

2 Overview

2.1 Name

INSPIRE data specification for the theme Oceanographic geographical features.

2.2 Informal description

Definition:

An Oceanographic Geographical Feature (Ocean Feature) is defined as “Physical conditions of oceans (currents, salinity, wave heights, etc.)” [Directive 2007/2/EC]

Description:

Historical versions of the theme definition are found in the INSPIRE IMS and Scoping papers which define an Ocean Feature as:

- The measurable physical conditions of oceans e.g. salinity, oxygen, other chemical components, currents. Representation e.g. as grids or other spatial organisation. Based on measurements directly or combined with models. (INSPIRE IMS, 2003)
- Physical conditions of oceans (e.g. currents, salinity, etc) represented as lines, grids or points. Includes spatial data sets based on measurements, on models or on a combination thereof and includes measurement locations (INSPIRE Scoping, 2004)
- Although the scope of the Directive says ‘physical conditions of the oceans’, the intent is for both physical and chemical conditions of the ocean. This is consistent with the Directive text that considers ‘salinity’ to be within scope and the INSPIRE scoping papers.

From these descriptions we expand the definition as follows:

- An OF is essentially a coverage (ISO 19126) describing the ocean. Examples in common use are
 - 1D Points / PointTimeSeries such as the results of an instrument at a fixed location measuring parameters over time
 - 2D Grids / GridSeries such as data from a numerical model or satellite over a gridded field and (optionally) repeated over time

Oceanographic Geographical Features are usually represented as Point and Grid observations. Although other representations are possible, Points and Grids are most commonly used and other representations are primarily for scientific investigation rather than providing a statement on the conditions of the ocean. Implementing other representations would be unduly complex and provide higher burdens on MS with limited benefit at this stage.

- The data can be an observation or simulation. As a simulation, forecasts of OF are allowed.
- The OF specification does not prescribe the property or phenomena of the ocean, only its representation. This is covered in more detail in the section on Data Capture.
- A OF is application or intent agnostic, i.e. it is not bound to any particular domain of application. For example suspended sediments measured for water quality reporting are treated in the same way as suspended sediments measured for coastal erosion management. The user may however choose to process the data in different ways.

Examples of Ocean Features

Based on the above scope, the following are examples of Ocean Features.

- Measurements of water temperature and salinity recorded by a buoy or fixed instrument at sea for the purpose of water quality reporting
- Measurements of ocean waves recorded by a buoy for the purpose of understanding a coastal flood hazards
- Gridded measurements of ocean colour from an earth observation satellite for the purpose of defining regions for water quality reporting.
- Monitoring of contaminants e.g. sampling for trace metals.
- Aggregated summary data e.g. climatic means.

What an Ocean Feature is not

- Direct measurements of biological phenomena such as phytoplankton¹³, zooplankton or any marine species counts, although proxy measurements of such phenomena such as Ocean Colour may be represented as Ocean Features.
- Derived products based on underlying observation and measurements¹⁴
 - E.g. exceedance plot, wave rose, isolines
- An Atmospheric Geographical Feature (AF – Annex III)
 - Winds for example are part of Atmosphere
- Elevation (EL – AnnexII)
 - Bathymetric measurements of the ocean depths
- A Sea Region (SR – Annex III)
 - Contours or areas of the Sea classified by their physical or chemical conditions

Definition:

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Description:

An Ocean Geographical Feature (OF) represents the (physical or chemical) properties of a Sea Region. This type of information is essentially a coverage describing the ocean and could be presented as a set of point data, gridded data, but also as vertical profiles through ocean depths and trajectories along the ocean surface. The Ocean Geographical Features theme employs the ISO 19156 Observations and Measurements standard for consistent encoding of measured, modelled or simulated data.

Entry in the INSPIRE registry: <http://inspire.ec.europa.eu/theme/of/>

2.3 Normative References

¹³ Measurements of ocean colour can be used to determine parameters such as Chl-a and these are within the scope of Sea Regions.

¹⁴ Such analysis is subjective to a particular purpose. Summary data e.g. ‘mean wave height’ is in scope.

