 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Many agencies across the globe are generating important datasets by collecting measurements from instruments in-situ and on board aircraft and spacecraft, globally and constantly. The data resulting from such measurements and digital products derived from them are valuable resources that need to be preserved for the benefit of future generations. These observations are the primary record of the Earth's environment and are therefore the key to understanding how conditions in the future will compare to conditions today. Earth observational data, derived products and models are used to answer key questions such as “How is the global Earth system changing?”, “What are the sources of change in the Earth systems and what are their magnitudes and trends?”, “How will the Earth system change in the future?”, and “How can Earth system science improve mitigation of and adaptation to global change?”.

In the near-term, as long as the missions' data are being used actively for research and applications, it continues to be important to provide easy access to the data and services commensurate with current information technology. For the longer term, when the focus of the research community shifts towards new missions and observations, it is essential to preserve the previous mission data and associated information. This will enable a new user in the future to understand how the data were used for deriving information, knowledge and policy recommendations and to “repeat the experiment” to ascertain the validity and possible limitations of conclusions reached in the past as well as to provide confidence in long-term trends that depended on data from multiple missions.

Organizations that collect, process and utilize Earth observation data today have a responsibility to ensure that the data and associated content continue to be preserved by gathering this information and preserving it themselves, or by handing it off to other organizations. In order to ensure preservation of all the content necessary for understanding and reusing the data and derived digital products, a standard is needed that specifies this content. While there are existing standards that address archival and preservation in general, there are no existing international standards or specifications to address what content should be preserved.

Specifications for preservation of information content complement existing archive standards. Space agencies that are members of the International Consultative Committee for Space Data Systems (CCSDS) have long recognized the importance of developing information standards for use in long-term preservation of space-related data collections. Volunteers developed the Open Archival Information System Reference Model (OAIS-RM). Subsequent activities continue to expand through a range of related interests that reach towards more practical guidance for developing agency standards. An example of this is a recommended standard on packaging of data and metadata (XFDU), to facilitate information transfer and archiving^[1]. The most recent update to the OAIS-RM is ISO 14721. The OAIS-RM provides a conceptual framework for archiving digital information. The CCSDS has also developed ISO 16363, which specifies requirements for certification of trustworthy digital repositories, based on the OAIS-RM, and ISO 16919, which describes how to audit archives for conformance with the requirements.

ISO 19115-1 provides a metadata model for describing geographic information and services, and ISO 19115-2 augments ISO 19115-1 with additional structure to describe the acquisition and processing of geographic imagery and gridded data. It provides the structure needed to represent properties of the instruments acquiring data, e.g. instrument geometry and production processes. The structure provided by ISO 19115-2 is useful for representing the preservation content intended to be specified with this document (ISO 19165-2).

ISO 19165-1 considers geographic information preservation in general and this document (ISO 19165-2) is its extension for Earth observation data and its derived products.

ISO 19165-1:2018, 7.3.1 indicates that specific content items needed to preserve the full provenance and context of data and associated data depend on the needs of the designated communities and types of datasets (e.g., maps, remotely sensed data from satellites and airborne instruments, physical samples). It also states that follow-up parts to ISO 19165-1 may be developed to provide details of content items appropriate to specific disciplines.