Benefits Realised from INSPIRE:

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European Commission Joint Research Centre

www.jrc.ec.europa.eu

Serving society
Stimulating innovation
Supporting legislation
Background to INSPIRE

- Europe is a patchwork of several countries with different traditions, cultures and socio-economic models…
- This is reflected in terms of their geo-spatial management choices
Main problems

- Difficulties of access to information (insufficient metadata at all levels);
- Different projections and scales, making existing information difficult to integrate;
- Unclear status of the information as to its currency;
- Prohibitive cost of geographical data;
- Lack of interoperability between data sets, and among web-enabled services;
- Lack of standardisation in the codes used to represent the objects described;
- Varying data quality from one country to another within the same layer of geographical information;
- Lack of long-term solutions (instead: supply of snapshots, absence of information on changes, resulting in information that becomes quickly outdated and hence the need for duplication of data collection efforts).
INSPIRE Directive 2007/02/EC

The INSPIRE Directive 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.

This decentralised infrastructure is built on the infrastructures for spatial information established and operated by the Member States.

1. Metadata
2. Interoperability of spatial data sets and services
3. Network services (discovery, view, download, transform, invoke)
4. Data and Service sharing (policy)
5. Coordination and measures for monitoring & reporting

JRC is the technical coordinator.
### 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
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
Key INSPIRE Legal Acts published in the Official Journal


- INSPIRE **Metadata** Regulation *03.12.2008*

- Commission Decision regarding INSPIRE monitoring and reporting *05.06.2009*

- Regulation on INSPIRE **Network Services** *19.10.2009* (View and discovery) and *10.12.2010* on Download and Transformation

- Regulation on INSPIRE **Data and Service Sharing** *29.03.2010*


European law affecting 30+ countries, 21+ languages

**APPROACH**
- Expert knowledge and case studies
- Clear assumptions, generous with costs, conservative with benefits
- Incremental costs due to the Directive, where possible in monetary terms
- Benefits estimated for the environmental sector

**DATA**
- Access to data from several European projects and case studies, e.g.
  - CORINE Land Cover
  - EUROSION
  - GETIS
  - MIDAS
  - Space for Geo-Information
  - TERRIS

**RESULTS**
- Estimated cost of INSPIRE: 93-138 m€ for 10 years
- Benefits 7-10 times higher than costs
- Higher expenditures recorded at the subnational scale
Summary costs/investment (rounded figures € m. p.a.)

Table 4: Summary of investments for the reduced scope of INSPIRE, including the revised basic assumptions

<table>
<thead>
<tr>
<th>Blocks of INSPIRE policy measures</th>
<th>EU-level</th>
<th>National Organisations</th>
<th>Regional/local</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harmonisation</td>
<td>0,6</td>
<td>1,2</td>
<td>0,5</td>
</tr>
<tr>
<td>Metadata</td>
<td>0,2</td>
<td>1,9-2,2</td>
<td>33</td>
</tr>
<tr>
<td>Data Policy Framework</td>
<td></td>
<td>0,4</td>
<td></td>
</tr>
<tr>
<td>Coordination and implementation including outreach</td>
<td>1,1</td>
<td>9,6</td>
<td>44-88</td>
</tr>
<tr>
<td><strong>Total investment per annum over 10 years (€m) (rounded)</strong></td>
<td><strong>1,9</strong></td>
<td><strong>13</strong></td>
<td><strong>77-122</strong></td>
</tr>
</tbody>
</table>
Assumed benefits  
(after revisions in 2004)

