



# Consultation Paper on a Forthcoming EU Legal Initiative on Spatial Information for Community Policy-making and Implementation

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The European Commission is currently preparing legislation that will significantly change how data on the environment is organised and shared among public authorities and with European citizens.

The ambitious initiative, called **INSPIRE - Infrastructure for Spatial Information in Europe**, will contribute to further European integration and enable more coherence in Community policies, thereby promoting sustainable development and increased protection of the environment.

INSPIRE will first and foremost benefit policy-makers and authorities at the European, national and local levels, but improved on-line access to public geographical information will also lead to all kinds of practical uses for the general public. Researchers will benefit as well and the new infrastructure will also help many types of businesses operating in more than one Member State. For example, in the fields of insurance, utility planning and operations, sustainable use of natural resources, communications, agriculture, tourism, etc.

In phase one of the INSPIRE Internet consultation, the idea behind the initiative was introduced along with the basic issues that are involved. In this second phase paper, the INSPIRE initiative is explained in detail: what it is, why it is needed, what policies are being proposed, how it is being realised, what are the expected impacts, and how it will work in practice.

**Readers familiar with INSPIRE, or with concepts such as spatial data infrastructures, might decide to skip the first two chapters and focus on the proposed policy measures and their implementation. For them, chapters 3 and 4 contain all the information needed to participate in the present Internet consultation. Novices in this field should familiarise themselves with the phase one document first.**

## 1. What is the INSPIRE Initiative?

INSPIRE is a legal framework being developed by the Commission services with officials and experts in Member States and accession countries from the national, regional and local levels. It is to be implemented throughout the European Union (EU) from 2006/7 onwards with different types of geographical information gradually harmonised and integrated, resulting in a **European Spatial Data Infrastructure**.

For some visual examples demonstrating the benefits of a **Spatial Data Infrastructure**, visit the INSPIRE website at <http://inspire.jrc.it/> and click on **SDI BENEFITS**. Case studies are presented there for Disaster Management, Airport Noise Pollution, and Motorway Planning. Click on **SDI INITIATIVES** for links to a number of interesting ongoing international, regional, and national SDI initiatives.

Initially, INSPIRE will focus specifically on information needed to monitor and improve the state of the environment, including air, water, soil, and natural landscape. Much of this information needs to be underpinned by "multi-purpose" spatial data. Examples of such types of data are elevation data important for water management and flooding, soil data important for nature protection and groundwater management, etc.

A key objective of INSPIRE is to make more and better spatial (geographical) information available for Community policy-making and implementation in a wide range of sectors, starting with environmental policy and later extended to other sectors such as agriculture, transport, etc.

The main beneficiaries of INSPIRE will therefore be those involved in the **formulation, implementation, monitoring and evaluation of policies** - at the European, national and local level and involving public authorities, legislators and citizens and their organisations. However, other user groups are also expected to benefit from INSPIRE, including the private sector, universities, researchers, citizens, the media, etc.

### What is a spatial data infrastructure?

The INSPIRE initiative intends to trigger the creation of a European Spatial Data Infrastructure (ESDI) that delivers to the users integrated spatial information services. Possible services are the visualisation of information, overlay of information from different sources, spatial and temporal analysis, etc. They should allow the users to find and access spatial or geographical information from a wide range of sources, from the local level to the global level, in an inter-operable way for a variety of uses.

A spatial data infrastructure encompasses the policies, organisational remits, data, technologies, standard delivery mechanisms and financial and human resources necessary to ensure that those working with spatial data, whether at the global or the local scale, are not impeded in meeting their objectives.

## 1.1. Context and vision

Good policy relies on quality information and informed public participation. The increasing complexity and inter-connection of issues affecting the quality of life today are recognised by the policy-makers and influences the way new policies are being prepared today.

For instance, the **Sixth Environment Action Programme**<sup>1</sup> emphasises the need to base environmental policy on sound knowledge and participation, principles that will influence the EU's environmental policy decisions for the next decade.



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Presently, precious spatial information is available at local and regional level, but it is difficult to exploit in a broader context for a variety of reasons. The data is often of unsatisfactory or undefined quality, based on proprietary geographic information systems and not accessible to the public or other users at local, regional, national and international level. Therefore, projects that need to combine data coming from various sources to provide policy-relevant information are often time-consuming and costly.

Policies need to be employed to reduce the duplication in data collection and to assist and promote harmonisation, wide dissemination and use of spatial data. These policies should result in increased efficiency, the benefits of which can be reinvested in improving the availability and

<sup>1</sup> See the web pages on The Sixth Environment Action Programme of the European Community: Environment 2010: Our Future, Our Choice at: <http://europa.eu.int/comm/environment/newprg/index.htm>

quality of spatial information. In turn, the increased availability of data will stimulate innovation among data and information providers in the commercial sector.

INSPIRE envisages the establishment of integrated spatial information services, based upon a distributed network of databases, linked by common standards and protocols to ensure compatibility and inter-operability<sup>2</sup>.

In short, the INSPIRE policy vision is to make harmonised and high quality spatial information readily available for formulating, implementing, monitoring and evaluating Community policy and for the citizen to access spatial information, whether local, regional, national or international<sup>3</sup>.

## 1.2. Origins and background

Regarding access to public information in general, the **European Parliament** pointed out in 1999 that the EC Treaty has conferred a number of fundamental freedoms on EU citizens, but that considerable practical difficulties can prevent people from exercising those rights<sup>4</sup>. These difficulties result primarily from a lack of information for citizens, employers and administrations at all levels.

Access to environmental information in particular was the subject of the 1998 **Aarhus Convention**<sup>5</sup> that was seen as a big step forward for both the environment and democracy as it improves the public's rights in the making and implementation of environmental policy.

The Aarhus Convention and its implementation through Directive 2003/4/EC on public access to environmental information defines "environmental information" very broadly. This definition (see box below) shows how closely the environment is linked to activities in other sectors.

### THE DEFINITION OF ENVIRONMENTAL INFORMATION

**Article 2:** For the purposes of this Directive, "environmental information" shall mean any information in written, visual, aural, electronic or any other material form on:

- a) the state of the elements of the environment, such as air and atmosphere, water, soil, land, landscape and natural sites including wetlands, coastal and marine areas, biological diversity and its components, including genetically modified organisms and the interaction among these elements;
- b) factors such as substances, energy, noise, radiation or waste, including radioactive waste, emissions, discharges and other releases into the environment, affecting or likely to affect the elements of the environment referred to in a);
- c) measures (including administrative measures), such as policies, legislation, plans, programmes, environmental agreements and activities affecting, or likely to affect, the elements and factors referred to in a) and b) as well as measures or activities designed to protect those elements;
- d) cost-benefit and other economic analyses and assumptions used within the framework of the measures and activities referred to in c); and
- e) the state of human health and safety, conditions of human life, cultural sites and built structures in as much as they are, or may be affected by, the state of the elements of the environment referred to in a) or, through those elements, by any of the matters referred to in b) and c).

<sup>2</sup> Interoperability is the ability of two or more autonomous entities (e.g., systems, applications, data sets, ...) to communicate and co-operate among themselves in a meaningful way despite differences in language, context or content. This interaction should not require special efforts by the data producer or consumer - be it human or machine.

<sup>3</sup> The INSPIRE initiative will link with relevant initiatives at the global level, such as the work to develop the Global Spatial Data Infrastructure (GSDI). URL: <http://www.gsdi.org/>

<sup>4</sup> See the European Parliament's Green Paper on Public Sector Information in the Information Society COM(98)585final, adopted on 20 January 1999 and available in the Document Archive on the INSPIRE website: <http://inspire.jrc.it/>

<sup>5</sup> The full name of the treaty is the Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters. For more information visit <http://www.unece.org/env/pp/>

Given the interconnection of issues in different sectors, the European Commission in 2001 called for a co-ordinated approach in its **White Paper on European Governance**<sup>6</sup>. The White Paper proposes opening up the policy-making process to have more people and organisations involved in shaping and delivering EU policy. It promotes greater openness, accountability and responsibility for all those involved. This should help people to see how Member States, by acting together within the Union, are able to tackle their concerns more effectively.

Also since 2001, the **European Sustainable Development Strategy**<sup>7</sup> advocates a new approach to policy-making through better coherence in the Community policies. An information base that provides detailed, relevant and harmonised spatial information for different policy areas and that is commonly accessible could significantly contribute to this objective.

This was the reason given for the INSPIRE initiative in the **Memorandum of Understanding**<sup>8</sup> between Commissioners Wallström, Solbes, and Busquin on 11 April 2002 to provide a basis for continued co-operation between the Commission services DG Environment, EUROSTAT and the Joint Research Centre for developing the INSPIRE initiative. Since then, DG Information Society and DG Research, Technology and Development have also provided significant contributions.

The knowledge-based approach to policy making advocated by the **Sixth Environment Action Programme (EAP)**<sup>9</sup> requires quality information on the state of the local and global environment to be readily available. Such data is required to mitigate the risks due to natural disasters (with climate change a driving factor), man-made hazards and societal pressures on the environment, particularly in areas of high vulnerability such as the coastal zones. In addition to the introduction of a more coherent and efficient reporting system, the 6<sup>th</sup> EAP refers to the reinforcement of the development of spatial information systems, of space monitoring applications and support to Member States in setting up adequate data collection systems.



Photo: courtesy AFP

The **World Summit on Sustainable Development**<sup>10</sup> held in Johannesburg in 2002 provides the global context in stressing the need to develop preventive strategies to cope with environmental degradation. Such strategies require collecting and sharing data and information, both locally and globally. The WSSD plan of implementation adopted in 2002 refers in this context to the development and wider use of earth observation technologies, global mapping and geographic information systems.

But it is not only in global action plans, international conventions and European strategies that there is a call for better and more accessible geographic information. Within the EU and in the Member States, on-going work on such issues as urban, marine, health and natural resources show day after day the need for better data collection.

Several efforts to address these problems are underway as there are steps to draft information requirements and streamline information dissemination, albeit currently still without an overall co-ordination taking place. Limiting these efforts to ad hoc determined themes (urban, soil, water, forests, air...) or geographical areas (e.g. certain regions) will not allow the complexity of local and regional ecosystems to be taken into account or provide for an integrated European approach.

<sup>6</sup> COM(2001)428 – European Governance - a White Paper. The paper is available at: [http://europa.eu.int/comm/governance/white\\_paper/index\\_en.htm](http://europa.eu.int/comm/governance/white_paper/index_en.htm)

<sup>7</sup> Presidency Conclusions – Göteborg European Council, 15 and 16 June 2001

<sup>8</sup> The Memorandum of Understanding is available on the INSPIRE website <http://inspire.jrc.it/> under **Document Archive**.

<sup>9</sup> See the web pages on The Sixth Environment Action Programme of the European Community: Environment 2010: Our Future, Our Choice at: <http://europa.eu.int/comm/environment/newprg/index.htm>

<sup>10</sup> For the final report of the Summit go to: <http://www.johannesburgsummit.org/>

Preparatory work for INSPIRE, the **GMES**<sup>11</sup> pilot and the lessons learned during the implementation of the **Water Framework Directive**<sup>12</sup>, also show a fragmented situation of data collection and availability. Even in domains where significant progress has already been made, such as on air quality, many inter-regional gaps continue to exist. The demand for information is currently not being met by an adequate supply, while on the other hand the data providers are insufficiently briefed on the information requirements. As a result, the public is informed in a very fragmented and incoherent way on the state of the environment and on the risks to which it is exposed.

Co-ordinated action is needed to understand the current gaps and deficiencies in the data collection and information supply infrastructures and to develop solutions through research, technology developments and EU-wide to global co-operation to fill these gaps in a cost efficient way.

### 1.3. How is INSPIRE being developed and by whom?

The INSPIRE initiative has developed in a very horizontal and collaborative way with Member States, accession countries and representatives of key stakeholders at the local and regional level, including those from EFTA countries, who are represented in an INSPIRE Expert group. During 2002, 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, published at the end of 2002 in separate position papers<sup>14</sup>, after which they were dissolved. They were replaced with two new working groups to bring their work forward:

- Implementation Strategy
- Framework Definition Support

The Implementation Strategy working group responds to a strong demand from stakeholders to anticipate the implementation of INSPIRE and focuses on the practical implementation aspects of INSPIRE. The working group is currently working on an implementation strategy and action plan for phase 2003-2006/7, with a view to preparing and speeding up the implementation of INSPIRE after it comes into force.

The Framework Definition Support working group examines the overall impacts of the INSPIRE initiative. This work is supported by a contractor engaged by the Commission and will lead to an Extended Impact Assessment report expected to be ready by July 2003. Some of the preliminary conclusions of the group are summarised in section 3.5 below.

Detailed descriptions of the working groups and their reports are available on the INSPIRE Internet site: <http://inspire.jrc.it/>.

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<sup>11</sup> Global Monitoring for Environment and Security (GMES). See section 2.2. For further information see the GMES website: [http://europa.eu.int/comm/space/space02/index\\_en.html](http://europa.eu.int/comm/space/space02/index_en.html)

<sup>12</sup> DIRECTIVE 2000/60/EC see also in **Document Archive** on the INSPIRE website: <http://inspire.jrc.it/>

<sup>13</sup> Summary information or a description of the characteristics of a set of data. Often referred to as "data about data", metadata is the information and documentation which makes data understandable and sharable for users over time (ISO 11179 Annex B)

<sup>14</sup> See **Position Papers** on the INSPIRE website: <http://inspire.jrc.it/>



On the basis of the recommendations of all of these groups on a wide range of technical and other aspects, and taking into account the Extended Impact Assessment as well as the public internet consultation, the Commission expects to come up with a proposal for the INSPIRE legislation by late 2003.

The Commission will send its proposal for a legal act to the European Parliament and the Council for adoption. Once implemented, each Member State will create or adapt its Spatial Data Infrastructure. These will be integrated to become a European Spatial Data Infrastructure (EDSI) providing data and related services from across the EU. INSPIRE is the legal framework; ESDI involves the concrete deliverables.

Later on, the INSPIRE framework legislation could be complemented where appropriate with daughter legislation of a more specific nature requiring additional data to be made available.

