

Session 1 – Pillars of INSPIRE data interoperability

Data Specifications

Andrej Abramić



ECOAQUA
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EMODnet-INSPIRE technical workshop
7-8 December 2015, Brussels

Research and Technology to enhance excellence in maritime development under an Ecosystem approach



Interoperability???



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North America Grounded NEMA 5-15	Japan Non-grounded JIS C 8303	Europe German style CEE7/4 Schuko	Europe French style Schuko	Europe/Russia Non-grounded CEE7/16 Europlug	Great Britain Grounded BS-1363	Great Britain "Shaver socket" BS-4573
						
Australia/China Grounded AS-3112	Italy Grounded CEI 23-16	Switzerland Grounded SEV-1011	Denmark Grounded GRAF 1962/DB	Israel Grounded SI 32 (IS 16A-R)	India Grounded BS-546 "Small"	South Africa Grounded BS-546 "Large"



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Interoperability deals with:

- 24 official languages
- 3 official alphabets
- Different institutional setups
- Diverse data governance
- Celebrated diversity



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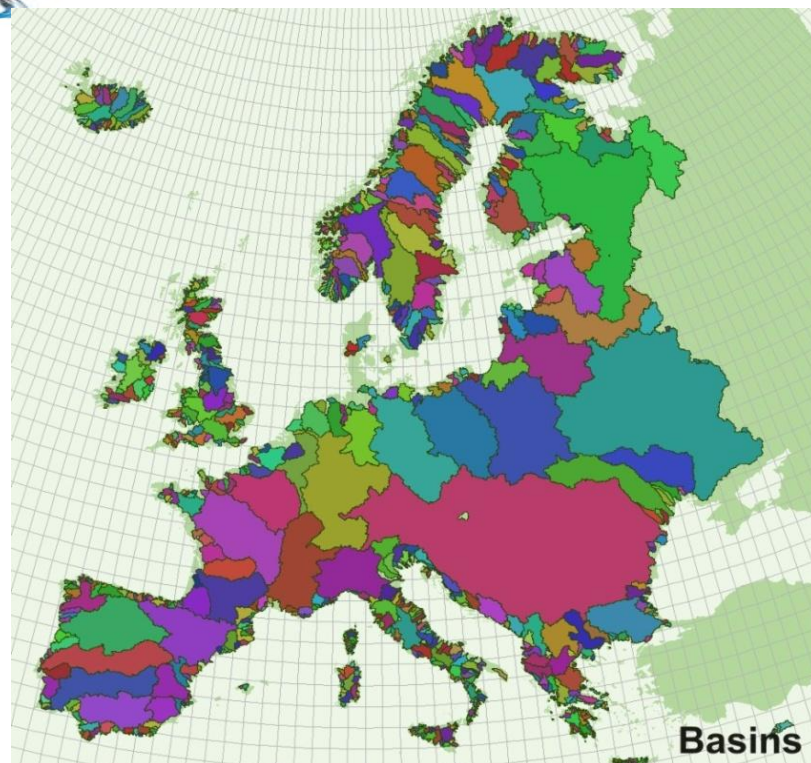
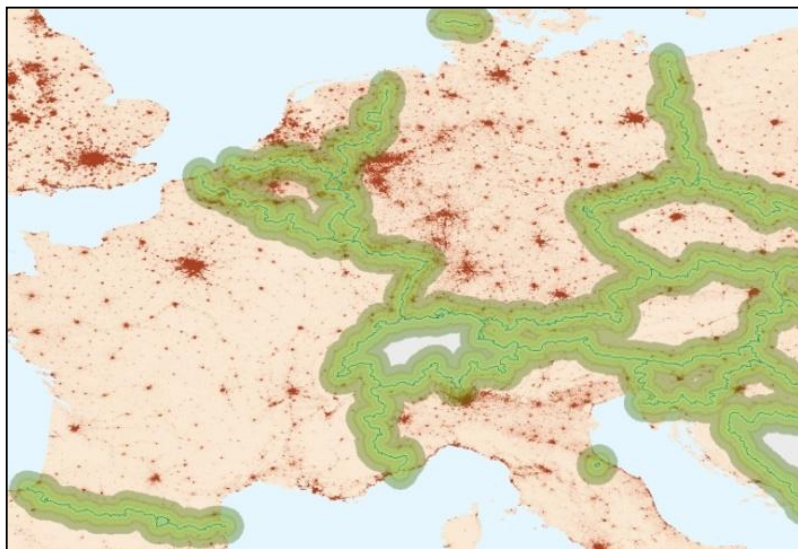




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Motivation for the interoperability and development of European SDI

- Natural Disasters and as well as other environmental phenomena do not stop at national borders!
- 20% of the EU citizens (115 million) live within 50 Km from a border



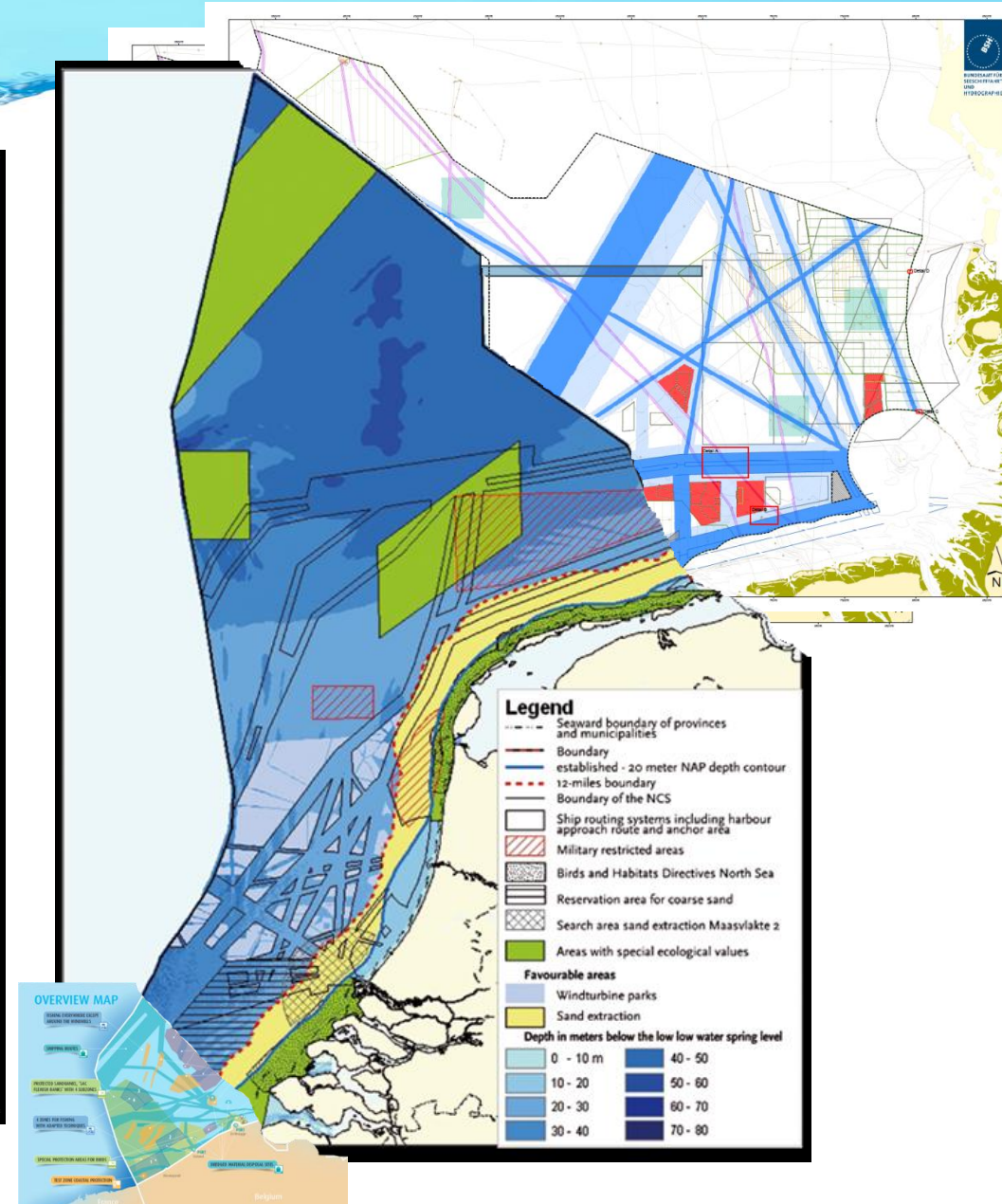
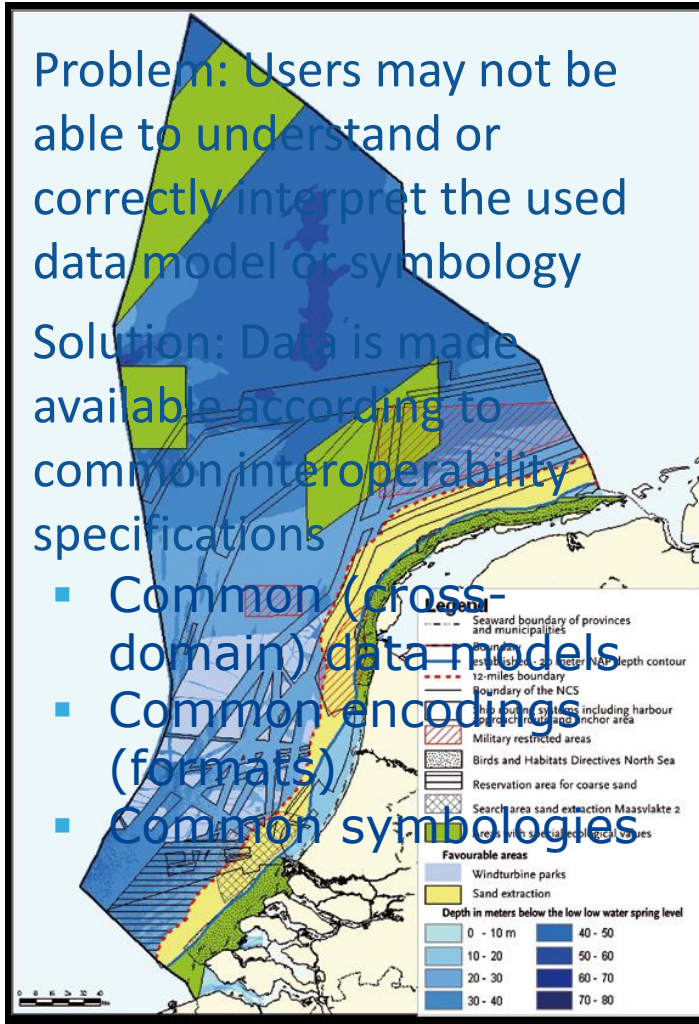
- 70% of all fresh water bodies in Europe are part of a trans-boundary river basin
- The EU Water Framework Directive 2000/60/EC - *integrated river basin management* for Europe