[Directive 2007/2/EC] Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)

[ISO 19107] EN ISO 19107:2005, Geographic Information – Spatial Schema

[ISO 19108] EN ISO 19108:2005, Geographic Information – Temporal Schema

[ISO 19108-c] ISO 19108:2002/Cor 1:2006, Geographic Information – Temporal Schema, Technical Corrigendum 1

[ISO 19111] EN ISO 19111:2007 Geographic information - Spatial referencing by coordinates (ISO 19111:2007)

[ISO 19113] EN ISO 19113:2005, Geographic Information – Quality principles

[ISO 19115] EN ISO 19115:2005, Geographic information – Metadata (ISO 19115:2003)

[ISO 19118] EN ISO 19118:2006, Geographic information – Encoding (ISO 19118:2005)

[ISO 19123] EN ISO 19123:2007, Geographic Information – Schema for coverage geometry and functions

[ISO 19125-1] EN ISO 19125-1:2004, Geographic Information – Simple feature access – Part 1: Common architecture

[ISO 19135] EN ISO 19135:2007 Geographic information – Procedures for item registration (ISO 19135:2005)

[ISO 19138] ISO/TS 19138:2006, Geographic Information – Data quality measures

[ISO 19139] ISO/TS 19139:2007, Geographic information – Metadata – XML schema implementation

[ISO 19157] ISO/DIS 19157, Geographic information – Data quality

[OGC 06-103r4] Implementation Specification for Geographic Information - Simple feature access – Part 1: Common Architecture v1.2.1

NOTE This is an updated version of "EN ISO 19125-1:2004, Geographic information – Simple feature access – Part 1: Common architecture".

[Regulation 1205/2008/EC] Regulation 1205/2008/EC implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata

[Regulation 976/2009/EC] Commission Regulation (EC) No 976/2009 of 19 October 2009 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards the Network Services

[Regulation 1089/2010/EC] Commission Regulation (EU) No 1089/2010 of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services

[ISO 19156] ISO 19156: 2011, Geographic information - Observations and measurements

2.4 Terms and definitions

General terms and definitions helpful for understanding the INSPIRE data specification documents are defined in the INSPIRE Glossary¹⁵.

2.5 Symbols and abbreviations

AC-MF	Atmospheric Conditions & Meteorological Geographical Features (INSPIRE Data Specification)
ATS	Abstract Test Suite
CSML	Climate Science Modelling Language
EC	European Commission
EC	European Commission
EEA	European Environmental Agency
EF	Environmental Monitoring Facilities (INSPIRE Data Specification)
ETRS89	European Terrestrial Reference System 1989
ETRS89-LAEA	Lambert Azimuthal Equal Area
EU	European Union
EVRS	European Vertical Reference System
GCM	General Conceptual Model
GML	Geography Markup Language
INSPIRE	Infrastructure for Spatial Information in Europe
IR	Implementing Rule
ISDSS	Interoperability of Spatial Data Sets and Services
ISO	International Organization for Standardization
ITRS	International Terrestrial Reference System
LAT	Lowest Astronomical Tide
LMO	Legally Mandated Organization
O&M	ISO 19156 Observations and Measurements
OF	Oceanographic Geographical Feature
SDIC	Spatial Data Interest Community
SLD	Styled Layer Descriptor
SOS	OGC Sensor Observation Service
SR	Sea Regions (INSPIRE Data Specification)
TG	Technical Guidance
TWG	Thematic Working Group
UML	Unified Modeling Language
URI	Uniform Resource Identifier
UTC	Coordinated Universal Time

¹⁵ The INSPIRE Glossary is available from <http://inspire-registry.jrc.ec.europa.eu/registers/GLOSSARY>

WCS	OGC Web Coverage Service
WFS	OGC Web Feature Service
WMS	OGC Web Map Service
XML	EXtensible Markup Language

2.6 How the Technical Guidelines map to the Implementing Rules

The schematic diagram in Figure 1 gives an overview of the relationships between the INSPIRE legal acts (the INSPIRE Directive and Implementing Rules) and the INSPIRE Technical Guidelines. The INSPIRE Directive and Implementing Rules include legally binding requirements that describe, usually on an abstract level, *what* Member States must implement.

In contrast, the Technical Guidelines define *how* Member States might implement the requirements included in the INSPIRE Implementing Rules. As such, they may include non-binding technical requirements that must be satisfied if a Member State data provider chooses to conform to the Technical Guidelines. Implementing these Technical Guidelines will maximise the interoperability of INSPIRE spatial data sets.

