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Infrastructure for Spatial Information in the European Community

INSPIRE Data Specification Development

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Focus on drafting INSPIRE data specifications

- Overview
- Methodology
- Annex I themes testing
- Next steps and conclusions







Overview of INSPIRE Data Specifications process

Excerpt from Roadmap related to data specifications Adoption

Milestone date	Article	Description
2007-05-15		Entry into force of INSPIRE Directive
2009-05-15	9(a)	Adoption of IRs for the interoperability and harmonisation of spatial data sets and services for Annex I spatial data themes
2012-05-15	9(b)	Adoption of the IR s for the interoperability and harmonization of spatial data sets and services for Annex II and III





Overview of INSPIRE Data Specifications process

Excerpt from Roadmap related to data specifications Implementation

Milestone date	Article	Description
2011-05-15	7§3, 9(a)	Newly collected/ restructured Annex I spatial data sets available
2014-05-15	7§3, 9(b)	Newly collected/restructured Annex II/III spatial data sets available
2016-05-15	7§3, 9(a)	Other Annex I spatial data sets available
2019-05-15	7§3, 9(b)	Other Annex II and III spatial data sets available





Overview of INSPIRE Data Specifications process - Progress

- The development of INSPIRE Implementing rules for the interoperability and, where practicable, harmonisation of spatial data sets and services follow a two-step approach:
 - Development of conceptual framework and specification methodology.
 - DS-D 2.3 Definition of Annex Themes and Scope
 - DS-D 2.5 Generic Conceptual Model (GCM),
 - DS-D 2.6 Methodology for Specification Development.
 - DS-D 2.7 Guidelines for Encoding
 - Development of data specifications for each data theme based on the
 - conceptual framework
 - common specification development methodology,
 - and on the INSPIRE roadmap



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Overview of INSPIRE Data Specifications process – Progress 2

Specification component	Based on	Status
Definition of the Annex Themes and Scope	INSPIRE position papers Selected reference materials Comments from stakeholders	Baseline version published on INSPIRE website
Generic conceptual Model	EN ISO 19101, 19103, 19107, 19108, 19109, 19110, 19111, 19112, 19115, 19123, 19126, 19131, ISO 19136, 19139, ISO/IEC 19501, OGC 06-103r3; Comments from stakeholder consultation	Baseline version published on INSPIRE website
Methodology for specification development	Methodology developed by the RISE project Selected reference materials from stakeholders Comments from stakeholder consultation	Baseline version published on INSPIRE website
Guidelines for encoding	EN ISO 19118, ISO 19136, 19139 INSPIRE Generic Conceptual Model	Draft is being revised following the stakeholder consultation
Data specifications	EN ISO 19131. Materials of the INSPIRE conceptual framework. Relevant reference materials submitted by the SDICs and LMOs.	Activity started in February 2008. Draft specifications ready in 2009 for Annex I and in 2012 for Annex II and III. Testing Annex I starts in December 2008





Roadmap

Description	Who	Start	End
Task 1: User requirements and use cases	TWG	2008-03	2008-05
Task 2: Analysis of the relevant reference materials	TWG	2008-02	2008-05
Task 3: "As-is" analysis according to the methodology in D2.6	TWG	2008-02	2008-08
Task 4: Gap analysis according to the methodology in D2.6	TWG	2008-02	2008-08
Task 5: Drafting data specification of Annex I data themes	TWG	2008-05	2009-03
Task 6: Testing of draft data specifications for themes	SDICs, LMOs	2008-12	2009-03
Task 7: Preparation and adoption of IR for the interoperability and harmonisation of spatial data sets and services for Annex I spatial data themes	CT, TWG INSPIRE Committee	2009-03	2009-07



Stakeholders' participation 2

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TWGs



Data specifications are developed by Thematic Working Groups consisting of domain experts proposed by the stakeholders (SDIC/LMO) and a facilitator and editor nominated by the Commission **8 Thematic Working Groups on** Annex I data SE NO PL 'NL DE BE HU FR ES