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## **Provisional Timetable for Preparation and Enactment of the INSPIRE Policy Framework**

A common infrastructure for spatial information in Europe can only be realised in the long run. Therefore, a step by step approach is being developed. The steps completed so far and the next steps to be taken include:

### Preparation of the INSPIRE proposal

- |  |                          |
|--|--------------------------|
| • Establish INSPIRE Expert group         | completed December 2001  |
| • Establish INSPIRE first Working Groups | established January 2002 |
| • Working Groups' Final Reports          | completed October 2002   |

### Pre-Legal Framework Implementation

- |                                   |                            |
|-----------------------------------|----------------------------|
| • Develop Implementation Strategy | to be completed June 2003  |
| • Implement Strategy              | to be initiated thereafter |

### Conduct Impact Analysis

- |                                  |                              |
|----------------------------------|------------------------------|
| • Prepare Impact Analysis        | initiated December 2002      |
| • Produce Impact Analysis report | to be completed by July 2003 |

### Develop Legal Framework

- |                                  |  |
|----------------------------------|--|
| • Phase I Internet consultation  | 25 March to 29-April 2003                        |
| • Phase II Internet consultation | 29-April 2003 to 29-May 2003                     |
| • Prepare Commission Proposal    | adoption by the Commission expected by late 2003 |

### Legislative Process for legal Framework

- |  |             |
|--|-------------|
| • Legislation Preparation / Co-decision  | 2003-2006/7 |
| • INSPIRE Policy Framework legislative act in place (adoption by Council and Parliament) | 2006/7      |
- 

## **2. Why is INSPIRE needed?**

### **2.1. The State of Play of Geographical Information in Europe today**

Europe has a long tradition in cartography. As a result, detailed geographical information is available in Europe to support a broad range of policies. Indeed, map-based information is used in many reporting, analysis, evaluation and forecasting tools and activities. In addition, the emergence of the Internet allows for widespread and low-cost distribution of this type of information and could contribute to better understanding and awareness by the wider public for various policy issues<sup>15</sup>. So can we say that the situation in Europe is satisfactory?

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<sup>15</sup> Examples: <http://www.europa.eu.int/water/cgi-bin/bw.pl>  
<http://www.europa.eu.int/comm/environment/nature/natura.htm>

Despite these many initiatives, widespread access and use of geographical information is still a problem in Europe. The existing services - all very laudable individually - are fragmented and poorly co-ordinated at European level. Although a lot of the geographical information collected could potentially be useful for a wide range of purposes, the wider needs are rarely taken into account.

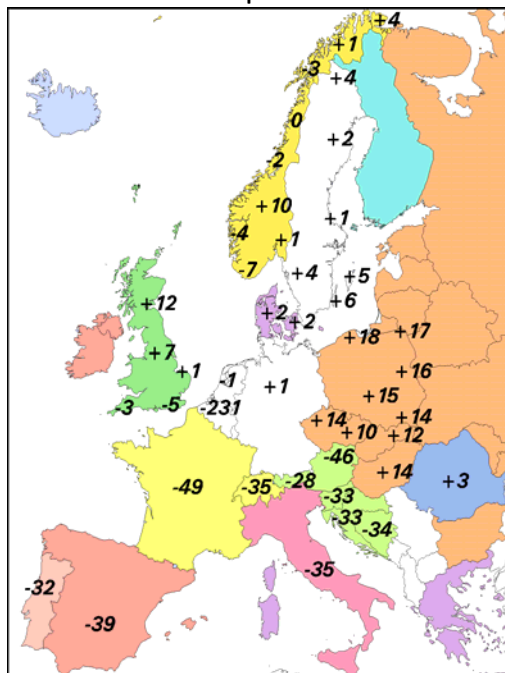
Traditionally, geographical information has been a specialised activity organised by individual national states and professions in different ways. European standards for data definition and exchange are only now emerging, but are complex to use. Provision of basic European spatial datasets supporting technology and knowledge infrastructure has not been well co-ordinated across disciplines or national boundaries, making it difficult and expensive to fit data together from many different sources in a seamless way.

In spite of the potential for the creation of a market for added-value services in spatial information, a dynamic internal market for spatial information fails at present to take off in Europe<sup>16</sup>, contrary to experience in the US.

The main problems can be summarised as follows:

- Difficulties to know and access existing information (insufficient metadata at all levels);
- Different standards and scales, making existing information difficult to integrate;
- Dates of updating and observation incompatible and rarely available;
- Prohibitive cost of geographical information;
- Lack of standardised data exchange formats;
- Lack of standardisation in the codes used to represent the objects described;
- Varying data quality from one country to another within the same information layer;
- Lack of long-term strategies.

An example of such problems (various standards), is illustrated in the box (right) which shows differences between the European and various national measurements for heights.<sup>17</sup>



Luckily, awareness is growing at national and EU level over the need for quality geo-referenced information for understanding the complexity and for containing the negative impacts of the ever-increasing human activity in the EU. Many regional and national initiatives are being introduced<sup>20</sup> and the new INSPIRE initiative has been welcomed both in the Member States and in the different Commission services. In addition, the newly developed concept of a European Research Area<sup>21</sup> proposes a framework to rationalise scattered research in Europe.

## 2.2. Various initiatives and lesson learned

In the preparation of the INSPIRE legal framework, a wide range of experience from related initiatives is being taken into account. These initiatives include international, European, national and regional ones, as well as the experience of other non-European national efforts such as in Australia, Canada and the US. Links to the websites of many of the organisations and programmes involved can be found on the INSPIRE website. (See also the INSPIRE Extended Impact Assessment outlined in section 3.5).

### European level

An example of a European initiative from which much has been learned is the case of the EUROSION project that aims to provide the EC with recommendations on policy and management measures to address coastal erosion in the EU.<sup>22</sup>

The specific problems found in the EUROSION project concerning the geographical information available included the following:

- A large variety of data types (satellite images, maps, aerial photographs, diagrams, statistics, reports, databases, etc.) and formats exist. The integration of various formats is time consuming and uncertain.
- Many geographical gaps still remain. These need to be identified and there should be priorities to bridge them.
- Reference systems are not harmonised. There is a need to adopt/support a common terrestrial reference system for data interoperability.
- Many data sources are not consistent. There is a need to build pan-European "seamless" data with standard specifications.
- Data accuracies are not compatible. There is a need to adopt a common level of representation of data.
- Many data sources are not interoperable. For example, different datasets define the European coastlines with differences of up to 200 meters.
- Costs and access restrictions. For example:
  - Most existing datasets are subject to copyrights that restrict the dissemination of end-products (sometimes, end-products have to be "degraded")
  - Licenses become very expensive when many users need to use the data.
  - Quality "labels" are not commonly adopted: uncertainty exists over the products licensed.

In summary, according to the EUROSION study, the absence of a European spatial data infrastructure results in higher investment costs (2 to 3 times), delayed implementation, uncertain quality and puts constraints on dissemination.

Still on the European level, there are a number of other initiatives from which the EU has gained considerable experience. (See box below).

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<sup>20</sup> See Examples of regional and national initiatives to create a spatial information infrastructure in GE, UK, PT on the Internet <http://inspire.jrc.it/>

<sup>21</sup> See <http://europa.eu.int/conniVresearch/area.html>

<sup>22</sup> See the Powerpoint presentation "EUROSION: A base of experience for INSPIRE" on the INSPIRE website at <http://inspire.jrc.it/> and click on **DOCUMENT ARCHIVE**. Click in the heading "PowerPoint Presentations" on the presentation "**EUROSION: A base of experience for INSPIRE**".



### Geographical Information in the Commission

Eurostat established the GISCO project in 1992 (Geographic Information System of the Commission). From the outset, Eurostat has been confronted with the lack of geographical information covering the European territory in a homogeneous way. Eurostat has tried to set up a geographical referenced database by tackling one by one the difficulties encountered. But the Commission is confronted with the same difficulties as policy-makers at national level in acquiring the necessary geographical information to support its policies and progress is slow.

The Commission, on the initiative of Eurostat and DG INFSO, created in November 1999 an inter-service group on geographical information (COGI) to increase awareness of the potential of this information and to co-ordinate the use of geographical information within the Commission. It also aims to develop a common policy to share information within Commission departments and to disseminate it in order to encourage the creation of added value services by the private sector.

The JRC project GI-GIS within the 5th Framework Programme has fostered links between various networks: Official Mapping Agencies (EUROGEOGRAPHICS<sup>23</sup>), Research Laboratories (AGILE<sup>24</sup>), National Associations (EUROGI<sup>25</sup>), Industry (OPENGIS<sup>26</sup>), Geodesists (EUREF<sup>27</sup>), standardisation bodies (ISO TC211<sup>28</sup>) and other international organisations (UNGIWG - United Nations Geographical Information Working Group<sup>29</sup>). With this project, the JRC has played, and still plays, an important role (through the new ESDI action within the 6<sup>th</sup> Framework Programme) in preparing the ground for the establishment of a European Spatial Data Infrastructure.

Issues related to the exploitation of public sector information were discussed in a Communication adopted by the Commission on 23 October 2001 on the re-use and the commercial exploitation of public sector information. This Communication has been followed up by an online consultation on a document outlining a possible legal instrument for the re-use of public sector information. Such a legal instrument could address some of the problems, but given the issues at stake in relation to geographical information, a specific legal initiative is needed.

Of particular interest among the European level activities is the GMES. The **Global Monitoring for Environment and Security** is a joint initiative of the Commission and the European Space Agency (ESA). It aims to strengthen the Community's capabilities in acquiring and integrating high-quality data derived from space borne, terrestrial and marine observations with geographical and socio-economic information. This would support knowledge-based policy making from local to global level. In an initial period 2001-2003, policy requirements and existing structures will be assessed to draft a design of the future set-up. It also provides a broad platform of stakeholder consultation, including users and information service providers, to identify obstacles and solutions in the access and use of environmental and geographical information.

The GMES initiative is supported by several calls for proposals in the context of the Fifth and Sixth Research Framework Programme. As such, GMES will also contribute to the aims of the INSPIRE initiative.

The complementing of INSPIRE and GMES can be summarised as follows:

- INSPIRE provides the platform on which EU spatial data requirements resulting from the environmental reporting requirements, implementation of environmental policies such as thematic strategies and other activities will be co-ordinated and structured. It will provide a legal basis for establishing a data policy framework, common data discovery and sharing mechanisms, and for harmonising spatial data.
- On the basis of established requirements, GMES will provide the harmonised and cost-efficient monitoring networks for collecting the data. It will also develop applications relying on the data collected and stored in the European Spatial Data Infrastructure to deliver information to policy makers, to local, regional and national stakeholders and to the public.

<sup>23</sup> See <http://www.eurogeographics.org/index.htm>

<sup>24</sup> See <http://www.agile-online.org/>

<sup>25</sup> See <http://www.eurogi.org>

<sup>26</sup> See <http://www.opengis.org>

<sup>27</sup> See <http://www.euref-iaq.org/>

<sup>28</sup> See <http://www.isotc211.org/welcome.html>

<sup>29</sup> See <http://www.un.org/Depts/Cartographic/ungis/ungis.htm>

## National / regional level

According to the INSPIRE Extended Impact Assessment (see section 3.5), which has looked at developments concerning spatial data infrastructures around Europe, considerable progress can be expected in the next few years across the EU, both in meeting e-government targets and in developing SDIs. However, there will remain a great deal of fragmentation and duplication at the national and local levels and a lack of co-ordination between different levels of government and across Europe as a whole.

Without the INSPIRE initiative, key reference and environmental data will still exist and will be documented with metadata, but by 2010 there will continue to be multiple “standards” in use across government departments and national/regional levels. In particular, the integration between e-government portals and SDI/thematic portals is not likely to be uniform.

Without the INSPIRE framework, interoperability across national boundaries based on national SDIs will remain patchy. This is partly the effect of variable levels of political commitment, the legal basis of the SDIs and the variable operational effectiveness of co-ordinating mechanisms. Lack

of dedicated efforts for outreach and training also means that the culture of data documenting and sharing at the local level will be very variable. Local authorities will find it difficult to satisfy their information needs that draws upon combined data from the European, national and regional levels with their local data. Duplication of data collection will continue to be required for use at regional, national and European level due to the difficulties of building upon available lower level data.

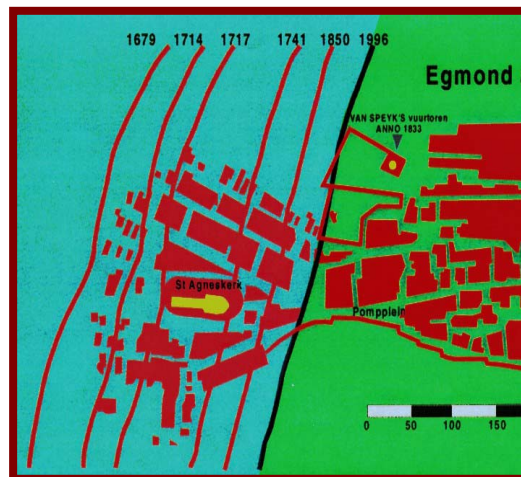


Photo: courtesy RIKZ, The Netherlands

## Summary

The preliminary results of the INSPIRE Extended Impact Assessment allow us summarise the situation on trans-European and national/regional levels. Without INSPIRE, it is likely there will be some improvement on the whole in the quantity, quality, and general availability of data relevant for policy, good governance and business. The major drawbacks though have to do with:

- the absence of agreed and transparent policies and mechanisms for access and reuse,
- a project-based approach to data that leaves gaps and, at the same time, wastes resources by duplicating data collections that cannot be fully re-used,
- no framework for regular updates,
- lack of co-ordination with emphasis on voluntary agreements,
- patchy interoperability of data,
- poor return on investment because projects are always one-off and not well integrated.

Policy-making tries to be more integrated and support sustainable development, but the information base underpinning it is still patchy in coverage and variable in quality.

## Elsewhere in the world

The INSPIRE Impact Assessment briefly describes how these issues are being addressed in the US, Australia and Canada, where Spatial Data Infrastructures have been created similar to that being considered for INSPIRE.

