

## Across Boundaries – SDI in a European Perspective (INSPIRE)

Jes RYTTERSGAARD, Denmark

**Key words:** SDI, GIM, Standards

### SUMMARY

After several initiatives from the European Union for creating an infrastructure for spatial information, the Directorate General - Environmental (DG-ENV) of the European Union (EU) took an initiative in 2001. The reason was that the environmental sector in Europe has a number of registration and reporting tasks comprising objects with a spatial reference. The new initiative adopted the name INSPIRE. INSPIRE is an abbreviation for **I**nfrastucture for **S**patial **I**nformation in **E**urope

INSPIRE aims at making available relevant, harmonised and quality geographic information for the purpose of formulation, implementation, monitoring and evaluation of Community policy-making.

The environmental sector has a leading role in this initiative, but it is fully aware of the similarities between the different sectors such as agriculture, transportation, health a.s.o. If things go according to plan the legislation process will start later this year and in 2006 or 2007 the legislation for an European Spatial Information Infrastructure will be in place. The rest is hard work.

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Jes RYTTERSGAARD, Denmark

## 1. INTRODUCTION

In the nineties there were several initiatives for creating a so-called infrastructure for spatial information on European level. All went wrong. The reason was, presumably, that the mapping sector was the originators.

In 2001 the Directorate General - Environmental (DG-ENV) of the European Union (EU) took another initiative. The reason was that the environmental sector in Europe has a number of registration and reporting tasks comprising objects with a spatial reference. It is characteristic for these activities that they are trans frontiers.

The new initiative adopted the name INSPIRE. INSPIRE is an abbreviation for **I**nfrastucture for **S**patial **I**nformation in **E**urope

INSPIRE aims at making available relevant, harmonised and quality geographic information for the purpose of formulation, implementation, monitoring and evaluation of Community policy-making.

INSPIRE is a legal initiative of the EU that will address technical standards and protocols, organisational and co-ordination issues, data policy issues including data access and the creation and maintenance of spatial information. (<http://inspire.jrc.it/home.html>).

The environmental sector has a leading role in this initiative, but it is fully aware of the similarities between the different sectors such as agriculture, transportation, health, a.s.o.

## 2. THE INSPIRE PRINCIPLES

From the very start the vision or the principles were formulated. They are still valid.

- Data should be collected once and maintained at the level where this can be done most effectively
- It should be possible to combine seamless spatial information from different sources across Europe and share it between many users and application
- It should be possible for information collected at one level to be shared between all the different levels, detailed for detailed investigations, general for strategic purposes
- Geographic information needed for good governance at all levels should be abundant under conditions that do not refrain its extensive use
- It should be easy to discover which geographic information is available, fits the needs for a particular use and under which conditions it can be acquired and used
- Geographic data should become easy to understand and interpret because it can be visualised within the appropriate context selected in a user-friendly way.

### **3. THE PROCESS**

To ensure sufficient attention to the initiative the three Commissioners responsible for Environmental policy, for Statistics and for Research signed a Memorandum of Understanding on the development of the INSPIRE initiative.

An expert group with participation from the member states, accession countries and representatives of key stakeholders at the local and regional level became a reality late 2001.

The initiative has been developed through several working groups. In the first phase of INSPIRE, six different horizontal working groups were created:

- Common Reference Data & Metadata<sup>13</sup>
- Environmental Data
- Data Policy and Legal Aspects
- Architecture and Standards
- Funding & Implementation Structures
- Impact Analysis

These groups provided the basic substance for the preparation of the INSPIRE initiative.

At the end of 2002 the results were published in six separate position papers.

Hereafter the working groups were replaced with two new working groups to bring their work forward:

- Implementation Strategy
- Framework Definition Support.

In 2003 the Framework Definition Support group became responsible for completion of an extended impact assessment. In line with EU legislation an internet consultation was held in spring 2003.

Against the background of the position papers, the results of the internet consultation and the extended impact assessment the DG-ENV decided to revise the scope and the measures of INSPIRE. This work will be finished in March 2004.

Probably in June 2004 the political process will start up. At best a EU-legislation will be in place late 2006.

### **4. THE INITIAL RECOMMENDATIONS**

The recommendations from the position papers could be divided in four groups:

- Rules and specifications.
- Contents.
- Services.
- Organisation.

