



INSPIRE

Infrastructure for Spatial Information in Europe

INSPIRE

Work Programme Preparatory Phase

2005 - 2006

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1. Executive Summary

Following 3 years of intensive collaboration with Member States experts and stakeholder consultation, the Commission has adopted on the 23rd of July 2004 a “**proposal for a Directive of the European Parliament and of the Council establishing an infrastructure for spatial information in the Community (INSPIRE)**” (COM(2004) 516 final). INSPIRE lays down general rules for the establishment of an infrastructure for spatial information in Europe, for the purposes of environmental policies and policies or activities which may have a direct or indirect impact on the environment.

INSPIRE will require the Member States to implement various measures. Some of these measures shall be transposed by the Member States, while others require more detail which will be provided in ‘**Implementing Rules**’. In order for Member States to be able to respect the roadmap for the implementation of INSPIRE, those Implementing Rules must be available in due time. The aim of this work programme is to identify the stepwise activities necessary to elaborate draft Implementing Rules during the Preparatory Phase (2005-2006), in parallel with the legislative co-decision process in the European Parliament and Council.

Once INSPIRE will enter into force, the Member States will have 2 years (2007-08) to transpose INSPIRE into their national legislation. Once INSPIRE is transposed, its measures will be implemented and monitored following a roadmap which is part of the proposal for a Directive (2009-13).

INSPIRE shall be based on infrastructures for spatial information established and operated by the Member States. The components of those infrastructures shall include: metadata, spatial data themes (as described in Annexes I, II, III of the proposal for a Directive), spatial data services; network services and technologies; agreements on sharing, access and use; co-ordination and monitoring mechanisms, process and procedures.

As the implementation of INSPIRE should not be undertaken in isolation from international global initiatives to which many EU Member State institutions participate, the organisational framework has to take into account cross-references with initiatives such as GMES, Galileo and GEO to name but a few. Simultaneously the harmonisation efforts ongoing in several communities have to be taken into account during the Implementing Rules development process.

The design of the different technical and policy measures in the proposal for a Directive requires intensive stakeholder participation. Therefore the concept of Spatial Data Interest Communities (SDICs) is introduced, which provides stakeholders the mechanism to participate in the development of the draft Implementing Rules. A SDIC bundles expertise and resources of users, producers or transformers of spatial data and services. It can originate from and be organised according to a specific sector in society, a geographic extent or a thematic issue. SDICs can provide expert knowledge required for the drafting, reviewing and testing of the Implementing Rules. A call for expression of interest is foreseen to identify SDICs willing to contribute and to participate in the Implementing Rules development process.

The establishment of draft Implementing Rules will be set up in 3 phases:

- during the association phase, Drafting Teams will be created and reference material will be collected;

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- during the drafting phase, the Drafting Teams will establish the draft Implementing Rules;
- during the review phase, a review mechanism will be set up to include stakeholder feedback through the SDICs, as well as implementation feasibility feedback from the Legally Mandated Organisations (LMOs), who will be responsible for implementation of INSPIRE in the public authorities in the Member States. Finally a public consultation will be organised. Commission services will fulfil a co-ordinating role for the various review steps.

Implementing Rules will be finally submitted to the INSPIRE Committee for adoption, and will become directly applicable in Member States, as a Commission Regulation or Decision.

This document elaborates an action plan which contains sections according to the chapters in the proposal for a Directive, and focuses in each section on objectives, scope, process, milestones and cross-references. A condensed overview of the final goals for each section is listed below:

- The draft Implementing Rule on metadata has to describe content and structure of the metadata for spatial data.
- Data specifications and harmonisation activities have to yield a draft Implementing Rule for harmonised data specifications and exchange, differentiated according to the data themes listed in the annexes of the proposal for a Directive.
- The draft Implementing Rule on network services will deal with technical specifications and performance criteria for upload (meaning integration in a network), discovery, view, download, and transformation services, as well as the “invoke spatial data services” services.
- The draft Implementing Rules on data and service sharing will deal with a) access and rights of use to spatial data sets and services for Community institutions and bodies, b) third party access to upload services (to integrate in the network) and c) potential for re-use of spatial data sets and services by third parties.
- The monitoring and reporting draft Implementing Rules will deal with the methodology, indicators and implementation schema for a 3-yearly reporting and a continuous monitoring process.
- Finally two horizontal sections were added in the action plan to deal with the organisational structures, co-ordination and necessary cross-analyses to ensure efficiency, effectiveness and coherence throughout the draft Implementing Rules development process, including awareness raising and training.

In preparation of the call for expression of interest for SDICs and projects, a separate chapter has been dedicated to the terms of reference which will be applied for the various organisational components involved in the Implementing Rules development process (SDICs, Drafting Teams and the selection of experts, the Consolidation Team (responsible for harmonisation between Drafting Teams) and the Legally Mandated Organisations (LMO)).

During the Preparatory Phase Community funding from the operational budgets will support the organisation of the necessary meetings and a selected number of INSPIRE related projects. A number of projects to which stakeholders participate through the RTD Framework Programme, and activities of the European Environment Agency support the preparatory activities of INSPIRE. The INSPIRE Preparatory Phase will therefore be

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supported through the combined use of these resources, while seeking further commitments from the SDICs through the call for expression of interest.

Examples of initiatives that constitute INSPIRE's broader context and possible SDICs whose activities can contribute to the Implementing Rules development process are presented in Annexes. Also included in the Annexes are examples of expected input and contributions from research and development projects, pilot activities and prototypes.

The work programme document will be publicly available as a 'non-paper'. It does not represent an official position of the Commission, and as such can not be invoked in the context of legal procedures. In no way does it predetermine the decisions by Commission, Council or European Parliament with regard to the elements of INSPIRE and any proposal for amendment or changes during the Co-Decision Procedure. Hence, the document and the actions it refers to will be subject to periodic review as INSPIRE moves towards its final formulation in the Co-Decision Procedure.

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2. Purpose of the document

This document is the work programme for the Preparatory Phase (2005-2006) of the proposed Infrastructure for Spatial Information in Europe (INSPIRE) framework directive. The aim of the work programme is to establish draft Implementing Rules for INSPIRE according to the implementation roadmap.

The document summarises the requirements of the Directive, the overall process for involving stakeholders, a translation of requirements into concrete actions. In addition it presents the broader framework and illustrates through a number of examples the context in which INSPIRE will be developed during the next two years.

It builds on the INSPIRE proposal (<http://www.ec-gis.org/inspire/>), on a first draft of the work programme prepared by a Task Force and discussed and commented during the 10th INSPIRE expert group meeting at Warsaw on the 22nd of June 2004, and the comments received from the INSPIRE expert group meeting in December 2004 on a revised version of the work programme.

The intended readership includes all the parties with an interest in the INSPIRE proposal.

The document wants to illustrate the open and transparent way in which the Commission, Member States and stakeholders work together towards developing draft INSPIRE Implementing Rules through a procedure which allows all interested parties to participate in the process.

The work programme is based on mature technologies. It is recognised that further research is required in order to improve the processes. The definition and prioritizing of adequate research activities, as well as their execution, are however outside the scope of this work programme.

The document is edited jointly by EUROSTAT, the Joint Research Centre (JRC), and the Directorate-General Environment (DG ENV).

<p>The work programme document will be publicly available as a 'non-paper'. It does not represent an official position of the Commission, and as such can not be invoked in the context of legal procedures. In no way does it predetermine the decisions by Commission, Council or European Parliament with regard to the elements of INSPIRE and any proposal for amendment or changes during the Co-Decision Procedure. Hence, the document and the actions it refers to will be subject to periodic review as INSPIRE moves towards its final formulation in the Co-Decision Procedure.</p>

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3. Introduction

Following 3 years of intensive collaboration with Member States experts and stakeholder consultation, the Commission has adopted on the 23rd of July 2004 a “**proposal for a Directive of the European Parliament and of the Council establishing an infrastructure for spatial information in the Community (INSPIRE)**”, hereafter referred to as INSPIRE (COM(2004) 516 final).

INSPIRE now entered into the Co-decision legislative process, where the Commission interacts with Council and European Parliament to discuss and further shape the proposal in its final form. This may eventually lead to an earlier or delayed adoption compared to an estimated date of entry into force at beginning 2007.

A three phased programme of work is proposed with a Preparatory (2005-2006), Transposition (2007-2008) and Implementation (2009-2013) phase. Throughout these phases the use of the Comitology procedure will be accompanied by the iterative stakeholder participation process.

3.1 The Preparatory Phase (2005-2006)

INSPIRE will require the Member States to implement various measures. Some of these measures shall be transposed by the Member States, while others require more detail which will be formulated in so called ‘**Implementing Rules**’. In order for Member States to be able to respect the INSPIRE roadmap for the implementation of these Implementing Rules they must be timely available.

Hence, in parallel to the Co-Decision Procedure, the Commission will initiate actions to prepare draft Implementing Rules. To this end it will continue the dialogue with the INSPIRE Expert Group which was created in 2001 to help preparing the INSPIRE proposal and whose role now evolves to supporting its implementation. Key to this phase is the participation of stakeholders in the preparation of the Implementing Rules.

3.2 The Transposition Phase (2007-2008)

Following adoption by the Council and the European Parliament, INSPIRE will enter into force as a Directive. The Member States then have a period of two years to transpose INSPIRE into their national legislation.

At this stage the Commission shall have in place the organisation necessary to assure co-ordination at Community level while appropriate structures and mechanisms will be installed by the Member States, including the point of contact with the Commission.

One of the key activities in the Transposition Phase regards the adoption of Implementing Rules following a timetable set by INSPIRE. Implementing Rules set out in detail the measures which are to be taken by the Member States, or in some cases by the Commission.

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INSPIRE requires the formal adoption of those Implementing Rules by the Commission following the “**Comitology Procedure**”¹. The regulatory nature of the Implementing Rules requires the Commission to present them to a **Regulatory Committee** of Member States representatives, referred to as the **INSPIRE Committee**, which will officially start its activities at the beginning of the Transposition Phase [within 3 months from the entry into force].

This INSPIRE Committee has the general task to assist the Commission and to deliver its opinion on the draft Implementing Rules proposed by the Commission. This opinion shall be delivered in the form of a vote. In the case of INSPIRE, the Commission can adopt the Implementing Rules if a qualified majority of the Member States votes in favour. If this is not the case, the Commission will submit the proposed Implementing Rule to the Council and inform the European Parliament. The Council will then act by qualified majority, and if it opposes the proposal, the Commission shall re-examine it and possibly submit an amended proposal. Once adopted, the Implementing Rules get the status of either a European Commission Decision, or a European Commission Regulation.

The adopted Implementing Rules will be applicable in the Member States.

3.3 The Implementation Phase (2009-2013)

Once INSPIRE is transposed by the Member States into national legislation, its measures will be implemented and monitored. Co-ordination at Community level by the Commission and at Member State level will be operational and Member States shall report according to the timetable (roadmap) set by INSPIRE.

¹ Council Decision (1999/468/EC) Official Journal L 184/23, 17.7.1999, “laying down the procedures for the exercise of implementing powers conferred on the Commission”.

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4. The INSPIRE Requirements

4.1 Overview of requirements

INSPIRE lays down general rules for the establishment of an infrastructure for spatial information in Europe, for the purposes of environmental policies and policies or activities which may have a direct or indirect impact on the environment. This infrastructure shall be based on infrastructures for spatial information established and operated by the Member States.

The composing elements of those infrastructures shall include:

- metadata,
- spatial data themes as described in Annexes I, II, III of INSPIRE and spatial data services;
- network services and technologies;
- agreements on sharing, access and use;
- co-ordination and monitoring mechanisms;
- process and procedures;

Member States will have to implement different measures to have these components into place.

For a number of those measures, Implementing Rules will have to be adopted first through the Comitology Procedure according to a timetable set by INSPIRE. The year of adoption is indicated for each Implementing Rule in the detailed sections below (on the basis of an entry into force of INSPIRE at the beginning of 2007) together with the deadline for Member States to implement the measures detailed in a given Implementing Rule.

When INSPIRE does not explicitly refer to a date of adoption for a particular Implementing Rule, the Implementing Rule will have to be adopted after the Transposition Phase [2009], hence, two years after its entry into force [2007].

Draft Implementing Rules worked out during this Preparatory Phase have to facilitate the successive formal process of definition and adoption of Implementing Rules through Comitology.

4.1.1 Metadata requirements

INSPIRE will require the Member States to create comprehensive metadata of a defined quality for spatial data sets and services, and to keep them up-to-date. **Implementing Rules for the creation and up-dating of the metadata** shall be adopted through Comitology in [2007].

The metadata will have to be created by the Member States within 3 years from the entry into force of INSPIRE for the Annex I and II spatial data themes [2010] and within 6 years for the data themes listed in Annex III [2013].

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4.1.2 Spatial data harmonisation requirements

Implementing Rules regarding the interoperability of the spatial data sets and services shall be adopted through Comitology.

The Implementing Rules will take the form of:

- Harmonised data specifications
- Arrangements for the exchange of spatial data

For all spatial data in Annex I, II, III the harmonised data specifications shall cover the definition and classification of the spatial objects relevant to the spatial data and the way in which they are geo-referenced.

In particular for Annex I and II data, the Implementing Rules shall address the following harmonisation and exchange aspects of spatial data:

- a common system of unique identifiers for spatial objects;
- the relationship between spatial objects;
- the key attributes and the corresponding multilingual thesauri commonly required for a wide range of thematic policies;
- the way in which information on the temporal dimension of the data is to be exchanged;
- the way in which updates of the data are to be exchanged.

The **Implementing Rules for harmonised data specifications and for exchange of spatial data**, will be adopted 2 years after the entry into force of INSPIRE for Annex I spatial data themes [2009] and by 5 years [2012] for the data themes listed in Annex II and Annex III.

Member States will then ensure that spatial data sets collected or updated later than two years after the date of adoption of the Implementing Rule conform to the specifications. This means, as from [2011] for Annex I, and as from [2014] for Annex II and Annex III.

