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ISO TC 211/WG 9

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Geographic information — Observations, measurements and samples

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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, *Intelligent transport systems*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement), and in collaboration with the Open Geospatial Consortium (OGC).

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This second edition cancels and replaces the first edition (ISO 19156:2011), which has been technically revised.

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The main changes are as follows:

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— ~~The the~~ UML model ~~as well as and~~ the requirements/conformance class structure has been completely redesigned to address the contemporary modelling and observation data provision use cases.

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— ~~The the~~ fundamental Observation model has remained largely the same as in ~~the ISO 19156:2011 edition, with, but certain~~ carefully designed improvements and clarifications for the intended use ~~have been included~~.

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— ~~The the~~ Sample model has ~~also been refined, given, given~~ the integral nature of the Sample model, it has been decided to include that term in the name of the ~~standard document~~.

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~~Annex C has been added listing the technical note describing the changes from the earlier version is available as Annex C Observation and Sample models between ISO 19156:2011 and this document.~~

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Introduction

This document arises from work originally undertaken through the Open Geospatial Consortium's Sensor Web Enablement (SWE) activity. A set of interfaces and protocols was standardized through which applications and services are able to access sensors of all types, and observations generated by them, over the Web.

A new generation of geospatial standards is now emerging, based on general Web standards, architecture, and current practice, as described in W3C Spatial Data on the Web Best Practices.^[31] This includes several new standards for describing and publishing sensors and observations, such as the OGC SensorThings API^[22] and the W3C/OGC Semantic Sensor Network Ontology.^[28] This second edition of ISO 19156:2022 of the ~~Observations, measurements and samples Standard~~ (now named "Observations, Measurements and Samples", ~~or abbreviated to "OMS-for-short")~~ is informed by these recent developments. The focus of ~~this revision~~ revising ISO 19156:2011 is aimed at enabling the publication of observation data as part of the Web of data, while also supporting other means of data exchange.

The content presented ~~here derives in this document is derived~~ from the previous ~~version~~ edition published by Open Geospatial Consortium as OGC 10-004r3, ~~OGC Abstract Specification Geographic information — Observations and measurements (and also ISO 19156:2011)~~. A technical note describing the changes ~~from the earlier version is available as in comparison to ISO 19156:2011 is provided in Annex C.~~

The name and contact information of the maintenance agency for this document can be found at www.iso.org/maintenance_agencies www.iso.org/maintenance_agencies.

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Geographic information — Observations, measurements and samples

1 Scope

This document defines a conceptual schema for observations, for features involved in the observation process, and for features involved in sampling when making observations. These provide models for the exchange of information describing observation acts and their results, both within and between different scientific and technical communities.

Observations commonly involve sampling of an ultimate feature-of-interest. This document defines a common set of sample types according to their spatial, material (for *ex situ* observations) or statistical nature. The schema includes relationships between sample features (sub-sampling, derived samples).

This document concerns only externally visible interfaces and places no restriction on the underlying implementations other than what is needed to satisfy the interface specifications in the actual situation.

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 19107:~~2019~~, *Geographic information — Spatial schema*

ISO 19108:~~2002~~, *Geographic information — Temporal schema*

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

application schema

conceptual schema for data required by one or more applications

[SOURCE: ISO 19101-1:2014, 4.1.2]

3.2

coverage

feature that acts as a function to return values from its range for any direct position within its domain

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