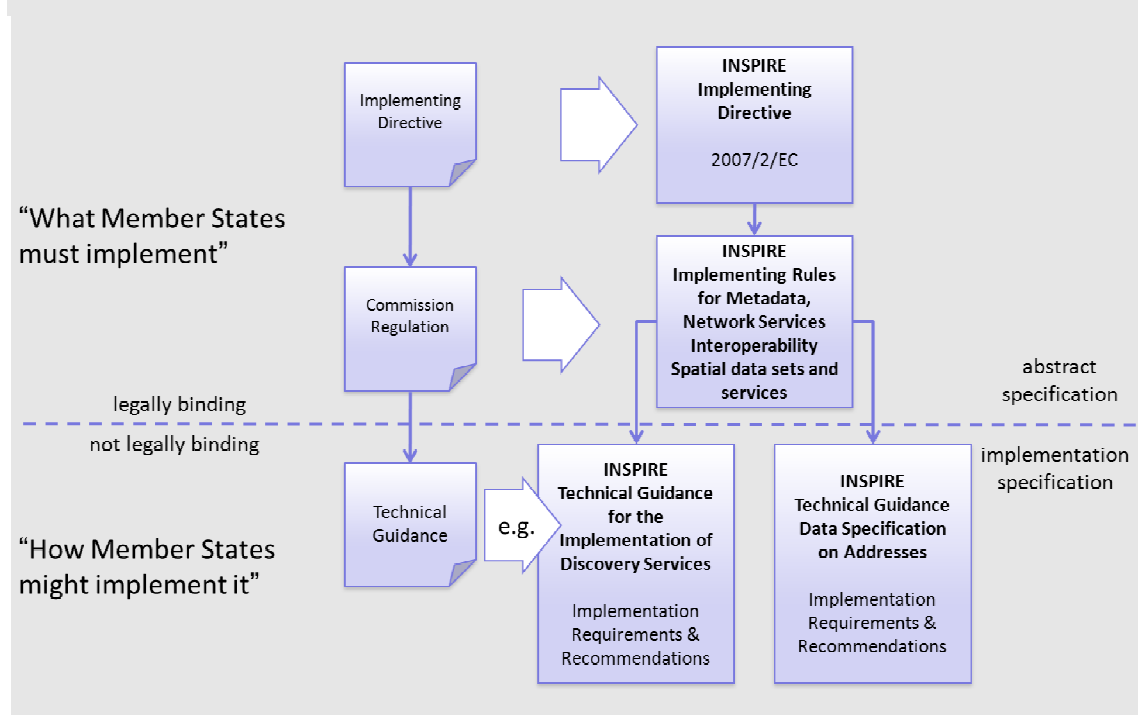


Figure 1 - Relationship between INSPIRE Implementing Rules and Technical Guidelines

2.6.1 Requirements

The purpose of these Technical Guidelines (Data specifications on *Oceanographic geographical features*) is to provide practical guidance for implementation that is guided by, and satisfies, the (legally binding) requirements included for the spatial data theme Oceanographic geographical features in the Regulation (Implementing Rules) on interoperability of spatial data sets and services. These requirements are highlighted in this document as follows:

IR Requirement
Article / Annex / Section no.

Title / Heading

This style is used for requirements contained in the Implementing Rules on interoperability of spatial data sets and services (Commission Regulation (EU) No 1089/2010).

For each of these IR requirements, these Technical Guidelines contain additional explanations and examples.

NOTE The Abstract Test Suite (ATS) in Annex A contains conformance tests that directly check conformance with these IR requirements.

Furthermore, these Technical Guidelines may propose a specific technical implementation for satisfying an IR requirement. In such cases, these Technical Guidelines may contain additional technical requirements that need to be met in order to be conformant with the corresponding IR requirement *when using this proposed implementation*. These technical requirements are highlighted as follows:

TG Requirement X This style is used for requirements for a specific technical solution proposed in these Technical Guidelines for an IR requirement.

NOTE 1 Conformance of a data set with the TG requirement(s) included in the ATS implies conformance with the corresponding IR requirement(s).

NOTE 2 In addition to the requirements included in the Implementing Rules on interoperability of spatial data sets and services, the INSPIRE Directive includes further legally binding obligations that put additional requirements on data providers. For example, Art. 10(2) requires that Member States shall, where appropriate, decide by mutual consent on the depiction and position of geographical features whose location spans the frontier between two or more Member States. General guidance for how to meet these obligations is provided in the INSPIRE framework documents.

2.6.2 Recommendations

In addition to IR and TG requirements, these Technical Guidelines may also include a number of recommendations for facilitating implementation or for further and coherent development of an interoperable infrastructure.

Recommendation X Recommendations are shown using this style.

NOTE The implementation of recommendations is not mandatory. Compliance with these Technical Guidelines or the legal obligation does not depend on the fulfilment of the recommendations.

2.6.3 Conformance

Annex A includes the abstract test suite for checking conformance with the requirements included in these Technical Guidelines and the corresponding parts of the Implementing Rules (Commission Regulation (EU) No 1089/2010).