D2.6 Methodology for the development of data specifications

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Methodology

۲	INSPIRE Infrastructure for Spatial Information in Europe
Draftin Metho specifi	g Team "Data Specifications" dology for the development of data cations
Title	Drefling Team "Data Specifications" - deliverable D2.6: Methodology for the devicement of data specifications
Creator	INSPIRE Drafting Team "Data Specifications"
Date	2007-08-23
Subject	Methodology for the development of data specifications
Publisher	INSPIRE Drating Team "Data Specifications"
Тура	Teat
Description	Proposed methodology for the development of INSPIRE data specifications for the spatial data themes as specified in the Annexes of the INSPIRE Directive
Contributor	Members of the INSPIRE Drafting Team "Data Specifications"
Format	MS Word (doc)
Source	
	Open access; commanis limited to registered SOICs and LMOs
Rights	P3.6 3.6 Final day
Rights Identifter	D2.5_X2.0_FM1.00C
Rights Identifter Language	Dn
Rights Identifier Language Relation	En na

- proposed by the INSPIRE Drafting Team Data Specifications
- based on guidelines from OGC and results of the RISE project
- version 2.0 has passed review by SDICs and LMOs (1148 comments)
- Guideline for the INSPIRE Thematic Working Groups (TWGs)
- Baseline version published on the INSPIRE website



D2.6 Methodology for the development of data specifications

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Step-wise methodology





Testing of INSPIRE Annex I Themes

- Purpose and expectations of the testing
- Transformation testing
- Application testing
- Cost-benefit considerations





- Scope : Annex I data specs (9 themes)
- Purpose and expectations:
 - Feedback to EC, Drafting team and TWG's
 - Identification of problem areas
 - Refinement of the data specs
 - Gathering Cost-benefit information
 - Feedback to SDIC/LMO's (testing partners)
 - Gaining experience in becoming INSPIRE compliant
 - Assess readiness/effort needed
 - Preview of the legal INSPIRE obligations
 - Feedback to impact the data specs
 - Feedback to other partners
 - Demonstrate usefulness of software tools





- Expected outcome
 - Continuous feedback towards TWG's, drafting team and INSPIRE CT
 - Testing report according to provided template, providing information on
 - architecture used
 - applied transformation methodology
 - testing methodology
 - test results and experiences
 - cost-benefit considerations
 - test report per "test case"





Transformation testing

- Scope (transformation testing only):
 - Transform the local data sets into INSPIRE compliant data sets
 - Per theme
 - Main topics to test (full data spec to be tested)
 - 1. Data transformation
 - 2. Data quality and metadata
 - 3. Portrayal





Application testing

- Definition:
 - Use of INSPIRE data for addressing real-world use cases (crossborder, cross-theme, ...)
 - Per use cases
- Purpose:
 - to show whether the chosen <u>use case can be implemented using</u> data that is harmonised according to an <u>INSPIRE data</u> specification
 - to illustrate <u>benefits</u> of a scenario that uses <u>harmonised INSPIRE</u> <u>data</u> (called INSPIRE scenario) by comparing the required efforts to a baseline scenario that does not use INSPIRE-compliant data.





Cost-Benefit Considerations

- The cost of implementing test environment helps to <u>estimate the</u> <u>cost of the full-scale implementation</u>
- Usefulness of the test environment as a training environment
- Comparison of costs and benefits of alternative methods (systematic vs. ad-hoc harmonisation, on-the-fly vs. off-line)
- Identification of missing data and the processes necessary for implementation of INSPIRE and/or NSDIs





CBC in transformation testing

- Estimate of efforts needed for transformation (focus on cost aspect)
 - Labour (person-month)
 - Initial investments (hardware, software, training)
 - Exploitation of existing tools and know-how
 - Resources needed for maintaining the operational transformation service
 - Frequency/Size of data requests





CBC in application testing

- Demonstration of (focus on benefits)
 - Economies in terms of time savings related to preparatory work (sorting out data integration problems)
 - Economies in the terms of the cost of tools not need for performing the usual tasks
 - Interaction and benefits of cross theme harmonisation
 - How and to what extent can existing tools and know-how be exploited





Example Protected Sites •Data Specification Development

INSPIRE Consolidated UML Model - Generated 1 October 2008 (1st draft, Revision 258)