## 4.1 Rules and Specifications

In order to ensure that data can be used in different connections and in combination with other data there is a need for common standards and specifications. As example one could call attention to:

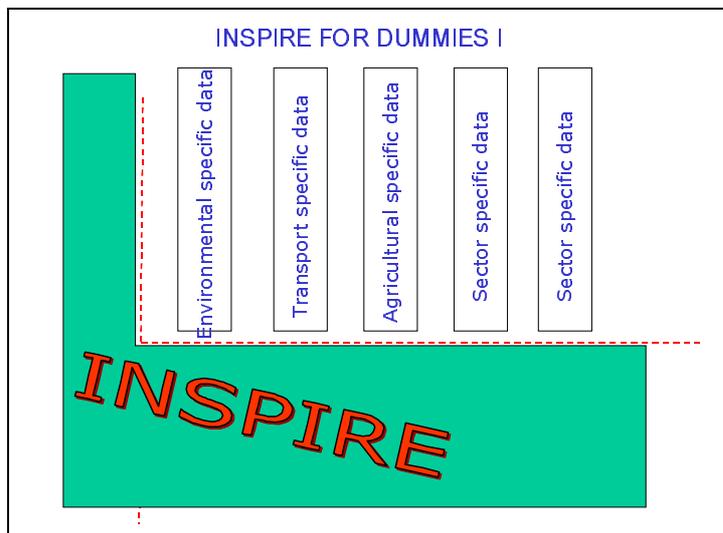
- ISO TC211
- OpenGIS
- Metadata
- Datamodeling
- Object definitions
- Rules for harmonization
- Quality measures
- Accuracy and/or scale
- Interoperability
- ...

## 4.2 Contents (data)

One of the position papers contains an analysis of the data used in the Environmental sector in Europe. In addition to what traditionally is understood as reference data and data used in many sectors (multi sector data) there was a large number of data specific for the environmental sector. About 60 different datasets were listed.

It is presupposed that metadata is available or will be established.

The relations between the different data types and metadata can be illustrated in the following way:



### 4.3 Services

One of the main goals with INSPIRE is to secure access to and dissemination of data and information. It is not surprising that the recommendations contains proposals on establishing a number of services to secure:

- That the users are able to data what data is available where.
- That the users get the possibility to download data
- That the user can combine data from different sources (model and coordinate transformation)
- That the user can analyse data
- .....

It is recommended to establish a common European portal with links to national geo-portals and facilities.

### 4.4 Organisation

It is not possible to establish, develop and maintain INSPIRE without a formal organisation. This organisation comprises as well the European as the national level and the interdependences within the frame of the EU-legislation.

Presumably there will be a European INSPIRE committee and a national committee in every member country.

## 5. INTERNET CONSULTATION AND IMPACT ASSESSEMNT

In line with normal EU practice an internet consultation took place. The basis for the Internet consultation was a short version of the consultation paper with specific reference to separate themes, for instance the extent and content of the proposed datasets.

In general the answers were very positive with wide support to the INSPIRE principals. Beside there were a number of specific indications on the need to be realistic with a step by step implementation. In general there was support to the ideas on rules, specifications and standards and organisation. Many made reservations on the proposed service just as the proposal on the extent of the datasets to be included/mentioned in the INSPIRE were met with many objections.

The impact assessment was based on a comprehensive collection of data, information and case studies. The results of the analysis were compared to a “do nothing alternative”. On the basis of realistic estimations of the costs and very conservative assumptions of the benefits the test came out with a plus on more than 1200m Euro pr. year.

## 6. REVISED SCOPE

In the light of the results of the Internet consultation and the impact assessment it was decided to develop a less ambitious alternative. The original principles should remain unchanged.

The primary focus of INSPIRE will be on those data which are essential basics for any spatial data infrastructure and which have most uses across different environmental themes and at different scales so as to maximise efficiency and cost-effectiveness.

INSPIRE will improve:

- Access to spatial basic data homogenous across the Community and to commonly used thematic data in electronic format together with corresponding services;
- Spatial coherence of environmental thematic data by setting principles, standards and guidelines for spatial features to be followed within both existing and future environmental legislation processes;
- Interoperability between National Spatial Data Infrastructures (SDI) in the framework of a European SDI.

The alternative comprises proposal on the following data-sets as cornerstones in the coming European Spatial Information Infrastructure.

