Infrastructure for Spatial Information in the European Community

INSPIRE
From transposition to implementation

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Joint Research Centre
Spatial Data Infrastructures Unit
The Mission of the Joint Research Centre

… is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies.

As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union.

Close to the policy-making process, it serves the common interest of the Member States, while being independent of special interests, whether private or national.
The intergovernmental Group on Earth Observations (GEO), formally established at the 3rd Earth Observation Summit in Feb 05, is leading a worldwide effort to build a Global Earth Observation System of Systems (GEOSS) over the next 10 years.

In 2005 the Environmental Policy Review Group endorsed the vision for a Shared Environmental Information System (SEIS) aiming to improve access to information needed for environmental policies and to reduce the administrative burden associated with reporting and monitoring.

The INSPIRE Directive 2007/2/EC, published in the OJ on the 25.4.07, will enter into force on the 15.5.2007 A MoU was signed in 2006 by the DGs of JRC, DG ENV and ESTAT establishing the collaborative framework until 2013. The JRC is responsible for the overall technical coordination of INSPIRE.

JRC is co-responsible together with ESA for Data Procurement of FTS Land and for the production of European Satellite Mosaic. We provide technical advice for GMES Data Specifications and we are member of the review board of ESA – HMA.
Objective of this presentation

- Explain what INSPIRE is
- Provide information about the current status of the technical Implementing Rule development
Outline

- Introduction
- Process
- Status of implementing rule development
- How can you contribute to INSPIRE?

- INSPIRE lays down general rules to establish an infrastructure for spatial information in Europe for the purposes of Community environmental policies and policies or activities which may have an impact on the environment.
- INSPIRE to be based on the infrastructures for spatial information established and operated by the Member States.
- INSPIRE does not require collection of new spatial data.
- INSPIRE does not affect existing Intellectual Property Rights.
- INSPIRE is a distributed infrastructure.
Scope INSPIRE Directive

- Spatial data held by or on behalf of a public authority operating down to the lowest level of government when laws or regulations require their collection or dissemination.

- INSPIRE covers 34 Spatial Data Themes laid down in 3 Annexes – *(required to successfully build environmental information systems)*
INSPIRE Components

- Metadata
- Interoperability of spatial data sets and services
- Network services (discovery, view, download, invoke)
  - Made available through the European geo-portal
- Data and Service sharing (policy)
- Coordination and measures for Monitoring & Reporting

**INSPIRE is a Framework Directive**

Detailed technical provisions for the issues above will be laid down in Implementing Rules. Once adopted, Implementing Rules become European legislative acts and national law in 27 Member States and in some EFTA countries.
From Commission proposal to Community Directive implementation

- **Preparatory phase** (2004-2006)
  - Co-decision procedure
  - Start of preparation of Implementing Rules

- **Transposition phase** (2007-2009)
  - Directive entered into force **15 May 2007**
  - INSPIRE Committee starts its activities **26 June 2007**
  - Continuation of preparation of Implementing Rules
  - Transposition into national legislation
  - Adoption of Implementing Rules by Comitology

- **Implementation phase** (2009-2013)
  - Implementation and monitoring of measures
  - Continuation of preparation of Implementing Rules
  - Adoption of Implementing Rules by Comitology
# Excerpt from Roadmap (adoption)

<table>
<thead>
<tr>
<th>Milestone date</th>
<th>Article</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-05-15</td>
<td></td>
<td><em>Entry into force of INSPIRE Directive</em></td>
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<tr>
<td>2008-05-15</td>
<td>5§4</td>
<td>Adoption of IR for the creation and updating of metadata</td>
</tr>
<tr>
<td>2008-11-15*</td>
<td>21(4)</td>
<td>Adoption of IR for monitoring and reporting</td>
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<tr>
<td>2008-11-15*</td>
<td>16</td>
<td>Adoption of IR for discovery and view services</td>
</tr>
<tr>
<td>2009-05-15*</td>
<td>16</td>
<td>Adoption of IR for download services</td>
</tr>
<tr>
<td>2009-05-15*</td>
<td>16(a)</td>
<td>Adoption of IR for coordinates transformation service</td>
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<tr>
<td>2009-05-15*</td>
<td>17(8)</td>
<td>Adoption of IR governing the access rights of use to spatial data sets and services for Community institutions and bodies</td>
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<tr>
<td>2009-05-15</td>
<td>9(a)</td>
<td>Adoption of IRs for the interoperability and harmonisation of spatial data sets and services for Annex I spatial data themes</td>
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<tr>
<td>2009-05-15</td>
<td>24§1</td>
<td><em>Provisions of Directive are brought into force in MS</em></td>
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<tr>
<td>2010-11-15*</td>
<td>16</td>
<td>Adoption of IR for schema transformation and “invoke spatial data services” services</td>
</tr>
<tr>
<td>2012-05-15</td>
<td>9(b)</td>
<td>Adoption of the IR s for the interoperability and harmonization of spatial data sets and services for Annex II and III</td>
</tr>
</tbody>
</table>