4.1.3 Network services and interoperability requirements

The Directive will require Member States to establish and operate a network of the following services for the spatial data sets and metadata:

- Upload services;
- Discovery services;
- View services;
- Download services;
- Transformation services,
- “Invoke spatial data services” services.

Those services shall be easy to use and accessible via the Internet or any other appropriate means of telecommunication available to the public².

² The issue of a widespread secure broadband infrastructure is an integral part of eEurope. In particular the Commission issued a communication on "connecting Europe at high speed: National Broadband

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To this end the Commission shall establish a Community Geo-portal [2009] through which Member States will provide access to the services, as well as through their own access points, if they wish to do so.

Implementing Rules for network services (technical specifications for those services, including minimum performance criteria) shall be adopted through the Comitology Procedure [2007]. They will have to be implemented by Member States within the Transposition Phase.

Implementing Rules laying down obligations (compliance of metadata, services and interoperability) on third parties which may want to use the upload services, shall be adopted through the Comitology Procedure [2007] and implemented by the Member States within the Transposition Phase by [2009].

4.1.4 Data Sharing and re-use requirements

INSPIRE requires Member States to adopt measures for the sharing of spatial data sets and services between Public Authorities [2009].

Implementing Rules to increase the potential re-use of spatial data sets and services by third parties will be adopted through the Comitology Procedure [2009].

Implementing Rules governing access and rights of use to spatial data sets and services for Community institutions and bodies will be adopted through the Comitology Procedure [2007].

4.1.5 Co-ordination and complementary measures (monitoring, reporting)

INSPIRE requires Member States to designate appropriate structures and mechanisms for coordinating the contributions of all stakeholders, including identification of needs, provision of information on practices and feedback on the implementation of INSPIRE [2009].

Member States shall designate a public authority responsible for contact with the Commission [2007].

The Commission, assisted by the European Environment Agency, shall be responsible for co-ordination at Community level [2007].

The Commission shall be assisted by a Regulatory Committee¹ with one representative per Member States [2007].

Member States shall monitor the implementation and use of their infrastructures for spatial information and make information on the monitoring accessible to the Commission [2009].

Implementing Rules for monitoring will be adopted through the Comitology Procedure [2007].

Member States shall report to the Commission on the implementation of INSPIRE. A first report is due by [2010], 3 years after entry into force. The second report by [2013], 6 years after entry into force.

Strategies" (COM(2004) 369) that addresses the national strategies. Also of particular interest for INSPIRE are the eEurope 2005 action plan and the communication from the Commission on "Electronic Communications: the Road to the Knowledge Economy" (COM(2003) 65 final) that calls for:- All public administrations to have broadband connections by end 2005;- Half of all internet connections to be broadband by 2005.

Implementing Rules for reporting will be adopted through the Comitology Procedure [2008].

4.2 Roadmap

The table below summarizes the INSPIRE milestones as found in the previous sections. The milestones are based on the entry into force of INSPIRE in year X – which is estimated as being 2007*.

Milestone*	Milestone	Description
2007	X	Entry into force of INSPIRE Directive
2007+3m	X+3months	Establishment of the INSPIRE Committee
2007	X+1 year at the latest	Adoption of Implementing Rules for the creation and up-dating of the metadata Adoption of Implementing Rules for network services Adoption of Implementing Rules on third parties use of the upload services Adoption of Implementing Rules for monitoring and reporting Adoption of Implementing Rules governing access and rights of use to spatial data sets and services for Community institutions and bodies
2009	X+2 years at the latest	Adoption of Implementing Rules for the use of spatial data sets and services by third parties
2009	X+2 years	Adoption of Implementing Rules for harmonised spatial data specifications and for the exchange of Annex I spatial data
2009	X+2 years	Provisions of Directive are brought into force in MS (transposition date)
2009	X+2 years	Designation of responsible public authorities for spatial data sets and services
2009	X+2 years	Implementation of sharing framework of spatial data sets and services between public bodies
2009	X+2 years	Implementation of provisions on monitoring
2009	X+2 years	Network services are operational
2010	X+3 years	Metadata available for spatial data corresponding to Annex I and Annex II spatial data
2010	X+3 years	Member States' First Report to the Commission. From then onwards MS have to present reports every 3 years
2011	X+4	New or updated spatial data sets available in accordance with Implementing Rules for harmonised spatial data specifications and exchange for Annex I spatial data
2012	X+5	Adoption of Implementing Rules for harmonised spatial data specifications and for the exchange of Annex II and Annex III spatial data
2013	X+6	Metadata available for Annex III spatial data
2014	X+7	New or updated spatial data sets available in accordance with Implementing Rules for harmonised spatial data specifications and exchange for Annex II and Annex III spatial data

2014	X+7	Commission's report to the EP and the Council. From then onwards the Commission has to present reports every 6 years
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Gantt chart showing the interdependencies

IR = Implementing Rule	MS = Member States	▼ = Milestone		= Implementation period
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	2007	2008	2009	2010	2011	2012	2013	2014	2015
Entry into force Directive (X)	▼								
Implement sharing between public bodies	↻		▼						
Responsible MS public authority designated			▼						
Commission report								▼	
Committee Kick-off (X+3m)	▼								
Technical Implementing Rules									
Metadata									
Adopt metadata IR	↻ ▼								
Implement Metadata Annex I - II	↻			▼					
Implement Metadata Annex III	↻						▼		
Network Services									
Adopt IR Network Services	↻ ▼								
Network Services Operational	↻		▼						
Harmonised specifications									
Adopt IR Annex I			▼						
Implement for new/updated Annex I			↻		▼				
Adopt IR Annex II - III						▼			
Implement for new/updated Annex II - III						↻		▼	
Procedural Implementing Rules									
Adopt IR Third Party Upload	↻ ▼								
Implement IR Third Party Upload	↻								
Adopt IR Third Party Use	↻		▼						
Implement IR Third Party Use			↻						
Adopt IR Community bodies			▼						
Implement IR Community bodies			↻						
Adopt IR monitoring and reporting	↻ ▼								
Implement monitoring and reporting	↻		▼						
Member States Report			↻	▼			▼		

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5. Implementing INSPIRE in the Broader Context

Before entering into the detail regarding the organisation and planning of the INSPIRE work programme it is important to consider its relevance to global level environmental monitoring and surveying initiatives to which many Member State organisations are committed and which have identified spatial data management issues being key to their success.

The implementation of INSPIRE needs to be considered in the broader context of two major initiatives, the Global Monitoring for Environment and Security, GMES³ initiative of the European Commission and European Space Agency, and the initiative of the international Group on Earth Observations, GEO⁴, launched in 2003.

Both initiatives are important to the INSPIRE implementation as they emphasise the need for improved data integration and information management in the context of the development of operational Earth monitoring through observations from space and in-situ networks. GMES and GEO have received the highest political backing and the resources made available already contribute to the financing of several INSPIRE related development activities.

INSPIRE will therefore constitute the EU's co-ordinated contribution both to GMES and GEO and close collaboration between the management structures of INSPIRE and those of the different programmes needs to be assured in order to avoid duplication of efforts and steer efficiently the deployment of the resources. The GMES and GEO programmes will facilitate exchanges of best practices and information and the collaboration on standards and specifications with other regional initiatives such as the US National Spatial Data Infrastructure, NSDI⁵, the Canadian Geo-Connection programme, CGDI⁶, Australia – New-Zealand ANZLIC⁷ SDI, etc...

The development of Spatial Data Infrastructures, SDI allowing the sharing and exchanging of data and information across thematic, administrative and juridical boundaries using interoperable networked services, is indeed recognised by a wide range of communities active on a global scale in application domains ranging from natural risk management, to biodiversity conservation to climate change monitoring.

The implementation of INSPIRE needs therefore to consider this broader context of global initiatives which aim to foster the development of a local to global SDI capacity in support of sustainable development goals. Especially where such initiatives have established, or are developing, network services, harmonised data specifications and data exchange and sharing agreements, an interaction with the INSPIRE implementation will be necessary.

The need for global action is illustrated by the “The Second Report on the Adequacy of the Global Observing Systems for Climate in Support of the UNFCCC”⁸ published in April 2003. This report points out repeatedly that with respect to almost all of the variables, the record of

³ <http://www.gmes.info/>

⁴ <http://earthobservations.org/>

⁵ <http://www.fgdc.gov/index.html>

⁶ <http://www.geoconnections.org/>

⁷ <http://www.anzlic.org.au/>

⁸ http://www.wmo.ch/web/gcos/Executive_Summary.pdf - prepared by the Global Climate Observing System (GCOS) Secretariat .

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many Parties in providing full access to their data is poor. Indeed, most Parties appear to be unaware of their performance in this respect and this despite of the binding nature of Decision 14/CP.4⁹ of the Conference of the Parties to the Kyoto Protocol which urges parties to undertake free and unrestricted exchange of data to meet the needs of the Convention.

INSPIRE can be seen on a global scale as a regional (i.e. a supra-national) initiative responding to the criticism raised in the UNFCCC adequacy report, as both the technical and procedural dimensions of how the data under the scope of INSPIRE, and identified also in the UNFCCC adequacy report, will be shared between public sector organisations and third parties in the European Union.

The Outcome document of the United Nations World Conference on Disaster reduction¹⁰ (Kobe, Japan 18-22 January 2005) calls to develop, update and widely disseminate risk maps and related information to decision-makers, the general public, and communities at risk in an appropriate format and to develop systems of indicators of disaster risk and vulnerability at national and sub-national scales that will enable decision-makers to assess the impact of disasters on social, economic and environmental conditions. This will require the full and open exchange and dissemination of data for assessment, monitoring and early warning purposes, as appropriate, at international, regional, national and local levels. INSPIRE can be seen in this context as a major regional contribution to building this capacity, as both the data under its scope and the policies and services it aims to put in place, are a prerequisite to the efficient functioning of early warning systems and the development and dissemination of risk maps.

It is important to recognise that already a wide variety of organisations both in the EU and at a global level have been establishing more or less binding agreements and partnerships on data exchange, sharing, formats and specifications, with varying degrees of success. In many cases networked services are being put in place or are under development. To these organisations, of which various EU Member States are member, the proposal for a Directive can either be seen as a threat, as it may interfere with their activities or, as the opportunity to bring their agreements under a binding legal framework hereby breaking down any remaining barriers still impeding the most efficient use of the spatial data under their custodianship.

The association of those organisations to the development of both the technical and more procedural Implementing Rules will be necessary to avoid duplication and confusion, while at the same time building upon and strengthening what has been already achieved.

The European Commission services which are tasked with the co-ordination of the implementation of INSPIRE will seek through the procedures described in the previous sections to associate these organisations to the development of the various Implementing Rules.

References to the World Meteorological Organisation (WMO), the International Hydrographic Organisation (IHO), the International Federation of Surveyors (FIG) and other organisations serve to illustrate the need for INSPIRE to interact with initiatives in a broader context. Details on a few of these examples are presented in Annex 1, without however

⁹ <http://unfccc.int/resource/docs/cop4/16a01.pdf>

¹⁰ The Framework for Action encompasses disasters caused by hazards of natural origin and related environmental and technological hazards and risks. It thus reflects a holistic and multihazard approach to disaster risk management and the relationship, between them which can have a significant impact on social, economic, cultural and environmental systems, as stressed in the Yokohama Strategy (section I, part B, letter I, p. 8).] – see: <http://www.unisdr.org/wcdr/official-doc/programme-outcome.pdf>

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claiming to provide an exhaustive overview of all relevant global initiatives in which organisations from the EU Member States and EFTA countries collaborate at a global level.

GALILEO¹¹ is worthwhile mentioning. GALILEO is a joint initiative by the European Space Agency and the European Union, to ensure Europe's independence in the field of satellite based navigation systems. GALILEO will provide major benefits for the management and the maintenance of spatial data as well. By facilitating the introduction of high accuracy positioning systems into survey campaigns, it becomes easier to avoid geometrical quality degradation of spatial data. GALILEO will also help to locate pollution, to monitor the atmosphere or to trace the movement of species, just to mention a few benefits from the environmental point of view. In the development of the Implementing Rules, INSPIRE is to take into account the technical characteristics of GALILEO in order to ensure that the synergies can be fully exploited to the mutual benefits of the users of GALILEO and INSPIRE.¹²

Conclusion:

- The implementation of INSPIRE can not be undertaken in isolation from international and global initiatives to which many EU Member States and EFTA countries' institutions participate.
- The development procedures of the INSPIRE Implementing Rules will therefore entail the possibility for relevant international global initiatives to contribute.
- The implementation of INSPIRE will benefit from the strong political backing of the global initiatives as it will provide the EU's co-ordinated contribution to the goals of these initiatives. The organisational framework will therefore include the necessary interaction with the various programme offices.

¹¹ http://europa.eu.int/comm/dgs/energy_transport/galileo/index_en.htm

¹² COM(2004) 516 Proposal for a Directive establishing an infrastructure for spatial information in the Community, section 5, Consistency with other policies

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6. Organisational structures and process for stakeholder participation

The development of the INSPIRE Implementing Rules requires the participation of stakeholders.

The next sections will introduce the organisational concept of Spatial Data Interest Communities (SDIC) and the process by which they will become involved.

6.1 The concept of Spatial Data Interest Communities

The process of developing the INSPIRE Implementing Rules, can be approached as a network of Spatial Data Interest Communities, organised by region, by societal sector and thematic issue, each with participating data providers and users exploiting spatial data.

Spatial Data Interest Communities bundle the human expertise of users, producers and transformers of spatial information, technical competence, financial resources and policies, with an interest to better use these resources for spatial data management and the development and operation of spatial information services. Through their activities they drive the demand for spatial data and spatial information services.

Stakeholders form specific Spatial Data Interest Communities through their common interest on one or more of the following aspects:

- data themes (INSPIRE annexes I, II and III)
- spatial information services
- legal and procedural issues (data policy, monitoring, ...)
- sectors in society (public services, private sector, research institutions ...)
- role in the processing chain (legal mandates concerning data management, users, providers, interdisciplinary GI-associations, umbrella organisations ...)
- status and approach in the Member States SDI development (according to the typology from the State of Play study)
- geographic extent / authority level (EU-25 +EFTA, national, regional...)

