

Australian/New Zealand Standard™

Geographic information—Metadata



AS/NZS ISO 19115:2005

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee IT-004, Geographical Information. It was approved on behalf of the Council of Standards Australia on 4 April 2005 and on behalf of the Council of Standards New Zealand on 18 March 2005.

This Standard was published on 27 April 2005.

The following are represented on Committee IT-004:

ACT Department of Urban Services
ANZLIC-the Spatial Information Council
Association of Aerial Surveyors Australia
Association of Crown Research Institutes, New Zealand
Australasian Fire Authorities Council
Australian Bureau of Statistics
Australian Map Circle
Australian Urban and Regional Information Systems Association
CSIRO Exploration & Mining
Department for Administrative and Information Services, SA
Department of Conservation, NZ
Department of Defence (Australia)
Department of Infrastructure, Planning and Environment, NT
Department of Natural Resources and Mines, Qld
Department of Primary Industries, Water and Environment, Tas.
Energy Supply Association of Australia
Geoscience Australia
Inter-Governmental Committee on Surveying and Mapping
Land Information New Zealand
Land Victoria
Land and Property Information, NSW
Local Government, New Zealand
Mapping Sciences Institute, Australia
Telecom New Zealand
Western Australian Land Information System

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Web Shop at www.standards.com.au or Standards New Zealand web site at www.standards.co.nz and looking up the relevant Standard in the on-line catalogue.

Alternatively, both organizations publish an annual printed Catalogue with full details of all current Standards. For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia or Standards New Zealand at the address shown on the back cover.

This Standard was issued in draft form for comment as DR 05045.

Australian/New Zealand Standard™

Geographic information—Metadata

First published as AS/NZS ISO 19115:2005.
Reissued incorporating Amendment No. 1 (October 2008).

COPYRIGHT

© Standards Australia/Standards New Zealand

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Jointly published by Standards Australia, GPO Box 476, Sydney, NSW 2001 and Standards New Zealand, Private Bag 2439, Wellington 6020

PREFACE

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

This Standard incorporates Amendment No. 1 (October 2008). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

A1 | This Standard is identical with, and has been reproduced from ISO 19115:2003, *Geographic information—Metadata*, and its corrigendum, ISO 19115:2003/Cor.1:2006.

The objective of this Standard is to specify, and provide geographic information system, developers with, the schema required for describing geographic information and services. It provides information about the identification, the extent, the quality, the spatial and temporal schema, spatial reference, and distribution of digital geographic data.

The terms ‘normative’ and ‘informative’ are used to define the application of the annex to which they apply. A normative annex is an integral part of a standard, whereas an informative annex is only for information and guidance.

As this Standard is reproduced from an international standard, the following applies:

- (a) Its number appears on the cover and title page while the international standard number appears only on the cover.
- (b) In the source text ‘this International Standard’ should read ‘this Australian/New Zealand Standard’.
- (c) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>		<i>Australian/New Zealand Standard</i>	
ISO		AS	
3166	Codes for the representation of names of countries and their subdivisions (all parts)	2632	Codes for the representation of names of countries and their subdivisions (all parts)
8879	Information processing—Text and office systems—Standard Generalized Markup Language (SGML)	3514	Information processing—Text and office systems—Standard Generalized Markup Language (SGML)
ISO/IEC		AS/NZS	
10646	Information technology—Universal Multiple-Octet Coded Character Set (UCS)	4189	Information technology—Universal Multiple-Octet Coded Character Set (UCS)
10646-1	Part 1: Architecture and Basic Multilingual Plane	4189.1	Part 1: Architecture and Basic Multilingual Plane
ISO		AS/NZS ISO	
19106	Geographic information—Profiles	19106	Geographic information—Profiles
19107	Geographic information—Spatial schema	19107	Geographic information—Spatial schema

ISO		AS/NZS ISO	
19108	Geographic information—Temporal schema	19108	Geographic information—Temporal schema
19111	Geographic information—Spatial referencing by coordinates	19111	Geographic information—Spatial referencing by coordinates
19112	Geographic information—Spatial referencing by geographic identifiers	19112	Geographic information—Spatial referencing by geographic identifiers
19113	Geographic information—Quality principles	19113	Geographic information—Quality principles
19114	Geographic information—Quality evaluation procedures	19114	Geographic information—Quality evaluation procedures