* = date proposed by Commission
Work Programme 2007-2009
Implementing Rule development cycle

Text of Directive
Reference materials
Requirements

Drafting of IR

Manage evolution of IRs

EU Regulation or Commission Directive

Stakeholders (SDICs, LMOs):
Reference material
Experts
Projects

Stakeholder consultation

Commission inter-service consultation

Regulatory process

Testing of draft IR
INSPIRE Architecture
INSPIRE Implementing Rules for Metadata approved

- INSPIRE Implementing Rules on Metadata approved by the INSPIRE Committee with unanimous decision (323 votes in total, (22 votes not represented)
ISO/TC 211 workshop, 28-05-2008

Strategic approach 1

Mandatory/Conditional

Conditional

Mandatory/Conditional

Optional

Data specifications

Use

IN

OUT

Level 1

Discovery

Level 2

Evaluation

Metadata on metadata

Soil 1)

Agricultural and aquaculture facilities

Natural risk zones

Habitats and biotopes

Data specifications

Use
Stakeholder comments

- 1250 received. Very successful exercise of participation
  - Every comment was answer with motivation and published
  - Key Grouping of comments
  - Distinguish clearly between IRs, and guidelines,
  - Granularity
  - Conformity, quality, time, constraints

Strategic approach 2

- Separate IRs from Guidelines
- IRs to focus on stable elements (What to do)
- Guidelines to implement based on ISO standards (How to do)
Key features of the IRs

- Minimum that is required to implement the requirements of the Directive and allow interoperability through standards
- Non-binding guidelines that allow conformance with EN ISO 19115 (data) and EN 19119 (services) + interoperability with e-government through ISO 15836.
- Guidelines can be updated when needed taking into account technological and standards change e.g. revision of OGC catalogue specifications and new CEN work on Discovery of e-government resources.
Interoperability and harmonisation of spatial data sets and services

- 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 2.5 Generic Conceptual Model (GCM),
    - DS-D 2.6 Methodology for Specification Development.
  - Development of data specifications for each data theme
    - Based on the conceptual framework and specification methodology, and based on the INSPIRE roadmap
Data Specifications - Approach

Implementing Rules comprising data (product) specifications for 34 themes

Annex I
- Coordinate Reference Systems
- Geographical Grids
- Protected Sites

Annex II
- Elevation
- Orthoimagery
- Geology

Annex III
- Statistical Units
- Buildings
- Energy Resources
- Mineral Resources

Conceptual Framework

D2.3 Definition of Annex Themes & Scope
D2.5 Generic Conceptual Model
D2.6 Methodology for Specification Development
D2.7 Guidelines for Encoding
The Data specification Drafting Team is responsible for the developing and maintaining the conceptual framework.

Data specifications of the theme will be developed by the Thematic Working Groups composed from domain and GIS/IT experts.

### Specification component

<table>
<thead>
<tr>
<th>Specification component</th>
<th>Based on</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition of the Annex Themes and Scope</td>
<td>INSPIRE position papers Selected reference materials submitted by the SDICs and LMOs</td>
<td>Comment resolution phase. Final document to be ready in February 2008</td>
</tr>
<tr>
<td>Generic conceptual Model</td>
<td>ISO 19101, 19103, 19107, 19108, 19109, 19110, 19111, 19112, 19115, 19123, 19126, 19131, 19136, 19139, ISO/IEC 19501, OGC 06-103r3</td>
<td>Comment resolution phase. Final document to be ready in February 2008</td>
</tr>
<tr>
<td>Methodology for specification development</td>
<td>Methodology developed by the RISE project Selected reference materials submitted by the SDICs and LMOs</td>
<td>Review phase by the SDICs and LMOs. Final version is expected in April 2008</td>
</tr>
<tr>
<td>Guidelines for encoding</td>
<td>ISO 19118, 19136, 19139 INSPIRE Generic Conceptual Model</td>
<td>Review by the SDICs and LMOs to be started in November 2007. Final version expected in June 2008</td>
</tr>
</tbody>
</table>
Data specification: progress

- 8 Thematic Working Groups have been set-up to address the 9 Annex I data themes
  - Coordinate reference systems and Geographical grid systems
  - Geographical names
  - Administrative units
  - Addresses
  - Cadastral parcels
  - Transport networks
  - Hydrography
  - Protected sites
- Kick-off on 14 and 15 February 2008
- First draft INSPIRE data specifications in September 2008
  - Stakeholder participation in testing
Network Services