Spatial Data Interest Communities naturally form strategic partnerships: public-public, public-private and private-private partnerships, aligning their demand for spatial data and services, together with their investments.

Environmental monitoring, reporting and development of applications and services for environmental management in the context of European regulatory obligations and international conventions are among the main driving forces behind the natural formation of Spatial Data Interest Communities.

The increasing risk of disasters arising when hazards interact with physical, social, economic and environmental vulnerabilities are an additional driving force behind the formation of Spatial Data Interest Communities.

Environmental oriented SDICs and those involved in disaster reduction share risk reduction objectives and their needs for services and data often overlap to a large extent. Risk assessment and management concerns, combined with EU environmental regulatory

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frameworks such as those related to air quality reporting, the Water framework directive, the integrated management of coastal zones, the management of the NATURA2000 areas, etc., make users, producers and custodians of spatial data jointly engage in the development of rules for metadata, common data models and content standards, exchange and use policies, and service architectures.

At national and regional (i.e., sub-national) levels spatial data infrastructures, including strategies and organisational structures are being put in place to tackle similar issues, with a growing recognition that agreements should preferably cross administrative and juridical boundaries.

For particular themes, such as meteorology, hydrography, oceanography, bathymetry, navigation etc. existing Spatial Data Interest Communities already exist, with often a long standing history in the development of agreed common data formats, standards, use agreements, etc. applicable in some instances far beyond the boundaries of the European Union.

Pan-European umbrella organisations of data custodians such as Eurogeographics, Eurogeosurveys etc. develop similar activities for the data under their custodianship.

Interdisciplinary GI-associations such as EUROGI can help formulate public sector user requirements, and can fulfil an active role in awareness raising.

It should however be recognized that not one single of the above Spatial Data Interest Communities can claim to be the single source for INSPIRE Implementing Rules.

INSPIRE Implementing Rules should satisfy the needs of many different uses of spatial data in applications where typically several different types of spatial data are combined. Each Spatial Data Interest Community will therefore have its role to play in the collaborative framework leading to these rules.

Annex 2 expands further on the concept of Spatial Data Interest Communities and provides a non-exhaustive list of examples.

6.2 The role of Spatial Data Interest Communities

The INSPIRE Implementing Rules will have an impact on the way Spatial Data Interest Communities will manage their spatial data and associated services. Through the SDICs, INSPIRE offers a unique opportunity to tune all stakeholders to a more consistent sharing of GI resources. The Spatial Data Interest Communities support is therefore paramount and such support can only be gained if the Spatial Data Interest Communities are involved in the design, review, testing and implementation of the draft Implementing Rules relevant to their community.

The design of the more technical Implementing Rules, both for spatial data and services requires expert knowledge and extensive testing and validation. Such expertise is available in the different Spatial Data Interest Communities, and needs structuring in a comprehensive and pragmatic organisational and procedural framework. Such a framework should allow experts from different Spatial Data Interest Communities to work together on draft Implementing Rules for spatial data themes in which they have a common interest, while equally they should foster the interoperability of services across the borders of their community, as what they have to offer may equally be of interest to others.

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The roadmap for the development and implementation of the INSPIRE Implementing Rules is clear in setting a number of priorities and deadlines. However, as the timing set forward by the INSPIRE proposal is to a large extent driven by feasibility constraints for developing Implementing Rules for a number of Spatial Data themes and services, it seems unavoidable that at the launch of the development of the Implementing Rules, the majority of the Spatial Data themes and services will have to be addressed, albeit with different milestones. Furthermore, it must be considered that the development of Spatial Data standards, metadata profiles etc. does not start from scratch. Many Spatial Data Interest Communities already engage in such activities and it is consequently of paramount importance to associate them as early as possible in the process.

The different roles of the Spatial Data Interest Communities in the drafting, reviewing and testing of the Implementing Rules can therefore be summarized as follows.

- to identify and describe user requirements (to be understood as in line with environmental policy needs, as opposed to “maximum” requirements beyond the scope INSPIRE and beyond realistically available resources.);
- to provide expertise to INSPIRE Drafting Teams;
- to participate in the review process of the draft Implementing Rules;
- to develop, operate and evaluate implementation pilot;
- to develop initiatives for guidance, awareness raising and training in relation with the INSPIRE implementation.

A generic workflow diagram for the Preparatory Phase with roles and responsibilities for the organisational components is elaborated in the following sections, whereas chapter 8 focuses on the terms of reference for each of these organisational components participating in the development of draft Implementing Rules.

6.3 Organising the interaction with the Spatial Data Interest Communities

A generic procedure in a number of phases, co-ordinated by the Commission services and in regular consultation with the INSPIRE Expert Group, is adopted allowing for the participation of the Spatial Data Interest Communities in the drafting and review of the Implementing Rules (Fig. 1).

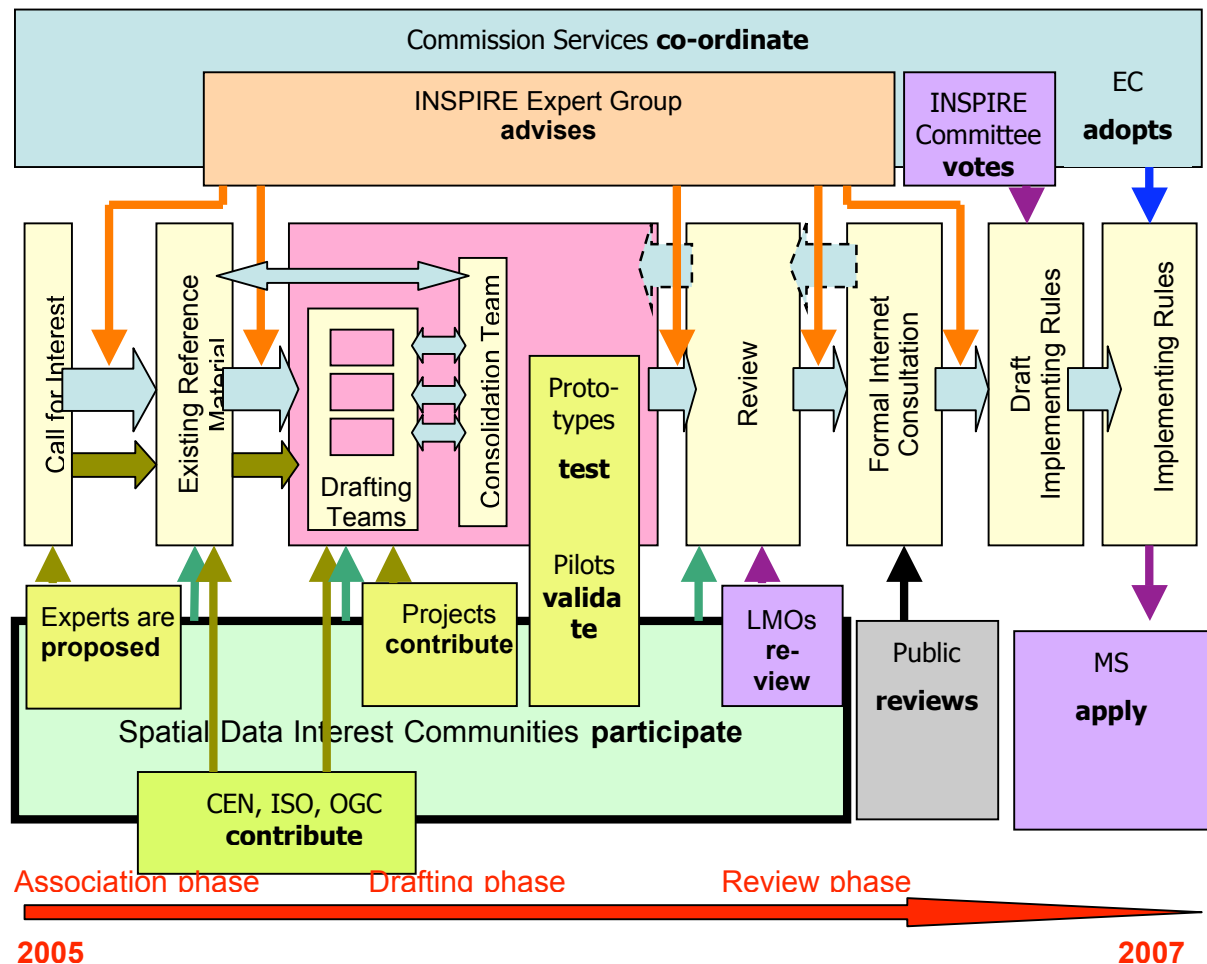


Fig. 1.

The generic procedure is constraint by the roadmap for adoption of Implementing Rules, while attempting to maximise the transparency and participation of the stakeholders. For the different Implementing Rules or their components specific procedures with their own milestones will be followed, always respecting the phases of the generic procedure.

The Association Phase is the phase in which the European Commission will organise a *call for expression of interest to Spatial Data Interest Communities*. The Spatial Data Interest Communities will be invited to state their level of interest to the development process. Various options are open: allocation of experts to the drafting, submission of reference material as an input to the drafting, participation to the review process. On the basis of the inputs received, and in function of the INSPIRE requirements an organisational structure of technical and procedural Drafting Teams will be set up.

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In addition, it is important to identify relevant research and development projects in an early stage to profit from existing work. For this purpose a specific *call for expression of interest for projects* will be launched

A Drafting Phase, in which Drafting Teams composed of a limited number (4 to 5) of selected, highly qualified experts from the Spatial Data Interest Communities, will prepare draft Implementing Rules under the co-ordination of the Commission services. The experts will benefit from the reference material received from the Spatial Data Interest Communities in the Association Phase. The activities and outputs of the Drafting Teams will be co-ordinated by the Commission through a Consolidation Team where each Drafting Team will be represented. The Consolidation Team will cross-check interdependencies between the draft Implementing Rules and assure the necessary co-ordination to maintain coherence.

Interaction with projects to provide further input and pilots for validation of the draft Implementing Rules is foreseen. International and national standardisation bodies, and similar organisations, will be closely associated.

A Review Phase, in which the produced draft Implementing Rules will be submitted firstly to those Spatial Data Interest Communities associated to the development process. The results of this review may lead to a number of iterations of the drafting and review cycle.

Following review by the Spatial Data Interest Communities the organisations which are legally mandated in the Member States to conduct Spatial Data Infrastructure activities, to which we will refer as Legally Mandated Organisations (LMO), are invited to verify the implications and impact of the draft Implementing Rules on their organisations and the feasibility of the implementation as an integrated part of their operational public tasks. Such may involve direct interaction at the level of legally mandated steering committees for national/regional SDI development initiatives to avoid duplication of efforts while ensuring compatibility of the various initiatives already in an early stage. Note however that the LMOs, through the nature of their activities should normally be part of the Spatial Data Interest Communities and therefore closely involved already in the Drafting Phase.

A Public Consultation Phase, allowing for a public review of the draft Implementing Rules, giving the opportunity to all stakeholders, not necessarily organised within one of the Spatial Data Interest Communities to express their views. In function of the result of the public review further fine-tuning of the draft Implementing Rules can be envisaged whereby an accelerated iteration of drafting and review phases is possible.

In case the participative approach as described above leads to conflicting interests between different SDICs, which would not get solved within the drafting and review process, it will be up to the Commission to propose a draft Implementing Rule. The Member States will then decide on the proposed draft Implementing Rule through their representation in the future INSPIRE Committee.

6.4 The role of Projects, Pilots and Prototypes

Many on going research and development projects, to which multiple Spatial Data Interest Communities often participate, such as those in the frame of GMES, could provide input for the drafting of the INSPIRE Implementing Rules.

Pilots and prototypes will be used to test the specifications that are embedded in the draft Implementing Rules. Depending on the nature of the pilots, they can also help in developing

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specifications. A typical pilot project is intended not only to provide a prototype but also to realise pre-operational components of INSPIRE, and is to meet the following requirements:

- Develop representative use-case scenarios and implement solutions that meet identified user needs. Use-case scenarios will describe cross border situations, address data sets covered by INSPIRE, and cope with multilingualism. The solutions will comprise distributed network services.
- Demonstrate the feasibility and advantages of interoperability-based solutions for sharing spatial data and information services while observing the principles and standards set out in the INSPIRE documents;
- Acquire experience in implementing interoperable solutions and developing re-usable processes for the INSPIRE Implementation Phase.
- Determine the cost and benefit of implementing interoperability-based solutions on the basis of real cases.

In addition to projects and pilots, on going initiatives of existing Spatial Data Infrastructure Communities must be considered and closely monitored to ensure the cross-harmonisation of the development of the INSPIRE Implementing Rules and to avoid possible duplication or inconsistency.

Annex 3 provides a number of examples of research and development projects, pilots and activities of Spatial Data Infrastructure Communities.

6.5 INSPIRE and GI standardization initiatives

The interoperable spatial data and spatial services envisaged by INSPIRE proposal are achieved by all stakeholders adopting and implementing common standards and specifications detailed in the Implementing Rules. It is recognized that the more the software industry supports these standards in its products, the easier it will be for those responsible for the implementation of INSPIRE to make systems in the Member States comply with the standards, thus improving the cost-effectiveness of the implementation of the Directive.

In addition to the generic information and communication technology standardisation efforts, there are currently three consensus building organisations dealing with GI and GIS interoperability that have the industry's attention: the International Organization for Standardisation (ISO), dealing with GI in ISO/TC211; the European Committee for Standardisation (CEN) with TC287, working in close collaboration with ISO/TC211; and the OpenGeospatial Consortium (OGC).

The value of the contribution of the above-mentioned organisations to the GI community is recognized, and the standards and specifications that they produce will be considered as reference material for the Consolidation Team and relevant Drafting Teams.

The involvement of working groups within CEN, ISO, and OGC in the development of the draft Implementing Rules can be direct by way of linking these working groups to the Drafting Teams, or indirect by way of SDICs, LMOs, and projects. Decisions in this regard will be taken by the Consolidation Team and Drafting Teams on a case by case basis.