Only international references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

CONTENTS

	<i>Page</i>
1	Scope 1
2	Conformance 1
2.1	Conformance requirements 1
2.2	Metadata Profiles 1
2.3	Obligation and condition 2
3	Normative references 2
4	Terms and definitions 3
5	Symbols and abbreviated terms 4
5.1	Abbreviations 4
5.2	UML notations 4
5.3	UML model relationships 5
5.3.1	Associations 5
5.3.2	Generalization 5
5.3.3	Instantiation/Dependency 5
5.3.4	Roles 5
5.4	UML model stereotypes 6
5.5	Package abbreviations 7
5.6	UML model/data dictionary relationships 8
6	Requirements 8
6.1	Metadata for geographic data requirement 8
6.2	Metadata application information 8
6.3	Metadata packages 9
6.3.1	Metadata package and entity relationship 9
6.3.2	Package descriptions 11
6.4	Metadata datatypes 14
6.4.1	Extent information (EX_Extent) 14
6.4.2	Citation and responsible party information (CI_Citation and CI_ResponsibleParty) 15
6.5	Core metadata for geographic datasets 15
6.6	Unified Modelling Language (UML) diagrams 16
6.7	Data dictionary 16
6.8	Metadata extensions and profiles 17
6.9	Abstract test suite 17
6.10	Comprehensive dataset metadata application profile 17
6.11	Metadata extension methodology 17
6.12	Metadata implementation 17
6.13	Hierarchical levels of metadata 17
6.14	Implementation examples 17
6.15	Multilingual support for free text fields 17
Annex A (normative)	Metadata schemas 18
A.1	Metadata UML models 18
A.2	Metadata package UML diagrams 19
A.2.1	Metadata entity set information 19
A.2.2	Identification information 19
A.2.3	Constraint information 21
A.2.4	Data quality information 22
A.2.5	Maintenance information 25
A.2.6	Spatial representation information 26

A.2.7	Reference system information	27
A.2.8	Content information.....	28
A.2.9	Portrayal catalogue information.....	29
A.2.10	Distribution information.....	30
A.2.11	Metadata extension information.....	31
A.2.12	Application schema information	32
A.3	Metadata data types	33
A.3.1	Extent information	33
A.3.2	Citation and responsible party information	34
Annex B	(normative) Data dictionary for geographic metadata.....	35
B.1	Data dictionary overview	35
B.1.1	Introduction	35
B.1.2	Name/role name	35
B.1.3	Short name and domain code	35
B.1.4	Definition	35
B.1.5	Obligation/Condition	36
B.1.6	Maximum occurrence.....	36
B.1.7	Data type.....	36
B.1.8	Domain.....	36
B.2	Metadata package data dictionaries	38
B.2.1	Metadata entity set information.....	38
B.2.2	Identification information (includes data and service identification).....	40
B.2.3	Constraint information (includes legal and security)	46
B.2.4	Data quality information.....	48
B.2.5	Maintenance information	57
B.2.6	Spatial representation information (includes grid and vector representation).....	59
B.2.7	Reference system information (includes temporal, coordinate and geographic identifiers)	63
B.2.8	Content information (includes Feature catalogue and Coverage descriptions).....	68
B.2.9	Portrayal catalogue information.....	73
B.2.10	Distribution information	73
B.2.11	Metadata extension information.....	78
B.2.12	Application schema information	80
B.3	Data type information	81
B.3.1	Extent information	81
B.3.2	Citation and responsible party information	85
B.4	Externally referenced entities.....	91
B.4.1	Introduction	91
B.4.2	Date and DateTime information.....	91
B.4.3	Distance, angle, measure, number, record, recordType, scale and UomLength information....	91
B.4.4	Feature type, property type, and attribute type information	91
B.4.5	PeriodDuration and temporal primitive information	91
B.4.6	Point and Object information	92
B.4.7	Set and Sequence information	92
B.4.8	Type name information	92
B.4.9	Vertical datum information	92
B.5	CodeLists and enumerations	92
B.5.1	Introduction	92
B.5.2	CI_DateTypeCode <<CodeList>>	92
B.5.3	CI_OnLineFunctionCode <<CodeList>>.....	93
B.5.4	CI_PresentationFormCode <<CodeList>>	93
B.5.5	CI_RoleCode <<CodeList>>.....	93
B.5.6	DQ_EvaluationMethodTypeCode <<CodeList>>	94
B.5.7	DS_AssociationTypeCode <<CodeList>>	94
B.5.8	DS_InitiativeTypeCode <<CodeList>>	94
B.5.9	MD_CellGeometryCode <<CodeList>>	95
B.5.10	MD_CharacterSetCode <<CodeList>>	95
B.5.11	MD_ClassificationCode <<CodeList>>	96
B.5.12	MD_CoverageContentTypeCode <<CodeList>>	96
B.5.13	MD_DatatypeCode <<CodeList>>	97