The Assessment cites a survey undertaken in December 2002<sup>30</sup> that indicated the total number of *data producers* participating in national portals initiatives in Europe (25) was 850 against some 1900 in Canada and 2200 in the US. Looking at the *number of datasets* available, the total

<sup>30</sup> Source: International Journal of Geographical Information Science: Assessing the worldwide developments of national spatial data clearinghouses. Joep Crompvoets, Abbas Rajabifard, Arnold Bregt and Ian Williamson.

number for European national clearinghouses/portals was 12,000, against 135,000 in the US and 25,000 in Australia. European portals were also much less actively managed as they were updated every 65 days<sup>31</sup> against daily updates in the US and Australia.

Despite Europe being comparable to the largest of these mentioned economies, there seems to be less interest in spatial data. But it is important when developing INSPIRE to heed lessons learned from other parts of the world and to ensure that the European initiative is compatible with global efforts for international co-ordination. (See box).

### International Co-ordination through the GSDI

**GSDI - Global Spatial Data Infrastructure** supports easy global access to geographic information. This is achieved through the co-ordinated actions of nations and organisations that promote awareness and implementation of complementary policies, common standards and effective mechanisms for the development and availability of interoperable digital geographic data and technologies to support decision making at all scales for multiple purposes.

The GSDI goals are to help advance awareness, acceptance and implementation of globally compatible spatial data infrastructures at local, national, and regional levels:

- Articulate the operational environment needed to achieve Global SDI compatibility
- Help build globally compatible SDI capacity around the world
- Educate decision-makers on the benefits of GSDI inside and outside their borders
- Assure that different SDI related policies can be facilitated by the GSDI
- Advance the GSDI mission until a global SDI is achieved

GSDI is being advanced through the leadership of many nations and organisations represented by a GSDI Steering Committee. This multi-national Steering Committee includes representatives from all continents and sectors - government, academia and the private sector.

URL: <http://www.gsdi.org/>

## 2.3. Policy principles and options

The policy options for INSPIRE have been developed and gradually refined through interactions with the INSPIRE Expert group and working groups that took place during 2002.

From this work, the following basic approaches emerge for INSPIRE:

- *decentralised approach*

*Recent advances in technology now allow the objectives of INSPIRE to be achieved without strongly developed centralised steering. A decentralised approach allows the building upon that which already exists in the Member States and to define INSPIRE broadly with limited overheads for overall co-ordination*

- *cross-sectoral approach, but starting with the needs of one sector*

*The importance of a cross-sectoral approach has been broadly acknowledged, but the need for pragmatism suggests not to start with all the relevant sectors at once. The environmental sector is considered to be a good starting point given its strong territorial dimension and its inter-linkages with the main sectors that also have this strong dimension (transport and energy, agriculture, fisheries, health and regional policies).*

- *multiple-measure approach*

*In the light of the number of issues to be addressed to meet the objectives, it was considered that single-measure policies would not be successful. Policy measures that focus, for instance, on single data themes or on only one issue (e.g. documentation of data or data policy) are expected to fail because the outcome would fall short of the expectations of the stakeholders.*

<sup>31</sup> Median number of days between two updates

- *Step by step approach*

*Given the challenges of the obstacles that need to be dealt with, and from experience elsewhere in the world, it was considered that a step by step approach is needed. This was confirmed early in the discussions with the key stakeholders for INSPIRE.*

Previous experience with policy measures on raising awareness and co-ordination have been tried before (GI2000<sup>32</sup>), but proved to be insufficient to create the necessary framework that deals with the obstacles to be addressed. A framework legislative act is therefore considered the most appropriate instrument.

The main trade-offs associated with this option are short term economic costs against medium and long term social and economic benefits, as well as important indirect benefits for the environment through support to environmental policy-making, implementation and monitoring, as detailed below.

When further developing this option, the following “designs” and “stringency levels” have been considered:

- *Number of spatial data themes and components to be brought within the framework*

*The selected spatial data themes and components are based upon the extensive analysis of the INSPIRE Environmental thematic data working group (see section 1.3) of spatial data needed to support EU environmental policy.*

*It is appropriate to bring under the legal framework the full range of data themes that result from this analysis, in particular as the framework will be established for a long period.*

- *Extent to which additional data collection requirements are set*

*Many Community environmental policies and policies in other sectors establish requirements for sector-specific data collection. It is opted for INSPIRE not to add on to these requirements, leaving data collection requirements to the responsibility of sectoral policies.*

*However, the inclusion of new requirements for cross-sectoral spatial data within the INSPIRE framework has been considered, but they will only be established through separate legislative acts, to be proposed once appropriate co-ordination mechanisms are in place and once the situation as regards existing data becomes clearer.*

*In summary, the INSPIRE framework legislation will not establish new data collection requirements.*

- *Degree of harmonisation requirements for spatial datasets*

The harmonisation requirements for spatial data focus on these aspects needed for making spatial data interoperable across different policy themes and across the boundaries of the Member States. Harmonisation of aspects that are specific to one application of policy will be dealt with by this particular policy and not by INSPIRE.

- *Design of a linked network of communication*

*The design of a network of communication to publish, discover, view, access and trade spatial data leaves sufficient flexibility for the framework to take into account technological progress as it evolves. In line with the principle of subsidiarity, it leaves the spatial data where it can be handled most effectively. The design is based on a distributed approach that builds interfaces between existing systems so that they become part of one integrated infrastructure.*

- *Stringency of data policy requirements*

The data policy measures have been designed to allow the application of different business models for the implementation of the Spatial Data Infrastructures, in line with the principle of subsidiarity. They are limited to those measures that are needed to achieve the objectives of INSPIRE. For instance, INSPIRE sets no general conditions for charging for access to spatial data, as other Community initiatives and policies address this already.

- *Stringency of phasing of implementation requirements*

Different options for target dates have been considered for INSPIRE. The proposed approach is to establish long-term target dates for overall spatial data harmonisation and medium term

<sup>32</sup> <http://www.ec-gis.org/copygi2000/>

target dates for harmonisation of a smaller set of core data. This will be combined with flexibility for the setting of intermediate targets needed to sustain the implementation of INSPIRE. This approach allows implementing the harmonisation requirements in a cost effective way, taking into account the priorities of different policies as they emerge.

### 3. The INSPIRE initiative in detail

#### 3.1. A new approach

INSPIRE will result in an EU legal framework addressing the challenges to achieving the widespread use of spatial information needed to support European governance. As stated earlier, these challenges are related to a number of factors, including technical incompatibility of data from different sources, difficulties in knowing which data is available, in accessing data, etc. The INSPIRE framework will deal with these challenges by addressing technical issues involving standardisation, organisations and co-ordination, data policy issues and with the data itself.

The INSPIRE initiative intends to improve the current situation by triggering the creation of a European Infrastructure for the access and use of spatial information built upon the INSPIRE principles. (See box).

#### **INSPIRE Principles**

- Data should be collected once and maintained at the level where this can be done most effectively
- It must be possible to combine seamlessly spatial data from different sources across the EU and share it between many users and applications
- It must be possible for spatial data collected at one level of government to be shared between all levels of government
- Spatial data needed for good governance should be available on conditions that are not restricting its extensive use
- It should be easy to discover which spatial data is available, to evaluate its fitness for purpose and to know which conditions apply for its use

#### ☐ **KEY QUESTION 1**

**Do you agree with the five INSPIRE principles?**

The implementation of the INSPIRE initiative should result in a higher efficiency of the considerable investments made today into the collection of geographical information, both at Community and Member State level. It should also reduce and gradually eliminate the duplication of collection of geographical information that now takes place because existing information cannot be re-used, accessed or integrated for specific policy needs.

The economic benefits of the creation of this harmonised information base for the added value information industry and its employment should not be underestimated. In return, the availability of advanced information and tools would provide decision-makers with a new range of instruments for policy evaluation, analysis of scenarios, etc.

The availability of a European Spatial Information Infrastructure, combined with the rapidly expanding possibilities of Internet access, would become a new means for communicating with the citizen on issues of concern for all policies with a territorial dimension. It would increase the visibility of the impacts of Community policies for the individual citizen and his/her environment.



Better communication would also raise the awareness of the citizen on the importance of community policies feeding back into more political support for new policies built on a common perception of problems.

In summary, policy makers at the international, Community, national and local level, the citizens and their organisations and industries will all benefit from the INSPIRE initiative, either directly as users of the information, or indirectly through the availability and use of the information by others.

### 3.2. Objectives

The overall objective of INSPIRE is to make harmonised and high quality spatial (geographical) information readily available for formulating, implementing, monitoring and evaluating Community policy (starting with environmental policy and later involving agriculture, transport, etc.) and for the citizen to access spatial information, whether local, regional, national or international.

As noted in section 1.2, INSPIRE will contribute to sustainable development by supporting the integration of the environment into other policies and the integration of social and economic considerations into environmental policies. For this purpose, spatial data common to several sectors and needed for environmental policies will be organised and co-ordinated by involving the sectors concerned.

The ultimate goals are to contribute to good governance through more and better-informed public participation in decision making by policy makers and environmental improvement resulting from better-informed decisions by individuals and businesses.

The specific objectives of INSPIRE are:

- To increase the usability of existing geographical information, in particular for supporting good governance in Europe;
- To increase the availability of quality geographical information;
- To reduce inefficiencies with the collection, handling, storing and distribution of geographical information; and
- To eliminate institutional and data policy barriers from the use of geographical information.

### 3.3. Key issues to be addressed

INSPIRE will address the challenges to achieve the widespread use of spatial information to support governance in Europe through the establishment of a spatial data infrastructure. These challenges are related to in the following five main obstacles:

- **gaps in Spatial data:** spatial data is often missing or incomplete,
- **lacking documentation:** description of available spatial data is often incomplete,
- **spatial datasets not compatible:** spatial datasets can often not be combined with other spatial datasets,
- **incompatible geographic information systems:** the systems to find, access and use spatial data often function in isolation only,
- **barriers to sharing and re-use:** cultural, institutional, financial and legal barriers prevent or delay the use of existing spatial data.

#### ☐ **KEY QUESTION 2**

**Are these the five main obstacles that prevent the widespread use of spatial data to support environmental governance? Do they exist at local, regional, national and international level? Should they be addressed by INSPIRE?**

### 3.4. Scope and proposed measures

#### Scope

Following extensive analysis work over twelve months co-ordinated by the European Environment Agency, the scope of INSPIRE can be defined by a list of 60 spatial data components grouped together in 17 themes (see below). These themes cover both information directly related to environment policy (e.g. noise, water quality, protected sites, etc) and information of a cross-sectoral nature, often needed by several sectors (e.g. administrative boundaries, elevation, transport networks, land cover, etc).

- |  |  |
|--|--|
| 1. Geographical location               | 10. Spatial planning / Area regulation |
| 2. Administrative units                | 11. Air and climate                    |
| 3. Properties, buildings and addresses | 12. Water / hydrography                |
| 4. Elevation                           | 13. Ocean and seas                     |
| 5. Geo-physical environment            | 14. Biota/biodiversity                 |
| 6. Land surface / land cover           | 15. Natural resources                  |
| 7. Transport                           | 16. Natural and technological risks    |
| 8. Utilities and facilities            | 17. Areas under anthropogenic stress   |
| 9. Society and population              |  |

See **Annex 1** for the complete list of 60 data components within these themes and **Annex 4** for a brief description of these data components.

All spatial datasets corresponding to these themes that are held in an electronic form by public sector bodies at national and local level would be covered by the INSPIRE framework. They should comprise the spatial data that is relevant to environmental policy.

☐ **KEY QUESTION 3**  
**Do we cover all the necessary themes?**

☐ **KEY QUESTION 4**  
**Is it appropriate that INSPIRE focuses on spatial data for which the public sector bodies are responsible without, however, excluding collaboration with the private sector where relevant by creating an open Spatial Data Infrastructure to which all stakeholders can contribute?**

It is currently being suggested that a subset of these spatial data components represents core spatial data components that are very important for the inter-operable functioning of the Spatial Data Infrastructure (in **bold** in the table in Annex 1). For these core spatial data sets, the INSPIRE measures will need to be implemented faster and be more comprehensive. Specific additional requirements will furthermore need to be established to obtain datasets with full European (EU25) coverage (see below).

☐ **KEY QUESTION 5**  
**Do you agree that the identified core data components have high priority?**

#### Obstacles and proposed measures

The five crucial problems that INSPIRE sets out to address and the policy measures proposed are identified below.