Marine Spatial Planning - advanced EU examples

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- Problem: Users may not be able to understand or correctly interpret the used data model or symbology
- Solution: Data is made available according to common interoperability specifications
 - Common (cross-domain) data models
 - Common encodings (formats)
 - Common symbologies





INSPIRE thematic scope

Annex I

1. Coordinate reference systems
2. Geographical grid systems
3. Geographical names
4. Administrative units
5. Addresses
6. Cadastral parcels
7. Transport networks
8. Hydrography
9. Protected sites

Annex II

1. Elevation
2. Land cover
3. Ortho-imagery
4. Geology

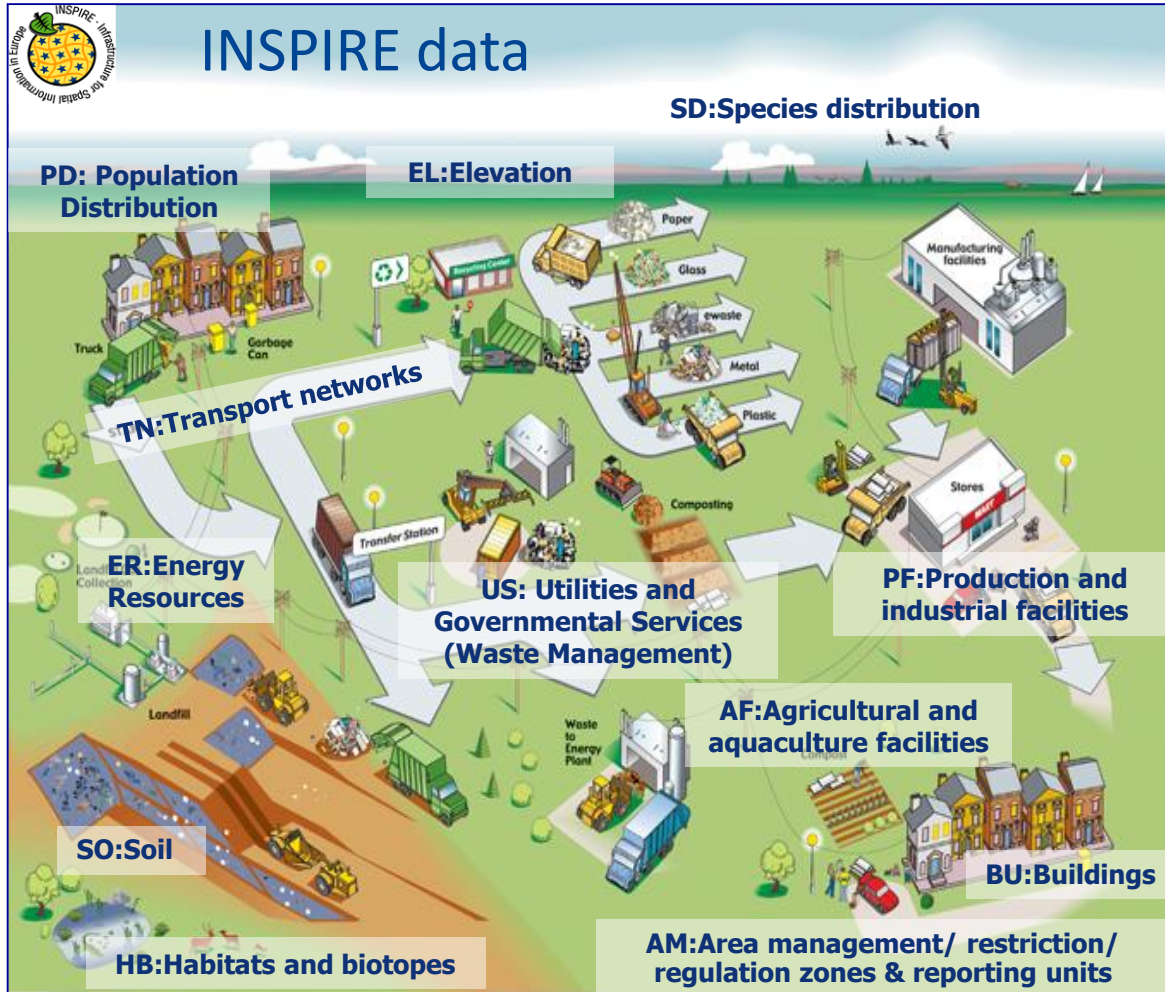
Annex III

1. Statistical units
2. Buildings
3. Soil
4. Land use
5. Human health and safety
6. Utility and governmental services
7. Environmental monitoring facilities
8. Production and industrial facilities
9. Agricultural and aquaculture facilities
10. Population distribution – demography
11. Area management/ restriction/regulation zones & reporting units
12. Natural risk zones
13. Atmospheric conditions
14. Meteorological geographical features
15. Oceanographic geographical features
16. Sea regions
17. Bio-geographical regions
18. Habitats and biotopes
19. Species distribution
20. Energy Resources
21. Mineral resources



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Cross-sector data interoperability



Data from other sectors

Measurement	Minimum	Maximum	Mean	Standard Deviation	Standard Error of Mean	Minimum	Maximum	Mean	Standard Deviation	Standard Error of Mean
Waste	0	100	50	30	3	0	100	50	30	3

Measurement	Minimum	Maximum	Mean	Standard Deviation	Standard Error of Mean	Minimum	Maximum	Mean	Standard Deviation	Standard Error of Mean
PRTR	0	100	50	30	3	0	100	50	30	3

SEVESO

- Urban Planning
- Environmental Impact Assessment
- Risk Management
- Waste Management Plans

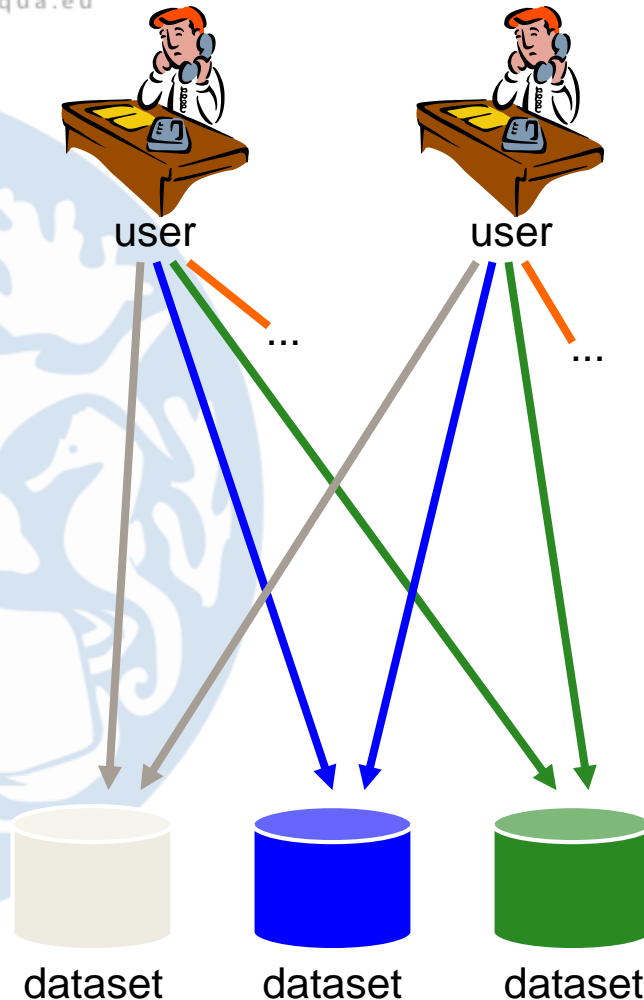
...



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Data interoperability

(pre**INSPIRE** situation)



The starting point ...