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6.6 The role of the Commission services and European Environment Agency

During the “Preparatory Phase”, Commission services will bundle the resources from various services such as the Joint Research Centre, EUROSTAT, DG ENV, DG INFSO and DG RTD where appropriate. The Joint Research Centre and EUROSTAT will focus on the organisation of the development process, the management of a number of pilots and the interaction with the other Commission services through the Commission inter-service group for geographic information, COGI. DG ENV concentrates on the Co-decision procedure and the interaction with the INSPIRE Expert group. DG INFSO and DG RTD are supporting the development process through various dedicated projects financed under the 6th RTD Framework Programme, mainly in the context of the GMES¹³ programme and through eContentPlus¹⁴.

From the Transposition Phase onwards, the INSPIRE Committee will be supported by an INSPIRE Secretariat, with a multi-annual work programme and budget in place at EU level in 2007.

The first role of the INSPIRE Secretariat will be to prepare the activities of the INSPIRE Committee and provide technical and administrative support to the Spatial Data Interest and Member States.

The second role of the INSPIRE Secretariat will be to provide a high level of technical and scientific support for coordinated implementation, for which it will rely on support from the Joint Research Centre.

In preparation of the establishment of the INSPIRE secretariat, Commission services will anticipate this future situation by collaborating during the Preparatory Phase.

DG-ENV, assisted by European Environment Agency will ensure the co-ordination with the needs of Environmental policies. The European Environment Agency will in addition become a centre of gravity for several SDICs active in the domain of environmental monitoring and reporting and through its planned development of a shared environmental information system.

¹³ <http://www.cordis.lu/fp6/aerospace.htm>

¹⁴ <http://www.cordis.lu/econtent/>

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7. Action Plan 2004-2006

On the basis of the INSPIRE Roadmap, actions are needed with regard to the deliverables at the 2007 milestone.

1. Implementing Rules for the creation and up-dating of the metadata
2. Implementing Rules for network services
3. Implementing Rules on third parties use of the upload services
4. Implementing Rules for monitoring and reporting
5. Implementing Rules governing access and rights of use to spatial data sets and services for Community institutions and bodies

In addition actions linked to milestone deliverables in 2008-2009 should be launched.

6. Implementing Rules for the use of spatial data sets and services by third parties, by 2009
7. Implementing Rules for harmonised spatial data specifications of Annex I and for the exchange of Annex I, II and III spatial data, by 2009

Some of the milestone deliverables are more technical in nature, whilst others refer more to the formulation of legal, organisational or procedural issues.

In order to meet the requirements, a Task Force of the INSPIRE Expert Group suggested that the action plan during the Preparatory Phase should deal with the following topics, linked to the above deliverables 1-7:

- metadata for spatial data (1)
- spatial data specifications and harmonisation (7)
- network services and interoperability (2)
- data and service sharing (3, 5 ,6)
- monitoring and reporting (4, 6)
- organisational structures and co-ordination
- Integration and Horizontal measures

The following sections define the objectives, definition and proposed milestones of each of the above activities. Depending on the results of the initial activities and the input from the SDICs, shifts of the proposed dates are possible.

In order to exclude potential ambiguity in the interpretation of terms, it is foreseen, where appropriate, to provide more precise definitions, terms or technical/procedural requirements as a very first deliverable before moving onwards to the activities as described in the action plan.

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7.1 Metadata for spatial data

7.1.1 Objectives

INSPIRE addresses two kinds of metadata: metadata for spatial services and metadata for spatial data. The objective of this activity is to draft the Implementation Rules that describe the content and the structure of Metadata for spatial data and to make them available for adoption by 2007. Metadata for services will be addressed within the activity on “Network services and interoperability”¹⁵.

7.1.2 Scope

The following issues shall be addressed:

- Rules for the creation, maintenance and updating of metadata
- Multilingual issues in the creation and maintenance of metadata
- Certification, Quality, Accuracy for the described resources, (Multilingual) thesauri to be used as a *common vocabulary* for metadata content (e.g. GEMET, EuroDicAutom)
- Standards to be followed for publishing metadata

7.1.3 Process

The first task will be to provide a more detailed description of the requirements on metadata for INSPIRE data as a basis for common understanding. An INSPIRE core metadata element set must be developed.

The elaboration of a set of profiles for different domains (e.g. related to thematic topics like soil, hydrology) may require an extension of the INSPIRE core metadata element set. This activity may therefore establish the rules for Spatial Data Interest Communities that need to extend the INSPIRE core metadata elements.

The Drafting Team will propose an initial draft core metadata element set based on the ISO 19115 standard. The EUROSTAT INSPIRE Pilot Project will test and document the proposed metadata element set. The test results and recommendations for the use of the draft metadata elements will be available in spring 2005, following which the Drafting Team will prepare a recommendation for the internal review process.

In the meantime the Drafting Team will focus on the rules for extending the INSPIRE core metadata elements in compliance with the ISO standard. It is highly recommended that the draft rules for extending the INSPIRE core metadata elements to thematic areas are ready by September 2005.

Other related existing and emerging standards from ISO (including Dublin Core), OGC, CEN (including TC287 Geographic Information) will have an important input to the process.

¹⁵ When the Drafting Team (DT) Metadata and the DT Network Services are installed and organize themselves they could propose to move Metadata for Services to the DT Metadata.

7.1.4 Proposed breakdown and milestones

Deliverable	Title	Milestone	Who
D 1.1	Detailed INSPIRE definitions on content and structure of metadata for spatial data	4/2005	JRC/CT
D 1.2	Survey of existing initiatives and solutions for content and structure of metadata for spatial data	5/2005	CT ¹⁶
D 1.3	Draft Implementing Rules for metadata for spatial data (including the draft core metadata element set) for reviewing	6/2005	DT
D 1.4	Draft rules for extending the INSPIRE core profile	9/2005	DT
D 1.5	Final draft Implementing Rules for metadata for spatial data (includes core metadata element set and extension rules).	12/2006	CT/DT

7.1.5 Cross-Reference

- Relevant standards and specifications (Dublin Core, CEN, ISO, W3C, CDS, OGC ...)
- Link with INSPIRE activities on network services;
- Link with ORCHESTRA Integrated Project
- Link to the CEN TC287 Geographic Information, Working Group 5 Spatial Data Infrastructure.
- Relevant work on national and European levels
- Link with selected EC Projects
- Link with EUROSTAT INSPIRE Pilot
- Link with the EU geo-portal.

¹⁶ Contribution of CEN/TC287 WG5 is acknowledged.

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7.2 Spatial data specifications and harmonisation

INSPIRE foresees the adoption of Implementing Rules covering harmonised spatial data specifications and data exchange at the latest by 2009 for Annex I and at the latest 2012 for Annex II and Annex III. It is however important to start their development as soon as possible. This is due to the required interaction with those actors in the Spatial Data Interest Communities which are already engaged in the development of spatial data specifications relevant to their activities and to meet timely environmental policy needs.

The spatial data of INSPIRE are categorised according to three separate annexes.

Annex I and Annex II themes are considered to provide the framework to which other thematic data sets are generally referenced and for which higher levels of harmonisation across administrative and juridical boundaries are needed. Establishing harmonised data specifications for these data themes is consequently a priority issue. The distinction between Annex I and II relates to the time horizon for delivery of the harmonised specifications.

The importance of deriving harmonised specifications for Annex III data, to make them at least geometrically coherent, should not be underestimated, as they are considered most relevant for environmental policies.

7.2.1 Objectives

The objectives of this activity are twofold: – to draft Implementing Rules for harmonised data specifications and for data exchange. According to the assumed adoption of the Directive in 2007, Annex I Implementing Rules shall be adopted by 2009 and Annex II/III by 2012.

7.2.2 Scope

The activity will address the following topics:

- Definition of the basic Conceptual Model¹⁷ for the data themes in the INSPIRE Annexes including definition of:
 - Geometrical, topological and temporal representations
 - Spatial and temporal relations
 - Unique identifiers
 - Reference to common spatial and temporal reference systems as well as multilingual thesauri
- Guidelines on the use of the defined conceptual model and related methodology to develop spatial data specifications
- Generalization rules to treat different scales (including aggregation, disaggregation, simplification, ...)
- Encoding (to support exchange of spatial data)

¹⁷ A conceptual data model is primarily created to scope the data requirements and then capture the business view of the data. No technical details regarding the data structure are introduced at this level. For the purposes of this work programme, the conceptual model shall deal with the generic aspects of geometry, topology, identifiers and relationships rather than the specific thematic attributes.

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The basic conceptual model will act as the reference point for further data specification and harmonisation processes, and will provide a common baseline for the representation of the spatial, topological and temporal characteristics of the modelled real world entities. For instance, by providing a common way to represent basic geometric features it will ensure that geometrical combination of different data sets subsumed in the INSPIRE Annex themes becomes feasible. Comparable attempts and solutions can be seen in the feature model defined and referred to by the ISO 191xx standards, by the OGC specifications and by several national conceptual models. Thus the principal output of this activity will be a coherent framework for spatial data modelling which can subsequently be applied to the various Data Themes of the INSPIRE Annexes, plus draft Implementing Rules for the exchange of spatial data.

7.2.3 Process

The initial specification activities need to achieve a common understanding and definition about the level of harmonisation needed for the INSPIRE Annex data specifications, concerning scale, spatial and temporal relations, object classifications, etc. These definitions will clearly influence the subsequent specification working process.

The conceptual model development will take into consideration conceptual models adopted at National level and those developed in consensus building processes (e.g. Water Framework Directive, Land Cover, Soil, Geology, ...) and relevant European initiatives. A specific workshop will be organised in the initial phase to have an overview of existing national conceptual models and methodologies used by Member States to develop specifications. The results of this workshop will be considered as an input for the Drafting Team of experts in conceptual modelling of geo-information with experience in SDI development or related interoperable geo-information applications.

The first two components mentioned under Annex I (co-ordinate reference system and geographical grid systems) are meant as a part of the conceptual model and will have to be treated as part of this conceptual model. This work can benefit in particular from previous agreements on a European Coordinate Reference System and European Reference Grid System.

Based on the first draft of the Conceptual Model its usability as a basis for further Annex I, Annex II and Annex III data themes will be tested by different pilot projects. The results of these will feed into the future development process.

Inputs will be derived from projects such as RISE, MOTIIVE and others addressing data specification issues relevant to INSPIRE.

7.2.4 Proposed breakdown and milestones

Deliverable	Title	Milestone	Who
D 2.1	Detailed high Level INSPIRE definition on harmonised data specifications and / arrangements for the exchange of spatial data	4/2005	JRC/CT

D 2.2	Survey of existing initiatives at European, national and subnational levels , covering Conceptual Models and Methodologies used to develop specifications for Annex Data	7/2005	JRC/CT ¹⁸
D2.3	Definition of Annex I/II/III Themes and Scope ¹⁹	7/2005	DT
D 2.4	Comparative review of existing National and European Conceptual Models and Methodologies to develop specifications for Annex Data	9/2005	CT
D 2.5	First draft version of the Conceptual Model (generic aspects).	12/2005	DT
D 2.6	First draft Methodologies to develop specifications for Annex Data ²⁰	3/2006	DT
D 2.7	First draft of Implementing Rules on the arrangements for the exchange of spatial data	6/2006	DT
D 2.8	First version of the Conceptual Model(s) (generic aspects) and Methodologies to develop specifications for Annex Data	6/2006	CT
D 2.9	Reports on the impact assessment of the conceptual model as a basis for Annex I data specifications	12/2006	LMOs, SDICs, CT

7.2.5 Cross-Reference

- Link with National data modelling and data re-engineering initiatives and other European related initiatives
- Link with CEN TC 287 WG 5 “SDI”
- Link with Projects (RISE, MOTIIVE and others) through their possible participation in the DT.
- Link with INSPIRE Pilots

¹⁸ This includes reference materials provided by the SDICs and LMOs. A database of this reference material will be created for use by Drafting Teams and SDIC’s/LMO’s. A workshop is proposed to bring together the principal actors in such initiatives.

¹⁹ The deliverable will take into account the clarifications provided during the co-decision process. DG Environment and the European Environment Agency are expected to play an important role in the development of this deliverable.

²⁰ The framework developed during the Preparatory Phase can be used for the development of thematic data specifications according to the appropriate timescale.

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7.3 Network services and interoperability

7.3.1 Objectives

The objectives of this task are to draft the Implementing Rules for Network Services and to develop the prototype of the EU Geo-portal.

7.3.2 Scope

This activity will define the functional and non functional requirements of the INSPIRE Network Services to support the following functionalities:

- Upload services (for metadata and spatial data)
- Discovery services
- Data view services
- Download services
- Transformation services
- “invoke spatial data services” services

The first task is to establish a common understanding and definition of functionality of the network services. In addition INSPIRE requires the network services to be accessible through a EU geo-portal, therefore the geo-portal software architecture shall enforce the interoperability with the Member States network. In particular the following issues will be addressed:

- General architectural model
- Security (access to the service and data transfer) when applicable
- Multilingualism as requested by INSPIRE.
- Metadata for services²¹
- Compliance with services metadata and impact
- Technical architectures and protocols
- End-users’ needs.

7.3.3 Process

The Drafting Team should be composed by IT experts with experiences in SDI development. The Drafting Team will have also the responsibility to link with the activities on metadata and on data specifications.

Inputs will be derived from projects such as ORCHESTRA, WIN, the Oxygen initiative of the European Space Agency, and others addressing architectural issues relevant to INSPIRE.

Existing and emerging open IT and geospatial standards from W3C, WS-I, OMG, OGC, ISO, OASIS, CEN will have an important input to the process.

²¹ When installed the DT Metadata and the DT Network Services will organize themselves and could propose to move assign Metadata for Services to the DT Metadata.

The JRC will develop a first prototype for the EU Geo-portal that will be used to test the services specifications. The development of the EU Geo-portal will be done in close collaboration with National Portal developments and with some selected European Thematic Services such as those available in the EEA.

