

2 Overview

2.1 Name

INSPIRE data specification for the theme *Environmental Monitoring Facilities*.

2.2 Informal description

Definition:

Location and operation of environmental monitoring facilities includes observation and measurement of emissions, of the state of environmental media and of other ecosystem parameters (biodiversity, ecological conditions of vegetation, etc.) by or on behalf of public authorities [Directive 2007/2/EC].

Description:

The scope as defined in the INSPIRE directive includes two aspects. The environmental monitoring facility as a spatial object in the context of INSPIRE and observations and measurements linked to the environmental monitoring facility.

After Version 1 of data specification for Annex II and III themes it was decided to address the observation and measurement aspect in an additional work group with the task to tailor the ISO 19156 standard for Observations and Measurements (O&M) for harmonised use in INSPIRE data specification. A specific guideline paper (DS-D2.9) is available.

The overall target of theme EF data specification is to provide a generic model which can be used across various domains and leave the necessary freedom to thematic domains to bring in specific needs while keeping a shared structure. So the data specification provides a common structure but not a thematic harmonisation across domains.

The recursive structure might look complex but it enables domain communities to specify environmental monitoring facilities and the linked observations and measurements to the appropriate level of detail which is relevant for data exchange. This data specification document tries to keep the balance between being generic (fit across domain) and being not too abstract and readable by domain experts without UML expertise for review and commenting. EF defines ONLY vocabulary which has to be used cross domains and provides an option to access information from a cross domain point of view.

Descriptive elements in natural language and examples are, by nature of a cross domain usable data specification, never complete. The experts of the thematic working group provided examples from their domains. The examples focus on explaining the structure of our model to non UML expert from thematic domains.

Covered by EF data specification:

Description of environmental monitoring facilities is a basic element to link Observations and Measurements to a spatial feature. Monitoring facilities can be grouped to monitoring networks as a number of facilities belong to monitoring programmes with long term perspective (mostly induced by legislation) or can be included in specific monitoring activities.

Legislation as a basic element to establish environmental monitoring facilities provides important background information for public authorities dealing with the environment. As observations and measurements linked to an environmental monitoring facility contribute to any kind of reporting (obligatory and voluntary) a link is included in the data specification to establish a relationship between environmental monitoring facilities and reports to be delivered or provided. This is meant to optionally support e-reporting in the future.

The specification covers all kinds of environmental monitoring using fixed stations, moving equipment or remote sensing and can be applied to the thematic needs of the various domains.

Access rights and data protection on station level/observation points is a highly relevant aspect for special monitoring like in nature protection and biodiversity monitoring as a publication of the monitoring station/facility might change the observed item and therefore make the monitoring itself obsolete. Aspects related to the appropriate level of detail and sharing of data and information according to these scaling are in scope of the theme environmental monitoring facilities. Others aspects related to access rights and data protection are out (see the out of scope part).

Not covered by EF data specification:

- Domain specific semantic and appropriate structure of those semantic elements,
- Guidance on the appropriate level of detail as this is domain specific,
- Examples covering thematic areas addressed by other themes of INSPIRE Annexes as domain expertise is not available in TWG EF,
- The correct management of access rights and data protection is out of scope for this data specification.

Definition:

Location and operation of environmental monitoring facilities includes observation and measurement of emissions, of the state of environmental media and of other ecosystem parameters (biodiversity, ecological conditions of vegetation, etc.) by or on behalf of public authorities [Directive 2007/2/EC].

Description:

The theme scope includes two main aspects; the first is the environmental monitoring facility as a spatial object, the second is the data obtained through observations and measurements taken at this facility, encoded using the ISO 19156 standard. This information is complemented by further administrative information pertaining to the facility and activities undertaken there such as networks the facility is part of or programmes the facility provides data to. The *Environmental Monitoring Facilities* theme is cross-cutting to environmental domains; thus, the generic model allows the necessary freedom to bring in thematic specific needs while keeping a shared data structure.

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

2.3 Normative References

[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 19105] EN ISO 19105:2000, Geographic information -- Conformance and testing

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

2.4 Terms and definitions

General terms and definitions helpful for understanding the INSPIRE data specification documents are defined in the INSPIRE Glossary¹.