- Access to spatial data in various ways
- User has to deal with interpreting heterogeneous data in different formats, identify, extract and post-process the data he needs
→ lack of interoperability

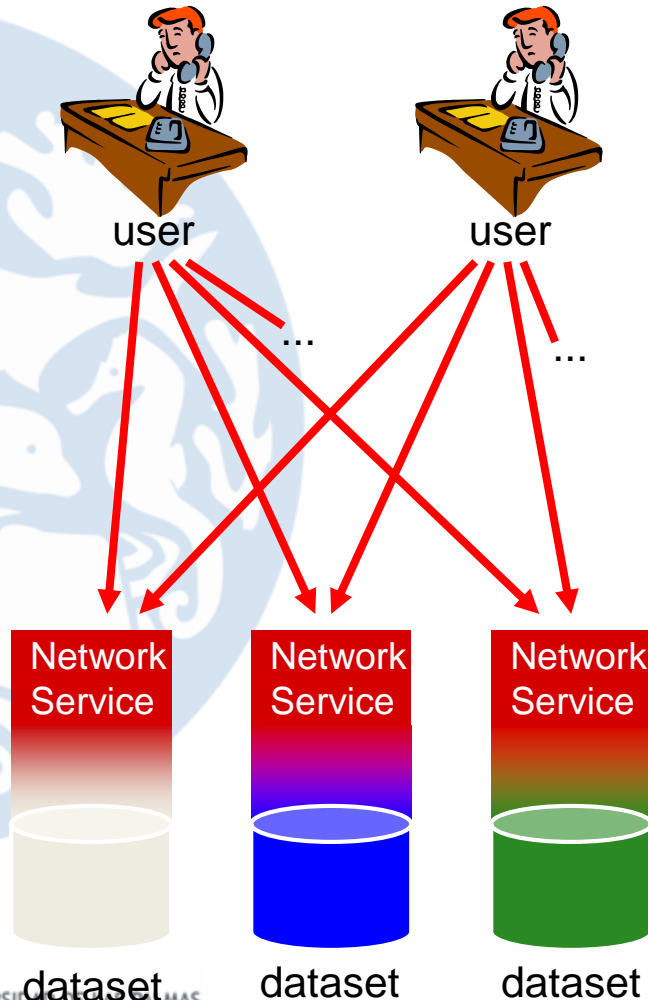
Data interoperability

... and what INSPIRE is aiming at

- Provide access to spatial data via network services and according to a harmonised data specification to achieve interoperability of data

! **Datasets used in Member States may stay as they are**

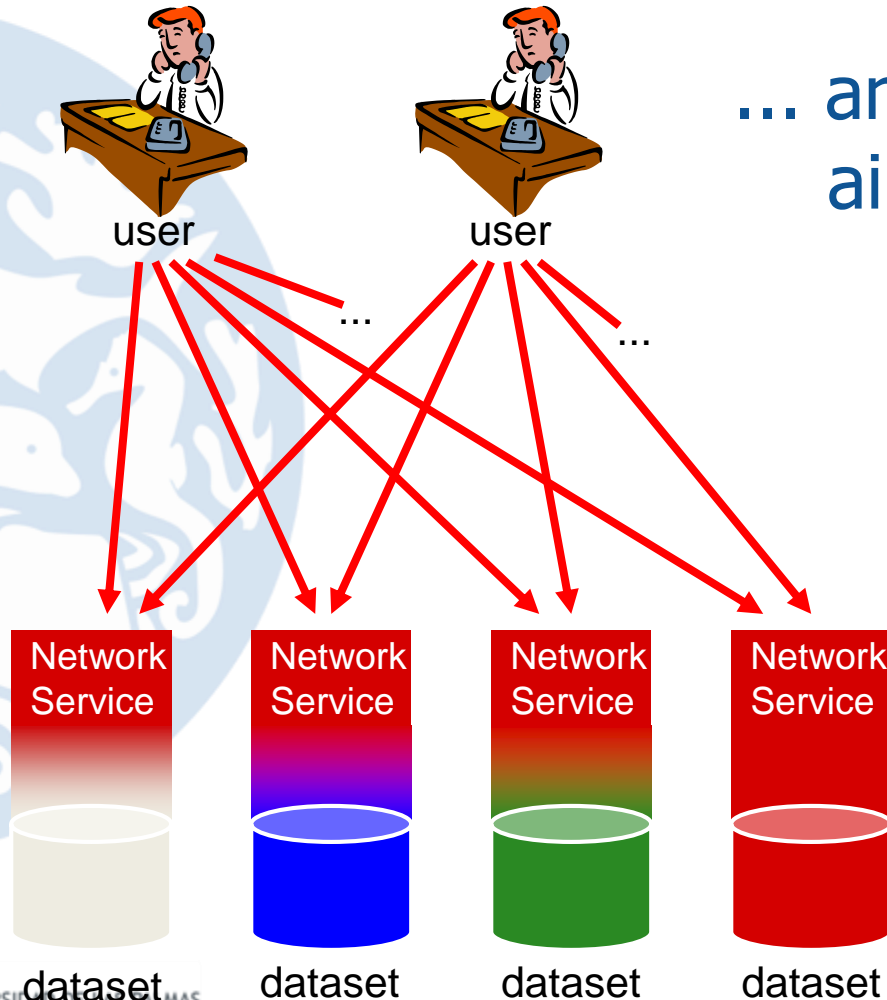
! Data or service providers have to provide a transformation between their internal data model and the harmonised data specification





Data interoperability

... and what INSPIRE is aiming at



- Data providers may also choose to align their internal data model with the harmonised data specifications and extend these based on their requirements



INSPIRE Directive

- INSPIRE is a **Framework Directive**
- **General rules to establish an Infrastructure for Spatial Information in Europe** for
 - Community **environmental policies**
 - Policies or activities which impact on the environment
- INSPIRE is built on the **SDIs established and operated by the Member States**
- Spatial data held by/on behalf of **public authorities**
- Does **not** require **collection of new data**
- **JRC is/was the technical coordinator**

25.4.2007 L EN Official Journal of the European Union L 108/1

I

(Acts adopted under the EC Treaty/Framework Treaty whose publication is obligatory)

DIRECTIVES

DIRECTIVE 2007/2/EC OF THE EUROPEAN PARLIAM AND OF THE COUNCIL of 14 March 2007

establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)

THE EUROPEAN PARLIAM AND THE COUNCIL OF THE
EUROPEAN UNION,

Having regard to the Treaty establishing the European Commu-
nity, and in particular Article 175(i) thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Economic and
Social Committee (1),

After consulting the Committee of the Regions,

Acting in accordance with the procedure laid down in Article 251
of the Treaty, in the light of the joint text approved by the
Conciliation Committee on 17 January 2007 (2),

Whereas:

(1) Community policy on the environment must aim at a high
level of protection taking into account the diversity of
situations in the various regions of the Community.
Moreover, information, including spatial information, is
needed for the formulation and implementation of this
policy and other Community policies, which must integrate
environmental protection requirements in accordance with
Article 6 of the Treaty. In order to bring about such

integration, it is necessary to establish a measure of
coordination between the users and providers of the
information so that information and knowledge from
different sectors can be combined.

(2) The Sixth Environment Action Programme adopted by
Decision No 1600/2002/EC of the European Parliament
and of the Council of 22 July 2002 (3) requires full
consideration to be given to ensuring that the Community's
environmental policy-making is undertaken in an in-
tegrated way, taking into account regional and local
differences. A number of problems exist regarding the
availability, quality, organisation, accessibility and sharing of
spatial information needed in order to achieve the
objectives set out in that programme.

(3) The problems regarding the availability, quality, organisa-
tion, accessibility and sharing of spatial information are
common to a large number of policy and information
themes and are experienced across the various levels of
public authority. Solving these problems requires measures
that address exchange, sharing, access and use of
interoperable spatial data and spatial data services across
the various levels of public authority and across different
sectors. An infrastructure for spatial information in the
Community should therefore be established.

(4) The Infrastructure for Spatial Information in the European
Community (Inspire) should assist policy-making in
relation to policies and activities that may have a direct
or indirect impact on the environment.

(5) Inspire should be based on the infrastructures for spatial
information that are created by the Member States and that
are made compatible with common implementing rules
and are supplemented with measures at Community level.
These measures should ensure that the infrastructures for
spatial information created by the Member States are
compatible and usable in a Community and transboundary
context.

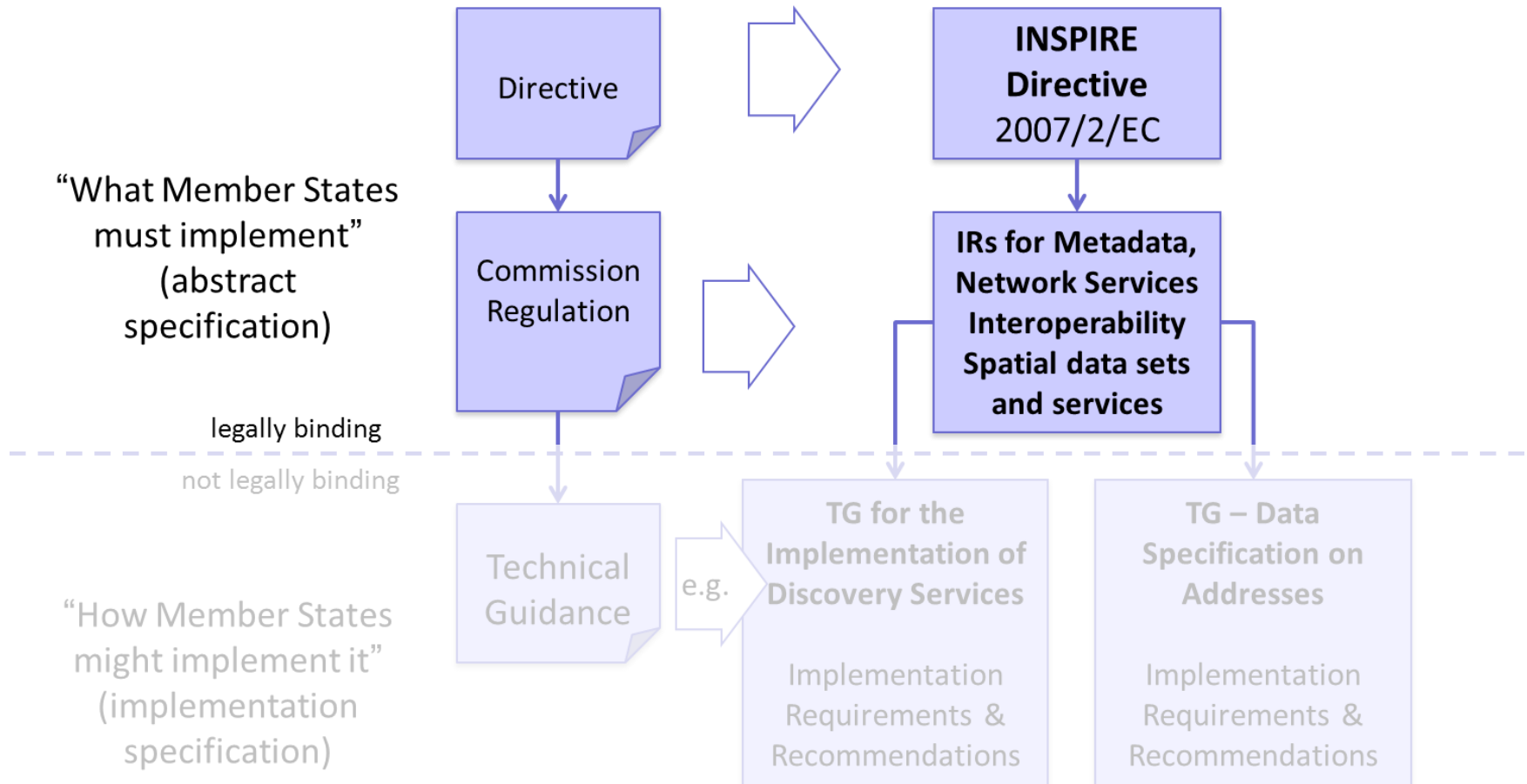
(1) OJ L 221, 8.9.2005, p. 33.