In addition the development of the services specifications and the geo-portal prototype will be accompanied by pilot implementations proving the applicability of the specifications

7.3.4 Proposed breakdown and milestones

Deliverable	Title	Milestone	Who
D 3.1	Detailed definitions on the INSPIRE Network Services and the EU Geo-portal	4/2005	JRC/CT
D 3.2	Survey of existing initiatives and solutions	6/2005	DT
D 3.3	First drafts of interface specifications for Network Services and the technical specification of the EU Geo-portal	12/2005	DT
D 3.4	Test report and impact analysis using the EU-Geoportal	6/2006	JRC/MS/EU ²²
D 3.5	INSPIRE Network Services draft Implementing Rules	12/2006	CT/DT
D 3.6	1 st Prototype of the EU Geo-portal using the prototypical INSPIRE network services	12/2006	JRC

7.3.5 Cross-Reference

- Link with international bodies and National standardisation initiatives (when relevant)
- Link with selected EC and ESA Projects
- Link with INSPIRE pilots
- Link with International, National, Regional and corporate SDIs.

²² MS: Organizations in charge of national portal development; EU: European initiatives developing thematic European portals.

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7.4 Data and Service Sharing

7.4.1 Objective

The action has three objectives:

- to develop draft data-sharing Implementing Rules governing access and rights of use to spatial data sets and services for Community institutions and bodies available for adoption by 2007.
- to draft Implementing Rules governing third party access to upload services by 2007.
- to draft Implementing Rules increasing the potential re-use of spatial data sets and services by third parties by 2009.

7.4.2 Scope

This activity will address and report on issues such as:

- Requirements of Community institutions and bodies, requirements of third parties
- Current types of rights, such as rights of ownership, rights of use, copyright
- Types of access, such as retaining, sharing and trading
- Types of use, such as discover, view, download
- Current best practices and models for data policies

7.4.3 Process

This action will determine the requirements for access and use of spatial data sets and services for Community institutions and bodies, including bodies established by international agreement to which the Community or Member States are party – in relation to the performance of tasks that may have a direct or indirect impact on the environment. It will be necessary to establish the current status, also as a baseline for further monitoring, and to formulate recommendations for the drafting of the Implementing Rule.

This action will determine the requirements on third parties wishing to integrate (upload) their spatial data sets and services in the European spatial data infrastructure and the requirements on third parties for re-use of the INSPIRE spatial data sets and services. This shall be underpinned by an assessment of the current situation and the documentation of a series of “best practice” examples, including successful public-private partnerships and business models on the basis of which recommendation will be formulated for the drafting on the Implementing Rule.

Drafting teams, composed of experts from Community bodies²³, international bodies, Member State organisations, European Umbrella organisations, and third parties will analyse the requirements and current situation and assess coherence with legislation and practice in the fields of data protection, freedom of information, human rights, re-use of public sector information and the Aarhus Convention. Reference material collected in the Association Phase and related documentation will serve as input. This includes the following:

²³ i.e. bodies operating at Community level

- The INSPIRE Data Policy and Legal Issues position paper;
- The PSI Directive and the GMES Data Policy Assessment (DPAG);
- Existing data policies in Member States and agreements of international bodies to which the Community or Member States are party and umbrella organisations.

7.4.4 Proposed breakdown and milestones

Deliverable	Title	Milestone	Who
D 4.1	Report on status and requirements for access and rights of use of spatial data sets and services for Community institutions and bodies – including bodies established by international agreement to which the Community or	03/2006	ESTAT/CT
D 4.2	Draft data-sharing Implementing Rules governing access and rights of use of spatial data sets and services for Community institutions and bodies	12/2006	ESTAT/CT
D 4.3	Report on status and requirements of third parties on access to upload services.	03/2006	DT
D 4.4	Draft Implementing Rules on third party access to upload services	12/2006	DT/CT
D 4.5	Report on the status and on the requirements of third parties for re-use of spatial data sets and services.	12/2007	DT
D 4.6	Report with overview of current best practices and models for data policies	12/2007	DT

7.4.5 Cross-Reference

- Link with PSI Directive
- Link with requirements of environmental legislation and international conventions (Kyoto ...)
- Link with Community bodies (agencies at Community level such as EEA, ...)
- Link with GMES
- Link with European Association initiatives (EuroGeographics²⁴, Eurogi²⁵, Eumetnet²⁶, EuroGeosurveys²⁷, ...)
- Link to e-government
- Link with GEO (GEOSS)

²⁴ EuroGeographics represents nearly all European National Mapping and Cadastral Agencies

²⁵ EUROGI has 25 members - 22 national GI associations and 3 pan-European associations involved in GI.

²⁶ EUMETNET is a network grouping 19 European National Meteorological Services.

²⁷ EuroGeosurveys is the association of the Geological Surveys of the European Union

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7.5 Monitoring and reporting

7.5.1 Objective

The objective is to draft Implementing Rules for reporting and monitoring by 2007.

7.5.2 Scope

The activity is to propose the mechanisms, methodology and indicators by which:

- a continuous monitoring of the implementation progress is measurable with respect to the targets set out by INSPIRE,
- a three yearly report to the Commission is provided to describe the approach applied by the Member States to translate the requirements set out by INSPIRE into concrete measures and describe the developments of its SDI,
- collected indicators are validated and transferred to the Commission, as well as being made accessible to the public through appropriate information channels.

The indicators should be derivable as much as possible from the applications and services that are set up, in order to facilitate a continuous monitoring process with marginal overhead.

This activity on reporting addresses:

- what organisational structure is applied to build up and maintain the relevant SDI components,
- how quality assurance is organised,
- an overview of contributions from the public authorities during the past 3 years,
- data on the actual usage of the SDI, including evolution on cross-border effects,
- what progress has been made in data-sharing and third party licensing agreements,
- figures on tangible costs and benefits in relation to the implementation of INSPIRE.

The activity will further address an implementation schema of the monitoring and reporting process.

7.5.3 Process

An analysis of existing monitoring and reporting activities, starting from the State of Play²⁸ study, will serve to identify possibilities for automated indicator collection and will assess the relevance of some indicators in terms of distance to target. On this basis, INSPIRE related series of indicators and monitoring mechanisms will be drafted and an implementation schema proposed. It is important to focus on various aspects of costs and benefits related to a better sharing of spatial data and services across themes within a region or MS, but also including cross border effects.

²⁸ Spatial Data Infrastructures in Europe: State of Play, Spring 2003
 Spatial Data Infrastructures in Europe: State of Play, Spring 2004

7.5.4 Proposed breakdown and milestones

Deliverable	Title	Milestone	Who
D 5.1.	Monitoring indicators	6/2005	DT
D 5.2	Draft Implementing Rules for Monitoring	12/2006	DT
D 5.3	Draft Implementing Rules for Reporting	12/2007	DT/CT

7.5.5 Cross-Reference

- Other environmental monitoring and reporting obligations such as: Directive 91/692/EEC²⁹.

²⁹ This directive provides for the harmonisation of sector reports on the implementation of 27 directives in the air, water and waste sectors.

7.6 Organisational structures and co-ordination of INSPIRE

7.6.1 Objectives

The primary purpose of this activity is to define the organisational structure that should be in place when INSPIRE will enter into force (from the Transposition Phase onwards), and to define roles and responsibilities of the components of the proposed organisational structure.

7.6.2 Scope

This document will define the minimum necessary components of an organisational structure taking into account:

- strategic (policy) developments at Commission level,
- co-ordination tasks at Community level (e.g. COGI), at national level and at thematic community level,
- operational support,
- technical development and technological evolution including progressive standardisation,
- link with relevant international initiatives (e.g. GMES, GALILEO, GEO-GEOSS, GSDI, Digital Earth, Global Map, ISPRS...),
- experiences gained during the Preparatory Phase on Community level and in the Member States.

It will provide a clear definition of links and responsibilities between the various components proposed.

It will also elaborate on the roles of the Commission services involved in the process.

7.6.3 Proposed breakdown and milestones

Deliverable	Title	Milestone	Who
D 6.1	1 st Proposal for Organisational structures, roles and responsibilities	12/2005	DT
D 6.2	Final Organisational structures, roles and responsibilities (including formal link with international initiatives)	12/2006	CT

7.6.4 Process

The organisational structure of the European Spatial Data Infrastructure has been subject to in-depth considerations by the INSPIRE expert group and dedicated working groups. The INSPIRE proposal envisages that the European Commission, in collaboration with the European Environment Agency has a co-ordinating role, while Member States shall identify a single body to interact with the Commission in the Comitology Procedure.

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As the growing acceptance of INSPIRE is stimulating the creation of several National and Regional Spatial Data Infrastructure initiatives, it will be necessary to involve them through a dedicated Task Force which will work out and refine the organisational structure before the end of 2006.

7.6.5 Cross-Reference

- Generic rules for Committees related to Directives
- eGovernment
- National SDIs lessons learnt

7.7 Integration and Horizontal measures

7.7.1 Objective

The primary purpose of this activity is to ensure an overall co-ordinated progress across the different areas of work.

This activity shall also identify a set of horizontal measures to support the draft Implementing Rules development process, including for example:

- Temporary management and overall co-ordination of activities
- Continuously broadening the scope for involvement and feedback on preparatory activities
- Awareness raising
- Issues related to migration from existing systems towards INSPIRE compliance
- Capacity building and change of management practices

In addition this activity should monitor new projects and inform them of INSPIRE (bilateral), with the aim to synchronise development.

7.7.2 Scope

This activity will:

- Cross-check interdependencies in the draft Implementing Rules
- Broaden the involvement and feedback
- Ensure a transparent and broad communication (CIRCA, website, publications, discussion forum...)
- Support to education and training initiatives related to INSPIRE
- FAQ concerning INSPIRE, to support awareness raising
- Design template checklists for convergence or divergence with INSPIRE.
- Guidelines for INSPIRE compliance

7.7.3 Proposed breakdown and milestones

Deliverable	Title	Milestone	Who
D 7.1	Cross-check interdependencies	continuously	CT
D 7.2	FAQ on INSPIRE for policy makers	9/2005	ESTAT
D 7.3	Guidelines on migration issues	12/2006	DT
D 7.4	Guidelines for INSPIRE compliance	12/2006	DT

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7.7.4 Process

This task is part of the Commission tasks on co-ordination with input from Member States through the INSPIRE Expert Group.

A close collaboration between DG-ENV, ESTAT and JRC is foreseen. Basically DG-ENV will take the lead for the legislative process. JRC will be responsible for the co-ordination of technical issues, whereas ESTAT will be responsible for procedural and implementation preparation issues.

During the Preparatory Phase JRC and ESTAT will support the preparatory work as part of their work programme.

JRC has defined a specific action titled European Spatial Data Infrastructure (ESDI)³⁰ (nr.2142) whereas ESTAT plans to prepare the operational framework for the INSPIRE initiative.

7.7.5 Cross-Reference

- Link with relevant European, National, Regional initiatives
- Link with previous activities to ensure coherence
- Link with European Associations initiatives (Eurogi, AGILE, CLGE, ...)

³⁰ http://projects.jrc.cec.eu.int/show.gx?Object.object_id=PROJECTS000000000001AD63

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8. Terms of Reference

Chapter 6 of this work programme describes the organizational structure and the process proposed to prepare the draft Implementing Rules. Openness and transparency of the process proves to be a continuous challenge. Not only should this preparatory process be reactive to expression of interest but pro-active in soliciting organisations and groups with relevant experience and a mix of background (central and local government, academia, private sector, national GI associations, and environmental NGOs etc.) to come forward. This can yield a broader pool from which to select expertise, which will help to ensure the necessary openness and transparency.

The organizational model includes existing structures and new components created by INSPIRE to support the development of the Implementing Rules, in addition to the existing INSPIRE Expert Group created in 2001.

A call for expression of interest for SDICs and for projects will be organized to ensure optimal stakeholder participation. Terms of reference for each of the components which will participate in the process are required in order to ensure a correct understanding of the resources needed as well as the expectations to be met to yield the draft Implementing Rules.

Referring to the INSPIRE principles, it shall be a prerequisite for all the stakeholders involved, to alert of any attempt which might be made by various hardware, software or service vendors to embed unique technologies into the INSPIRE draft Implementing Rules, which may be hampering the objectives of INSPIRE by introducing new dependencies (e.g. patents).

During the Preparatory Phase Community funding from the operational and research budgets will support the following activities:

- ESTAT, JRC, DG-ENV operational budgets:
 - Organisation of co-ordination meetings:
 - INSPIRE Expert Group meetings (DG-ENV)
 - Consolidation Team meetings (ESTAT – JRC)
 - Co-ordination meetings (ESTAT – JRC)
 - Thematic workshops (ESTAT – JRC)
 - INSPIRE pilots and prototypes (ESTAT-JRC)
 - Perform the JRC-ESDI action (JRC)
- 6th RTD Framework programme (DG RTD, DG INFSO)
 - GMES related projects (including ESA support)
 - INSPIRE data harmonisation project
- eContent Plus programme (DG INFSO)

In the Preparatory Phase the same approach previously applied to the drafting of the orientation and position papers will be pursued, i.e. participation on a voluntary basis, with funding limited to travel expenses for a limited number of physical meetings.

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8.1 Spatial Data Interest Community terms of reference

8.1.1 Mandate

The mandate of a SDIC can be one or more of the following:

- to collect and describe user requirements (in its field of competence),
 - Identify and describe user requirements primarily in line with environmental policy as identified within the SDIC's membership
- to submit/develop reference materials as an input to the Drafting Teams (DT),
 - Provide reference material to Consolidation Team (CT);
 - Provide further input to CT may that be required;
 - Create in collaboration with the CT and DTs new working groups under CT request to support the DT's work;
 - Develop new reference materials through existing or new working groups.
- to allocate experts to the Drafting Teams,
 - Identify experts within the SDIC to be nominated for the Drafting Teams
 - Submit the CV and details of the expert as described in the Call for Expression of Interest for SDICs
- to participate in the review process,
 - Coordinate the SDIC's reviewing of a DT's "intermediate" deliverable or a draft Implementing Rule delivered by the CT
 - Send the results of the review to the CT
- to implement pilot projects to test/revise/develop the draft Implementing Rules,
 - Identify and propose to the CT existing projects liaised to the SDIC that are willing to support the CT and DTs by testing and evaluating deliverables.
 - In cooperation with the CT, identify the need for and propose new projects in order to develop new specifications from scratch if required.
 - Compile feasibility, evaluation, and impact analysis reports.
- to make cost/benefit analysis of the draft Implementing Rules,
 - On the basis of on going projects or running operational activities provide input for the cost/ benefit analysis of the draft Implementing Rules,
- to contribute to awareness raising and training,
 - Create awareness among SDIC's members
 - Develop initiatives for guidance, awareness raising and training in relation with the INSPIRE implementation.
- to be kept informed.
 - Internal (members, WGs) and external (with DTs, CT) communication

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8.1.2 Set-up and composition

8.1.2.1 Characteristics of a SDIC

The development of the INSPIRE Implementing Rules requires the participation of stakeholders. INSPIRE Implementing Rules should satisfy the needs of many different uses of spatial data in applications where typically several different types of spatial data are combined. Each Spatial Data Interest Community will therefore have its role to play in the collaborative framework leading to these rules.