OBSTACLE	PROPOSED POLICY MEASURES
<p><b>Spatial Data Gaps</b></p> <p>1. Full European coverage for certain datasets in accordance with minimum quality criteria is essential for efficient use of data from a variety of sources. However, there remain important gaps in Europe even for the most essential spatial datasets.</p>	<ol style="list-style-type: none"> <li>1. INSPIRE should set the framework for requiring for core spatial datasets full EU coverage in accordance with agreed data collection methods and quality criteria. These requirements would not be part of the INSPIRE framework legislation, but be adopted at later stages through separate legislative processes as part of the implementation of the framework legislation. The INSPIRE Framework legislation would then only refer to future legislative initiatives to deal with data gaps. <b>Annex 2</b> provides some indicative information on the issues that could be addressed in the future.</li> <li>2. As such, INSPIRE would provide the legal framework for the future establishment of requirements for cross-sector data.</li> </ol>

□ **KEY QUESTION 6**

**Do you consider that in the future, legal initiatives need to be taken to ensure that certain spatial data fully covers the EU territory in accordance with agreed data collection methods and quality criteria such as those referred to in Annex 2 of the INSPIRE consultation document? Are the core datasets referred to above the most relevant ones in the context of INSPIRE?**

OBSTACLE	PROPOSED POLICY MEASURES
<p><b>Data documentation is often lacking</b></p> <p>In many cases, data documentation does not exist, making it impossible to trace possibly valuable information; existing data documentation is available in a variety of formats.</p>	<ol style="list-style-type: none"> <li>3. Metadata needs to be made available in order to help users identify and locate relevant datasets. Building on this, INSPIRE would require that the core spatial datasets in the short term and the other spatial datasets in the medium term corresponding to the themes listed in Annex 1, are documented according to common standards and that the metadata is updated. Metadata should discover relevant datasets and provide information on access and use.</li> <li>4. Metadata should be made available free of charge to all users</li> </ol>

□ **KEY QUESTION 7**

**Is the knowledge on the existing public sector spatial datasets that correspond to the themes in Annex 1 needed to unlock their potential to support the widest possible re-use?**

OBSTACLE	PROPOSED POLICY MEASURES
<p><b>Spatial datasets are not compatible/interoperable</b></p> <p>Most uses of spatial data require data from various sources (e.g. combine environmental information with basic topographic data, combine information on environment and health), but data from various sources is often not compatible. This requires repeated adaptation of data sources, or discourages the use of the spatial data.</p>	<ol style="list-style-type: none"> <li>5. Member States would be required to contribute to the definition of standard ways of organising and presenting spatial datasets. (These standards would take the form of common dataset specifications, based on common data models.)</li> <li>6. Member States would be required to make their spatial datasets compatible with these common dataset specifications, in the medium term for core datasets and in the long term for the other spatial datasets corresponding to the themes listed in Annex 1. Member States could do this either by changing the organisation of their datasets, or by providing “translators” or “bridges” between their datasets and the standards. These common dataset specifications would need to follow guidelines, such as those referred to in Annex 3.</li> <li>7. The data and information needed to make spatial datasets interoperable<sup>33</sup> should be made available free of charge and be free of restrictions on use.</li> <li>8. The datasets on administrative boundaries that can be used as a reference for seamless integration of other spatial datasets should be made available free of charge and free of restrictions on use.</li> </ol>

□ **KEY QUESTION 8**

**Does the establishment of common specifications and the building of bridges between existing datasets and these common specifications useful to increase the potential of re-using public sector spatial data?**

□ **KEY QUESTION 9**

**Should certain information on standards and key components of data be made available free of charge and free of restriction on use in order to encourage their use by a wide range of data providers?**

<sup>33</sup> This information covers, for instance, the definition of a common European grid system, the definition of a common reference system and the codes used for the unique identification of spatial objects and the corresponding information needed to distinguish them.

OBSTACLE	PROPOSED POLICY MEASURES
<p><b>GIS initiatives in Europe are often incompatible</b></p> <p>Technology progress today allows us integrated discovery, access and use of spatial data from different sources, located at different sites. Several communities have set up their own mechanisms for exchanging spatial data (e.g. regional Spatial data infrastructures or thematic spatial data infrastructures like the bio-diversity clearinghouse mechanism), but often these initiatives are not co-ordinated across the boundaries of the communities involved. This leads to duplication and forgone potential economies of scale. In Europe, an overarching initiative is needed to bring together the existing and emerging initiatives into one consistent framework.</p>	<p>9. Member States would be required to establish a distributed network of services that publish, discover, view, access and trade the spatial datasets that are covered by INSPIRE, in accordance with common standards.</p> <p>10. This network should be open to non-public sector providers of spatial datasets and to spatial data that falls outside the themes listed in Annex 1 that are consistent with a minimum set of conditions needed to ensure the overall consistency and ease of access to the Spatial Data Infrastructure. Such conditions could include compliance with metadata standards, conditions for access to metadata and view of data (see below) and implementation of INSPIRE network services.</p> <p>11. The Commission would need to establish and operate an “EU-Portal” that would provide a multilingual point of access to the spatial data and services accessible through the network.</p>

☐ **KEY QUESTION 10**

**Should Member States establish standard publish, discover, view, access and trade services to provide all users with the possibility to find, view and possibly re-use the spatial datasets?**

☐ **KEY QUESTION 11**

**Should the Spatial Data Infrastructure be open to data and services not covered by INSPIRE, subject to minimum requirements ensuring the overall consistency of the spatial data infrastructures?**

☐ **KEY QUESTION 12**

**Do you consider that there should be one point of access for data and services covered by INSPIRE?**



OBSTACLE	PROPOSED POLICY MEASURES
<p><b>Barriers for use</b></p> <p>Important barriers exist of a procedural, legal or financial nature for access and use of spatial data, even between public sector bodies. There is often no culture of sharing information between public sector bodies. Therefore, possibilities for the re-use of information between different levels of government are limited, leading to duplication of data collection and maintenance. In addition, many public bodies apply prohibitive charges or licensing conditions for the re-use of spatial data (including to other public bodies).</p>	<p>12. In view of the objectives of INSPIRE to support governance in Europe, Member States would be required to establish a licensing framework for sharing spatial data between public sector bodies that provides:</p> <ul style="list-style-type: none"> <li>• for all public sector bodies, exchange of spatial data that is free of barriers of a transactional, procedural, legal, institutional or financial nature</li> <li>• unrestricted rights of use for public sector bodies related to the performance of their public tasks.</li> </ul> <p>13. Complementary to a licensing framework between public bodies, a more general licensing framework governing all spatial data of the infrastructure could be requested by INSPIRE. This could cover 1) use by citizens (whether as a private person or a business) 2) a separate framework for commercial re-use (where a business is utilising public body spatial data in a product that they supply to others)</p> <p>14. In order to make the spatial data infrastructures efficient and appealing from a user point of view, viewing of all datasets corresponding to the themes listed in Annex 1 should be free of charge to all users. Viewing means the display on a screen of the visual aspects of the data, with appropriate legends needed for its interpretation. It does not mean download of a copy of the data in its native format or visualisation of all the textual and numerical attributes (e.g. measurements).</p>

☐ **KEY QUESTION 13**

**Do you consider that a data policy framework should be established for public bodies in the EU to share the spatial datasets that correspond to the themes listed in Annex 1 of the consultation document?**

☐ **KEY QUESTION 14**

**Would it be useful to establish in the EU a harmonised licensing framework that extends to uses and users of spatial data beyond the realms of public sector bodies? If yes, do you think that it should cover either or both of 1) use by citizens and 2) commercial re-use, or do you have some other comment on what should be covered by the extended framework?**

☐ **KEY QUESTION 15**

**Do you consider it important to be able to view the data available and that this can be done free of charge?**

### Additional measures

Implementing the above measures will require further provisions in the INSPIRE legislation in order to deal with methods, quality, standards and organisational issues, including the creation of a solid framework within which providers and users from various sectors can co-ordinate spatial data requirements and provision.

The INSPIRE legislation therefore needs to establish a flexible procedure for the adoption of the necessary implementation measures. These include the adoption of guidelines for reporting to the Commission, of the common dataset specifications and standards for documenting, organising and representing spatial data, of technical standards for services for discovery, viewing and downloading of data and of implementation schedules for standardisation work.

Furthermore, INSPIRE would require the Member States to monitor, on a continuous basis and according to common rules, the development of the spatial data infrastructure as regards the availability of spatial datasets and services.

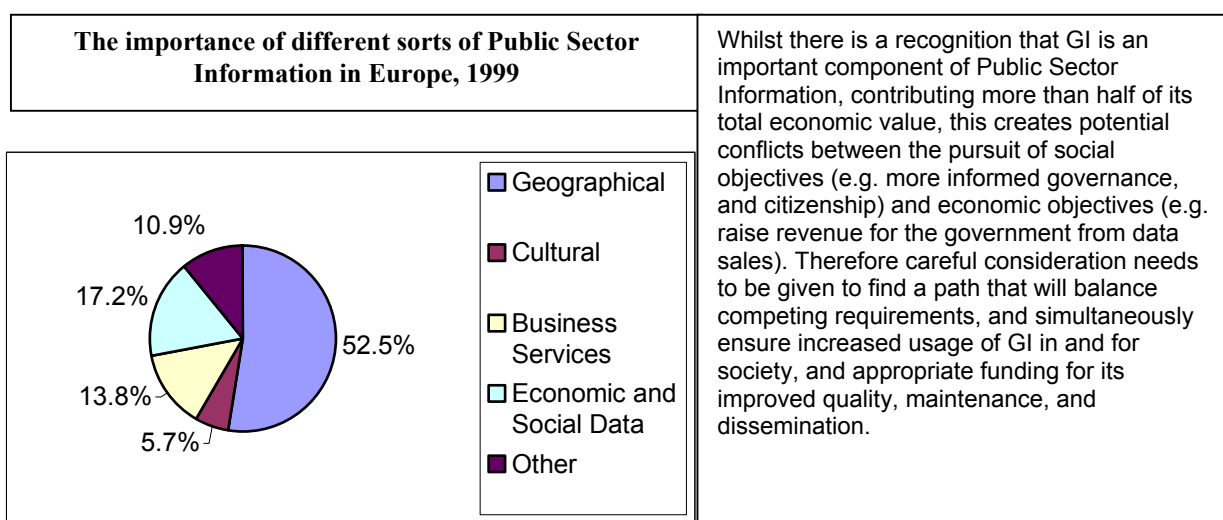
### 3.5. Impact Assessment

An extended impact assessment is being produced for the proposed INSPIRE initiative. It will be based upon literature, information coming from the INSPIRE working groups and from newly collected information about the situation in the Member States and Accession countries. It looks at the various scenarios envisaged in the context of the proposed INSPIRE framework legislation.

Given the broad scope of the initiative, the assessment is mainly of a qualitative nature, but it does provide some quantitative indications on costs and benefits where such information could be collected within the available time frame.

What does the INSPIRE Extended Impact Assessment do?

- It describes what is being addressed by the INSPIRE initiative based on the pre-requisite of assuring access to geographical and environmental data needed for the formulation, implementation, monitoring and evaluation of environmental policy and to provide the public with better access to such data.
- It outlines the "do-nothing" scenario of what the situation in Europe would be in 2010 without INSPIRE, based on current developments and trends at both the trans-European and national/regional levels, noting also what is being done in Australia, Canada and the US.



Source : Pira et al., 2000 ([ftp://ftp.cordis.lu/pub/econtent/docs/commercial\\_final\\_report.pdf](ftp://ftp.cordis.lu/pub/econtent/docs/commercial_final_report.pdf))

- It enumerates the expected benefits of INSPIRE as follows:
  - Increasing the efficiency of existing monitoring activities through better co-ordination
  - Significantly increasing the potential of using information collected
  - More efficient Community policies that take more into account the spatial dimension
  - Better implementation of Community policies
  - More integration of environmental issues into other policies and more integration of social and economic considerations into environmental policies, contributing to sustainable development
  - More efficient monitoring of policies
  - Increased interest and participation of the citizen in Community policy-making and implementation
- It spells out the basic assumptions for the purpose of the impact assessment and identifies the following group of policy measures:
  - Data covered by INSPIRE
  - Metadata and catalogues
  - Policy framework
  - Co-ordination and implementation

- It explains the scope of the proposal, general principles, and components, as well as the obstacles to be addressed and the policy measures identified and various policy options considered.
- It looks at the benefits of INSPIRE, in general terms and with concrete examples for each group of INSPIRE measures.
- It identifies and estimates the costs of the INSPIRE initiative for the EU 25, assuming that citizens, NGOs, the private sector and research institutions are unlikely to face significant additional costs from the adoption of INSPIRE. The aspects of the INSPIRE measures that would be most costly are likely to be:
  - Building transformation tools for existing datasets
  - Documenting existing data at the regional and local level
  - Co-ordination and implementation
- It identifies the main groups of stakeholders affected by INSPIRE that face both costs and benefits to be:
  - The European Commission and European Union agencies/services
  - National data providers and related associations (e.g. Eurogeographics)
  - National government agencies and organisations
  - Regional and local authorities, in particular cities of over 100,000 inhabitants and regional authorities in large countries or central authorities in small countries

Participants in the Internet Consultation are invited to read and react to the assumptions made for estimating the costs and benefits in the Extended Impact Assessment (for more information read the document "Assumptions and approaches for the Assessment of Impacts of INSPIRE" in the Document Archive on the INSPIRE website: <http://inspire.jrc.it/>).

### 3.6. Interaction with other policies

#### Related horizontal legal instruments

Several other Community instruments that aim at promoting the availability of public sector information exist or are under development. The most important ones are the Directive on public access to environmental information<sup>34</sup>, the proposal for a Directive on the re-use and commercial exploitation of public sector documents<sup>35</sup> and a forthcoming proposal for a framework Directive on environmental reporting announced in the 6<sup>th</sup> Environmental Action Programme.<sup>36</sup>

All these instruments contribute to the objective of making more and better information available for environmental policy and sustainable development. However, as explained before, additional measures are required to fuse and streamline policy-relevant spatial data from different sectors and at different levels in an organised, consistent framework needed for fully exploiting the potential of spatial information. INSPIRE, therefore, complements these instruments and will aid their implementation.

Furthermore, account will need to be taken of existing legal framework in relation to data protection and copyright.

#### The re-use and exploitation of Public Sector Information (PSI)

The scope and content of the recently adopted (5th June 2002) proposal for a Directive on the re-use and commercial exploitation of Public Sector documents is of considerable importance to the development of the INSPIRE proposal.

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<sup>34</sup> Directive 2003/4/EC

<sup>35</sup> COM/2002/0207 final

<sup>36</sup> See the web pages on The Sixth Environment Action Programme of the European Community: Environment 2010: Our Future, Our Choice at: <http://europa.eu.int/comm/environment/newprg/index.htm>

The key principles in this proposal are that:

- all conditions and charges for re-use should be transparent and non-discriminatory,
- charges for the re-use of documents shall be, at the maximum, cost-oriented (including a return on investment),
- public sector bodies shall not grant exclusive deals, unless these can be justified in the light of the general economic interest,
- cross-subsidies between public task activities and market activities of public sector bodies shall be banned,
- procedures for requesting documents shall be clear,
- standard licence agreements shall be in place, which can be processed electronically.

The scope of the INSPIRE initiative and the proposal for a Directive on the re-use and commercial exploitation of public sector documents partly cover: parts of the information under INSPIRE will also be covered by the PSI-directive. However, the two initiatives jointly implemented would strengthen one another. INSPIRE will make more information (those referred to in annex 1 of this consultation document) available for re-use in a harmonised format and therefore broaden the positive impact of the proposed PSI Directive. Conversely, the provisions of PSI are complementary to the INSPIRE measures and strengthen the potential of re-use and commercial exploitation of data covered by INSPIRE.