(2) Opinion of the European Parliament of 7 June 2005 (OJ C 124 E,
25.5.2006, p. 116), Council Common Position of 23 January 2006
(OJ C 124 E, 10.3.2006, p. 16) and Position of the European
Parliament of 13 June 2006 (not yet published in the Official
Journal), Decision of the Council of 29 January 2007 and legislative
resolution of the European Parliament of 13 February 2007 (not yet
published in the Official Journal).

(3) OJ L 242, 10.9.2002, p. 1.



Legally binding documents



INSPIRE Implementing Rules (IRs)

1. 126/12 DE Amtsblatt der Europäischen Union 4.12.2008

VERORDNUNG (EG) Nr. 1205/2008 DER KOMMISSION
vom 3. Dezember 2008

zur Durchführung der Richtlinie 2007/2/EG des Europäischen Parlaments und des Rates hinsichtlich

Metadaten

Die KOMMISSION DER EUROPÄISCHEN GEMEINSCHAFTEN —
gestützt auf den Vertrag zur Gründung der Europäischen Gemeinschaft,

gestützt auf die Richtlinie 2007/2/EG des Europäischen Parlaments und des Rates vom 14. März 2007 zur Schaffung einer Geodateninfrastruktur in der Europäischen Gemeinschaft (INSPIRE) (1), insbesondere Artikel 4 Absatz 4,

in Erwägung nachstehender Gründe:

- (1) Die Richtlinie 2007/2/EG enthält Bestimmungen, die es den Mitgliedstaaten ermöglichen, sich an internationalen Interoperabilitätsvereinbarungen zu beteiligen, die erforderlich ist, um die Interoperabilität der Geodateninfrastruktur zu gewährleisten und die damit verbundenen Kosten zu mindern.
- (2) Die Definition eines Satzes von Metadaten ist für die Identifizierung der Informationen, die für die Klassifizierung erforderlich ist, sowie für die Identifizierung ihrer geographischen Standards und ihre zeitliche, thematische, Qualität und Gültigkeit, ihrer Übereinstimmung mit den Durchführungsbestimmungen zur Interoperabilität der Geodateninfrastruktur und -dienste, ihrer Zugänglichkeit und Nutzungsbedingungen sowie der für die Klassifizierung notwendigen Organisation, Fehler werden die erzielten Metadaten aktualisiert werden, und damit die Organisation ermöglicht werden kann, die für die Identifizierung und Pflege der Metadaten zuständig ist. Dieser Satz von Metadaten ist ein Mindeststandard, auf den die Anforderungen der Richtlinie 2007/2/EG zu entsprechen, wenn über die Möglichkeit nicht ausgeschlossen wird, dass Organisationen die Informationsressourcen durch

HAT FOLGENDE VERORDNUNG ERGASSEN:

20.10.2009 DE Amtsblatt der Europäischen Union 1. 27/9

VERORDNUNG (EG) Nr. 676/2009 DER KOMMISSION
vom 19. Oktober 2009

zur Durchführung der Richtlinie 2007/2/EG des Europäischen Parlaments und des Rates hinsichtlich

der Netzwerke

Die KOMMISSION DER EUROPÄISCHEN GEMEINSCHAFTEN —
gestützt auf den Vertrag zur Gründung der Europäischen Gemeinschaft,

gestützt auf die Richtlinie 2007/2/EG des Europäischen Parlaments und des Rates vom 14. März 2007 zur Schaffung einer Geodateninfrastruktur in der Europäischen Gemeinschaft (INSPIRE) (1), insbesondere Artikel 18,

in Erwägung nachstehender Gründe:

- (1) In der Richtlinie 2007/2/EG sind allgemeine Bestimmungen für die Schaffung der Geodateninfrastruktur in der Europäischen Gemeinschaft festgelegt, die es den Mitgliedstaaten ermöglichen, sich an internationalen Interoperabilitätsvereinbarungen zu beteiligen, die erforderlich ist, um die Interoperabilität der Geodateninfrastruktur zu gewährleisten und die damit verbundenen Kosten zu mindern.
- (2) Um die Interoperabilität der Geodateninfrastruktur zu gewährleisten, ist es erforderlich, dass die Dienstleistungen, die von den Mitgliedstaaten für die Dienste erbracht werden, die in der Richtlinie 2007/2/EG vorgesehen sind, den Anforderungen der Richtlinie 2007/2/EG entsprechen, wenn über die Möglichkeit nicht ausgeschlossen wird, dass Organisationen die Informationsressourcen durch

HAT FOLGENDEN VERORDNUNG ERGASSEN:

- Artikel 1**
Gegenstand
- Diese Verordnung legt die Anforderungen für die Schaffung und Erhaltung der in Artikel 11 Absatz 1 der Richtlinie 2007/2/EG vorgesehenen Netzwerke, bestehend aus „Netzwerken“ gemäß, und die Verpflichtungen in Bezug auf die Verfügbarkeit dieser Dienste für die Behörden der Mitgliedstaaten und Dritte gemäß Artikel 12 dieser Richtlinie fest.
- (1) ABL L 108 vom 24.4.2007, S. 1.
- (2) ABL L 326 vom 4.12.2008, S. 1.

8.12.2010 DE Amtsblatt der Europäischen Union 1. 32/11

VERORDNUNG (EG) Nr. 1089/2010 DER KOMMISSION
vom 23. November 2010

zur Durchführung der Richtlinie 2007/2/EG des Europäischen Parlaments und des Rates hinsichtlich

der Interoperabilität von Geodatenbanken und -diensten

Die EUROPÄISCHE KOMMISSION —
gestützt auf den Vertrag über die Arbeitsweise der Europäischen Union,

gestützt auf die Richtlinie 2007/2/EG des Europäischen Parlaments und des Rates vom 14. März 2007 zur Schaffung einer Geodateninfrastruktur in der Europäischen Gemeinschaft (INSPIRE) (1), insbesondere Artikel 1 Absatz 1,

in Erwägung nachstehender Gründe:

- (1) Die Richtlinie 2007/2/EG enthält allgemeine Bestimmungen für die Schaffung einer Geodateninfrastruktur in der Europäischen Gemeinschaft, die es den Mitgliedstaaten ermöglichen, sich an internationalen Interoperabilitätsvereinbarungen zu beteiligen, die erforderlich ist, um die Interoperabilität der Geodateninfrastruktur zu gewährleisten und die damit verbundenen Kosten zu mindern.
- (2) Um die Interoperabilität der Geodateninfrastruktur zu gewährleisten, ist es erforderlich, dass die Dienstleistungen, die von den Mitgliedstaaten für die Dienste erbracht werden, die in der Richtlinie 2007/2/EG vorgesehen sind, den Anforderungen der Richtlinie 2007/2/EG entsprechen, wenn über die Möglichkeit nicht ausgeschlossen wird, dass Organisationen die Informationsressourcen durch

HAT FOLGENDEN VERORDNUNG ERGASSEN:

- Artikel 1**
Gegenstand
- In dieser Verordnung sind die Anforderungen für die technische Modalitäten für die Interoperabilität und -dienste festgelegt, die unter der in den Anhängen II und III der Richtlinie 2007/2/EG aufgeführten Themen fallen.
- Artikel 2**
Begriffserklärungen
- Für die Zwecke dieser Verordnung gelten neben den in Anhang II festgelegten themenspezifischen Definitionen die nachfolgenden Begriffserklärungen:
1. „Abstrakter Datentyp“ (abstract type) Datentyp, der zwar nicht implementiert werden, aber Attribut- und Assoziationsrollen haben kann.
- (1) ABL L 108 vom 24.4.2007, S. 1.