<b>BASIC DATA INSPIRE Annex I data</b>	<b>COMMONLY USED THEMATIC DATA INSPIRE Annex II data</b>
<ul style="list-style-type: none"> <li>- Administrative units</li> <li>- Transport networks</li> <li>- Hydrography including water catchment areas</li> <li>- Elevation including terrestrial elevation, bathymetry and coastline</li> <li>- Cadastral parcels</li> <li>- Land cover</li> <li>- Protected sites</li> <li>- Ortho-imagery</li> </ul>	<ul style="list-style-type: none"> <li>- Statistical units</li> <li>- Buildings</li> <li>- Soil</li> <li>- Geology</li> <li>- Land use</li> <li>- Human health and safety</li> <li>- Government service and environmental monitoring facilities</li> <li>- Production and industrial facilities</li> <li>- Agricultural and aquaculture facilities</li> <li>- Population distribution - demography</li> <li>- Area management/restriction/regulation zones &amp; reporting units</li> <li>- Natural risk zones</li> <li>- Atmospheric conditions</li> <li>- Meteorological spatial features</li> <li>- Sea regions</li> <li>- Bio-geographical regions</li> <li>- Habitats and biotopes</li> <li>- Species distribution</li> </ul>
<ul style="list-style-type: none"> <li>- Coordinate reference systems</li> <li>- Geographical grid systems</li> <li>- Geographical names</li> <li>- Addresses including postal regions</li> </ul>	

The proposed measures within INSPIRE include:

- data sharing between public bodies of existing public sector spatial data in electronic format and corresponding services: data publishing, search, viewing, download, transformation, metadata, e-commerce;
- harmonization: standardisation of data exchange formats, information models, key attributes, topology and data representation.

For Annex I data components, the measures foreseen for INSPIRE fully apply, in particular in relation to information harmonisation which comprises the level of harmonisation needed to make the data comparable and geometrically consistent (meaning that overlaying of geographical data leads to meaningful information on how they interact at specific locations). In practise, this means that attributes of data such as unique identifiers (e.g. EU coding system for rivers) and data classification (e.g. road classification) will be addressed based on detailed dataset specifications (e.g. ISO10131) and a feature catalogue (e.g. ISO10110).

For Annex II data components, the measures foreseen for INSPIRE as regards harmonisation to the level of data harmonisation needed to make the spatial data objects geometrically consistent. This also required addressing semantic consistency related to the general definition of the spatial objects. However, semantic consistency of individual features falls outside the scope of Annex II. In practise, this means that harmonisation of Annex II spatial data concerns the way information is defined and geo-referenced (e.g. the way x,y,z coordinates of identified spatial objects are specified and the way information is linked to Annex I data). Harmonisation of the thematic features of the data is either left for a later stage or left to the thematic community who will of course need to take into account the INSPIRE standards.

## **7. FINAL REMARKS**

The preparation of INSPIRE passes of in a very positive atmosphere. The combination of experts from the environmental and the mapping sector creates a common understanding on needs, possibilities and limitations. At the same time the INSPIRE process facilitates discussions and cooperation on national level.

Although one can see a lot of problems, constraints and barriers piles up in the horizon, such as agreements on data models, rules for harmonisation, etc. the general feeling is that INSPIRE is like a magnetic field. It defines the appropriate developments. The INSPIRE intentions will be implemented in Europe with or without legislation. The difference will be the timing.

## **REFERENCES**

<http://inspire.jrc.it/home.html>

## BIOGRAPHICAL NOTES

**Jes Ryttersgaard:** Head of the Informatics Department, National Survey and Cadastre Denmark.

Chair: FIG Commission 3 (Spatial Information Management) 1998-2002

1968 M.Sc geodesy and cadastral surveying

1971-1973 Assistant professor

1973-1984 Associate professor

1984- Head of various department at the National Survey and Cadastre.

1994-1998 Vice-chair FIG Commission 3

1998-2002 Chair FIG Commission 3 (Spatial Information Management)

2002- Member of the Inspire Expert Group

Author of several compendiums and professional papers, articles etc..

## CONTACTS

Jes Ryttersgaard

National Survey and Cadastre, Denmark (KMS)

Rentemestervej 8

Copenhagen

DENMARK

Tel. + 45 3587 5022/+ 45 2145 7811

Fax + 45 3587 50 51

Email: jr@kms.dk

Web site: kms@kms.dk