### **Access to environmental information**

Directive 2003/4/EC updates the requirements regarding public access to environmental information specified in Directive 90/313/EEC. In addition to taking into account experience in applying the old Directive, it also reflects, as regards public access to environmental information, the terms of the 1998 Aarhus *Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters*.

There is also a significant coverage between the public access to environmental information Directive and INSPIRE: much of the information covered by INSPIRE will also be covered by the public access to environmental information Directive (see also section 1.2).

In terms of policy measures, the two initiatives will work in a complementary way. INSPIRE will substantiate the general requirements of the public access to the environmental information Directive in relation to quality. It will also provide implementing mechanisms for requirements of public access to the environmental information Directive in relation to access to information and its dissemination. In other areas such as charging provisions, there is little overlap between the two initiatives.

### **Forthcoming proposal for an initiative on the reporting of environmental information**

The Commission is currently working on a new proposal for reporting on environmental information, replacing the existing directive harmonising reporting on air, water and waste (1991/692/EC). According to the current orientations, this proposal would also have a large scope in terms of the type of information covered. It would therefore also have a certain degree of coverage with INSPIRE. On the other hand, the reporting initiative will target more specifically environmental information requirements at EU and international level and INSPIRE will focus more on cross-sectoral information and information at all levels from local to EU.

As regards the policy measures, the initiatives again work in a synergistic way. The reporting initiative will revise environmental reporting requirements with a view to improving the knowledge base for environmental policy and to rationalise the existing reporting system. Whereas, INSPIRE will not impose additional environmental information collection requirements. The spatial information infrastructure will support the implementation of a shared information system that is currently considered for the exchange of reporting information between the Member States and EU institutions, international organisations and the public.

## 4. How will INSPIRE work?

### 4.1. The stepwise approach to implementation

The INSPIRE implementation will follow a step-wise approach, starting with unlocking the potential of existing spatial data and spatial data infrastructures and then gradually harmonising data and information services. This will eventually allow the seamless integration of systems and datasets at different levels into a coherent European spatial data infrastructure. It will require the establishment of appropriate co-ordination mechanisms to ensure that all the key stakeholders are involved. Where relevant, synergies with the GMES initiative will be sought in order to ensure coherence between INSPIRE and GMES.

The **first step** will focus on the **harmonisation of documenting existing datasets (metadata)** and on the implementation of basic query, view and access mechanisms. Portals will be established at EU, national and regional levels and will provide the opportunity to access and query spatial datasets. This will be a gradual process where first the “core datasets” (see Annex 1) will be documented and accessible and, later on, the other datasets. This will allow the interested user at any level to gradually see a picture of which spatial data exists and for what purposes it can be used. It will also allow the building of interfaces to provide the general public with simple viewing and access to the spatial data.

As datasets become documented and visible, the sharing agreements established between public sector bodies will remove other disincentives from public bodies to re-use spatial data collected by others. This will pave the way for fully exploiting the benefits of the data collected in a wide range of public policies to the benefit of sustainable development.

The **second step** will focus on the harmonisation of existing spatial datasets. A better knowledge of the existing datasets achieved through the first step, and the establishment of co-ordination mechanisms, will allow the key stakeholders to contribute to the **definition of common ways to define and characterise spatial objects**, such as transport networks, forests, etc. Once these common specifications are adopted, data providers will start to build interfaces between their datasets that will, to a large extent, remain in their original formats and common specifications. These interfaces will, to a certain extent, “hide” from the user differences between datasets from various sources. It will be the start of a harmonised spatial data infrastructure that will combine information from various sources to support more advanced analysis work.



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The **third step** will push the harmonisation one stage further. Even if the above measures significantly increase the ability to combine data from different sources, the use of existing data will, at a certain stage, start to show its limitations. This will be particularly discomforting for core spatial datasets to which many others will refer to for linking information to specific places and spaces. Separate legal initiatives will therefore be taken to ensure that, for these datasets, the limitation of existing data in terms of measurement methods, quality, immediacy and geographical coverage will be overcome.

These separate legal initiatives and their associated impact assessments will build upon the co-ordination mechanisms and information that has become available through the first two steps. The core spatial datasets of consistent quality with full EU coverage will provide the backbone for integrating data from different sectors and sources.

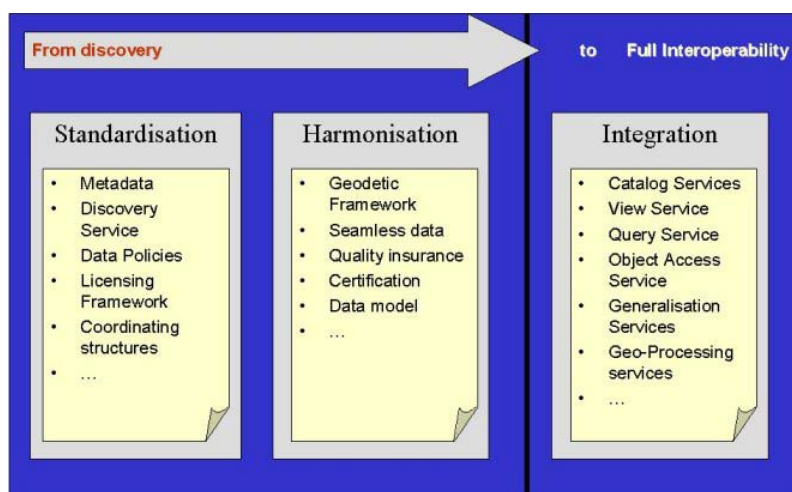
This separate legislation would set long-term requirements for the collection of harmonised primary spatial data at the highest level of accuracy, while medium term requirements for the delivery of intermediate datasets would be set at a lower level of accuracy. Ideally, intermediate datasets would be derived from the high accuracy primary datasets. However, until the harmonised primary datasets are available, ad hoc solutions would need to be considered for



making the intermediate datasets available in the medium term. This could be done by generating them from un-harmonised and incomplete data, or by taking recourse to specific data collection activities. Possible requirements for primary and intermediate spatial datasets are presented in Annex 2.

The **fourth and last step** will build upon the previous steps and concentrate **on completing the common models and on providing the services to fully integrate data** from various sources and various levels into coherent seamless datasets supporting the same standards and protocols. This will allow real time access to up-to-date data across the whole of Europe. Furthermore, by this stage, INSPIRE will have developed an open framework of interest to other sectors to join, complementing the cross-sectoral and environmental information with details on agriculture, transport, energy etc. This will support cross-sectoral policy co-ordination and facilitate the integration of environmental, social and economic concern in support of sustainable development.

### Towards an Infrastructure for Spatial Information



## 4.2. Practical aspects and requirements

### Elements

The concrete elements of the European spatial data infrastructure are the following:

1. **Co-ordinating structures at EU and national level** that organise the practical implementation of the European spatial data infrastructure.
2. **Metadata** that describes existing datasets held by public sector bodies (using internationally agreed standards).
3. **A linked electronic network** that allows anybody to query, view free of charge, access and trade the spatial datasets held by public bodies from a single point of (electronic) access through a distributed communications network (e.g., the Internet).
4. **A range of standards for spatial data sets and services**, which will be co-ordinated with international standardisation organisations and translation services between existing datasets and these standards.
5. **New cross-sectoral core spatial datasets with cross-EU coverage** of consistent quality that is kept up to date.
6. **A data policy framework and a range of sharing agreements between public bodies** ensuring that information is exchanged without barriers.

## Phasing

Although this is still under discussion, an indicative phasing of the INSPIRE proposal could be the following:

The timing requirements for the generic datasets could represent:

- for documenting existing datasets (metadata): gradual implementation achieved 5 years after INSPIRE enters into force (e.g. 2013) (2 years for inventory)
- for harmonisation according to data model: gradual implementation achieved 12 years after INSPIRE enters into force (e.g. 2020)

For the core spatial datasets, however, the timetable looks different:

- for documenting existing datasets (metadata): gradual implementation achieved 2 years after INSPIRE enters into force (e.g. 2010) (1 year for inventory)
- for harmonisation and delivery: gradual implementation achieved 9 years after INSPIRE enters into force

The co-ordination structures need to be established from the beginning and the linked electronic network and sharing agreements need to be established as spatial data is documented and made available.

## Subsidiarity

The subsidiarity principle is intended to ensure that decisions are taken as closely as possible to the citizen and that constant checks are made as to whether action at European level is justified in the light of the possibilities available at national, regional or local level.

INSPIRE will respect the subsidiarity principle. The application of this principle is particularly important for INSPIRE because, for example, of the variety of information systems already in place in Member States to organise and distribute spatial data. INSPIRE is designed to build upon those existing information systems and provides the overall framework so that they can work in synergy and form part of the European spatial data infrastructure.

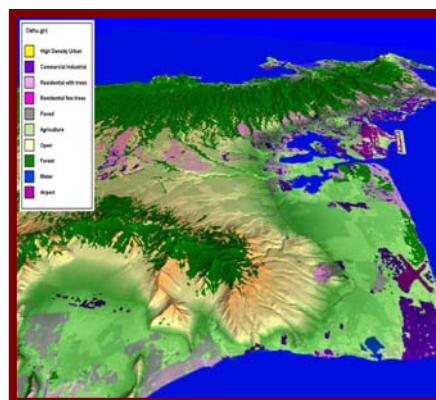


Photo: courtesy IGN-FI

INSPIRE will also build upon existing organisations already involved in spatial data use and production and provide, as far as organisational issues are concerned, only the overall co-ordination mechanisms needed for the infrastructure to operate at the European level. This is clearly reflected in the concept of a European spatial data infrastructure that is based upon the inter-linkage of national and sub-national spatial data infrastructures.

As regards standardisation, INSPIRE will only address those aspects that are needed to obtain cross-level and cross-thematic consistency of spatial data and to make it available to support Community policies. This is, for example, reflected in the focus on core data of a cross-sectoral nature.

## 4.3. Funding

INSPIRE represents an important European initiative that cannot succeed without investing resources from both the Member States and the EU. At EU level, funding will be required for the co-ordination structures and the EU-level support and monitoring actions. Work is currently proceeding in different working groups (see section 1.3) to provide dimension to the budgetary implications of this support and monitoring at EU level.

At Member State level, funding will be necessary for the implementation of the INSPIRE requirements, mainly needed for the establishment of national and sub national co-ordination,

documentation of datasets, implementation of the linked electronic network to query, view, access and trade the spatial datasets and for their conversion to common standards.

The impact assessment work is currently examining the costs of these measures and will come to the conclusion that they are significant. However, these investments need to be seen in the light of current expenditure already involved in spatial data collection and use at EU level and in the Member States and of the possible benefits they could bring. It is therefore appropriate to explore the use of existing funding instruments, both at national and EU level. For instance at EU level, the 5<sup>th</sup> and 6<sup>th</sup> Research Framework Programme and GMES already contribute and could further contribute in the future to research activities that need to underpin the implementation of INSPIRE. Also, the structural funds already contribute and could further contribute in the future to the collection of spatial information and its integration in European Spatial Data Infrastructure. The adoption of INSPIRE as a legal instrument would, in fact, help to prioritise and direct the contribution of these instruments to the creation of a European Spatial Data Infrastructure.

However, these financial instruments will need to be supplemented with additional specific funds, in particular during the phase of setting up the spatial data infrastructures. The INSPIRE working group on implementing strategies is currently looking at these issues.

❑ **KEY QUESTION 16**

**Do you consider that the general interest in the creation of a spatial data infrastructure justifies that public authorities dedicate specific funding for the implementation of INSPIRE?**

#### 4.4. Users, producers and other stakeholders

Potentially, INSPIRE will impact on society as a whole if it contributes to more informed and effective governance. In practice, a number of key stakeholders have been identified, including national and trans-national data providers and users, regional and local data providers and users, the private sector, research, citizens and NGOs. The impacts of INSPIRE are likely to affect the different groups of stakeholders differently in respect to extent of the impact and timing.

**Environmental users** are many and various, and include users who need spatial data for planning, management, assessment, monitoring and reporting, in summary for integrating environmental considerations into their day-to-day decisions. Hence, the user community is very broad and diverse and includes:



- Governments & Administrations
  - EU
  - National
  - Regional
  - Local
- Utility and Public Services, including
  - Transport
  - Health
  - Emergency services
  - Utilities (e.g. water, telecommunications, gas, electricity).
- Research and development
  - Universities
  - Public and Private Institutes
  - Application Developers for Information
- Commercial & Professional End Users
  - Fisheries
  - Farming and forestry
  - Mining, drilling, dredging and quarrying
  - Tourism
  - Surveyors
  - Property Developers
  - Architecture / Engineering
  - Insurance
  - Value Added Resellers
  - Media
- Non Governmental Organisations (NGOs) and non-profit organisations
- Citizens

Different user categories must be considered because their requirements in terms of data access can vary significantly.

**The producers of spatial information** within the public sector include national environmental protection agencies, mapping agencies, national geological surveyors, national maritime administrations, meteorological services, cadastral, land registration and other land administration organisations, local authorities and utilities.

It should also be noted that, under certain circumstances, private data producers may offer production capacity to public bodies, or possibly sell data directly onto the market themselves. In some Member States, there is an active private sector geographic information industry supplying data and services directly to the commercial market.

However, most spatial data is either used internally by public bodies, or is supplied to other public sector organisations under various types of agreements. A relatively small number of government departments or agencies conduct commercial business with the private sector or with the public.

### **Other stakeholders**

The delivery of INSPIRE, like initiatives such as eEurope and eGovernment, is dependent on information technology. It will have a profound impact on a variety of disciplines and professions, affecting many individuals and organisations that cannot be categorised as users or producers. This group of other stakeholders will therefore also have an important role in the process of shaping the infrastructure. Examples of these other stakeholders are:

- The Information and Communication Technology sector and, in particular, product providers who offer software, hardware, and related systems, and service providers who offer system development, database development operations support, and consulting services;
- Standardisation bodies like ISO<sup>37</sup>, CEN<sup>38</sup>, and national standardisation organisations;
- Co-ordinators and regulators, including European and national associations.