No 1089/2010
(Annex I)

No 102/2011
(code values Annex I)

No 1253/2013
21 Oct 2013

10.12.2013 DE Official Journal of the European Union 1. 33/11

REGULATIONS

COMMISSION REGULATION (EU) No 1253/2013

amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC as regards

interoperability of spatial data sets and services

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to 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) (1), and in particular Article 12 thereof,

Whereas:

- (1) Commission Regulation (EU) No 1089/2010 of 23 November 2010 implementing Directive 2007/2/EC as regards interoperability of spatial data sets and services (2) sets out the technical arrangements for the interoperability of spatial data sets and services related to the spatial data themes in Annex 1 to Directive 2007/2/EC.
- (2) In order to ensure the full interoperability of spatial data sets, it is appropriate to add the technical arrangements for the interoperability of spatial data sets and services related to the spatial data themes in Annex 1 to Directive 2007/2/EC.
- (3) In order to ensure the overall consistency of the technical arrangements for the interoperability of spatial data sets and services related to the spatial data themes in Annex 1 to Directive 2007/2/EC, certain candidate types should be removed from the “Administrative Units” and the “Hydrography” spatial data themes.
- (4) Since, in order to avoid overlap with spatial object types specified for spatial data themes of Annexes II and III to Directive 2007/2/EC, certain candidate types should be removed from the “Administrative Units” and the “Hydrography” spatial data themes.
- (5) Since, in order to avoid overlap with spatial object types specified for spatial data themes of Annexes II and III to Directive 2007/2/EC, certain candidate types should be removed from the “Administrative Units” and the “Hydrography” spatial data themes.
- (6) Regulation (EU) No 1089/2010 should therefore be amended accordingly.
- (7) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 22 of Directive 2007/2/EC.

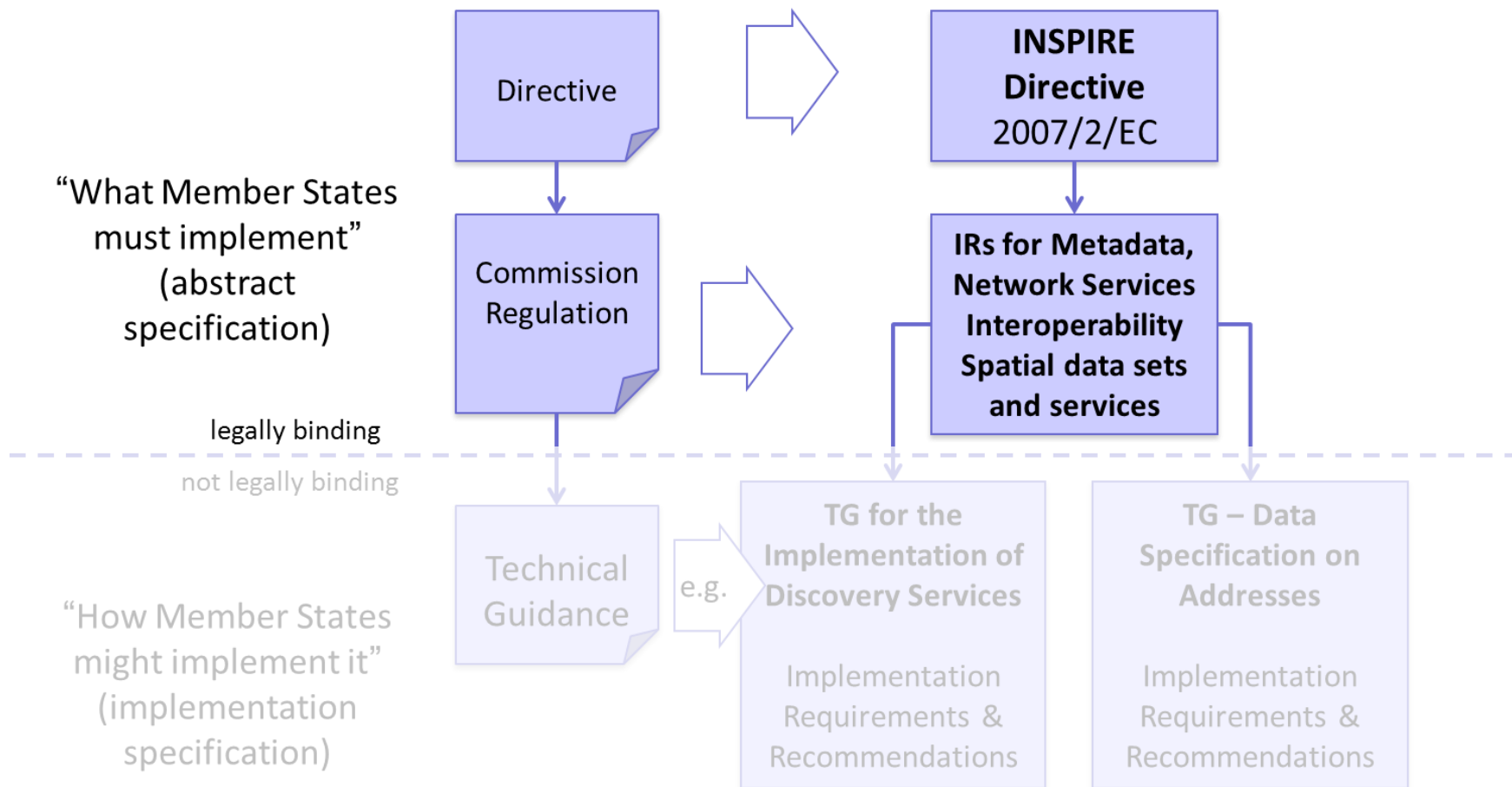
(1) OJ L 108, 24.4.2007, p. 1.

(2) OJ L 323, 8.12.2010, p. 11.

METADATA
NETWORK SERVICES
INTEROPERABILITY OF SPATIAL DATA SETS & SERVICES (ISDSS)
ANNEX I & II



Implementing Rules vs. Technical Guidelines





Key pillars of INSPIRE data interoperability

Conceptual data models

- spatial objects and their properties and relationships for 34 data themes
- cross-domain harmonization
- based on a common modelling framework
- managed in a common UML repository

Encoding

- GML application schemas as standard encoding
- conceptual models independent of concrete encodings
- also possible to derive other encodings (e.g. based on RDF)

Harmonised vocabularies

- to overcome interoperability issues caused by free-text and/or multi-lingual content
- allow more specific terms from local vocabularies in addition to the harmonized terms

Registers

- provide unique and persistent identifiers for resources
- allow their consistent management and versioning
- items can be made unique and referred to unambiguously

Session 1 – Available tools and guidance's Data Specifications Andrej Abramić



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EMODnet-INSPIRE technical workshop
7-8 December 2015, Brussels

Research and Technology to enhance excellence in maritime development under an Ecosystem approach





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Data specification corner on INSPIRE web

<http://inspire.ec.europa.eu>



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INSPIRE

Infrastructure for Spatial Information in the European Community

European Commission > INSPIRE > Data Specifications

Data Specifications

Legislation Who Consultations Testing Roadmap Library News Themes Data Models xml schemas

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- IOC
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- Maintenance and Implementation

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Legislation

- Commission Regulation (EU) No 1312/2014 of 10 December 2014 amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data services **11.12.2014**
- COMMISSION REGULATION (EU) No 1252/2013 of 21 October 2013 amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC as regards interoperability of spatial data sets and services **10.12.2013**
- COMMISSION REGULATION (EU) No 102/2011 of 4 February 2011 amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services **05.02.2011**
- 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 **08.12.2010**

Technical Guidelines Annex I

- INSPIRE Data Specification on Addresses – Technical Guidelines 3.1 **17.04.2014**
- INSPIRE Data Specification on Administrative Units – Technical Guidelines 3.1 **17.04.2014**
- INSPIRE Data Specification on Cadastral Parcels – Technical Guidelines 3.1 **17.04.2014**
- INSPIRE Data Specification on Coordinate Reference Systems – Technical Guidelines 3.2 **17.04.2014**
- INSPIRE Data Specification on Geographical Grid Systems – Technical Guidelines 3.1 **17.04.2014**
- INSPIRE Data Specification on Geographical Names – Technical Guidelines 3.1 **17.04.2014**
- INSPIRE Data Specification on Hydrography – Technical Guidelines 3.1 **17.04.2014**
- INSPIRE Data Specification on Protected Sites – Technical Guidelines 3.2 **17.04.2014**
- INSPIRE Data Specification on Transport Networks – Technical Guidelines 3.2 **17.04.2014**

Technical Guidelines Annex II & III

- INSPIRE Data Specifications – All v3.0 Technical Guidelines for Annexes II & III **13.12.2013**
- INSPIRE Data Specification on Agricultural and Aquaculture Facilities – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Area Management/Restriction/Regulation Zones and Reporting Units – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Atmospheric Conditions and Meteorological Geographical Features – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Bio-geographical Regions – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Buildings – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Elevation – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Energy Resources – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Environmental Monitoring Facilities – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Geology – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Habitats and Biotopes – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Human Health and Safety – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Land Cover – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Land Use – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Mineral Resources – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Natural Risk Zones – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Oceanographic geographical features – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Orthoimagery – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Population Distribution – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Production and Industrial Facilities – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Sea Regions – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Soil – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Species Distribution – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Statistical Units – Technical Guidelines **10.12.2013**
- INSPIRE Data Specification on Utility and Government Services – Technical Guidelines **10.12.2013**

Framework Documents

- Guidelines for the encoding of spatial data **08.04.2014**
- Guidelines for the use of Observations & Measurements and Sensor Web Enablement-related standards in INSPIRE Annex II and III data specification development **08.04.2014**
- INSPIRE Generic Conceptual Model **08.04.2014**
- INSPIRE Data Specifications – Base Models – Activity Complex **05.04.2013**



SEARCH INSPIRE

- INSPIRE Documents
- INSPIRE Website

LOGIN / REGISTRATION



16 11 14
days hours minutes

Time left until the INSPIRE-GWF 2015 Conference



NEWS | EVENTS

- 05-May-15 INSPIRE InteractiveData specification Toolkit V1.0
- 04-May-15 Updated xml schemas for INSPIRE Data
- 30-Apr-15 INSPIRE team @ INSPIRE-Geospatial World Forum 2015
- 20-Apr-15 Turkey: Call for Tender Technical assistance for capacity building INSPIRE Directive
- 20-Apr-15 New releases of the Registry software and INSPIRE Registry service