TWG composition



	Name	Country	Supporting SDIC/LMO
Facilitator	Markus Seiftert	German	Bavarian Agency for Surveying and Geoinformation
Editor	Kristin Stock		Keith Porter
Member	Dirk Hinterlang	German	Landesamt für Natur, Umwelt und Verbraucherschutz NRW
Member	Rania Spyropoulou	EEA	European Environment Agency
Member	Keith Porter	United Kingdom	Natural England NESDIC
External	Franz Daffner	EEA	European Environment Agency
External	Andrew Newman	United Kingdom	Natural England NESDIC
Observer	András Attila TAKÁCS	Hungary	Hungarian Ministry for Environment and Water





Definition

A Protected Site is an area designated or managed within a framework of international, Community and Member States' legislation to achieve specific conservation objectives. Protected Sites and Protected Areas are synonymous.

Overview description

According to the International Union for the Conservation of Nature (IUCN) a Protected Site is an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.

- Within the INSPIRE context, Protected Sites may be located in terrestrial, aquatic and/or marine environments, and may be under either public or private ownership.
- They may include localities with protection targets defined by different sectors and based on different objectives, especially dedicated to the conservation of nature, the protection and maintenance of biological diversity and of natural resources. Protected sites may also apply protection to person-made objects including buildings; pre-historic and historic archaeological sites; other cultural objects, or sites with specific geological, hydrogeological or geomorphological value. The Sites may receive protection due to more than one type of objective, and may have a double or multifarious designation status.





Scope 2

- Examples of legislation and policies regulating protected sites are:
 - the Habitats Directive (1992) (Directive 92/43/EC);
 - the Birds Directive (1979) (Directive 79/409/EC);
 - the Water Framework Directive (200) (Directive 2000/60/EEC)
 - the World Heritage Convention (1975);
 - the Ramsar Convention (1971);
 - the Barcelona Convention (1976);
 - the Helsinki Convention (1974);
 - the OSPAR Convention (1992) and
 - the national laws of each European country and EU and international sector policies (for example, relating to forests or fisheries).





Scope 3

- This Specification identifies three profiles of Protected Sites, each for a different purpose:
 - Simple: A very limited set of fundamental attributes, including geometry, identifier, name and legal foundation date and document reference. Only current Protected Areas are included.
 - Full: The full model including all attributes and historical as well as current Protected Areas, but with most attributes being optional, so values may be omitted.
 - Natura2000: The full model with all attributes and historical as well as current Protected Areas, and with mandatory attributes required for updating and maintaining of Natura2000 site data by Member States. Member States may use this profile to provide Natura2000 site data.



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Name of the use-case	Description	
Generic Spatial Report on Protected Sites	The user analyzes cross-boarder datasets on PS up to a European extent by means of a GIS-application to create overview-maps and/or tabulations on PS-data. The results will be part of special reports of different kinds (e.g. under Art. 17 Habitat Directive) and specified elsewhere (e.g. under SEIS).	
Naively Query and View Protected Sites	The user uses a publicly accessible (probably web based) GIS to zoom/pan to or find, by gazetteer search, the location of interest and display the data on screen.	
Expertly Query, View, Visualise and Analyse Protected Sites	The scenario for the Expertly Query, View, Visualise and Analyse Protected Sites use case is that a user needs to ensure that the protected site will not be adversely affected by any proposed land-use change. This is a routine requirement of any agency responsible for administering protected sites systems through formal consultation from other legitimate land use planning agencies.	
Download Protected Sites Data	The user downloads protected sites data and associated metadata in a selected area and with selected feature types included.	
Provide Protected Sites Data to INSPIRE	The user is an EU member state, and prepares and provides its data to the INSPIRE process, in the form of a static data set, or served as a web service conforming to one of the OGC specifications.	