Typically, SDICs have the following characteristics:

- they bundle the human expertise of users, producers and value-adders of spatial information, as well as technical competence, financial resources and policies. An SDIC is therefore not a single organisation, it groups many stakeholders, yet, it can be represented in the context of INSPIRE, by a lead entity.
- they can be organised by region, thematic issue or sector (industry), or a combination thereof.
- they have an interest to better use their resources for spatial data management and the development and operation of spatial information services.
- through their activities, they drive the demand for spatial data and spatial information services.

A SDIC considered relevant for INSPIRE:

- Shares common interests among its members in relation to the INSPIRE Proposal. Examples of those interests are:
 - Environmental Policy implementation, monitoring and development
 - Data themes (INSPIRE annexes I, II and III)
 - Legal and procedural issues (data policy, monitoring, ...)
 - Spatial information services
 - Sectors in society (public services, private sector, research institutions...)
 - Role in the processing chain (legal mandates, users, providers, umbrella ...)
 - Status and approach in the Member States SDI development
 - Geographic extent / authority level (EU-25, national, regional...)
 - Research
- Has an interest in being involved in the development of the Implementing Rules and is willing to provide an in-kind contribution to the development of those rules during the INSPIRE Preparation Phase.
- Is open to associate new members, users or providers, which are not initially part of the SDIC.

8.1.2.2 SDIC registration process

Groups of organisations, consortia, or people that want to be recognized as an INSPIRE SDIC shall organize themselves and make themselves known to the Commission by following the instructions in the Call for expression of Interest for SDICs, providing identification information, the area of work, and the proposed role in the INSPIRE Implementing Rules development process. For example, a proposed SDIC can contribute to the draft

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Implementing Rules for Data Specifications, by Reviewing and Testing and evaluating the technical deliverables.

The registration of a SDIC formalises its participation in the process.

The proposal for SDIC should contain:

- SDIC identification;
- Area of work/experience;
- Potential role in the INSPIRE development process.

Details are available in the Terms of Reference of the Call for Expressions of Interest to SDICs.

The Commission, with advice of the INSPIRE Expert Group, evaluates proposals for SDICs using the above mentioned characteristics and will compose and maintain the directory of INSPIRE participating SDICs.

The Commission will make this list of recognized SDICs publicly available.

The SDIC will be requested to state the level of interest in the development process of the draft Implementing Rules, which can be one or more of the following:

- to describe user requirements related to Environmental policies,
- to submit/develop reference material as an input to the drafting,
- to allocate experts to the Drafting Teams,
- to participate in the review process,
- to implement pilot projects using resources available within an SDIC,
- to contribute to awareness raising and training
- to be kept informed

8.1.3 Working methods

In principle, the CT is in charge of the communication with all participating SDICs. In a second stage, the communication regarding the specific aspects a DT is addressing can be established directly between a SDIC and a DT.

Any reference material that the SDIC wants to make available to the DTs' work shall be submitted to the CT by the SDIC. The term *reference material* relates to information, documents (in particular technical standards and specifications, user requirements, testing results, ...) or software programme that support the DTs in reaching their goal. Reference material is expected to be in the public domain. It is understood that provided material will be used only for the purpose of drafting the INSPIRE Implementing Rules.

If experts from the SDIC are allocated to a DT, the SDIC shall provide any reasonable support to the experts. This should enable them to contribute not only from their personal knowledge and experience, but also on behalf and for the benefit of the SDIC they belong to. The SDIC may appoint separate contact persons for the topics addressed by the DTs.

In case reference material is not fully adequate, the CT could ask existing working groups within a SDIC to further develop the material for the DT. SDICs can decide to set-up ad-hoc working groups to address aspects not already covered by an existing working group.

If a SDIC expressed an interest in participating in the review process, it will be requested to comment on various intermediate deliverables.

The SDIC contact persons are requested to regularly update the information provided in the initial proposal.

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8.1.4 Resources

The contribution of experts by SDICs and SDIC's member is in-kind.

Funding resources from the Commission will be available to cover limited participation to co-ordination meetings (e.g. kick-off workshop).

8.2 Drafting Teams' terms of reference

8.2.1 Mandate

- To analyse and review the reference material provided by the SDICs;
- To demand further input from SDICs if required;
- To write the draft INSPIRE Implementing Rules; the scope will be determined by one of the areas for which Implementing Rules are required;
- To provide recommendations to the Consolidation Team in case of conflicting technical specifications or issues;
- To provide suggestions to the Consolidation Team regarding the testing of any proposed technical specifications.

A Drafting Team is not expected to be involved in the following:

- Procedural aspects towards an approved Implementing Rule
- Developing of new specifications
- Resolving conflicts
- Maintenance of the specifications beyond the Preparatory Phase

8.2.2 Set-up and composition

A Drafting Team is installed by the European Commission.

For a better efficiency in drafting, a Drafting Team consists of a small number of experts, (typically 4 to 5). The experts are selected from those proposed by SDICs, by Legally Mandated Organisations (LMOs), by the INSPIRE Expert Group, and others. Those experts participating in the INSPIRE expert group, should not participate in a Drafting Team. The selection of experts is done by the European Commission, with the advice of the INSPIRE Expert Group. More precisely DG JRC will select Drafting Teams focusing on technical aspects with advice from DG Eurostat, DG ENV and the INSPIRE expert group. DG Eurostat will select Drafting Teams focusing on organizational, legal, and policy aspects with advice of DG JRC, DG ENV and the INSPIRE Expert Group. In particular cases (for instance extreme urgency, or particularly sensitive issues) the European Commission may appoint or dismiss experts.

Any vacancies in the Drafting Team shall be filled by using the selection procedure described in the previous paragraph.

In cooperation with the members of the Drafting Team and the Consolidation Team, a chair will be appointed. Any DT chair shall also be member of the Consolidation Team.

The chair appoints a co-chair who replaces him or her whenever needed.

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8.2.3 Working methods

Initial reference material and guidelines to the DT are directly provided by the Consolidation Team. Based on its scope and available reference materials, the DT shall, in collaboration with the Consolidation Team, define its precise agenda and action plan.

For the drafting process of the Implementing Rules, two scenarios are foreseen:

1. A SDIC is providing or could provide reference material to start the process of drafting
2. No material is available or only pieces scattered among many SDICs.

In the first case we have two possibilities:

1. The reference material is mature and satisfies the INSPIRE requirements. Then the DT is only required to make a peer review or fine tuning with only limited interactions with the SDIC.
2. The reference material is under development or could be developed by a specific working group inside a SDIC. In this case the DT will wait until the results are made available³¹.

In the second case, the CT in collaboration with the DT will facilitate the creation of a new working group that is needed to develop the missing material. The working group could be established within an existing SDIC or be a temporary independent association funded through a specific project.

These scenarios (fig. 2) will influence the way in which a DT organizes itself. The CT shall facilitate the DT in establishing direct relationships with SDICs and in particular with their existing working groups (developing the reference material).

³¹ It is implicit that the foreseen development should be compatible with the INSPIRE calendar.

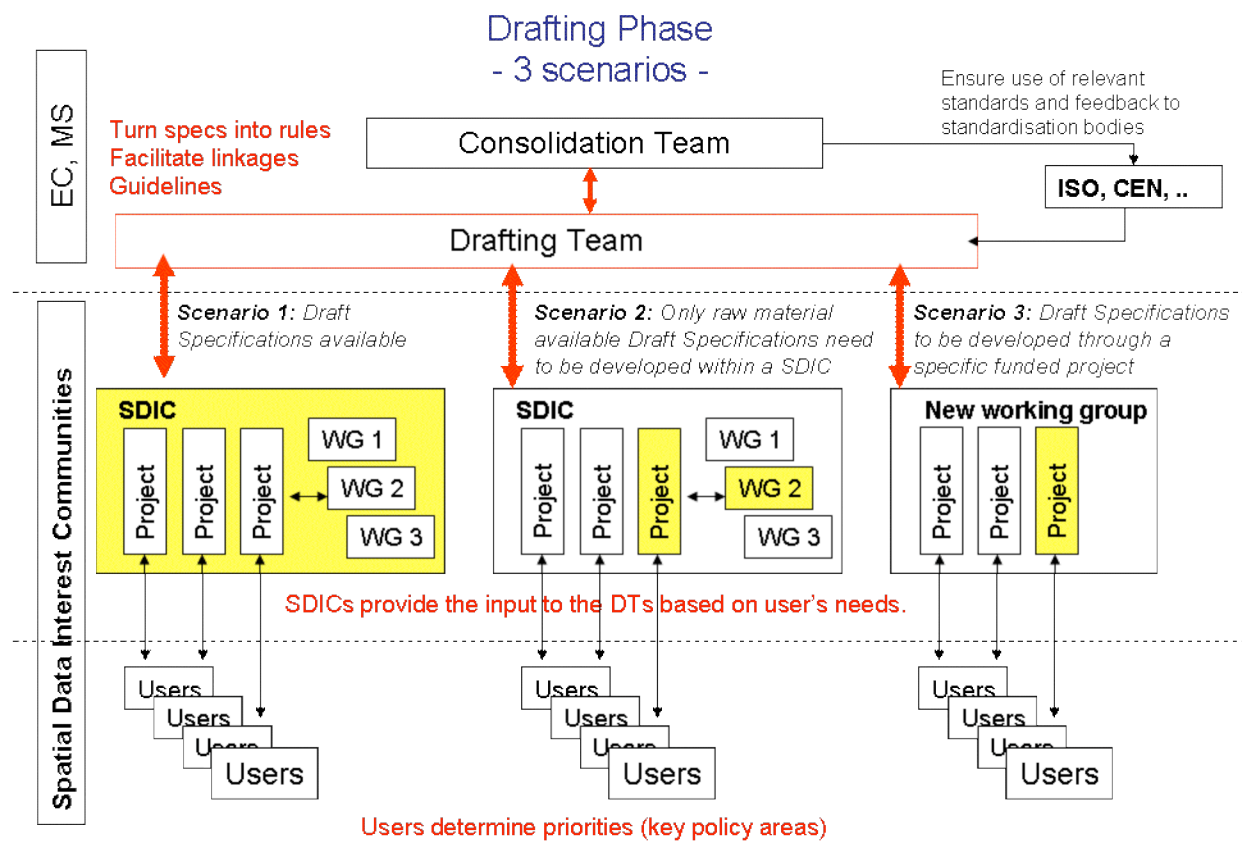


Fig. 2

Example of working group

A working group may be charged with a specific theme of the INSPIRE annexes regarding data specification (e.g. meteorology, geology...) or a specific service in the context of network services (e.g. catalog services).

The chair of the DT is member of the CT, and he/she is requested to regularly attend the plenary meetings of the Consolidation Team.

Any link with other DTs shall be made by way of the CT.

A DT shall use existing materials which are compiled and edited into the draft Implementing Rule. A DT will work primarily with input from the Consolidation Team (CT) and contributing SDICs – this ensures the continued participation and contribution of SDICs. Any input shall be a matter of public record.

The DT's working language shall be English. It is expected that essential input from SDICs shall be made available in English if requested.

Meetings and Communication

- Most of the DT's work can be done with the DT members working from within their own organizations, intensively using telecommunication tools.
- A kick-off workshop with all DT leaders will take place to form the CT.

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- Each DT will be asked to have its own internal kick-off workshop with its members to start the work.
- The DT shall have physical meetings with DT members or workshops whenever required.
- The DT leaders shall have regular physical meetings at CT level.
- The European Commission will make an intranet collaboration tool available to the DT.

Reporting requirements

Reporting shall be done on a regular basis according to standard templates made available by the CT:

- Internally within the Drafting Team – for monitoring the DT’s own activities; should be accessible by the CT;
- To the Consolidation Team – following deliverables agreed upon between the DT and the CT;
- Reporting to all SDICs – regularly by way of the CT;
- Public reporting – through the INSPIRE channels in collaboration with the CT

All material used in the draft Implementing Rules shall be properly referenced.

All intermediate and final deliverables will be subject to two iterative review phases: a) internal review by CT, SDICs, LMOs; and b) public consultation. The CT coordinates all reviews and collects the responses; the DT is responsible for incorporating comments.

The DT is required to account for all input received (including comments) and to show how input reference material has been included or excluded. This is to ensure that all input material has been considered in a comprehensive and rigorous manner, and that decisions can be traced back.

The Consolidation Team will be responsible for making output of the DTs publicly available.

Testing

Testing of draft Implementing Rules can be done at two levels: within the DT through the associated linked Working Group, and by the CT.

The DT can recommend the CT to start the testing of draft specifications. Any testing of draft specifications in Pilot or Prototype projects shall be coordinated by the Consolidation Team. Test results will be evaluated in the CT and therefore be made available to all DTs.

Testing of draft specifications is required for:

- Proof of concept (i.e., there is physical evidence that proposed specifications can be implemented), feasibility, show that it works!
- Interoperability with other draft specifications (the test-bed concept)
- Performance
- Cost/benefit of implementation
- Feasibility studies that Legally Mandated Organizations (LMOs) may require.