RSS FEED

Technical Guidelines

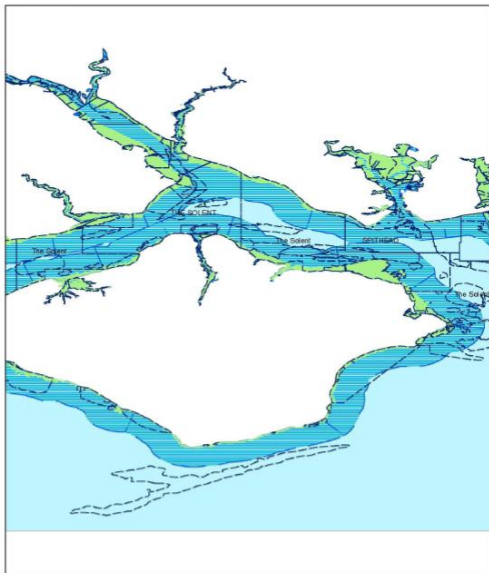
(TG-Data Specification)

INSPIRE	Reference: D2.8.III.16_v3.0		
TWG-OF-SR	Data Specification on Sea Regions	2013-12-10	Page 92

SEAREGIONS - SeaArea

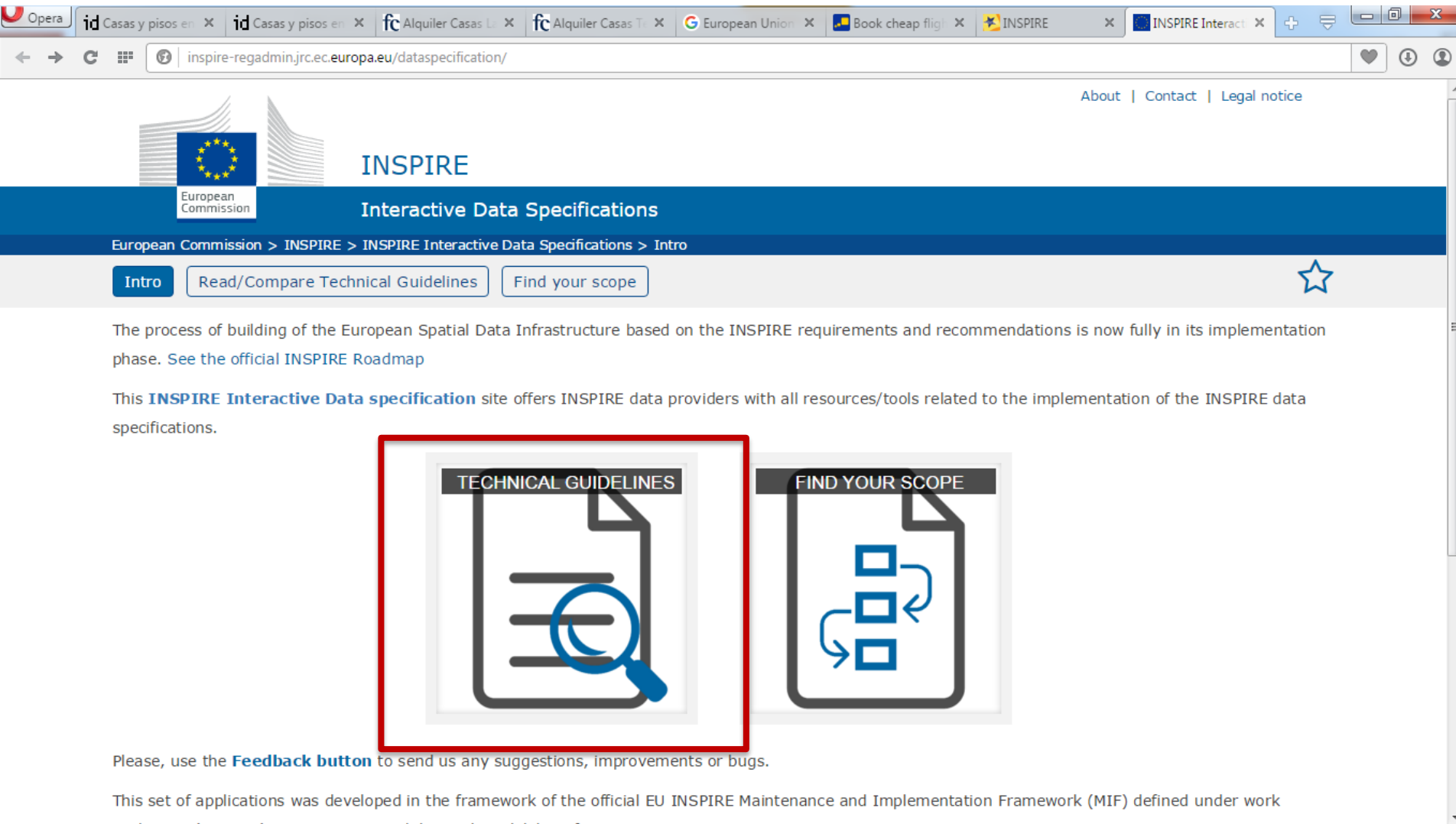
SR.SeaRegions Legend

-  SeaArea
-  Inter/TidalArea
-  mixingZone
-  sedimentCell
-  Sea



- 1 Scope
- 2 Overview and Description
- 3 Specification scopes
- 4 Identification information
- 5 Data content and structure
 - Application schemas, Feature catalogue, Notations, Voidable characteristics, Enumerations, Code lists
 - Identifier management
 - Geometry representation, Temporality representation
- 6 Reference systems, units of measure and grids
 - Theme-specific requirements & recommendations
- 7 Data quality
- 8 Dataset-level metadata
- 9 Delivery incl. Encoding
- 10 Data Capture
- 11 Portrayal
- 12 Bibliography
- Annex A (normative) Abstract Test Suite
- Annex B (informative) Use cases
- Annex C (normative) Code list values
- Annex D (informative) Examples

INSPIRE Interactive Data Specifications – read Technical Guidelines



The screenshot shows a web browser window with the URL `inspire-regadmin.jrc.ec.europa.eu/dataspecification/`. The page header includes the European Commission logo and the text "INSPIRE Interactive Data Specifications". A navigation bar contains buttons for "Intro", "Read/Compare Technical Guidelines", and "Find your scope". The main content area features two large icons: "TECHNICAL GUIDELINES" (a document with a magnifying glass) and "FIND YOUR SCOPE" (a document with a circular arrow). The "TECHNICAL GUIDELINES" icon is highlighted with a red border. Below the icons, there is a "Feedback button" and a paragraph about the development framework.

Opera id Casas y pisos en x id Casas y pisos en x fc Alquiler Casas L x fc Alquiler Casas T x European Union x Book cheap flight x INSPIRE x INSPIRE Interact x

inspire-regadmin.jrc.ec.europa.eu/dataspecification/

About | Contact | Legal notice

INSPIRE
Interactive Data Specifications

European Commission > INSPIRE > INSPIRE Interactive Data Specifications > Intro

Intro Read/Compare Technical Guidelines Find your scope

The process of building of the European Spatial Data Infrastructure based on the INSPIRE requirements and recommendations is now fully in its implementation phase. See the official INSPIRE Roadmap

This **INSPIRE Interactive Data specification** site offers INSPIRE data providers with all resources/tools related to the implementation of the INSPIRE data specifications.

TECHNICAL GUIDELINES FIND YOUR SCOPE

Please, use the **Feedback button** to send us any suggestions, improvements or bugs.

This set of applications was developed in the framework of the official EU INSPIRE Maintenance and Implementation Framework (MIF) defined under work



Key pillars of INSPIRE data interoperability

Conceptual data models

- spatial objects and their properties and relationships for 34 data themes
- cross-domain harmonization
- based on a common modelling framework
- managed in a common UML repository

Encoding

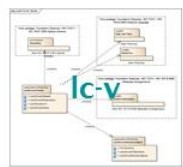
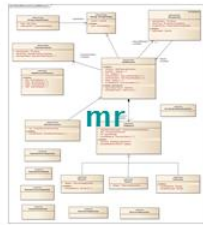
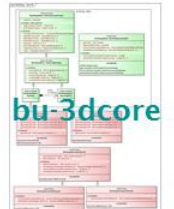
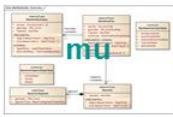
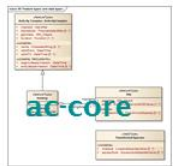
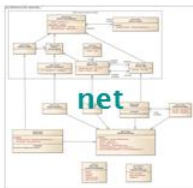
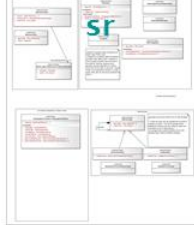
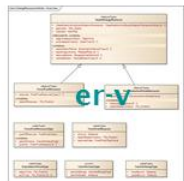
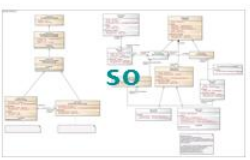
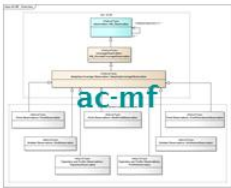
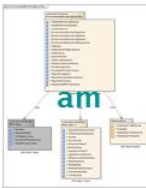
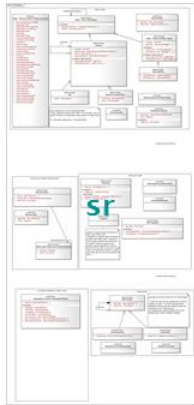
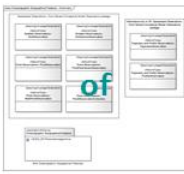
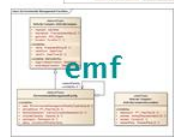
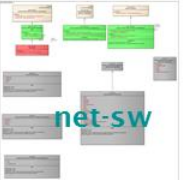
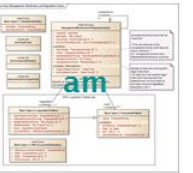
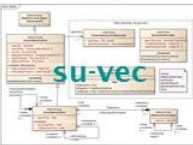
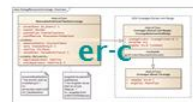
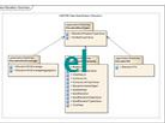
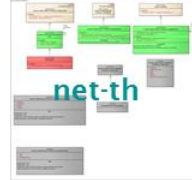
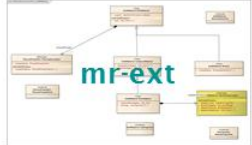
- GML application schemas as standard encoding
- conceptual models independent of concrete encodings
- also possible to derive other encodings (e.g. based on RDF)

