

Australian/New Zealand Standard™

**Geographic information —
Reference model**

Part 2: Imagery



AS/NZS ISO 19101.2:2019

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 3 May 2019 and by the New Zealand Standards Approval Board on 3 April 2019.

This Standard was published on 29 May 2019.

The following are represented on Committee IT-004:

- ANZLIC - the Spatial Information Council
- Australian Antarctic Division
- Australian Bureau of Meteorology
- Australian Bureau of Statistics
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This Standard was issued in draft form for comment as DR AS/NZS ISO 19101.2:2019.

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ISBN 978 1 76072 478 8

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Part 2: Imagery

First published as AS/NZS ISO 19101.2:2011.
This edition AS/NZS ISO 19101.2:2019.

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Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee IT-004, Geographical Information/Geomatics, to supersede AS/NZS ISO 19101.2:2011, *Geographic information — Reference model*.

The objective of this Standard is to define a reference model for standardization in the field of geographic imagery processing. This reference model identifies the scope of the standardization activity being undertaken and the context in which it takes place. The reference model includes gridded data with an emphasis on imagery. Although structured in the context of information technology and information technology standards, this document is independent of any application development method or technology implementation approach.

This Standard is identical with, and has been reproduced from, ISO 19101-2:2018, *Geographic information — Reference model — Part 2: Imagery*.

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.

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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).

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 on 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 the following URL: www.iso.org/iso/foreword.html.

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

This edition cancels and replaces the first edition (ISO/TS 19101-2:2008) which has been technically revised. In order to promote backward compatibility between different versions of standards, the changes that have been made between this document and the previous version are described in [Annex D](#).

A list of all parts in the ISO 19101 series can be found on the ISO website.

Introduction

This document provides a reference model for processing of geographic imagery which is frequently done in open distributed manners. The motivating themes addressed in this reference model are given below.

In terms of volume, imagery is the dominant form of geographic information.

- Stored geographic imagery volume will grow to the order of an exabyte.
- National imagery archives are multiple petabytes in size; ingesting a terabyte per day.
- Individual application data centers are archiving hundreds of terabytes of imagery.
- Tens of thousands of datasets have been catalogued and can be accessible online.

Large volumes of geographic imagery will not be portrayed directly by humans. Human attention is the scarce resource, and is insufficient to view petabytes of data. Semantic processing will be required: for example, automatic detection of features; data mining based on geographic concepts.

Information technology allows the sharing of geographic information products through processing of geographic imagery. Standards are needed to increase creation of products. A number of existing standards are used for the exchange of geographic imagery.

Examples of technical, legal, and administrative hurdles to moving imagery online include

- technical issues of accessibility – geocoding, geographic access standards,
- maintenance of intellectual property rights,
- maintenance of individual privacy rights as resolution increases, and
- technical issues of compatibility requiring standards.

Governments have been the predominant suppliers of remotely sensed data in the past. This is changing with the commercialization of remotely sensed data acquisition. Geographic imagery is a key input to decision support for policy makers.

The ultimate challenge is to enable the geographic imagery collected from different sources to become an integrated digital representation of the Earth widely accessible for humanity's critical decisions.

Currently a large number of standards exist that describe imagery data. The processing of imagery across multiple organizations and information technologies (IT) is hampered by the lack of a common abstract architecture. The establishment of a common framework will foster convergence at the framework level. In the future, multiple implementation standards are needed for data format and service interoperability to carry out the architecture defined in this document.

The objective of this document is the coordinated development of standards that allow the benefits of distributed geographic image processing to be realized in an environment of heterogeneous IT resources and multiple organizational domains. An underlying assumption is that uncoordinated standardization activities made without a plan cannot be united under the necessary framework.

This document provides a reference model for the processing of geographic imagery which is frequently done in open distributed manners. The basis for defining an information system in this document is the Reference Model for Open Distributed Processing (RM-ODP).^[42] A brief description of RM-ODP can be referenced in [Annex B](#). The basis for defining geographic information in this document is the ISO 19100 series of standards.

The RM-ODP^[42] viewpoints are used in the following fashion.

- Typical users and their business activities, and policies to carry out those activities, are addressed in the Enterprise Viewpoint.

- Data structures and the progressive addition of value to the resulting products are found in the schemas of the Information Viewpoint.
- Individual processing services and the chaining of services are addressed in the Computational Viewpoint.

Approaches to deploy the components of the Information and Computational viewpoints to distributed physical locations are addressed in the Engineering Viewpoint.

Australian/New Zealand Standard

Geographic information — Reference model

Part 2: Imagery

1 Scope

This document defines a reference model for standardization in the field of geographic imagery processing. This reference model identifies the scope of the standardization activity being undertaken and the context in which it takes place. The reference model includes gridded data with an emphasis on imagery. Although structured in the context of information technology and information technology standards, this document is independent of any application development method or technology implementation approach.

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 19115-1:2014, *Geographic information — Metadata — Part 1: Fundamentals*

ISO 19115-2:2009, *Geographic information — Metadata — Part 2: Extensions for imagery and gridded data*

ISO 19119:2016, *Geographic information — Services*

ISO 19123:2005, *Geographic information — Schema for coverage geometry and functions*

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

band

range of wavelengths of electromagnetic radiation that produce a single response by a sensing device

3.2

calibration

process of quantitatively defining a system's responses to known, controlled signal inputs

[SOURCE: CEOS WGCV]

3.3

computational viewpoint

viewpoint (3.42) on an ODP system and its environment that enables distribution through functional decomposition of the system into objects which interact at *interfaces* (3.16)

[SOURCE: ISO/IEC 10746-3:2009, 4.1.1.3]

1) Under preparation. Stage at the time of publication: ISO/DIS 19130-1.