## **4.5. What will the INSPIRE policy framework deliver?**

When aligned with related directives, the INSPIRE statute will make a number of key differences to using and sharing spatial information, including:

- It will create an open mechanism for accessing and utilising in a straightforward manner local, regional, national and European spatial data.
- It will significantly increase the coherence of information produced as a response to public needs in different sectors.
- It will improve delivery mechanisms and services related to the supply of spatial information held by public bodies.
- It will provide an institutional framework that will facilitate the re-supply of the data in commercial products.
- It will increase the overall efficiency of information collection by reducing duplication of information collection between policy areas and between levels of government.

It therefore achieves the specific aim of creating a policy and legal framework for the establishment and operation of a spatial data infrastructure for Europe, for the purpose of formulation, implementation, monitoring and evaluation of Community policies at local, regional, national and international level.

When implemented, the policy proposed, combined with EU legislation or proposals for the exploitation of public sector information, for environmental reporting and for access to Environmental Information, would achieve a paradigm shift in the way geospatial information is disseminated, shared, traded and managed for a sustainable future for Europe.

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<sup>37</sup> International Organisation for Standardisation

<sup>38</sup> European Committee for Standardisation

## Annex 1: INSPIRE Data Sets (underlining indicates core spatial datasets)

1. Geographical location
  - 1.1 Geographical reference systems
  - 1.2 Geographical names
  - 1.3 Geographical grids
2. Administrative units
  - 2.1 Official administrative units
  - 2.2 Government management zones
  - 2.3 Blocks, census and statistical districts
  - 2.4 Civil security units
  - 2.5 Environment management & reporting units
  - 2.6 Postal codes/regions
3. Properties, buildings and addresses
  - 3.1 Properties
  - 3.2 Buildings
  - 3.3 Addresses
4. Elevation
  - 4.1 Terrestrial elevation
  - 4.2 Bathymetry
  - 4.3 Coastline
5. Geo-physical environment
  - 5.1 Soil
  - 5.2 Bedrock geology
  - 5.3 Geo-morphology
6. Land surface
  - 6.1 Land cover
  - 6.2 Orthophoto-images
7. Transport
  - 7.1 Transport networks
  - 7.2 Transport services
8. Utilities and facilities
  - 8.1 Transmission lines and pipelines
  - 8.2 Environmental protection facilities
  - 8.3 Production facilities, industry
  - 8.4 Agricultural facilities
  - 8.5 Trade and service facilities
9. Society and population
  - 9.1 Urban and rural settlement
  - 9.2 Population distribution - demography
  - 9.3 Human health and safety
  - 9.4 Cultural heritage
  - 9.5 Natural amenities
10. Area regulation
  - 10.1 Land use plans
  - 10.2 Protected sites
  - 10.3 Area restriction/regulation zones
11. Air and climate
  - 11.1 Air and atmospheric conditions
  - 11.2 Meteorological spatial features
  - 11.3 Climate zones
12. Water bodies/Hydrography
  - 12.1 Surface water bodies/ Hydrography networks
  - 12.2 Water catchments
  - 12.3 Groundwater bodies/aquifers
13. Ocean and seas
  - 13.1 Oceanographic spatial features
  - 13.2 Sea regions
14. Biota/biodiversity
  - 14.1 Bio-geographical regions
  - 14.2 Vegetation
  - 14.3 Habitats and biotopes
  - 14.4 Species distribution
  - 14.5 Landscape diversity
15. Natural resource
  - 15.1 Ecosystem resources
  - 15.2 Water resources
  - 15.3 Agricultural land and soil resources
  - 15.4 Forest resources
  - 15.5 Fishery resources
  - 15.6 Geological resources
  - 15.7 Renewable energy resources
16. Natural and technological risks
  - 16.1 Natural risk vulnerability zones
  - 16.2 Technological risk vulnerability zones
  - 16.3 Technological accidents and natural disasters
17. Areas under anthropogenic stress
  - 17.1 Polluted areas
  - 17.2 Noise and radiation zones
  - 17.3 Areas of intensive exploitation



## Annex 2: Possible elements of future quality requirements for core spatial data sets

Possible future quality requirements for INSPIRE core data sets	Territorial coverage	Scale (indicative on quality level)	Minimum location accuracy, m	Minimum height accuracy, m	Minimum update frequency, years	Geometric topology	Seamless	Harmonised datamodel	Important attributes	Year of latest realisation	Theme list nr	Keywords: Indicates content, only examples given, do not cover all aspects of data. See Appendix 2 for details
<b>Primary core data</b>												
<b>A: topographical data</b>												
Geographical names	ls	1:250.000	<250		1	v	yes	yes	name, type of object	2008	1.2	place names, locality names
Official administrative units	ls	1:10.000	<10		1	v	yes	yes	id, name	2010	2.1	country, region, municipality
Hydrographic network	l	>1:50.000	< 10		5	vn	yes	yes	id, name	2015	12.1	lake, river, channel, reservoir
Properties – Parcels	l	>1:10 000	< 1		0	v	no	no	id, number	2015	3.1	property, parcel
Buildings	l	>1:10 000	< 1		0	v	no	no	id, function	2015	3.2	house, building,
Addresses	l	>1:10 000	< 5		0	v	yes	yes	name, number	2010	3.3	address, routing
Terrestrial elevation	l	>1:50.000	< 10	< 25	15	r	yes	yes	height	2010	4.1	height on land areas
Bathymetry	s	>1:100.000	< 100	< 100	no	r	yes	yes	depth	2015	4.2	depth in marine areas
Coastline	l	>1:50.000	< 10		15	v	yes	yes		2015	4.3	coast, tide, land/sea
Transport network	ls	>1:50.000	< 10		2	vn	yes	yes	id, name	2010	7.1	road, rail, sea and air fairways
Orthophoto high resolution	l	>1:50.000	< 2.5	< 2.5	5 <sup>39</sup>	r	yes	yes	reflectance value	2010 <sup>40</sup>	6.2	Image, aerial photo, satellite,
<b>B: thematic data</b>												
Land cover	l	>1:100.000	< 100		10	v	yes	yes	category	2010	6.1	agriculture, forest, urban, marsh
Soil types	l	>1:50.000	< 50		15	v	yes	yes	category	2015	5.1	sandy, clay, saline, surface soil
Bedrock geology	l	>1:250.000	< 500		no	v	yes	yes	category	2010	5.2	stone, rock, surface bedrock
Satellite images	l	>1:250.000	< 500		3/10	r	yes	yes	reflection value	2015	6.2	picture, air photo, satellite image
Land use plans	l	>1:50.000	< 10		1	v	yes	yes	zone code	2015	10.1	agriculture, forest, urban, marsh
Water catchments	l	>1:50.000	< 50		5	v	yes	yes	catchment id	2012	12.2	watershed, river catchments
Protected sites	ls	>1:50.000	< 10		1	v	yes	yes	id, category	2010	10.2	designated areas, nature reserve
Vegetation	l	>1:250.000	< 100		15	v	yes	yes	category	2015	14.2	plant cover, species, biodiversity
Transmission lines /pipelines	ls	>1:50.000	< 10		2	v	yes	yes	category	2010	8.1	electricity, oil, gas,
Environmental protection facilities	ls	>1:50.000	< 10		2		yes	yes	id, category, authority	2010	8.2	waste treatment, noise protection
Government service facilities	l	>1:50.000	< 10		2	v	yes	yes	id, category, authority	2010	8.3	hospitals, schools,
Production facilities	ls	>1:50.000	< 10		2	v			id, category, authority	2010	8.4	factories,

<sup>(39)</sup> The European Commission recommended, for Olistat project, an updating frequency of 5 years for 1m orthophotos

<sup>(40)</sup> This dataset is a basic input for obtaining many of the other data sets

<b>Possible future quality requirements for INSPIRE core data sets</b>												
Trade and service facilities	l	>1:50.000	< 10		2	v			id, category, authority	2015	8.5	harbour facilities, hotels
Area regulation zone	ls	>1:50.000	< 10		2	v			id, category, authority	2015	10.3	regulated dump site, nvz,
Settlements , Rural and urban	l	>1:50.000	< 10		1	v			id, name	2010	9.1	agriculture, forest, urban, marsh
Demography – population	l	>1:50.000			5	v			pop tot, gender, age	2010	9.2	number of people,
Air/ atmospheric conditions	ls	>1:250.000	<250m								11.1	
Meteorological features	ls	>1:250.000	<250m								11.2	
Oceanographical features	s	>1:250.000	<250m								13.1	
<b>Intermediate core datasets</b>												
<b>A. Medium scale</b>												
Official adm. units V250	ls	1:250.000	< 125 m		1	v	yes	yes	id, name	2010	2.1	country, region, municipality
Hydrographic network V250	l	1:250.000	< 125 m		5	vn	yes	yes	id, name	2010	12.1	lake, river, channel, reservoir
Transport network V250	ls	1:250.000	< 125 m		2	vn	yes	yes	id, name	2010	7.1	road, rail, sea and air fairways
Terrestrial elevation R250	l	1:250.000	< 250 m	± 25m	5	r	yes	yes	height	2010	4.1	height on land areas
Geographical names V250	ls	1:250.000	< 125 m		1	v	yes	yes	name, type of object	2006	1.2	place names, locality names
Orthoimages (pixel =< 15 m)	l	>1:250.000	< 30 m		1-2 <sup>41</sup>	r	yes	yes	reflectance value	2010	6..3	image, picture, satellite, multispec
Geographical names V250	ls	1:250.000	< 50 m		1	v	yes	yes	name, type of object	2006	1.2	place names, locality names
Land cover V250 <sup>(42)</sup>	l	1:250.000	< 50 m		5	v	yes	yes	class, class code	2010	6.1	agriculture, forest, urban, marsh
Land cover R250	l	1:250.000	< 50 m		5	r	yes	yes	class, class code	2010	6.1	agriculture, forest, urban, marsh
Land cover V250	l	1:250.000	< 125 m		10/3	v	yes	yes	class, class code	2010	6.1	agriculture, forest, urban, marsh
Water catchments V250	l	1:250.000	< 125 m		5	v	yes	yes	id	2010	12.2	watershed, river catchments
Protected sites V250	ls	1:250.000	< 125 m		1	v	yes	yes	id, name,	2010	10.2	designated areas, nature reserve
Soil types V250	l	1:250.000	< 125 m		15	v	yes	yes	class, class code	2010	5.3	sandy, clay, saline, surface soil
<b>B. Small scale</b>												
Official adm. Units V1000	ls	1: 1 mill	< 500 m		1	v	yes	yes	id, name	2006	2.1	country, region, municipality
Hydrographic network V1000	l	1: 1 mill	< 500 m		5	v	yes	yes	id, name	2006	12.1	lake, river, channel, reservoir
Transport network V1000	ls	1: 1 mill	< 500 m		2	v	yes	yes	id, name	2006	7.1	road, rail, sea and air fairways
Terrestrial elevation R1000	l	1: 1 mill	< 1000 m	± 50m	No	r	yes	yes	height in m	2006	4.1	height on land areas
Bathymetry R1000	s	1: 1 mill	< 1000 m	± 50m	No	r	yes	yes	depth in m	2006	4.2	depth in marine areas

<sup>(41)</sup> It is very inexpensive, and is going to be made every 5 years for all europe for Image&Corine Land Cover Project

<sup>(42)</sup> This corresponds to Corine Land Cover Data that is nominally considered as a 1:100.000 database, but its geometric accuracy and level of detail are both really in correspondence with 1:250.000 scale

Possible future quality requirements for INSPIRE core data sets												
Geographical names V1000	ls	1: 1 mill	< 500 m		1	v	yes	yes	name, type of object	2006	1.2	place names, locality names
Land cover V1000	l	1: 1 mill	< 1000 m		2	v	yes	yes	class, class code	2006	6.1	agriculture, forest, urban, marsh
Water catchments V1000	l	1: 1 mill	< 500 m		5	vn	yes	yes	id	2006	12.2	watershed, river catchments
Protected sites V1000	ls	1: 1 mill	< 500 m		1	vn	yes	yes	id, name	2006	10.2	designated areas, nature reserve
Soil types V1000	l	1: 1 mill	< 500 m		15	r	yes	yes	class, class code	2006	5.1	sandy, clay, saline, surface soil
Bedrock geology types V1000	ls	1: 1 mill	< 500 m		No	r	yes	yes	class, class code	2006	5.2	stone, rock, surface bedrock
Bio-ecological regions V1000	ls	1: 1 mill	< 500 m		15	r	yes	yes	class, class code	2006	14.1	biodiversity, plants, animals

#### Explanation to table in table above

The table describes the proposed mandatory requirements for data to be accessible from the Member States.