Reviewing

The DT can request the CT to start a review process that is appropriate for the maturity of the technical specifications. The CT will coordinate the review process and deliver the comments back to the DT.

Final deliverable

The final deliverable of a DT can be called a draft Implementing Rule if it is:

- Based on input provided by SDICs;
- Agreed within the DT;
- Tested;
- Reviewed and, if necessary, revised;
- Supported by the relevant SDICs;
- Approved by the CT.

8.2.4 Closure of the Drafting Team

The Drafting Team will be disbanded after it has delivered the draft Implementing Rule.

Given the context in which a Drafting Team operates, it is a matter of principle that the lifetime of a DT will not exceed that of INSPIRE's Preparatory Phase.

The Consolidation Team may decide to make a Drafting Team dormant when the draft Implementing Rule has been delivered.

8.2.5 Resources

Similar to the working groups which drafted the INSPIRE orientation and position papers, participation in Drafting Teams will be done on a voluntary basis. Funding resources from the Commission will be available to cover participation to co-ordination meetings with the CT.

8.2.6 Criteria for the selection of experts

SDICs, LMOs, the INSPIRE Expert Group and other organisations are being requested to propose experts for the Drafting Teams. Nominations need to be accompanied by the expert's contact information, the precise area of expertise, and a short (300 words max) and long curriculum vitae, along with the preference for the DT to which the expert wishes to contribute and a realistic commitment on his or her availability. This availability should be expressed both in terms of person days and in terms of the time window in which he or she can contribute to the DT.

The curriculum vitae and other information that the selection panel may have about the candidate will be used to see to which extent the candidate matches a set of general and specific criteria. These criteria are listed in the tables below. Eventually a balance should be ensured between experts from Public Administration, Private sector, Research institutions. .

Table I: Generic criteria for the selection of experts.

Type	Criterion
Background	Active involvement in the development of NSDI, RSDI is required
	Knowledge of environmentally and information society related Directives is an asset

	Involvement in on going projects related to INSPIRE Implementing Rules is an asset
Drafting experience	Effective drafting
	Knowledge of developing abstract specifications
	Knowledge of developing implementation specifications
Commitments	Availability and Commitment to perform the tasks
	Commitment to ensure a broader feedback to experts' community in due time

Table II: Specific criteria for the selection of experts.

Area	Criterion
Metadata for spatial data	<p>Thematic expertise in metadata for the INSPIRE themes</p> <p>Participation in national and international standards development including thesauri and multi-lingual issues</p> <p>Experience with encoding (XML)</p> <p>Development and implementation of mechanisms for schema translation</p>
Data Specifications	<p>conceptual modelling of spatial databases and Conceptual schema language expertise (UML)</p> <p>Thematic expertise in INSPIRE themes</p> <p>Participation in standards development for data specifications at local, national or international level, including multi-lingual issues</p> <p>Implementation of relevant standards for development of data specifications and data exchange mechanisms (XML/GML)</p> <p>Ontology modelling expertise and experience of multi-resolution representation in spatial databases</p> <p>Development and implementation of mechanisms for schema translation</p>
Network services	<p>Experience in SDI technical implementation</p> <p>System Architecture expertise</p> <p>Experience in Architecture verification and validation</p> <p>Knowledge of existing and emerging open IT and geospatial standards</p> <p>Distributed processing implementation and operation experience</p> <p>Specifications methods knowledge (UML,...) and tools</p> <p>Implementation specifications expertise</p>
Data & service sharing	<p>Thematic expertise in different types of rights, such as rights of ownership, rights of use, copyright</p>

Area	Criterion
	Experience with international / national / regional data policy development Knowledge of PSI Directive, Aarhus Convention Knowledge of different business models on data dissemination Knowledge on other related legal circumstances (e.g. privacy issues, national defence...)
Monitoring and reporting	Knowledge on indicator generation Knowledge on automated indicator generation Experience with other Community reporting obligations Knowledge of cost/benefit analysis approaches

8.3 Consolidation Team terms of reference

From the Terms of Reference of the Drafting Teams, a number of points for the Consolidation Team can be deducted.

8.3.1 Mandate

- To coordinate and support DTs' activities, which includes:
 - To create the general guidelines and templates for the DTs
 - To assist the DT in collecting and structuring the basic reference material as provided by the SDICs, MS, CEN/ISO etc...
 - To review reports and deliverables of the DTs
- To coordinate with the SDIC, which includes:
 - To maintain/update the SDIC directory
 - To interact with them in case of conflicts
 - To organise the annual SDIC forum
- To ensure coherence between different Implementing Rules proposed by the DTs and make sure that the work of all DTs is based on the same assumptions
- To final edit harmonised draft Implementing Rules ensuring their overall coherence
- To coordinate Pilot and Prototype projects
 - Formulate, in collaboration with the DTs, statements of work and technical specifications
 - To monitor/supervise the execution of selected projects
 - To evaluate, in collaboration with the DTs, the outcome of the projects
- To coordinate the review processes including the interaction with Legally Mandated Organisations (LMOs).

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- To follow the link to other directives under preparation and to ensure feedback from the co-decision process.
- To link to legal services of the European Commission

The consolidation is not expected to be involved in the following:

- Developing of new specifications
- Drafting initial version of the draft Implementing Rules

8.3.2 Set-up and composition

There is one Consolidation Team only; it is installed by the European Commission and consists of Commission staff.

The CT is assisted by the EEA and by the chairs of the DTs and a small number of temporary additional experts appointed by the Commission when appropriate. The CT is co-chaired by JRC, EUROSTAT and DG ENV. JRC will ensure the coordination with the DT metadata, the DT data specification and the DT network services, Eurostat will ensure the coordination with the DT data and service sharing and the DT monitoring and reporting. DG ENV will ensure the feedback from the co-decision process and, with the assistance of the EEA, will ensure the link to other environmental policies development.

The Commission provides the secretariat for the CT

8.3.3 Working methods

The Consolidation Team will be responsible for the development of the INSPIRE guidance material. The guidance material will be the basis for all further initial reference material and guidelines that are provided to the DTs. The CT will work with the DT to define/revise the DT's scope, action plan, and deliverables.

The CT will assist the DTs in approaching appropriate working groups that the DT feels it needs, and if necessary in setting-up new working groups.

It is the responsibility of the CT to collect the initial reference documentation that the DTs need. The CT will coordinate additional inputs from other parties and/or previous work and contributing SDICs if needed.

The CT shall review draft Implementing Rules made available by the DTs and make recommendations to DTs on improvements of coherence.

The CT will coordinate the testing of all draft Implementing Rules. Test results will be made available to the DTs, the SDICs, LMOs, and the public.

The CT will coordinate the review processes of the DT's output once considered mature enough. The outcome of a review process will be made available to the DT without delay.

The CT will interface with the LMOs concerning the technical feasibility and operational impact of the draft Implementing Rules on which the LMOs will report. Where this impact is substantial in terms of costs, the LMOs are to report on the costs and benefits of implementing the proposed draft Implementing Rules.

Any CT member will have access to any DT's documents. The chair and co-chair of the CT can participate in any DT's meetings. The CT will ensure that the DT's Terms of Reference is respected.

The CT's working language shall be English.

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Meetings and Communication

- A kick-off workshop with all DT leaders will take place to form the CT.
- The DT leaders shall have regular physical meetings at CT level.
- The CT will structure the intranet collaboration tool made available by the European Commission
- The CT will maintain the SDIC Directory and the communication with registered SDICs

Reporting requirements

Reporting shall be done on a regular basis according to standard templates:

- To the INSPIRE Secretariat and the INSPIRE Expert Group
- To all SDICs and LMOs.
- Public reporting – through the INSPIRE channels (newsletter, website, etc.).

Testing

Any testing of draft specifications in Pilot or Prototype projects shall be coordinated by the CT. The DT can recommend the CT to start the testing of draft specifications. Test results will be evaluated in the CT and thus be made available to all DTs.

Reviewing

The DT can request the CT to start a review process that is appropriate for the maturity of the technical specifications. The CT will coordinate the review process and deliver the comments back of the DT.

Final deliverables

The final deliverables of a CT are the draft Implementing Rules. A deliverable can be called a Draft Implementing Rule if it is:

- Based on input provided by DTs;
- Tested;
- Reviewed and, if necessary, revised;
- Supported by the relevant SDICs, LMOs, and the INSPIRE Expert Group.

8.3.4 Resources

Funding of the Consolidation Team activities is ensured through the budget of the Commission Services involved in INSPIRE

8.4 Legally Mandated Organisations terms of reference

8.4.1 Mandate

The main tasks of the Legally Mandated Organisations (LMO) are:

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- To collaborate within the SDICs, or autonomously in providing technical specifications
- To help identify user needs
- To contribute to the analysis of the technical and operational feasibility of implementation of proposed draft Implementing Rules
- To provide feedback on the cost/benefit consequences of Implementing Rules at Member State level.

8.4.2 Identification of LMOs

A particularly important group in relation to the INSPIRE proposal are all the public authorities, institutions and bodies who already got or will get a legal mandate to set up and run one or some of the components of national and regional SDIs, and which are eligible to become the MS' contributors to the ESDI for a particular component. These components cover all fields of activity targeted by INSPIRE and can be either of a technical nature, or of a policy and organisation related nature.

Examples of such LMOs can be:

- either umbrella organisations legally mandated to cover the core components of the set up and operation of an SDI at regional or national level (e.g. BE: GIS-Flanders, CTC, CIBG; DE: IMAGI, etc...)
- or organisations covering only one or a few but very specific components essential to the set up of an SDI at regional or national level:
 - Cadastral agencies, if legally mandated to collect and maintain cadastral parcels (and eventually buildings as well);
 - Geodetic services or NMAs, if legally mandated for e.g. co-ordinate reference systems, selected topographical themes etc...;
 - Statistical agencies, if legally mandated to collect and maintain census units;
 - Environmental agencies, if legally mandated to collect or co-ordinate environmental data acquisition;
 - Ministries of transport, if legally mandated to collect and maintain the spatial information on transport networks (and eventually hydrography as well);
 - Administrations or institutions, if legally mandated to set up SDI service components such as metadata service, data viewing services etc...;
 - SDI service components such as metadata service, data viewing service, if legally mandated to set up and run these services
 - Agencies covering specific thematic topics (geological institutes, nature conservation institutes...)
 - ...

LMO input and assessment is important for the drafting of the Implementing Rules, since these are among the organisations who will have to apply the INSPIRE measures for one or more components internally in the public authorities of the MS.

It is up to those instances that can be considered as LMOs to explain their legal mandate in relation to either the overall set up and operation of an NSDI/RSDI, or to the set up and operation of one or a few components of an NSDI/RSDI.

8.4.3 Working methods

Given the legally mandated responsibilities of LMOs within the MS, it is strongly encouraged that they would participate in the activities of the SDICs they belong to, by way of

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contribution to the draft Implementing Rules development process in the INSPIRE Preparatory Phase.

The components of an SDI as a result of a legal mandate hold by an LMO, serve as a basis to develop downstream value added applications and services. As such an LMO is expected to be well placed to have a clear understanding of operational user needs in their field of activity. LMOs can provide the SDICs with concrete identification of the “largest common denominator” of a series of operational user needs they are aware of, and which should be dealt with when writing/editing draft Implementing Rules. It is then up to the SDICs to transmit the information on crucial elements of user needs to the CT as part of the basic material needed to successfully draft the IRs.

A particularly crucial activity foreseen for LMOs concerns the analysis of the technical and operational feasibility of the implementation of the proposed draft IRs at MS level, as well as the provision of feedback on the cost/benefit consequences of IRs at MS level.

Taking into account the different configurations of LMOs in the MS, it will be up to the LMOs themselves to propose an appropriate method of working to collect and process information on technical feasibility and cost/benefit implications. However a minimal set of requirements can be identified in relation to this part of the LMO’s review tasks:

Meetings and Communication:

- Each LMO should establish the necessary consultation with their user communities to ensure realistic estimates of feasibility, eventual obstacles and expected consequences. To that end it is encouraged that each LMO organises meetings with representatives from their user communities whenever required.

Reporting requirements:

- The CT will provide a template to report feasibility and implications issues.
- Although the collection and processing of information will be done according to each LMO’s best professional judgement, the transparency on the methods applied should be maintained and reflected in the reporting.
- Reporting shall be done to the CT on major versions of the draft IRs.
- The reporting has to provide essential information to support the Commission to get a clear view on the feasibility of the implementation of a draft IR in the MS, in order to evaluate the opportunity of presenting a draft IR to the INSPIRE Committee for adoption.
- The reporting has to identify eventual legal obstacles or interferences at MS level with the draft IRs.

Final deliverables:

The final deliverable of an LMO is an advice on both technical feasibility of the implementation of a draft IR in its MS, and on the legal/organisational implications of this implementation.

8.4.4 Resources

No specific funding for the LMOs is foreseen.

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8.5 Overall Co-ordination by Commission services

8.5.1 Tasks

The main task of the Commission Services in relation to the work programme for the Preparatory Phase is to ensure the overall co-ordination of the Implementing Rules development process. As such the Commission Services are responsible for the updating of the work programme. The co-ordination task affects all the phases described in Chapter 6 of the work programme, and is presented in figure 1. More particularly following subtasks are identified:

- To organise the calls for interest (SDICs, experts, LMOs)
- To set up the Drafting Teams
- To set up the Consolidation Team
- To facilitate the operation of the Consolidation Team
- To organise the INSPIRE Expert Group meetings
- To organise various formal internet consultations
- To formalise the draft Implementing Rules to be submitted to the INSPIRE Committee
- To decide on the closing down of activities of various subgroups

8.5.2 Commission Services involved

During this “Preparatory Phase”, Commission services will bundle the resources from the Joint Research Centre, EUROSTAT and DG ENV, as well as other DGs where appropriate. In preparation of the establishment of the INSPIRE secretariat, the three services will collaborate through the Consolidation Team according to their respective roles as described in Chapter 6 of this work programme.

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9. Annex 1: The Broader Scope – Examples

A number of examples to illustrate the need for INSPIRE to interact with initiatives in a broader context are presented, without however attempting to list a comprehensive overview of all similar initiatives in which EU Member State organisations collaborate at levels beyond the boundaries of the European Union.

