ISO/TC 211

Geographic information/Geomatics

Standardization in the field of digital geographic information.

EuroGeographics Quality KEN
Wednesday 17th April, 2024

Peter Parslow, chair

Our vision:

ISO/TC 211 wants to support a sustainably prosperous future by providing, in cooperation with others, a set of standards that enable better management of geographic information.

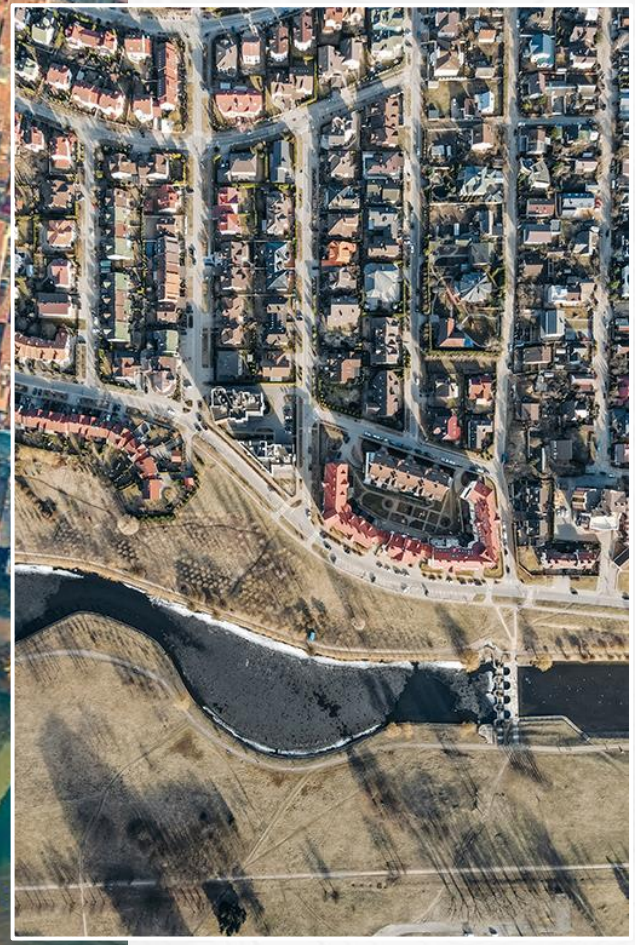
Our strategy:

- Collaboration
- Harmonization
- Outreach

Domains: INSPIRE, IHO, WMO, etc

Geo standards: TC 211, OGC

IT standards: W3C, IETF, ISO/IEC




INSPIRE
etc
OGC
TC 211
FAO
IHO
IAG

Modernising

- ISO
  - ISO SMART – *standards (that are) machine applicable, readable and transferable*
    - Terminology: GeoLexica
    - Data models
    - Data validation
  - Online Standards Development
- IT
  - Geolexica
  - OpenAPIs (with OGC)
  - Web ontologies
  - JSON
- Domains
  - Intelligent transport
  - Digital twins
  - Analysis ready data

TC 211 Data quality standards

	ISO Standard		
Metadata	ISO 19115	Reporting assessed data quality	
Data product specification	ISO 19131	Setting / describing expected data quality	
Data quality	ISO 19157	Measuring data quality	
Quality assurance of data supply	ISO 19158	Assuring data quality (originally OS, EuroGeographics discussion)	
Address data quality	ISO 19160-3	ISO 19157 for Address data	
Older standards			
Quality principles	ISO 19113	Withdrawn 2013	Replaced by ISO 19157
Quality evaluation procedures	ISO 19114	Withdrawn 2013	

ISO 19131:2022 *Data product specifications*

- Either to say what you want or to describe what you have
- Basis of INSPIRE Data specifications

Sections of a product specification

ISO 19131		INSPIRE Data specs
Identification	Title, abstract etc	✓
Scope	When partitioned	Most state “one scope”
Content & structure	Application schema(s) & feature catalogue	✓
Reference systems	Spatial & temporal, by reference	✓
Data quality	Requirements & conformance levels	✓
Capture & production	Instructions or descriptions	✓
Maintenance	Instructions or descriptions	Description: minimal metadata
Portrayal	For human interpretation	✓
Delivery	Instructions or description of format & service	✓
Metadata	Requirements on metadata to be provided	✓

Data quality in ISO 19131

Define and establish quality requirements at a dataset level as well as at a data element level for critical items