B.5.14	MD_DimensionNameTypeCode <<CodeList>>	97
B.5.15	MD_GeometricObjectTypeCode <<CodeList>>	97
B.5.16	MD_ImagingConditionCode <<CodeList>>	98
B.5.17	MD_KeywordTypeCode <<CodeList>>	98
B.5.18	MD_MaintenanceFrequencyCode <<CodeList>>	99
B.5.19	MD_MediumFormatCode <<CodeList>>	99
B.5.20	MD_MediumNameCode <<CodeList>>	99
B.5.21	MD_ObligationCode <<Enumeration>>	100
B.5.22	MD_PixelOrientationCode <<Enumeration>>	100
B.5.23	MD_ProgressCode <<CodeList>>	100
B.5.24	MD_RestrictionCode <<CodeList>>	101
B.5.25	MD_ScopeCode <<CodeList>>	101
B.5.26	MD_SpatialRepresentationTypeCode <<CodeList>>	102
B.5.27	MD_TopicCategoryCode << Enumeration>>	102
B.5.28	MD_TopologyLevelCode <<CodeList>>	104
Annex C	(normative) Metadata extensions and profiles	105
C.1	Background	105
C.2	Types of extensions	105
C.3	Creating an extension	105
C.4	Rules for creating an extension	105
C.5	Community profile	106
C.6	Rules for creating a profile	107
Annex D	(normative) Abstract test suite	108
D.1	Abstract test suite	108
D.2	Metadata test suite	108
D.2.1	Test case identifier: Completeness test	108
D.2.2	Test case identifier: Maximum occurrence test	108
D.2.3	Test case identifier: Short name test	108
D.2.4	Test case identifier: Data type test	109
D.2.5	Test case identifier: Domain test	109
D.2.6	Test case identifier: Schema test	109
D.3	User-defined extension metadata test suite	109
D.3.1	Test case identifier: Exclusiveness test	109
D.3.2	Test case identifier: Definition test	110
D.3.3	Test case identifier: Standard metadata test	110
D.4	Metadata profiles	110
D.4.1	Test case identifier: Metadata profiles	110
Annex E	(normative) Comprehensive dataset metadata application profile	111
E.1	Comprehensive dataset metadata application schema	111
E.2	Comprehensive dataset metadata profile – UML model	112
Annex F	(informative) Metadata extension methodology	113
F.1	Metadata extensions methodology	113
F.2	Review of existing metadata elements (Stage 1)	113
F.3	Definition of a new metadata section (Stage 2)	114
F.4	Definition of a new metadata codelist (Stage 3)	114
F.5	Definition of a new metadata codelist element (Stage 4)	114
F.6	Definition of a new metadata element (Stage 5)	115
F.7	Definition of a new metadata entity (Stage 6)	115
F.8	Definition of a more stringent metadata obligation (Stage 7)	116
F.9	Definition of more restrictive metadata codelist (Stage 8)	116
F.10	Documentation of metadata extensions (Stage 9)	117
Annex G	(informative) Metadata implementation	119
G.1	Background	119
G.1.1	Problem statement	119
G.1.2	Scope and objectives	119
G.1.3	Granularity of spatial data supported	119
G.2	Metadata hierarchy levels	120