- **Naming of data sets:** P= primary or local level data, 250 and 1000 indicates the required quality. V=vector R=raster
- **Territorial coverage:** Geographical coverage in the MS territory, divided into two: l=land, s=sea
- **Scale:** Indicative on quality level, indicates both location accuracy, level of details, smallest figures to be included, number and kind of attributes
- **Location accuracy:** How detailed a line, boundary or point is represented in the database compared to the real location (on the ground)
- **Height accuracy:** Only relevant for data where height is requested
- **Updating frequency:** how often the dataset should be updated
- **Geometric topology:** v=vector (point, line, polygon) , vn=vector network, r=raster
- **Seamless:** If the data shall be developed as one Pan-European seamless dataset or not
- **Harmonised data model:** If the data should follow a Common European Specification and data model
- **Important attributes:** The minimum required attributes for the specific data set
- **Year of latest realization:** Which year the data should be ready according to specification, at being accessible through the ESDI
- **Description code:** Reference to Appendix 2 code for each of the descriptions
- **Keyword:** Indicates content, only examples given, do not cover all aspects of found in the data. See Appendix 2 for details about the spatial data

### **Annex 3. Possible guidelines for harmonisation of spatial data**

INSPIRE only interferes with those aspects of spatial data standardisation that are needed to ensure the interoperability between different themes of spatial data. Guidelines for harmonisation of spatial datasets might include the following:

- Spatial data should be compatible with other topographic components and be consistent between levels
- There should be agreement on the depiction and position of common features along shared borders between Member States
- The reference to the location using co-ordinates shall refer to a common geodetic reference system covering horizontal and vertical references
- Use of Unicode for alphanumerical character sets
- Where possible, make use of common codes for attribute information
- Spatial objects shall be assigned unique identifiers
- Where appropriate, spatial objects shall be geo-referenced by referring to other spatial datasets

#### ***KEY QUESTION 17***

**Do you consider that these guidelines are generally applicable to standardisation of spatial datasets?**

## Annex 4. Brief description of spatial data components listed in Annex 1 and additional information on actual and anticipated use

	<b>INSPIRE Spatial data component</b>
<b>1</b>	<b>Geographical location:</b>
1.1	<b>Geodetic reference system:</b> <u>Description:</u> include levelling benchmarks, permanent satellite observation stations, tide gauges, marker id, access information, coordinates and system for definition and transformation data of the reference system. National Mapping agencies are commonly in charge of establishment and setup of the geodetic reference systems. <u>Use examples:</u> All users of GIS-data need geodetic reference data to be in place.
1.2	<b>Geographical names:</b> <u>Description:</u> a harmonised European geographical place name spatial database is needed at different scales. National databases exists, together with some at the European level. Geographical names at scale 250.000 exists on map series and databases throughout Europe, possibly also at lower scales. European geographical name data exists, e.g. GISCO. Commonly produced by mapping agencies and local authorities. <u>Use examples:</u> used for search and overview, location in all data layers and as a base layer on maps. Important for effective operations at local level. Currently, different sectors use different sets of names, e.g. mapping and transport sectors.
1.3	<b>Geographical grids:</b> <u>Description:</u> Geographical grids are an agreed, defined and harmonised grid net for Pan-Europe with standardised location and size of grid cells. Different resolutions, example of cell sizes could be 10x10 m, 100x100 m, 1x1 km, 16x16 km. Some initiatives exist to standardise reference grids, but other new initiatives are sector solutions. <u>Use examples:</u> The grids are used to reference certain environmental and social qualities of the grid cells. At present, different institution use different grids. It is essential to have a stable and harmonised system in Europe to be used for reference of a wide range of environmental and sector information. It allows for spatial analysis in time-series of statistics without the burden of changes in statistical units as often is the case for administrative units. In many cases it is possible to handle fairly detailed information without compromising the individual rights of privacy.
<b>2</b>	<b>Administrative units:</b>
2.1	<b>Official administrative units:</b> <u>Description:</u> Each national territory is divided into administrative units. The administrative units are divided by administrative boundaries. On the national level, data sets of administrative boundaries are available in most European countries. The national data sets differ with respect to resolution, data model and geometry of international boundaries. <u>Use examples:</u> Is a key dataset for any kind of spatial data handling. Important in operations and management, showing competent authorities, in referencing of information and statistics, as a basis for generation of statistical map showing economic phenomena, demography etc. Used as reference for correct location of objects and "cutting" of databases.
2.2	<b>Government management zones:</b> <u>Description:</u> These include major common operational spatial units for different government services, e.g. health care districts, school districts, waste collection districts, water supply districts. <u>Use examples:</u> Of very high value for the sectors own operations, for other sectors interaction on these issues andfor services towards the public.
2.3	<b>Blocks, census and statistical districts:</b> <u>Description:</u> The component include blocks in urban areas commonly used for statistical information. <u>Use examples:</u> Used in urban and rural planning, demographic studies of regional development, estimates on exposure to pressures and availability of services.
2.4	<b>Civil security units:</b> <u>Description:</u> These include major common operational spatial units, such as fire, police, ambulance, coastguard etc. <u>Use examples:</u> Of very high value both in the sectors own operations and in cross-sector emergency operations, e.g. at occasions of natural and technological hazards, accidents where health, economy or ecology is affected.
2.5	<b>Environment management and reporting units:</b> <u>Description:</u> These are sector/ thematic management areas or reporting areas. A wide range of management areas are relevant both at European, national, regional and local levels. Examples: WFD River Basin Districts, not strictly being defined of subsets of water catchments, needs to be defined as a separate management area, OSPAR reporting units at sea and Coastal zone management areas. <u>Use examples:</u> Primarily used by the sector itself, but is usually also relevant for other sectors.
2.6	<b>Postal codes/regions:</b> <u>Description:</u> Data set with the units for each postal region, where appropriate. For postal codes being located at a specific location and not a region these should be reflected as points. <u>Use examples:</u> Used for referencing many kinds of information where addresses at street level are not operational, for any public or private contact with a specific area.
<b>3</b>	<b>Properties, buildings and addresses:</b>
3.1	<b>Properties:</b> <u>Description:</u> Only relevant with registration at highest accuracy. Parcel information in Europe is very un-homogenous. It should be taken steps to develop harmonised data set specifications and identification system, free to be used, but no data harmonisation target should be set. <u>Use examples:</u> Of highest important in local planning and emergency operations, property agents, the construction sector, taxation, agriculture, forestry.
3.2	<b>Buildings:</b> <u>Description:</u> Only relevant with registration at highest accuracy. Building information in Europe is very un-homogenous It should be taken steps to develop harmonised data set specifications and identification system, free to be used, but no data harmonisation target should be set. <u>Use examples:</u> Important in local planning and management, emergency operations, property agents, construction sector, taxation. In environmental assessment also to locate buildings over noise levels, in follow up of cultural heritage sites etc.

3.3	<b>Addresses:</b> <u>Description:</u> Geographical location of addresses, entrance at ground level, some sophisticated also include level/floor (x,y,z). Use examples: Used in local management, transport routing system, important in eGovernment, hazards operations/management. Many address parallel registers and sources exist. Commonly produced and managed at regional or national levels. Route systems etc are containing such information for Europe.
<b>4</b>	<b>Elevation:</b>
4.1	<b>Terrestrial elevation:</b> <u>Description:</u> Digital elevation information and digital elevation models for land surface and surface of inland waters. Simplified or pre-processed data as contours. Different data for different uses: - Elevation grid/DEM of low accuracy (ca. 1: 100.000) is needed in Pan-European analysis - Elevation grid of high accuracy is needed. <u>Use examples:</u> Important in modelling of land slides and avalanches, flooding vulnerability, risk to erosion, flow of water and pollutants, spread of air pollution, fires, noise, biodiversity. Used in many sectors, amongst others environment, water supply, energy sector, agricultural and forestry.
4.2	<b>Bathymetry:</b> <u>Description:</u> Digital depth information and digital models. Consists of soundings, gridded bottom model or other DEMs. Isoline databases should also be available. Hydrographical surveys in the different countries produces the core data. Simplified or pre-processed versions with contours from GISCO. <u>Use examples:</u> Safety at sea, will anticipated effect of fewer accidents and thereby pollution, location of valuable biodiversity sites in shallow waters, location of sea resources and valuable sites for fish farming. Understanding of flow pattern and chemical composition in water. Also important in assessment of location of pipelines at sea.
4.3	<b>Coastline:</b> <u>Description:</u> Important element to be treated separately. Different methods for definition and observation of coastline. <u>Use examples:</u> Harmonised data needed at all levels. Important as reference in production of all features on land and sea, when integrated with all kinds of data presentations/maps. Detailed coastline data important in assessing climate change.
<b>5</b>	<b>Geo-physical environment:</b>
5.1	<b>Soil:</b> <u>Description:</u> Categorisation of soils and subsoil according to depth, texture, structure and content of particles and organic material, stoniness, sometimes mean slope and anticipated water storage capacity. FAO nomenclature is widely used, with 350 soil classes, Existing dataset in small scale. CORINE soils, later developed by JRC to soil type database for Europe: A digital map, 1: 1 mill, European coverage. Large scale data common for agricultural land. <u>Use examples:</u> Important in assessment and management of soil as a resource for agriculture and forestry, including also special effects such as erosion, salinisation, desertification. Also used in location of areas for gravel and peat extraction, groundwater resources and as a habitat.
5.2	<b>Bedrock geology:</b> <u>Description:</u> Classification of bedrock geology according to composition and structure of bedrock. A variety of classification systems. EuroGeoSurveys coordinates harmonisation processes. <u>Use examples:</u> General data used to understand regional environmental diversity, to study geo-chemical content and effects on natural environment and health, to estimate buffer capacities in soil, to locate groundwater aquifers in bedrock.
5.3	<b>Geo-morphology:</b> <u>Description:</u> Geomorphological processes and results of processes, commonly monitored both as landscape changes and as potential risks. Important also in loss of land and gain of land. <u>Use examples:</u> Example: coastal erosion and progradation, land rise, natural hazards – land slide probability assessments.
<b>6</b>	<b>Land surface/land cover:</b>
6.1	<b>Land cover:</b> <u>Description:</u> Land cover represents the physical and biological land cover. <u>Corine Land Cover:</u> provides Pan-European data of biophysical land cover (44 class nomenclature). It is made available on 100 and 250m grid database and original vector formats in 1:100 000. CLC 1990 is currently updated - CLC 2000. <u>Use examples:</u> Different resolutions and classification systems are relevant for different uses. CLC is used as a source for a wide range of Pan-European environmental assessments, e.g. defined in EEA indicators. Special needs for assessment and follow up in certain geographical areas produces needs for higher frequency and higher resolution. Their methodology is harmonised at European level for the purpose of comparison: coastal assessment - LACOAST, cities - MOLAND. Relevant for designated sites. Review of land use changes requires repetitive mapping.
6.2	<b>Orthophoto-images:</b> <u>Description:</u> Pre-processed "picture" data or unclassified data of the earth surface. Source either satellite or air-borne sensors, recordings of visible light, infra-red bands, radar or other sensors. Different data exists for Pan-Europe, e.g. Landsat, SPOT. Image2000 will constitute the first European wide free access ortho-image database. <u>Use examples:</u> Small-scale data for Pan-European overview and analysis. Large-scale data for local and regional needs. Commonly used in environmental and land use management, environmental impact assessment, forestry, agriculture and in many kinds of public information systems, amongst property agents etc. The use is refrained due to high costs.
<b>7</b>	<b>Transport:</b>
7.1	<b>Transport network:</b> <u>Description:</u> The transport component should comprise an integrated transport network, and related features, that are seamless within each national border. Transportation data includes topographic features related to transport by road, rail, water, and air. It is important that the features form networks where appropriate, and that links between different networks are established. <u>Use examples:</u> At European level of prime importance to have access to an updated version of the road network in 1: 1 mill or 1: 250.000, one version per year. Additional information on transport network segments on kind of traffic, frequency, speed etc. At national level the same data should be available, and in addition names and numbering - addresses. Accuracy should be 1 meter or better.
7.2	<b>Transport services:</b> <u>Description:</u> Services linked specifically linked to the networks are established. <u>Use examples:</u> At European level of prime importance to have access to an updated version of the road network in 1: 1 mill or 1: 250.000, one version per year. Additional information on transport network segments on kind of traffic, frequency, speed etc. At national level the same data should be available, and in addition names and numbering - addresses. Accuracy should be 1 meter or better.



<b>8</b>	<b>Utilities and facilities:</b>
8.1	<b>Transmission lines and pipelines:</b> <u>Description:</u> Physical construction for transport of defined products: These may include pipelines for transport of oil, gas, water, sewage or other pipelines. Transmission lines may include electrical, phone, cable-TV or other networks. Rough pipeline databases exist at European level. Data within countries is un-homogenous. <u>Use examples:</u> Used in construction industry - examples of national portals, distributing maps/data on location of pipelines for providing warnings to construction. Relevant for environmental sector e.g. on land use, urban and rural planning, risk and hazards management, assessment of material flows.
8.2	<b>Environmental protection facilities:</b> <u>Description:</u> Treatment, storage sites of production industry/mines and utilities/services: Concerning utilities, they may include sewage, waste, energy facilities/production sites. National databases probably existing. <u>Use examples:</u> Linked to official statistics. Environmental protection facilities as listed in the SERIEE (Classification of environmental protection facilities) (Eurostat 1994) Can be used in assessments of environmental stress, e.g. within water catchments. Citizens as property owner and users of areas are interested in both location of and distance to such facilities.
8.3	<b>Governmental service facilities:</b> <u>Description:</u> Sites for governmental services, location of hospitals and medical treatment locations, schools, kindergartens, churches etc Databases may exist at regional and national level. <u>Use examples:</u> Important in information systems for the public (web/phone), in emergency operations and in governmental management, spatial location important for assessment of impacts on governmental service facilities
8.4	<b>Production, industry, agricultural facilities:</b> <u>Description:</u> Sites for production, industry/mines: chemical, hydrocarbons (oil/gas), mines or any other industry. Includes water abstraction facilities and energy industry. Overall dataset in GISCO. National databases probably exist. Facilities can be classified according to the NACE1.1 used in official statistics when relevant. Farming production facilities. Incl. Farming equipments/facilities (irrigation systems, greenhouses, stable. <u>Use examples:</u> Important in handling of emissions, production flows and risks. Identification important in connection to the IPPC/EPER Register, the Seveso Directive, the Large combustion plants Directive, as well as Inventory of Contaminated sites, Emissions to water, Nuclear reporting. Important in local land use planning and agricultural and water management, also of interest to the public.
8.5	<b>Trade and service facilities:</b> <u>Description:</u> Sites for trade and private services, e.g. shopping centres, hotels and guest rooms, camping, sports facilities. <u>Use examples:</u> Citizens are interested in the location of such facilities and much information on them exists, but often not complete and not harmonised. In assessments of tourism e.g. in coastal and mountain areas, location and size of such facilities is needed. Also needed in transport assessments
<b>9</b>	<b>Society and population:</b>
9.1	<b>Urban and rural settlement:</b> <u>Description:</u> The category includes the physical distribution of the cities, towns and settlements, including also industrial sites and other built-up areas. <u>Use examples:</u> Information on settlement structure and spatial extent is important for urban planning in general and land use planning in particular. Time-series makes it possible to assess policies directed towards urban sprawl and new settlement and land use patterns.
9.2	<b>Population distribution/demography:</b> <u>Description:</u> Population commonly aggregated, by municipalities by blocks of houses or in grids. Population can also for internal purposes be handled at individual level by address. <u>Use examples:</u> Important in regional and urban planning, planning of facilities, utilities, social services, transport infrastructure. Also important for estimates on exposure to pollution or hazards, and for the use in disaster operations.
9.3	<b>Human health and safety:</b> <u>Description:</u> in particular for the diseases directly (epidemics, spread of diseases, health effects due to environmental stress (air pollution, chemicals, depletion of the ozone layer, noise...) and indirectly (food, gene-modified organisms, stress...) linked to the quality of the environment. <u>Use examples:</u> Important aspects on health in the 6EAP, followed by the health communication. High concern for the citizen
9.4	<b>Cultural heritage:</b> <u>Description:</u> Databases on cultural heritage will show areas or objects with cultural values, some being protected, others not. The objects can be remnants of ancient and medieval civilizations, religious objects, catch pitfalls, grave sites, or objects from more recent cultures such as valuable buildings, industrial constructions. Includes objects at both land and sea. <u>Use examples:</u> Important in managing the cultural heritage. Cultural protected sites are commonly also including buffer zones and valuable landscapes. Relevant for land use planning, citizen and land owner information, also in planning of nature conservation areas.
9.5	<b>Natural amenities:</b> <u>Description:</u> The spatial data component includes data on free services/ natural qualities of areas and landscapes, used in recreation and other activities. Includes bathing sites, local recreation sites, viewpoints, track and viewpoints, hunting areas and areas for use of other non-commercial resources in forests. <u>Use examples:</u> Important aspects for land use planning, regional planning, health management, also important aspects in multi-purpose use of forests, agricultural regions, habitat conservation.
<b>10</b>	<b>Spatial planning and area regulation:</b>
10.1	<b>Land use plans:</b> <u>Description:</u> Land regulation is the general spatial planning tool at regional and local levels. The land use plans regulate actual and future use of areas. The land use plans commonly have significant textual regulations to each area/ land category. Diverse situation in Europe. No known harmonisation. Each country has its own system. The documents are frequently seen as legal documents, and the categories remain for decades as rights directing use of property. <u>Use examples:</u> sustainable territorial development
10.2	<b>Protected sites:</b> <u>Description:</u> Areas with certain protection as defined by sectors. Many of the categories refer to conservation of nature, but could also refer to other objects, cultural heritage sites, cultural landscape sites. <u>Use examples:</u> Several databases are based on areas designated through international conventions, EU legislation, national legislation e.g. Natural 2000, Habitat directive sites, Ramsar sites, nationally designated sites. <u>Use examples:</u> Conservation of protected sites
10.3	<b>Area restriction/ regulation zones:</b> <u>Description:</u> A wide range of sector regulations: different sectors have different regulations of areas. Examples: defined dumping sites, restricted areas around drink water sources, nitrate vulnerable zones, regulated fairways at sea or large inland waters, areas for dumping of waste (OSPAR) , noise restriction zones, prospecting and mining permit areas. The data is most relevant at medium to low scale levels. <u>Use examples:</u> In cooperation with the sectors, the environmental sector needs overview of sector management regions and reporting areas.