Harmonised vocabularies

- to overcome interoperability issues caused by free-text and/or multi-lingual content
- allow more specific terms from local vocabularies in addition to the harmonized terms

Registers

- provide unique and persistent identifiers for resources
- allow their consistent management and versioning
- items can be made unique and referred to unambiguously

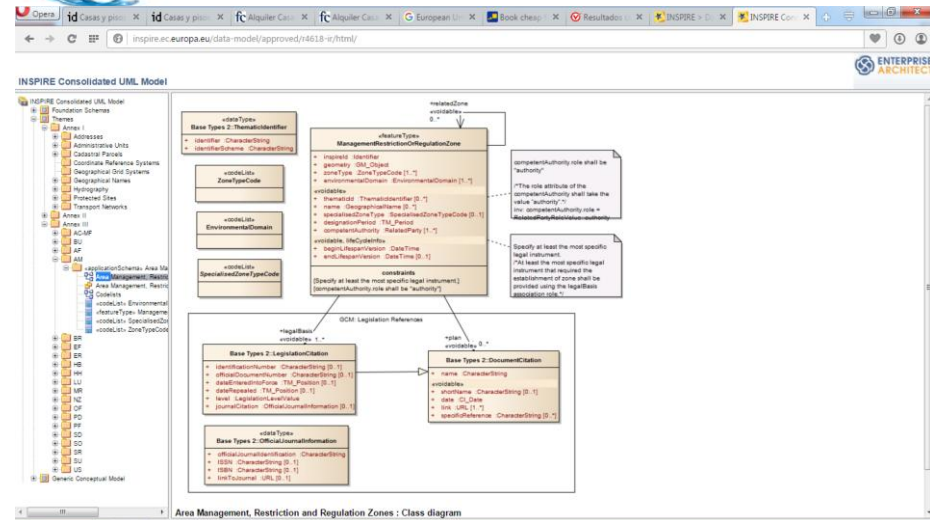




Conceptual data models available :



- As UML models & As Feature Catalogue
- Available in HTML at the “Data specification corner”
- Available in Technical Guidance's documents
- **Explanation of the conceptual (UML) models** are given in the technical guidance documents



The screenshot shows the INSPIRE data type specifications in a web browser. It displays two data types:

Data Type: InputOutputAmount

Title: amount of input or output

Definition: Type and, where available, measurable amount of a classified or registered material that enters or leaves a technical and economical unit.

Descriptions:

- NOTE Depending on the thematic scope it can refer to different terms as Biomass, Bio-Waste, Fuel, Organic Solvents, Waste Water, Waste for disposal or recovery, Primary Materials, etc.

Type: Data Type

Attributes:

- Name: inputOutput
- Title: inputOutput
- Definition: A classified or registered type of material or something immaterial, that enters a technical and economical unit according to its function.
- Descriptions: NOTE Depending on the thematic scope it can contain different values including terms as Biomass, Bio-Waste, Fuel, Organic Solvents, Waste Water, Waste for disposal or recovery, Primary Materials, etc.
- Voidable: false
- Multiplicity: 1
- Value type: inputOutput:link (code list)

Attributes:

- Name: amount
- Definition: The amount (such as a volume or mass) of the classified or registered material that enters or leaves a technical and economical unit.
- Voidable: true
- Multiplicity: 1
- Value type: Measure (data type)

Data Type: Permission

Title: permission

Definition: Official Decision (formal consent) granting authorization to operate all or part of an Activity Complex, subject to certain conditions which guarantee that the installations or parts of installations on the same site operated by the same operator comply with the requirements fixed by a competent authority. A permit may cover one or more functions and its parameters of capacity. The term could be extended to other kind of certificates or documents of special relevance depending of the scope (e.g. ISO, EMAS, National Quality Standards, etc). The term may be extended to other kind of certificates or documents of special relevance depending of the scope (e.g. ISO, EMAS, National Quality Standards, etc).

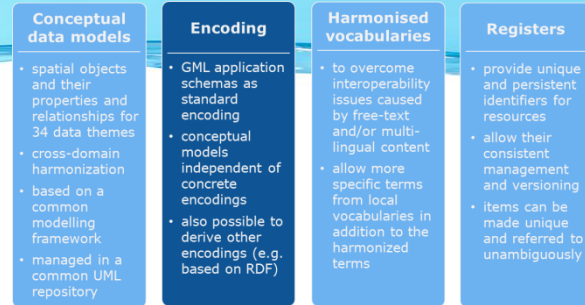
Descriptions:

- NOTE This term is referred in several legislative acts as "permit", "authorization", "development consent" or "expansion permit" among others.
- EXAMPLE 1: ... a [permit] decision by which the competent authority grants permission to operate all or part of an installation.
- EXAMPLE 2: ... the decision of the competent authority or authorities which entitles the developer to proceed with the project.



Encodings

- **Commission Regulation on interoperability:**
 - Every encoding rule used to **encode spatial data shall conform to EN ISO 19118**. In particular, it shall specify **schema conversion rules** for all spatial object types and all attributes and association roles and the output data structure used.
- Specifically, **ISO 19118:2011** includes:
 - requirements for creating encoding rules based on UML schemas,
 - requirements for creating encoding services, and
 - requirements for XML-based encoding rules for neutral interchange of data.
- Every **encoding rule used to encode spatial data shall be made available**.





Standard GML

- Geography Markup Language (**GML**) application schemas as standard
- GML 3.2v **proposed** encoding
- The xml schema document is available on the *INSPIRE website* <http://inspire.ec.europa.eu> in the INSPIRE schema repository
 - **GML application schema** - XML schema - **kind of templates** that is used to express a set of conformance rules for an GML file (*.xsd files)
 - also possible to derive other encodings, but not provided this type of solution in the technical guidelines
- **Encoding guidelines (D2.7)**

The screenshot shows a web browser window displaying XML Schema Definition (XSD) code. The text is partially obscured by a red overlay that reads "XSD file rules for encoding". The visible code includes namespace declarations for 'inspire', 'gml', and 'xsd', and a complex type definition for 'VerticalPositionValueType' with an enumeration of values like 'onGroundSurface'.



ECO AQUA
www.ecoaqua.eu

Software for INSPIRE encodings

Humboldt Alignment Editor (HALE)

Maintained, frequently updated, current version 2.9.4 (GeoServer app)

Tool useful to:

- Create mappings (alignments)
- Validate
- Transform data to INSPIRE GML version 3.2

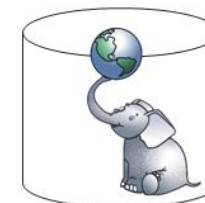
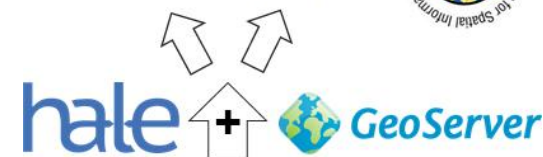
HALE Graphical User Interface

- **Usable and Flexible** (GUI completely customizable)

Already developed functions for transformation (but can be developed/modified by user)



WMS View Service
WFS Download Service

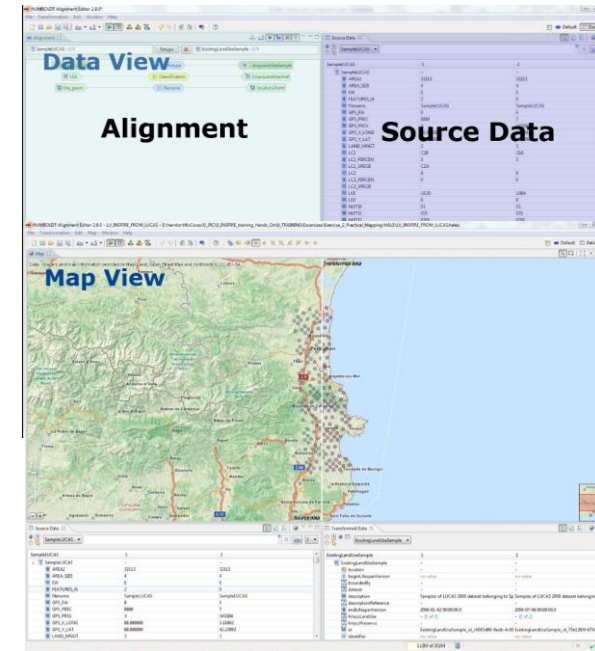
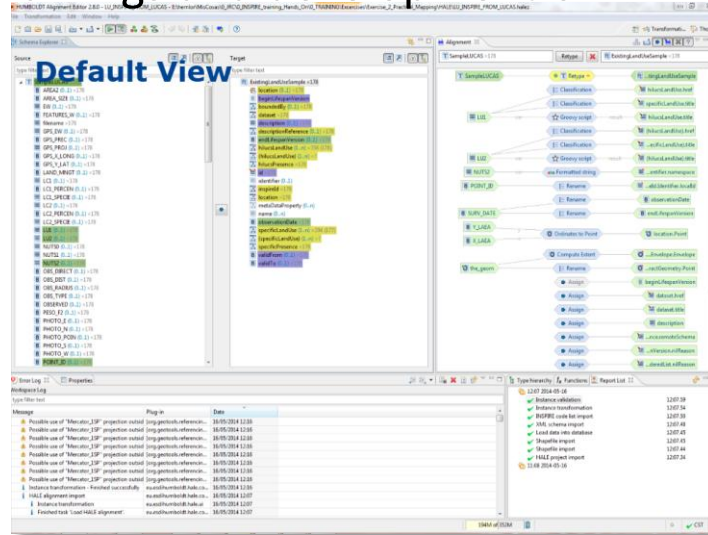




