AS/NZS ISO 19165.2:2020
ISO 19165-2:2020

Australian/New Zealand Standard™

Geographic information — Preservation of digital data and metadata

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

AS/NZS ISO 19165.2:2020

This Joint Australian/New Zealand Standard™ was prepared by Joint Technical Committee IT-004, Geographical Information/Geomatics. It was approved on behalf of the Council of Standards Australia on 4 November 2020 and by the New Zealand Standards Approval Board on 7 October 2020.

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ANZLIC — the Spatial Information Council
Australian Antarctic Division
Australian Bureau of Meteorology
Australian Maritime Safety Authority
CSIRO
Curtin University of Technology
Department of Agriculture, Water and the Environment
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Geoscience Australia
Science New Zealand
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Spatial Industries Business Association

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First published as AS/NZS ISO 19165.2:2020.

Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee IT-004, Geographical Information/Geomatics.

The objective of this document is to extend the long-term preservation of digital geospatial data to provide details about content describing the provenance and context specific to data from missions that observe the Earth using spaceborne, airborne or *in situ* instruments.

This document is identical with, and has been reproduced from, ISO 19165-2:2020, *Geographic information — Preservation of digital data and metadata — Part 2: Content specifications for Earth observation data and derived digital products.*

As this document has been reproduced from an International Standard, a full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms “normative” and “informative” are used in Standards to define the application of the appendices or annexes to which they apply. A “normative” appendix or annex is an integral part of a Standard, whereas an “informative” appendix or annex is only for information and guidance.

This draft has been issued for public comment and ballot as a joint (AS/NZS) project with Standards New Zealand. Notwithstanding the joint nature of this public comment and ballot draft, this project may not be published as a joint (AS/NZS) publication.

Contents

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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[11]. 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.

This document, as Part 2 of the ISO 19165 series, provides more detailed specifications for Earth observation data and derived digital products resulting from spaceborne and airborne remote sensing, as well as in situ observations.

This document benefits from the work performed by the Data Preservation and Stewardship Committee of the U.S. Earth Science Information Partners (ESIP)[5], NASA[6], ESA and CEOS WGISS[7]. The documents from these groups are integrated along with the ISO international standards mentioned above to provide specific content items to be preserved from Earth observing missions for the benefit of users. It is expected that if the content items specified by this document are preserved, users will have sufficient information to be able to understand, reuse, and, ideally, regenerate data products without the assistance of the original teams that were responsible for their initial generation.

Australian/New Zealand Standard

Geographic information — Preservation of digital data and metadata

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

1 Scope

This document aims to extend the long-term preservation of digital geospatial data to provide details about content describing the provenance and context specific to data from missions that observe the Earth using spaceborne, airborne or in situ instruments.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 19115-1, *Geographic information — Metadata — Part 1: Fundamentals*

ISO 19115-2, *Geographic information — Metadata — Part 2: Extensions for acquisition and processing*

ISO 19115-3, *Geographic information — Metadata — Part 3: XML schema implementation for fundamental concepts*

ISO 19130-1, *Geographic information — Imagery sensor models for geopositioning — Part 1: Fundamentals*

ISO/TS 19130-2, *Geographic information — Imagery sensor models for geopositioning — Part 2: SAR, InSAR, lidar and sonar*

ISO 19157-1, *Geographic information — Data quality — Part 1: General requirements*

ISO 19157-2, *Geographic information — Data quality — Part 2: XML schema implementation*

ISO/TS 19159-1, *Geographic information — Calibration and validation of remote sensing imagery sensors and data — Part 1: Optical sensors*

ISO/TS 19159-2, *Geographic information — Calibration and validation of remote sensing imagery sensors and data — Part 2: Lidar*

ISO/TS 19159-3, *Geographic information — Calibration and validation of remote sensing imagery sensors and data — Part 3: SAR/InSAR*

ISO 19165-1, *Geographic information — Preservation of digital data and metadata — Part 1: Fundamentals*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 19165-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/