
Geographic information — Data quality —

Part 1: General requirements

*Information géographique — Qualité des données —
Partie 1: Exigences générales*



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Contents

Page

Foreword.....	v
Introduction.....	vii
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	1
4 Abbreviated terms and packages.....	5
4.1 Abbreviated terms.....	5
4.2 Abbreviated packages.....	5
5 Conformance.....	5
5.1 General.....	5
5.2 Content of a data quality model.....	6
5.3 XML encoding of a data quality model.....	6
6 General requirements for geographic information quality.....	6
6.1 General.....	6
6.2 Data quality — general requirements, recommendations and permissions.....	6
7 Overview of data quality.....	8
8 Components of data quality.....	9
8.1 Overview of the components.....	9
8.2 Data quality unit.....	10
8.3 Data quality elements.....	11
8.3.1 General.....	11
8.3.2 Completeness.....	12
8.3.3 Logical consistency.....	12
8.3.4 Positional accuracy.....	13
8.3.5 Temporal quality.....	13
8.3.6 Thematic quality.....	13
8.3.7 Metaquality elements.....	14
8.4 Extending the data quality information model.....	14
8.5 Descriptors of data quality elements.....	15
8.5.1 General.....	15
8.5.2 Measure reference.....	15
8.5.3 Evaluation method.....	16
8.5.4 Quality result.....	16
8.5.5 Descriptors of a metaquality element.....	19
9 Data quality measures.....	19
9.1 General.....	19
9.2 Standardized data quality measures.....	19
9.2.1 General.....	19
9.2.2 Measure identifier.....	21
9.2.3 Name.....	21
9.2.4 Alias.....	21
9.2.5 Element name.....	21
9.2.6 Basic measure.....	21
9.2.7 Definition.....	21
9.2.8 Description.....	21
9.2.9 Parameter.....	22
9.2.10 Value type.....	22
9.2.11 Value structure.....	22
9.2.12 Source reference.....	22
9.2.13 Example.....	22
9.3 User-defined data quality measures.....	22

10	Data quality evaluation	23
10.1	The process for evaluating data quality	23
10.1.1	Introduction	23
10.1.2	The process flow	23
10.1.3	Process steps	24
10.2	Data quality evaluation methods	24
10.2.1	Classification of data quality evaluation methods	24
10.2.2	Direct evaluation	25
10.2.3	Indirect evaluation	25
10.3	Aggregation and derivation	26
11	Data quality reporting	26
11.1	General	26
11.2	Particular cases	27
11.2.1	Reporting aggregation (aggregated results)	27
11.2.2	Reporting derivation (derived results)	28
11.2.3	Reference to the original data quality result	28
11.2.4	Hierarchy principle	28
12	Requirements for XML encoding	29
Annex A (normative)	Abstract test suite	30
Annex B (informative)	Data quality concepts and their use	31
Annex C (normative)	Data dictionary for data quality	37
Annex D (informative)	Evaluating and reporting data quality	53
Annex E (informative)	Sampling methods for evaluating data quality	78
Annex F (informative)	Guidelines for the use of quality elements	86
Annex G (informative)	Aggregation of data quality results	95
Annex H (normative)	XML Encoding description	97
Annex I (informative)	Backward compatibility with ISO 19157:2013	98
Bibliography		101

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*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 287, *Geographic Information*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This first edition of ISO 19157-1, together with ISO 19157-3, cancels and replaces the first edition (ISO 19157:2013), which has been technically revised. It also incorporates the Amendment ISO 19157:2013/Amd 1:2018.

The main changes are as follows:

- terminology has been harmonized;
- the unique identification of normative components has been added;
- the definition of the data quality model extension has been added;
- the data quality measures have been moved into a new project on a standard data quality measures register;
- the conformance requirements have been updated;
- the usage of package prefixes for type name has been omitted;
- the 'usability' data quality element has been removed from the model;
- a new clause on extending the standard quality model and the quality measures has been added;
- the abstract test suite has been revised;
- requirements for XML schema implementation have been added;
- information on backwards compatibility with superseded edition of this document has been included.

A list of all parts in the ISO 19157 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.

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Introduction

Geographic data are increasingly being shared, interchanged and used for purposes other than their producers' intended ones. Information about the quality of available geographic data is vital to the process of selecting a dataset in that the value of data are directly related to their quality. A user of geographic data can have multiple datasets from which to choose. Therefore, it is necessary to compare the quality of the datasets to determine which best fulfils the requirements of the user.

The purpose of describing the quality of geographic data is to facilitate the comparison and selection of the dataset best suited to application needs or requirements. Complete descriptions of the quality of a dataset will encourage the sharing, interchange and use of appropriate datasets. Information on the quality of geographic data allows a data producer to evaluate how well a dataset meets the criteria set forth in its product specification and assists data users in evaluating a product's ability to satisfy the requirements for their particular application. For the purpose of this evaluation, clearly-defined procedures are used in a consistent manner.

To facilitate comparisons, it is essential that the results of the quality are expressed in a comparable way and that there is a common understanding of the data quality measures that have been used. These data quality measures provide descriptors of the quality of geographic data through comparison with the universe of discourse. The use of incompatible measures makes data quality comparisons impossible to perform. This document standardizes the components and structures of data quality measures and defines commonly used data quality measures.

This document recognizes that a data producer and a data user can potentially view data quality from different perspectives. Conformance quality levels can be set using the data producer's product specification or a data user's data quality requirements. If the data user requires more data quality information than that provided by the data producer, the data user can follow the data producer's data quality evaluation process flow to get the additional information. In this case the data user requirements are treated as a product specification for the purpose of using the data producer process flow.

The objective of this document is to provide a framework for defining the quality of geographic data. This includes principles for evaluating quality, a conceptual model for handling quality information, a structure and content of data quality measures, and guidelines for reporting a quality evaluation. The framework is extensible, with rules for how to add additional data quality measures. It also provides for complex dimensions of data quality.

Geographic information — Data quality —

Part 1: General requirements

1 Scope

This document establishes the principles for describing the quality of geographic data. It:

- defines a well-considered system of components for describing data quality;
- defines the process for defining additional, domain-specific components for describing data quality;
- specifies components and the content structure of data quality measures;
- describes general procedures for evaluating the quality of geographic data;
- establishes principles for reporting data quality.

This document is applicable to data producers providing quality information to describe and assess how well a dataset conforms to its product specification and to data users attempting to determine whether or not specific geographic data are of sufficient quality for their particular application.

This document does not attempt to define minimum acceptable levels of quality for geographic data. Such information is usually present as a requirement in a data product specification, defined in accordance with ISO 19131, for example.

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 19103:2015, *Geographic information — Conceptual schema language*

ISO 19109:2015, *Geographic information — Rules for application schema*

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

3 Terms and definitions

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

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

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

3.1

accuracy

closeness of agreement between a test result or measurement result and the true value

Note 1 to entry: In this document, the true value can be a reference value that is accepted as true.