ECOAQUA
www.ecoaqua.eu

Humboldt Alignment Editor (HALE)

- It is free of charge
- Have been used for trainings and development of the JRC Marine Pilot



HALE website

<http://www.dhpanel.eu/humboldt-framework/hale.html>

HALE Wiki

<http://www.esdi-community.eu/projects/hale/wiki>

HALE Tutorial

<http://www.dhpanel.eu/humboldt-framework/hale-tutorial.html>

HALE download

<http://www.esdi-community.eu/projects/hale/files>

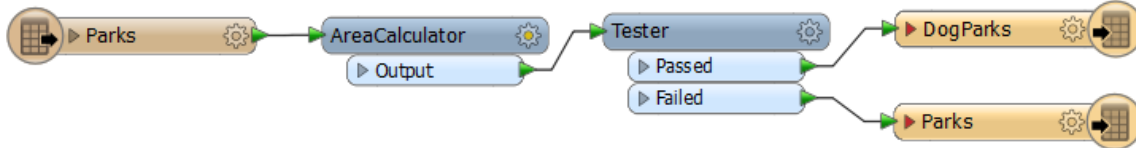
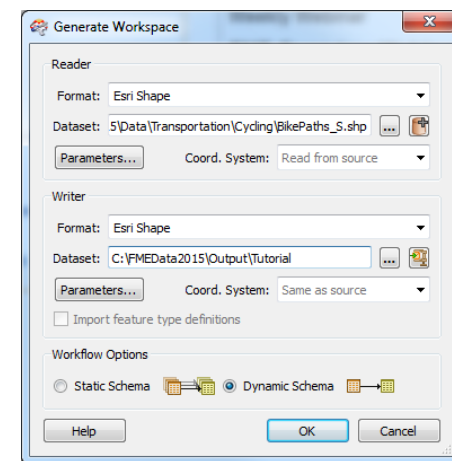
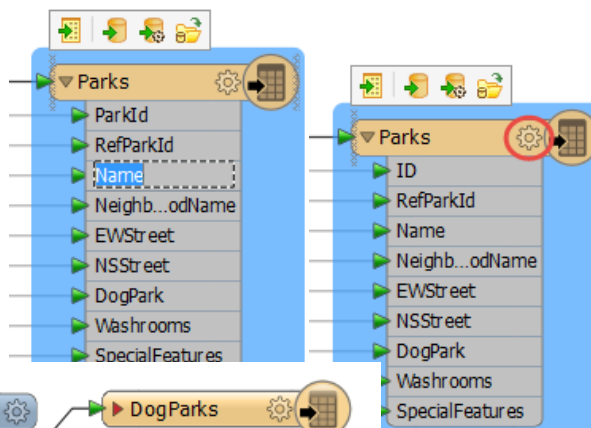
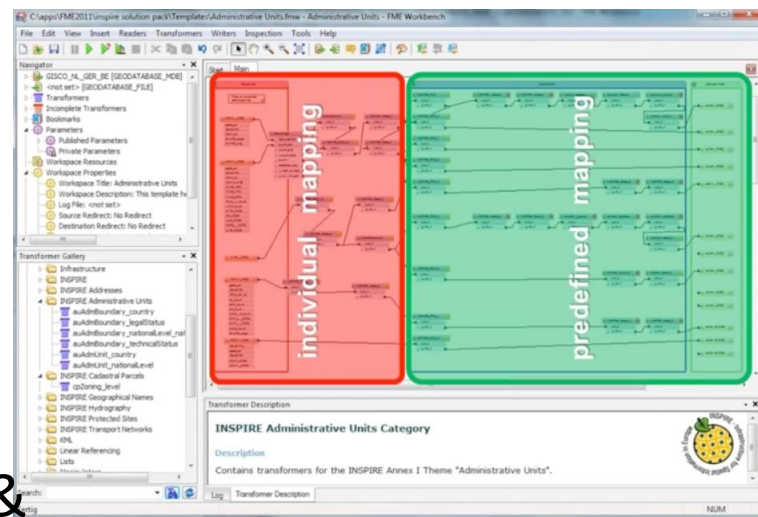
HALE User Guide

<http://hale.igd.fraunhofer.de/2.8.0/help/index.jsp>



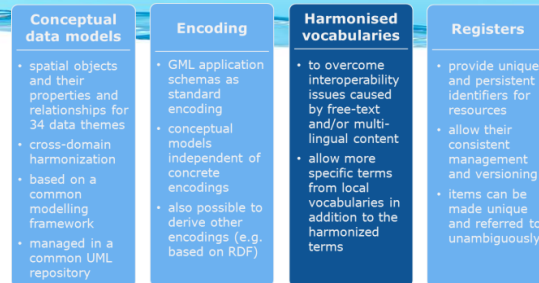
Feature Manipulation Engine (FME)

- Includes format translation - FME Workbench
- Content Transformation
 - Coordinate REProjection
- Data Restructuring
- XML validator
- Direct support for INSPIRE – reads & write INSPIRE GML





Harmonised vocabularies



- to overcome interoperability issues caused by free-text and/or multi-lingual content
- INSPIRE introduce **code lists** into data model

4 types of INSPIRE code lists according to extensibility

- a) **not extensible** – only values included in IRs are allowed
- b) **freely extensible** – values included in IRs and any other values are allowed
- c) **narrower extensible** – values included in IRs and any narrower values are allowed
- d) **empty** – any values are allowed

Any extension - values have to be included in the code list register

- INSPIRE code list register,
- national SDI code list register,
- thematic register as BODC P01, P03 or ICES parameter use registers

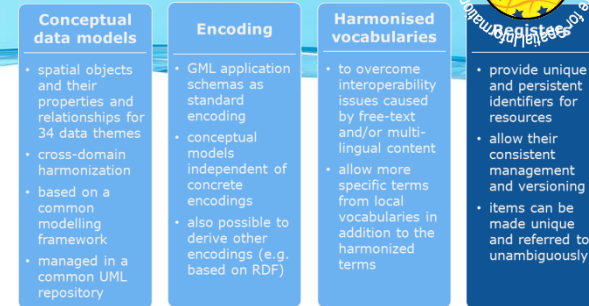


Registers & registry

- EC provides central registry/ies for INSPIRE resources
- INSPIRE registry provides a central access
- INSPIRE involves a number of items, which require clear descriptions and the possibility to be referenced through unique identifiers (URLs)
- published on

<http://inspire.ec.europa.eu/registry>

- registers: code lists, themes, application schemas, feature concept dictionary
- browsing and accessing register content
- Formats: HTML, XML, Atom, JSON and RDF/SKOS
- Multilingual content (based on IR content)
- Open to external contributions

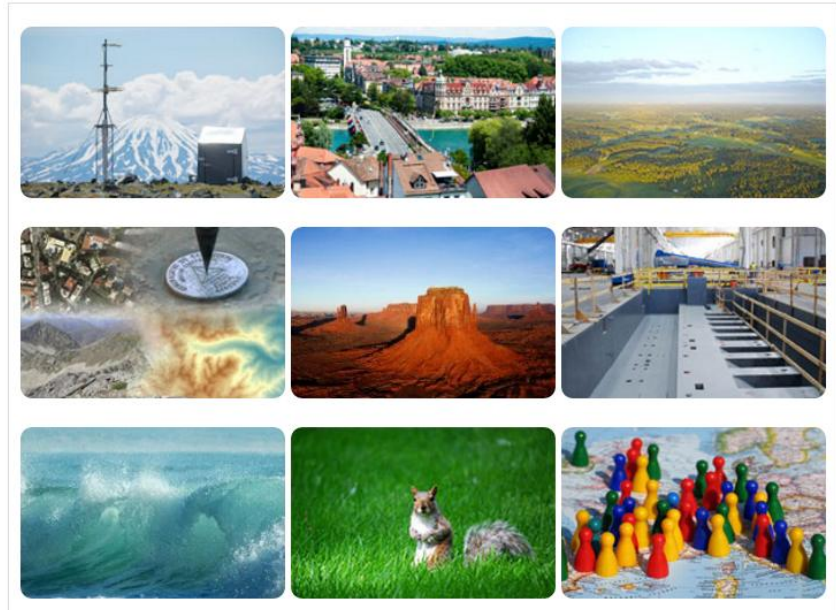




INSPIRE Thematic clusters



- **INSPIRE Thematic Clusters Platform** is a European Commission initiative, linked to the INSPIRE Maintenance and Implementation Framework, with the objective of supporting INSPIRE implementation
- platform that builds upon the relevant [INSPIRE Forum](#) content and software, **is a single entry point** for INSPIRE implementers and users to share experiences, best practices, raise questions and resolve issues **in their thematic domains**.





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Thank you for your attention



....and patience

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