<b>11</b>	<b>Air and climate:</b>
11.1	<b>Air and atmospheric conditions:</b> <u>Description:</u> Spatial data reflecting the physical conditions in air and atmosphere, either as isolines, grids or other spatial organisation. Based on measurements or models. Could also include the measurement locations. <u>Use examples:</u> Used in environmental and security assessments, in assessment of climatic change etc.
11.2	<b>Meteorological spatial features:</b> <u>Description:</u> Weather conditions and their measurements; precipitation, temperature, evapotranspiration, wind. <u>Use examples:</u> Used by the environmental sector to predict natural hazards e.g. flooding, drought, forest fires. Also used by other sectors, e.g. water supply to estimate recharge, for forecasting agricultural performance, for giving meteorological forecasts to shipping etc.
11.3	<b>Climate regions:</b> <u>Description:</u> Categorisation of past, present and future climatic conditions, focusing on temperature, humidity. Data have a relatively simple nature, based on recordings at monitoring sites or analysis/ modelling. <u>Use examples:</u> Used in assessment of climate change, biodiversity, modelling of erosion and natural hazards. Is also important in agricultural and forestry planning and in adaptation to climatic changes.
<b>12</b>	<b>Water bodies/Hydrography:</b>
12.1	<b>Hydrographical networks/surface water bodies:</b> <u>Description:</u> Representation of all main hydrographic elements, both natural and artificial: rivers, lakes, transitional waters, reservoirs, channels. Is one of the basic components for cartographic presentation and used by nearly all GIS users at all levels. Links to WFD classes: surface fresh water bodies, rivers lakes. <u>Use examples:</u> Is being used in environmental assessment and monitoring in estimation of water resources, pollution monitoring, wastewater cleaning estimation, species migration and biodiversity assessment, the hydrological elements being habitats. Inland fisheries management. Hazardous waste disposal sites. Land use planning/ management, recreation planning and management, transport routes. Assessment of flow patters of particles and pollutants must be based on high quality hydrographical networks.
12.2	<b>Water catchments:</b> <u>Description:</u> Synonymous with river basins. As defined in WFD: art 2, annex I, ii): River basin means the area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta. Sub-basin means the area of land from which all surface run-off flows through a series of streams, rivers and, possibly, lakes to a particular point in a water course (normally a lake or a river confluence) <u>Use examples:</u> Is used in assessment of water flow and flooding, flow of contaminants, erosion monitoring. Catchments are used to create WFD River Basin Management Districts, but does not have full correspondence in boundaries.
12.3	<b>Groundwater bodies/aquifers:</b> <u>Description:</u> Groundwater aquifers are areas with significant amounts of groundwater, for human consumption or anthropogenic production. Knowledge about groundwater aquifers is essential when managing areas of multi-purpose use where pollution/hazards exist and for securing quality water sources. <u>Use examples:</u> WFD is requesting data and reporting about groundwater body situation (impact/pressure). (WFD attributes: annex V – 2.5, VII – 4.2: Member States shall provide in the river basin management plan a map showing for each groundwater body or groups of groundwater bodies....)
<b>13</b>	<b>Ocean and seas:</b>
13.1	<b>Oceanographic spatial features:</b> <u>Description:</u> The measurable physical conditions of oceans e.g. salinity, oxygen, other chemical components, currents. Representation e.g. as isolines, grids or other spatial organisation. Based on measurements directly or combined with models. <u>Use examples:</u> Used in environmental assessments, sector resource exploitation.
13.2	<b>Sea and coastal regions:</b> <u>Description:</u> Seas and saline water bodies divided into regions and sub-regions. Each region with common characteristics, concerning water flow/ circulation, adjacent river catchments, bio-chemical or temperature of water, based on scientific criteria. Detailed information at regional level exist. <u>Use examples:</u> The WFD classes of surface saline water bodies, transitional waters, coastal waters to some extent coincide with sea regions, but have boundaries based on administrative/ reporting criteria, not scientific definitions.
<b>14</b>	<b>Biota/biodiversity:</b>
14.1	<b>Bio-geographical regions:</b> <u>Description:</u> Bio-geographical regions show the extent of areas with common characteristics, usually based on climatic, topographic and geo-botanical information. Thus the bio-geographical regions show areas with relatively homogeneous ecological conditions. DEMEER: Potential vegetation: Harmonised small-scale pan-European data exists. <u>Use examples:</u> Potential vegetation data is commonly used as a basis for the classifications. The data are used for comparisons and assessments of biodiversity and conservation. Includes both data termed bio-geographical regions and ecological regions. Needed for WFD (refers to ecological regions) and for Natura 2000 (refers to bio-geographical regions).
14.2	<b>Vegetation:</b> <u>Description:</u> The determination of structure and composition of the natural or near-natural vegetation. The classification of natural vegetation can be used to interpret ecological/ edaphic/ temperature conditions, environmental pressure and biodiversity modelling. Scattered data with a variety of classification systems exist at lower levels. <u>Use examples:</u> Used in assessment at European or regional/ local level, on natural production suitability, ecology, changes.
14.3	<b>Habitats and biotopes:</b> <u>Description:</u> Description of living areas for any kind of biota, usually used as a term for describing areas used by zoo-biota. Habitats commonly follow bio-geographical regions/ vegetation types, but habitats can also be described at more detailed levels. Includes small features of the rural landscape - hedgerows, creeks etc. <u>Use examples:</u> Linked to Habitats directive. The habitats designated to the directive are mentioned in the "area regulation" data component.
14.4	<b>Species distribution:</b> <u>Description:</u> Species distribution, species by species or grouped to family etc. Often species distribution is being recorded by grid cells. Pan-European mapping initiatives, e.g. for birds, insects, mammals, vertebrates. <u>Use examples:</u> In biodiversity assessment it is essential to have information on species distribution, quantities, development through time. Needed for Natura 2000
14.5	<b>Landscape diversity:</b> <u>Description:</u> Landscape can be divided into homogenous areas or certain important visible features may be mapped. Mostly local and regional level data exists. National examples based on different criteria/ nomenclature. <u>Use examples:</u> Landscape data are used in different kinds of environmental analysis and management.

<b>15</b>	<b>Natural resources:</b>
15.1	<b>Ecosystem resources:</b> <u>Description:</u> The ecosystems contain very many different kinds of resources not being captured in the traditional classes of resources, and grouped differently, and not limited to specific area types. The classifications could be as used by IUCN or in the Millennium assessments. <u>Use examples:</u> In assessments for values of areas and ecosystems, their state and their developments.
15.2	<b>Water resources:</b> <u>Description:</u> Features presenting the water resources for consumption, processes, energy or other uses. Usually linked to water features already documented in the data component "hydrography" and "groundwater bodies". Information about resources should be linked to the hydrography data by id's. <u>Use examples:</u> Used in water and energy supply management, risk and hazards management, agriculture sustainability assessments.
15.3	<b>Agricultural land and soil resources:</b> <u>Description:</u> Agricultural inventories, with mapping of existing and potential land for cultivation. Description of quality, production potential, suitable farming systems and crops, limiting factors under natural conditions. Land use by agriculture includes categories such as irrigated areas and organic farming areas. Important statistics should be available. <u>Use examples:</u> Usually agricultural inventories are coordinated by national agricultural bodies. Used in agriculture, in assessment of pressures – impact and responses to erosion, salinisation and desertification.
15.4	<b>Forest resources:</b> <u>Description:</u> Mapping of forest resources, areas potential production at detailed levels also forest stand quality. Information on sustainable exploitation levels. Forest resources is usually mapped at regional and local levels, coordinated by national inventory mapping bodies. <u>Use examples:</u> Used for management for sustainable exploitation of forest, planning for multi-purpose use of forest areas. Environmental assessment of erosion, biodiversity, water flow.
15.5	<b>Fishery resources:</b> <u>Description:</u> Overall fishery resource description, by mapping the stock distribution (breeding, migration, and living areas). Information on carrying capacity/sustainable catch levels. <u>Use examples:</u> Fishery institutions at national and regional levels. Fishery data is used for adjusting exploitation to carrying capacity levels, assessment of sustainability in the fishery sector and effects on other sectors and resources, biodiversity in particular.
15.6	<b>Geological resources:</b> <u>Description:</u> Geological resources, such as minerals, stone resources and deposits (sands/gravel), including hydrocarbons (oil, gas). <u>Use examples:</u> European level mapping of geological resources. Local level resource estimates. Important for assessment material flows, exploitation of definite resources, climate change, biodiversity.
15.7	<b>Renewable energy resources:</b> <u>Description:</u> Energy resources excluding hydrocarbons: hydropower, bioenergy, solar, wind etc. For some data relevant with depth/height information on the extent of the resource, e.g oil/gas and wind. <u>Use examples:</u> Of major importance to the sectors. In environmental assessments and planning used to view trends in extent and effect on other land cover or natural values, effect on sustainability or over-exploitation on resource use.
<b>16</b>	<b>Natural and technological risks:</b>
16.1	<b>Natural risk vulnerability zones:</b> <u>Description:</u> Categorisation of land according to estimated/ registered anticipated risk for natural hazards e.g.; floods, landslides, avalanches, forest fires, earthquakes, volcano eruptions. Methods for assessing risk zones is based on a variety of data. Important data include physical data about terrain, vegetation, climate, geology. <u>Use examples:</u> European projects on natural risks, forest fires etc.
16.2	<b>Technological risk vulnerability zones:</b> <u>Description:</u> Categorising areas according to their vicinity to locations producing, storing, transporting potential artificial/ technological hazards, chemical industry, nuclear power plants etc. <u>Use examples:</u> Seveso II Directive describes certain kinds of technological risks. Extension of fields covered by the Directive is proposed. Used in land use planning to decrease population exposed to risks.
16.3	<b>Technological accidents and natural disasters:</b> <u>Description:</u> Location of actual events, site of occurrence, cause, effects, e.g. the European forest fire mapping project <u>Use examples:</u> Important in disaster operations, assessment of risks and climate change, and follow up actions in areas affected.
<b>17</b>	<b>Areas under anthropogenic stress:</b>
17.1	<b>Polluted areas:</b> <u>Description:</u> Local contaminated sites, often sites near or at large industrial sites or at places of dumping of waste, mines and mine dump sites. Both land and sea. <u>Use examples:</u> Terrestrial local contamination areas are used for different purposes, but use is restricted. Clean-up actions or other measures need to be undertaken before use. Sea: Submission of data for the Annual OSPAR Report on Dumping of Wastes at Sea from OSPAR Convention for the protection of the marine environment of the north-east Atlantic
17.2	<b>Noise and radiation zones:</b> <u>Description:</u> Areas affected by noise. Commonly these appear as zones with different levels of noise disturbance due to distance from source. Common noise producing elements being used in calculation of noise zones are roads, rail, airports, ports. Could also be: Air routes, sailing lanes/fairways, rifle course, motorcross course, military training courses. <u>Use examples:</u> Objective of 6EAP describes that there should be focus on actions at the local level to reduce noise levels. One action mentioned is to produce noise maps.
17.3	<b>Areas of intensive exploitation:</b> <u>Description:</u> Areas of high economic interest and activity but also areas where high economic stress is possible, covers both land and sea. Includes data about pressure zones such as coastal or urban regions, but also derelict land, mining areas, oil drilling areas. <u>Use examples:</u> Important for land use planning, environmental assessments, information to the citizen.