G.2.1	Dataset series metadata (optional)	120
G.2.2	Dataset metadata	120
G.2.3	Feature type metadata (optional)	121
G.2.4	Feature instance metadata (optional)	121
G.2.5	Attribute type metadata (optional)	121
G.2.6	Attribute instance metadata (optional)	121
Annex H	(informative) Hierarchical levels of metadata	122
H.1	Levels of metadata	122
H.2	Example	122
Annex I	(informative) Implementation examples	126
I.1	Metadata examples	126
I.2	Example 1 – Exploration Licences for Minerals	126
I.3	Example 2 – Example of extended metadata	129
I.4	Data dictionary for the extended elements	130
I.5	MD_KeywordType (Modified)	136
Annex J	(informative) Multilingual support for free text metadata element	137
J.1	Free text metadata elements	137
J.2	Data structure for handling multi-languages support in free text metadata elements	138
J.3	Example of multi-languages free text in a metadata element	139
	Bibliography	140

INTRODUCTION

A revival in the awareness of the importance of geography and how things relate spatially, combined with the advancement of electronic technology, have caused an expansion in the use of digital geographic information and geographic information systems worldwide. Increasingly, individuals from a wide range of disciplines outside of the geographic sciences and information technologies are capable of producing, enhancing, and modifying digital geographic information. As the number, complexity, and diversity of geographic datasets grow, a method for providing an understanding of all aspects of this data grows in importance.

Digital geographic data is an attempt to model and describe the real world for use in computer analysis and graphic display of information. Any description of reality is always an abstraction, always partial, and always just one of many possible "views". This "view" or model of the real world is not an exact duplication; some things are approximated, others are simplified, and some things are ignored. There is seldom perfect, complete, and correct data. To ensure that data is not misused, the assumptions and limitations affecting the creation of data must be fully documented. Metadata allows a producer to describe a dataset fully so that users can understand the assumptions and limitations and evaluate the dataset's applicability for their intended use.

Typically, geographic data is used by many people other than the producer. It is often produced by one individual or organization and used by another. Proper documentation will provide those unfamiliar with the data with a better understanding, and enable them to use it properly. As geographic data producers and users handle more and more data, proper documentation will provide them with a keener knowledge of their holdings and will allow them to better manage data production, storage, updating, and reuse.

The objective of this International Standard is to provide a structure for describing digital geographic data. This International Standard is intended to be used by information system analysts, program planners, and developers of geographic information systems, as well as others in order to understand the basic principles and the overall requirements for standardization of geographic information. This International Standard defines metadata elements, provides a schema and establishes a common set of metadata terminology, definitions, and extension procedures. When implemented by a data producer, this International Standard will:

- 1) Provide data producers with appropriate information to characterize their geographic data properly.
- 2) Facilitate the organization and management of metadata for geographic data.
- 3) Enable users to apply geographic data in the most efficient way by knowing its basic characteristics.
- 4) Facilitate data discovery, retrieval and reuse. Users will be better able to locate, access, evaluate, purchase and utilize geographic data.
- 5) Enable users to determine whether geographic data in a holding will be of use to them.

This International Standard defines general-purpose metadata, in the field of geographic information. More detailed metadata for geographic datatypes and geographic services are defined in other ISO 19100 series standards and user extensions.

AUSTRALIAN/NEW ZEALAND STANDARD

Geographic information — Metadata

1 Scope

This International Standard defines the schema required for describing geographic information and services. It provides information about the identification, the extent, the quality, the spatial and temporal schema, spatial reference, and distribution of digital geographic data.

This International Standard is applicable to:

- the cataloguing of datasets, clearinghouse activities, and the full description of datasets;
- geographic datasets, dataset series, and individual geographic features and feature properties.

This International Standard defines:

- mandatory and conditional metadata sections, metadata entities, and metadata elements;
- the minimum set of metadata required to serve the full range of metadata applications (data discovery, determining data fitness for use, data access, data transfer, and use of digital data);
- optional metadata elements – to allow for a more extensive standard description of geographic data, if required;
- a method for extending metadata to fit specialized needs.

Though this International Standard is applicable to digital data, its principles can be extended to many other forms of geographic data such as maps, charts, and textual documents as well as non-geographic data.

NOTE Certain mandatory metadata elements may not apply to these other forms of data.

2 Conformance

2.1 Conformance requirements

Metadata shall be provided as specified in Clause 6 and Annexes A and B.

User-defined metadata shall be defined and provided as specified in Annex C.

Any metadata claiming conformance with this International Standard shall pass the requirements described in the abstract test suite presented in Annex D.

2.2 Metadata Profiles

Any profile conforming to this International Standard shall conform to the rules in Annex C, Clause C.6.