- Set quality requirements
- *Does not* describe the assessed quality of a specific data set
- Conformance quality level as a set of:
  - Threshold value of a quantitative result
  - Descriptive statement
- For various quality measures from ISO 19157
- Allows for *scopes* within the product to have different quality levels (e.g. rural / urban)
- Note: INSPIRE doesn't set requirements or levels; just recommends relevant measures for each theme

ISO 19115 *Metadata*

Report the high level assessment of quality based on more detailed evaluation performed with ISO 19157 and 19158

- INSPIRE still uses ISO 19115:2003 (encoded with ISO 19139)
- New edition: ISO 19115-1:2014 (with 2020 amendment)
  - Adopted in Australia, New Zealand, …
- INSPIRE *may* move to W3C's DCAT
- *Describe the assessed quality of a specific data set*

Metadata sections

ISO 19115		
Identification	Title, abstract, extent, citation,…	
Application schema	Application schema (usually by reference)	…tent & structure
Content information	Feature catalogue or coverage/image descri…on	
Reference systems	Spatial & temporal, usually by refere…ce	✓
Data quality	Actual Can include capture/production as lineage	19131 sets requirements 19115 gives assessment
Maintenance	Expectation: how often or when next	✓
Portrayal	Catalogue, by reference	✓
Distribution	Description of formats & services	“Delivery”
Constraint		
Spatial representation	e.g. vector or raster	

INSPIRE:
- Conformance to a specification
- Lineage

Data quality in ISO 19115

- *Describe the assessed quality of a specific data set*
- ISO 19115:2003 has
  - Lineage
  - Set of measures with method & result
  - INSPIRE uses “Conformance” to INSPIRE specification as the mandatory measure
- ISO 19115-1:2014 uses ISO 19157 – the measures are moved there

ISO 19157:2003 *Data quality*

Evaluate data quality with standardised measures; report quality in the context of tolerances established through quality requirements using ISO 19131

- defines components for describing data quality;
- specifies components and content structure of a register for data quality measures;
- describes general procedures for evaluating the quality of geographic data;
- establishes principles for reporting data quality
- **defines a set of data quality mea**
- *Does not* define acceptable levels of quality

ISO 19157-1:2023 moves these to a register being defined in ISO 19157-3

Data quality measures (1 of 2)

ISO 19157 Annex D			ISO 19115
Completeness		Commission (number, rate, or duplicates) Omission (number or rate)	✓
Logical consistency			✓
	Conceptual consistency	Compliance / non-compliance: Number, rate	✓
	Domain consistency	Conformance / non conformance: Number, rate	✓
	Format consistency	Physical structure conflict: number, rate	✓
	Topological consistency	(slivers, overshoots etc)	✓
Positional accuracy	Absolute Relative Gridded	(RMSE, but also many other options!)	✓

Data quality measures (2 of 2)

ISO 19157 Annex D			ISO 19115
Temporal quality	Many choices for 'time accuracy'; chronological order		Temporal accuracy
Thematic accuracy	Classification correctness Non-quantitative attribute correctness Quantitative attribute correctness	(number or rate) (various choices)	✓
Data product specification		Pass / fail count or rate	As conceptual compliance

ISO 19157-1:2023 moves these to a register

- being defined in ISO 19157-3
- to be run by OGC
- machine readable definitions
- extensible

ISO/TS 19158:2012 *Quality assurance of data supply*

Assess quality control (by supplier) and quality assurance (by customer) using ISO 19131, ISO 19157 and principles from ISO 9000

- Short standard – only 7 substantive pages!
  - three informative annexes (examples; couple of pages each)
- Uses ISO 9000, ISO 19157, ISO 19131;

ISO/TS 19158:2012 *Quality assurance of data supply*

- Covers:
  - Quality control (by supplier) and quality assurance (by customer);
  - Project management;
  - Process outputs
  - Sub-process outputs
  - Knowledge workers (team and individual)

- Revision just starting, to IS – aiming for public enquiry around end of 2024

Upcoming ISO/TC 211 plenary weeks

- London, UK, 24-28 June 2024
- Sydney, Australia, 11-15 November 2024

Liaison representatives always welcome, either "face to face" or online (Zoom)!

- See https://committee.iso.org/home/tc211

Thank you

Contact us

Useful links:

https://committee.iso.org/sites/tc211

GeoLexica: https://isotc211.geolexica.org/

Resources (UML, XML, …):
https://committee.iso.org/sites/tc211/home/re.html

SDG case studies:

https://committee.iso.org/sites/tc211/home/standards-in-action/united-nations.html

Route information service video:

https://youtu.be/eCVOKJwAQwE?t=0)

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