• General issues to address:
  – Architecture
  – Technical protocol
  – Right Management
  – Service metadata
  – Multilingualism

• Discovery and View services
• Download services
• Transformation services
• Services to Invoke spatial data services
**Network services status: progress**

- An INSPIRE Architecture is proposed to integrate INSPIRE services, e-commerce and DRM components,
- INSPIRE services shall be Web Services (W3C) using the SOAP protocol to exchange messages, and WSDL language to describe the services – reviewed by SDICs/LMOs

<table>
<thead>
<tr>
<th>INSPIRE Services</th>
<th>Based on:</th>
<th>IR Status</th>
</tr>
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<tbody>
<tr>
<td>Discovery services</td>
<td>OGC Catalogue service, with the ISO Application Profile: OGC CS-W 2.0 ISO AP</td>
<td>Draft IR has been reviewed by SDIC / LMO</td>
</tr>
<tr>
<td>View services</td>
<td>Web Map Service: ISO 19128 WMS 1.3</td>
<td>=&gt; Final draft: Spring 2008</td>
</tr>
<tr>
<td>Download services</td>
<td>- OGC Web Feature Service (ISO 19142), - OGC Web Coverage Service, - HTTP File download</td>
<td>Draft IR to be reviewed by SDIC / LMO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>=&gt; Final draft: June 2008</td>
</tr>
<tr>
<td>Transformation services</td>
<td>Functions of a Web Processing Service (OGC WPS): - Coordinate transformation services</td>
<td>Draft IR for a SDIC / LMO review early 2008</td>
</tr>
<tr>
<td></td>
<td></td>
<td>=&gt; Final draft: June 2008</td>
</tr>
<tr>
<td></td>
<td>- Schema transformation services</td>
<td>First draft during 2008</td>
</tr>
<tr>
<td>Invoke services</td>
<td>- Chaining services: BPEL (Business Process Execution Language form OASIS)</td>
<td>First draft during 2008</td>
</tr>
</tbody>
</table>
**Article 15**

1. The Commission shall establish and operate an Inspire geoportal at Community level.

2. Member States shall provide access to the services referred to in Article 11(1) through the Inspire geo-portal referred to in paragraph 1. Member States may also provide access to those services through their own access points.
Current Status

Prototype Development

- Under the responsibility of JRC
- Open to joint developments with stakeholders
- Test drive International standards and specifications
- Valuable resource of experiences
- Support INSPIRE DTs
  - provides a test platform for the development of the INSPIRE IRs

Current Priorities

- Metadata
- Discovery services (catalogue interoperability)
- View services
Metadata State of Play Compliance Testing

- The document contains an inventory of existing solutions for compliance testing and interoperability checking of metadata taking into account the draft INSPIRE metadata implementing rules under the assumptions that the metadata will be available in the XML format following an INSPIRE metadata schema definition file.
- This survey has proved that users can find, at present, different solutions as on the software market of commercial products as in the freeware source areas. These solutions can address the main requirements related to management (including validation and interoperability) of metadata resources.

Services State of Play Compliance Testing

- The document contains an inventory of existing solutions for compliance testing and interoperability checking of services, the assumption being that the services are web services.
- According to the evidence collected it seems that any software solution that will have to consider the INSPIRE requirements for web services and their interoperability cannot abstract from the “state of play” of a SOA architecture and its evolution. The problem with a “standard” SOA stack is that the well-defined and accepted “layers” associated with TCP/IP and OSI don’t exist.

Data State of Play Compliance Testing

• The document contains an inventory of existing solutions for compliance testing and interoperability checking for data taking into account the draft INSPIRE data specifications conceptual model (D2.5), the first draft of the INSPIRE Methodology for the development of data specifications (D2.6) and the first draft of the data Specifications Guidelines for the encoding of spatial data (D2.7), with a particular attention paid to checking compliance with “application schemas” as defined in the previously mentioned documents.

• The solutions, platforms and software packages investigated will need more time to adjust to the INSPIRE final requirements and get in tune with the involved standards.

How can you contribute to INSPIRE?

- Highest involvement of key stakeholders through the Spatial Data Interest Community (SDIC) and Legally Mandated Organisations (LMO) concepts

- Are you involved in a network representing producers, transformers and users of spatial data that falls within the scope of INSPIRE?
  - Register as a Spatial Data Interest Community!

- Has your organisation a legal mandate for one or more aspects of INSPIRE?
  - Register as a Legally Mandated Organisation!

Keep informed
- Review deliverables from the Drafting Teams and the Thematic Working Groups
- Propose experts
- Submit reference material
- Testing of draft specifications

http://www.ec-gis.org/inspire/
Thank you for your attention!

.....to know more come to the 2nd INSPIRE Conference, Maribor, Slovenia, 23-25 June 2008!!