Specifically, for the theme *Environmental Monitoring Facilities*, the following terms are defined:

Environmental Monitoring Facility (EMF). The definitions of Environmental Monitoring Facility (EMF) and related concepts are in detail provided in the feature catalogue. In addition, it is mentioned here as this element is core to understanding the data specification EF. Please be aware that an EMF does not belong to the definition taken for the thematic working group Buildings, Agricultural and aquacultural facilities, Production and industrial facilities and Utility and Governmental services. As Environmental monitoring facilities can be mobile they do not fit into the definition taken from a building/fixed installation point of view.

This aspect was discussed and agreed between the thematic working groups and thematic teams are aware of it. But for somebody new to the data specification EF (and others) it is essential to keep this in mind. Change of terminology was not feasible as we have to stick to the terms as they are defined by the directive.

2.5 Symbols and abbreviations

¹ The INSPIRE Glossary is available from <http://inspire-registry.jrc.ec.europa.eu/registers/GLOSSARY>

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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.

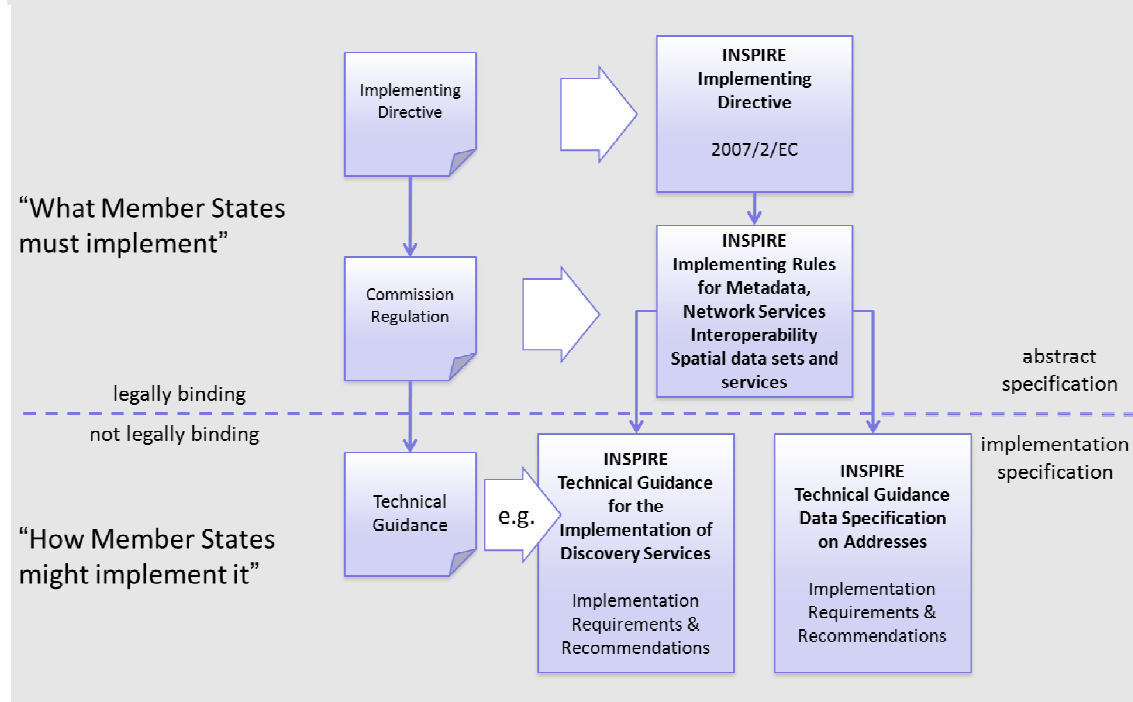


Figure 1 - Relationship between INSPIRE Implementing Rules and Technical Guidelines

2.6.1 Requirements

The purpose of these Technical Guidelines (Data specifications on *Environmental Monitoring Facilities*) is to provide practical guidance for implementation that is guided by, and satisfies, the (legally binding) requirements included for the spatial data theme *Environmental Monitoring Facilities* 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).