Content

- 1 Scope (of the Document)
- 2 Overview
- 3 Specification scopes
- 4 Data product identification
- 5 Data content and structure
- 6 Reference systems
- 7 Data quality

- 8 Metadata
- 9 Delivery
- 10 Data Capture (optional)
- 11 Portrayal
- 12 Additional information (optional)

Annex A (normative) Abstract Test Suite







in Euro



Data Model – Full profile

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Data Model – Natura 2000 profile

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INSPIRE INSPIRE Instruction Instruction





Specification Elements 1

- Feature Catalogue
 - 14 types
 - 5 enumerations
 - 10 codelists
- Reference Systems
 - Spatial: ETRS89/ITRS
 - Temporal: Gregorian Calendar, UTC
 - Projections: LAEA, LCC, TMzm
 - Units of measurements
- Quality
 - Best available recommended
 - Documentation according to ISO/TS 19138
 - Omission, topological consistency, conceptual consistency, positional, thematic, and temporal accuracy,





Specification Elements 2

- Metadata
 - dataSetURI,graphicOverview, extent, spatial resolution, DQ_CompletnessOmission, maintenance, contact, feature types, update scope, topology level, portrayalCatalogueCitation, transfer size, on-line geographicIdentifier
- Delivery medium
- Encoding
- Data capture
- Portrayal



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«fea	ntureType» Prote	cted Sites UML Model::ActivitiesInProtectedArea
	Definition:	Impacts resulting from human activities or natural process that positively or
		negatively affect the conservation status of the Protected Area. Information
		needed to inform evaluation of conservation status of a Protected Area. This
		includes management activities such as grazing or cutting, land uses such as
		mineral extraction or transport and natural processes such as disease fluvial
		erosion.
	Subtype of:	ProtectedAreaClassification
	Status:	Proposed
	Stereotypes:	«featureType»
Attr	ibute: intensity	
	Value type:	AssessmentType2
	Multiplicity:	0,,1
	Definition:	The intensity of the activity's influence on the site.
	Stereotypes:	«voidable»
	Collection	
	Constraints:	
Attr	ibute: influence	
	Value type:	AssessmentType3
	Multiplicity:	0,,1
	Definition:	The nature of the influence of the activity on the site (positive, negative or neutral).
	Stereotypes:	«voidable»
	Collection	
	Constraints:	
Attr	ibute: activity	
	Value type:	ActivityType
	Multiplicity:	11
	Definition:	The activities that occur on the site using the Natura2000 activity types from Appendix E in the <u>Natura</u> 2000 explanatory notes (Standard Data Form Item 6.1).
	Stereotypes:	«voidable»
	Collection	
	Constraints:	
Ass	ociation role: ha	IsActivities
	Value type:	Protected Sites UML Model: ActivitiesInProtectedArea
	Multiplicity:	0*
	Definition:	The link between a Protected Site and the activities that occur on the site.
	Stereotypes:	
	Collection	
	Constraints:	





Common issues	Data modeling issues
Is there a default CRS valid for all thematic data models? Have each model establish a link to this CRS and ISO 19111 respectively?	How we should specify portrayal rules, symbols etc. (SLD?)?
 TWG PS wants to define different levels of conformity: Conformance to NATURA2000 - more elements are mandatory. Conformance to nationally designated areas - less elements are mandatory Is the application of profiles the right way to define such conformance levels or are there other possibilities? 	TWG PS wants to introduce default values for some enumerations. Is there a common approach for that?
Optional attributes: In some cases it is necessary to express the difference between an attribute that is not applicable in an application and the other case when the attribute in gerneral is applicable but the inquiry comes to the conclusion that this attribute cannot be applied in this specific situation.	Object identifier: Should any feature type carry an OID?
Metadata: TWG PS decided to use the Metadata IR as core elements with some additional elements for PS. The ISO core will be ignored. Is ISO 19115 conformance obligatory?	Should enumeration have initial values or nor or is this optional?
Besides the regular SDIC/LMO review TWG PS wants to address specificly those countries that are not involved in the IR developing process. Especially TWG PS is a very small group covering just a few countries. Is there a possibility to reach directly other countries?	





Testing of INSPIRE Annex III Themes

- Under the preparation
- Various scenarios forseen
- INSPIRE Annex III data specification testing Call for participation



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Testing communication platform: Wiki http://inspire-twg.jrc.ec.europa.eu/







Outcomes Cross-TWG Meeting / Testing state of play

- Comment resolution internal consultation
 - TWGs currently processing 1000 comments
- Planning
 - TWGs will not be able to meet original deadline for v2 of the data specification
 - New deadline: 28 Nov ⇒ available to testing participants 1st week of December
 - New end of testing: 1st week of March 2009
 - New testing road map will be published on the wiki



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Thank you for your attention !