Table 6: Summary of benefits when reducing the scope of INSPIRE

<table>
<thead>
<tr>
<th>Type of benefit</th>
<th>Quantitative estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>More efficient EIA’s and SEA’s</td>
<td>60-121</td>
</tr>
<tr>
<td>More efficient environmental monitoring and assessment</td>
<td>64</td>
</tr>
<tr>
<td>More cost-effective expenditure on environmental protection</td>
<td>192</td>
</tr>
<tr>
<td>More cost-effective implementation of the environmental acquis</td>
<td>32</td>
</tr>
<tr>
<td>More effective implementation of EC projects</td>
<td>3-8</td>
</tr>
<tr>
<td>More effective expenditure on Trans European Networks</td>
<td>90</td>
</tr>
<tr>
<td>Reduced duplication of spatial data collection</td>
<td>25-160</td>
</tr>
<tr>
<td>Improved delivery of risk prevention policies</td>
<td>77-256</td>
</tr>
<tr>
<td>Improved delivery of health and environment policies</td>
<td>224</td>
</tr>
<tr>
<td><strong>Total (in m€ per annum)</strong></td>
<td><strong>770-1150</strong></td>
</tr>
</tbody>
</table>

Still benefits assumed to be 6-7 times greater than costs  
So what do we know 8 years on ?
Workshop on SDI cost/benefit & ROI

**APPROACH**
Analysis of best practices on assessing the impacts of SDIs in North America and Europe

**DATA**
From several experiences across EU and America:
- INSPIRE XIA
- Geospatial Interoperability ROI Study
- Benefits and costs of US national maps
- Dutch experiences in CBA
- GOS Initiative
- eGEP study...

**RESULTS**
Only ex-ante IA SDI investment cost estimation possible, but hard to value it as a proportion of governments’ expenditures in the GI sector

Hard to estimate the benefits (who are users?)

Costs in the short term, benefits in the long term, so political favour is not guaranteed.
Socio economic studies of Regional SDIs: Catalonia, Spain, 2007

**APPROACH**
- eGep measurement framework
- Survey of 23 local authorities and 15 end-users using the Catalan SDI

**DATA**
- indicators of Efficiency
- Effectiveness
- Democracy
- elaborated from the survey

**RESULTS**
- Costs: SDI set up: 1.5 m€ in 5 years (no data creation and update)
- Benefits: internal efficiency benefits (2.6m€/year), investment recovered in 6 months
- Narrowing of digital divide
## Socio economic studies of Regional SDIs: Lombardy, Italy, 2009

### APPROACH
- Same methodology as in the Catalonia study
- Face to face interviews with regional government, local authorities, technology providers, local utility companies, professionals, academic sector
- Coupled with the EIA/SEA survey in the Region

### DATA
- Information about the local context from interviews
- Information from 27 local EIA/SEA practitioners about use of spatial data and problems, replying on an average of 350 EIAs/y in the region and 270 SEA in 2008

### RESULTS
- **Costs:**
  - SDI set up: 1.36m€/y (first three years, no data creation and update)
- **Benefits:**
  - Savings thanks to the existence of the regional SDI
  - Average reduction of 11% in cost, and 17% in time for faster and less expensive finding and accessing data for EIA/SEA
  - Better dialogue between regulators and developers, thanks to the same base of data
JRC survey of 150 companies doing EIA/SEA in Europe: A legal obligation throughout the EU

Projects requiring EIA

- Infrastructure projects
- Energy industry
- Disposal of waste
- Agriculture, silviculture and aquaculture
- Tourism and leisure
- Extractive industry
- Chemical industry
- Mineral industry
- Metal production/processing
- Food industry
- Other
- Textile, leather, wood and paper industries
- Rubber industry

No. of responses

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Plans requiring SEA

- Town & Country planning
- Land use
- Water management
- Energy
- Waste management
- Transport
- Industry
- Tourism
- Agriculture
- Forestry
- Fisheries
- Other
- Telecommunications

No. of responses

http://dx.doi.org/10.2788/84003
Average time to complete EIA/SEA report is 1-3 months. SDIs save 15% of time and cost.

€ 46,000 EIA
€ 34,000 SEA
• EIA/SEA practitioners still face problems connected with accessing and using environmental data
• For 2006, COWI estimated the total number of EIA/SEA studies to be 24,000 x an average cost of € 40,000 \( \approx € 1 \text{ billion} \) for the sector
• If the 15% increase in cost (associated with data access/quality problems) were tackled, annual savings could be €150-200 million, given increases in demand for SEA, inclusion of more local ‘screening’ activities and EU membership.
• Assumptions made during assessment of INSPIRE verified.
Reducing Environmental Risk through INSPIRE

Stefan Carlyle
Environment Agency for England and Wales
4/5th March 2013

## Quantified annual benefits of mapping

Excludes additional but un-quantified benefits of reputation & legislative compliance

<table>
<thead>
<tr>
<th>Item</th>
<th>Detail</th>
<th>Annual Saving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured Productivity (FTE)</td>
<td>Only includes actual efficiencies measured in National Permitting Centre (PSC) - 16 FTE</td>
<td>516,000</td>
</tr>
<tr>
<td>Estimated Productivity (FTE)</td>
<td>Based upon the efficiencies that Easimap map provides in terms of faster/easier access to data &amp; information.</td>
<td>Ca 3,000,000</td>
</tr>
<tr>
<td>Revenue from sale of GIS based data</td>
<td>Gross £2.5m revenue per annum. Assume that 50% of value is based upon GI component</td>
<td>1,250,000</td>
</tr>
<tr>
<td>Cost Avoidance</td>
<td>Reduced/avoided IT development and support costs through re-use</td>
<td>360,000</td>
</tr>
</tbody>
</table>

Ca 5,126,000
Opportunities for cross-border applications

Improved sharing of harmonised data (e.g. air quality measures) enables improved modelling and alert system

Long range transport of air pollutant a clear example

On March 4 and 5, 2013 Belgium, Germany, The Netherlands and United Kingdom organise the working conference

SAFETY, MOBILITY, SUSTAINABILITY

www.poweredbyinspire.eu
Opportunities of extending INSPIRE across-sectors

Railways need many data sets to run their daily business.

Inspire and RINF are complementary

Inspire Advantage:
Provides access to different data sets (Annexes I-III) within MS

RINF Advantage:
Provides railway data from Point A to Point B within EU

Source: Erika Nissi, International Union of Railways Senior Advisor
From INSPIRE to Railway Business Solutions
Powered by INSPIRE Conference, Brussels, 4-5 March 2013
Opportunities for innovation and growth: smeSPIRE project

1. What are the main characteristics of the Geo-ICT sector in Europe?

2. How is the Geo-ICT sector in Europe currently involved in the implementation of INSPIRE?

3. Do Geo-ICT companies in Europe have the skills and knowledge to participate in the implementation of INSPIRE?

4. Does INSPIRE already have an impact on the innovative performance of Geo-ICT companies in Europe?
Overview

- Overall picture
  - Total ICT enterprises: 554,000 (Eurostat, 2009)
  - ICT SMEs: 480,000
  - Total turnover: 400bln€
  - People employed: 2.9 million
  - “micro” (< 10empl.) 90%

- smeSpire estimation: up to 2% of ICT SMEs dealing with GI

Location of new ICT SMEs

- 1995 - 2000
- 2001 - 2004
Impact of INSPIRE

Figure: changes already occurred and/or foreseen due to INSPIRE Directive

Findings:
• impact of INSPIRE already quite high, and expected to increase in future
• current impact related to introduction of new products/services
• future impact related to new products/services and new customers
Conclusions

- INSPIRE provides a comprehensive framework for interoperability of spatial data and services
- Methods and infrastructure components can be reused for increased interoperability across borders and sectors i.e. **Digital Single Market**
- INSPIRE already having a positive impact on SMEs that are the core of innovation and jobs in Europe
- A mid-term evaluation of INSPIRE will start in September 2013 to deliver in May 2014: are the barriers being overcome? Is the policy effective, and sustainable? What the spin-offs?
References


• Lombardia Study http://www.envplan.com/abstract.cgi?id=b38006


• SmeSpire: www.smespire.eu
Thank You!

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