- With regard to meteorological spatial features and hydrological data, the involvement of National Meteorological Services, through their role in the World Meteorological Organisation, WMO is an important issue for INSPIRE to consider in the global context. (*INSPIRE Themes: Meteorological geographical features, Atmospheric conditions*)
- The WMO activities, through a Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM) which is intergovernmental body of experts which provides the international co-ordination, regulation and management mechanism for an operational oceanographic and marine meteorological observation, data management and services system, are closely linked to those of the International Oceanographic Commission, IOC³² of UNESCO. The IOC, runs long-standing activities of the International Oceanographic Data and Information Exchange (IODE)³³ programme which aims to facilitate and promote the exchange of oceanographic data and information; to develop standards, formats and methods for the global exchange of oceanographic data and information; and through the development and maintenance of specialized Portals and clearing-house mechanisms. (*INSPIRE Themes: Oceanographic geographical features, Sea regions, Bio-geographical regions, Habitats and biotopes, Species distribution*)
- Another example regards the activities of the International Hydrographic Organisation, IHO³⁴ which undertakes INSPIRE related activities through collaboration with various international organizations in the developments of exchange formats and standards to expedite bathymetric data exchange, the harmonisation of nautical charts, or the online access to databases and services for bathymetry data with provision, free of charge to the IHO for use by its 60 Member Countries (IHO Data Centre for Digital Bathymetry, GEODAS global marine geophysical data base, etc.). (*INSPIRE Themes: Elevation, Hydrography*)
- The Global Biodiversity Information Facility (GBIF)³⁵, which aims to make the world's primary data on biodiversity freely and universally available via the Internet. GBIF is establishing standards and an interoperable network of biodiversity databases and information technology tools using web services and Grid technologies. In the near term, GBIF will provide a global metadata registry of the available biodiversity data with open interfaces, to construct thematic portals and specialised search facilities. Many EU countries are associated to GBIF through a Memorandum of

³² <http://ioc.unesco.org/iocweb/index.php>

³³ <http://ioc3.unesco.org/iode/>

³⁴ <http://www.iho.shom.fr/iho.html>

³⁵ http://www.gbif.org/GBIF_org/what_is_gbif

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Understanding. (*INSPIRE Themes: Bio-geographical regions, Habitats and biotopes, Species distribution*)

- Interaction between, the INSPIRE implementation process and the International Federation of Surveyors, FIG³⁶, which is an international, non-government organisation whose purpose is to support international collaboration for the progress of surveying in all fields and applications, is another issue of importance. The FIG is one of the few bodies through which surveyors can formally be represented in international official standardisation activities for which it has setup a Standards Network. In so doing, FIG is supporting its objective to collaborate with relevant agencies in the formulation and implementation of policies. FIG's aim in the field of standards³⁷ is to assist in the process of developing workable and timely official and legal standards covering the activities of surveyors. FIG is an active contributor to ISO TC211 (Geographic Information), and has through FIG's Commission 7, for example a leading role in the possible standardisation of the cadastral domain. (*INSPIRE Themes: Cadastral parcels, Co-ordinate reference systems, etc.*)

³⁶ <http://www.fig.net/>

³⁷ http://www.fig.net/standards_network/index.htm

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10. Annex 2: Spatial Data Interest Communities Examples

The concept of Spatial Data Interest Communities can be presented in a three-dimensional space of communities developing applications for a particular Sector in society, a given Thematic issue or within a specific Region.

Many of those Spatial Data Interest Communities are engaged in data acquisition, develop harmonized data specifications, exchange standards, data use and re-use policies and services to increase their internal efficiency.

Although INSPIRE lays down general rules for the establishment of an infrastructure for spatial information in Europe, for the purposes of environmental policies and policies or activities which may have a direct or indirect impact specifically on the environment, its overall framework provides a strong incentive for other sectors in society and possibly even an opportunity to bring their scattered islands of information and isolated spatial data infrastructures into a wider European Spatial Data Infrastructure.

It is therefore of paramount importance to seek in the first place the participation of these spatial data interest communities whose activities have a direct or indirect impact on the environment to the development of the INSPIRE Implementing Rules, allowing them to cross the boundaries of their communities while building and maintaining high-levels of internal efficiency. Other thematic sectors dealing with spatial information may welcome the opportunity to follow closely the process.

A few examples of Sectorial - , Thematic – and Regional Spatial Data Interest Communities will further illustrate the concept and serves to raise their interest in subscribing to the INSPIRE development and implementation process.

10.1 Thematic Spatial Data Interest Communities

The main driving force behind INSPIRE is the need to support the design, implementation and evaluation of European Union policies, with an initial focus on environmental policy needs. Under this broad environmental agenda Spatial Data Interest Communities are naturally formed around action programmes and strategies, such as the thematic strategies of the 6th Environmental Action Programme and the implementation and monitoring of EU Directives (e.g. Water, Habitats, Environmental Impact Assessment).

Those needs formed the basis on which the scope of INSPIRE was determined as illustrated in the table below.

Table: Analysis of policies versus INSPIRE data components

INSPIRE Data Themes	6EAP Strategies						Policy Implementation					Policy review/monitoring					
	Environment & Health	Marine thematic strategy	Urban thematic strategy	Soil protection thematic strategy	Biodiversity strategy	Air quality Directive – Café	Water Framework Directive	IPCC – Climate change	Noise	Forest protection	SEA	Nitrate Directive	Waste framework Directive	Habitats/Birds Directive	EIA	IPPC – EPER	Seveso
Coordinate reference systems	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geographical names	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Administrative units	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ortho-imagery	X	X	X	X	X	X	X	X	X	X			X	X	X	X	
Transport networks	X	X	X	X	X	X	X	X	X	X			X	X	X	X	
Hydrography / water catchments	X	X	X	X	X		X	X		X	X	X	X	X	X	X	
Elevation	X	X	X	X	X	X	X	X	X	X			X	X		X	
Land cover	X		X	X	X	X	X	X	X	X			X	X	X	X	
Cadastral parcels	X		X	X	X	X		X	X	X	X	X		X	X	X	
Geographical grid systems	X	X		X	X	X	X	X	X	X			X	X	X		
Protected sites		X		X	X	X	X	X		X	X		X	X			
Addresses	X		X					X						X	X	X	
Land use and land use plans	X		X	X	X	X	X	X	X	X			X	X		X	
Meteorological spatial features	X		X	X	X	X	X	X	X	X			X	X		X	
Population distribution	X		X	X	X	X	X	X		X			X	X		X	
Species distribution		X	X	X	X		X	X		X	X		X	X			
Government service and environmental monitoring facilities		X		X	X	X	X		X	X		X		X	X		
Habitats and biotopes		X		X	X		X	X		X	X		X	X			
Statistical units	X		X	X				X	X	X				X		X	
Bio-geographical regions				X	X		X	X		X	X		X	X			
Agricultural and aquaculture facilities	X	X		X	X		X			X	X			X			
Soil				X	X		X			X	X		X	X			
Buildings	X		X				X		X		X			X		X	
Natural risk zones					X		X	X		X	X			X		X	
Area management/restriction/regulation zones & reporting units					X		X		X		X	X		X		X	
Production and industrial facilities	X			X			X				X			X	X	X	
Geology				X			X	X		X	X			X		X	
Human health and safety	X		X							X				X		X	
Atmospheric conditions	X					X		X		X							
Oceanic spatial features		X			X			X		X							
Sea regions		X			X					X			X				

This analysis illustrates the need for environmental thematic SDICs to link, across administrative and juridical boundaries, their environmental data to a common geographic

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framework such as elevation, water catchments areas, transport networks, administrative boundaries etc. As such, their needs overlap with those of other SDICs, working on the spatial assessment and implementation of other sectorial policies, (e.g. transport, agriculture, energy, cohesion etc.), or activities related to the mitigation of man-made and natural disasters, to support geological exploration, weather forecasting, research etc.

There are however no one-to-one links between Thematic Spatial Data Interest Communities and the INSPIRE data themes. Thematic Spatial Data Interest Communities group stakeholders around applications that make combined use of several of the INSPIRE data themes. Some examples of such application domains are shown below.

Environmental monitoring, reporting and management

- Conservation & Monitoring, Wetland management, Wildlife management, Forest Fire management, Water pollution, Air pollution, Soil pollution, Waste Management, Climate change ...

Spatial Planning

- Urban sprawl, Fringe area development, Urban agglomeration, Urban transport, Rural development ...

Natural Resource Management

- Water Resources, Ocean Resources, Coastal Zone Management, Vegetation resources, Soil resources, Energy resources, Mineral resources ...

Man-made Hazard Management

- Transport and pipe-lines, Industrial sites, Hazardous waste ...

Natural Hazard Management

- Earthquake & volcano, Drought, Forest Fire, Floods & extreme weather, Landslide, avalanches, tsunami, Soil and coastal erosion, Health, Planning & monitoring,...

...

Those organisations in the Member States, or private sector bodies, which are currently acting as collectors and custodians of the needed common geographic framework data are not Spatial Data Interest Communities on their own as they are generally not involved in application development. They play however a key role in serving the needs of many Thematic Spatial Data Interest Communities and as such can be member of several. Therefore, within the context of the implementation process of INSPIRE, they are called to subscribe to a wide variety of Spatial Data Interest Communities to help structuring their common needs.

In Thematic Spatial Data Interest Communities, most stakeholders, users and producers of spatial data, information and services, are part of the public sector or non-governmental organisations. Many of the applications are to serve local to regional decision-making and governance, although awareness is a growing within those communities that collaboration across juridical and administrative boundaries is essential to better cope with the trans-boundary nature of many phenomena or to respond to European regulatory measures and global conventions.

A wide range of Spatial Data Interest Communities are therefore called upon to contribute to INSPIRE, for example:

- The meteorological community, the oceanographic community and the hydrographic community already have long-standing international collaborative frameworks and spatial

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data services in place and are in a position to contribute in the short term to the development of the INSPIRE Implementing Rules.

- European regulatory measures in the field of environment, such as the Water Framework Directive, the Forest Regulation, the Air quality and biodiversity directives or the Coastal Zone management recommendation, leverage collaborative frameworks for the acquisition, management and sharing of spatial data. Reporting on the implementation and monitoring of environmental legislation and international conventions based on common rules, fosters the development of harmonised reporting services and applications.
- Of particular importance is the reporting on the state-of-the-environment towards the European Environment Agency, to which the European Member States are committed. Through its EIONET, the European Environment Agency has an already well-structured Spatial Data Interest Community in place, covering many of the environment related thematic issues while the development of a European shared environmental information system is one of its main priorities for the future.
- European initiatives, as part of the 6th Environmental Action Programme, such as the Marine Thematic Strategy, the Urban Thematic Strategy, the Natural Resources Thematic Strategy and the Environment and Health initiative, will stimulate the creation of new Spatial Data Interest Communities in the near future.
- European and national action programmes and strategies aim at mitigating the impact of man-made and natural hazards. They trigger the organisation of various Spatial Data Interest Communities active in this domain. Again agreements on spatial data acquisition, exchange and sharing agreements, common information services and standards are discussed and implemented through pilots and operational services.
- Land information services for urban and rural land management in the context of spatial development based on cadastral data are the subject of yet another Spatial Data Interest Community. It is developing under the umbrella of the Permanent Committee Cadastre in the European Union³⁸ and Eurogeographics. Illustrative for this community is the EULIS³⁹ project which aims to set up a live operational service for reaching on-line and up to date information about land across European borders. Similarly the European Spatial Development Perspective, ESDP⁴⁰, and its European Spatial Observatory Network, ESPON⁴¹ are another community well organised to contribute to INSPIRE.
- The European research community is another source of Spatial Data Interest Communities. Research on environmental and ecological risk assessment, climate change etc. requires access to a wide variety of spatial data from local to global scales. Many research projects entail important data acquisition activities and the development of standards for exchange and sharing amongst the many international partners is common practise. For example, the SEA-SEARCH⁴² project, funded under the 5th Framework Programme, presents a “gateway to Oceanographic and Marine Data & Information in Europe”, and provides as

³⁸ <http://www.eurocadastre.org/eng/links.html>

³⁹ <http://www.eulis.org/>

⁴⁰ http://europa.eu.int/comm/regional_policy/sources/docoffic/official/reports/som_en.htm

⁴¹ <http://www.espon.lu/>

⁴² <http://www.sea-search.net/>

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such a mapping of key stakeholder organisations working together on marine data collection and sharing issues.

10.2 Regional/National Spatial Data Interest Communities

The EC-INSPIRE study report⁴³ on “Spatial Data Infrastructures in Europe: State of Play 2003”, conducted for 32 countries, yielded pertinent information on various Spatial Data Infrastructure components and building blocks at various stages of development.

The study concluded that operational National Spatial Data Infrastructures, NSDI made up of the integrated components as defined in the Global Spatial Data Infrastructure Cookbook do not yet exist in Europe (status 2002). However, various components of NSDIs are definitely in place or being developed.

The launch of the EC-INSPIRE initiative with the 2001 Memorandum of Understanding⁴⁴ between the Commission services Environment, EUROSTAT and the Joint Research and the following three years of intensive collaboration between the Commission services and stakeholders had an important leverage effect on the development of NSDI.

Indeed, several Member States and regions are in the process of developing and implementing strategies to create Spatial Data Infrastructures, often according to the INSPIRE principles. As such they develop data policy frameworks, organisational structures and business plans for government departments and public sector agencies, to drive their Spatial Data Infrastructure. They establish spatial data portals and mechanism for making reference data widely and quickly available, using funding and pricing mechanisms which maximise the widespread use of such data and develop the infrastructure that would enable linkage of distributed databases.

Obviously, the development of the INSPIRE Implementing Rules should be aimed at strengthening those national and regional initiatives and take their achievements fully into account. This can only be achieved if we see a concrete participation of the already existing SDI initiatives to the drafting and review process.

10.3 Sectorial Spatial Data Interest Communities

It has been estimated that 75 percent of business data have some type of geospatial content⁴⁵. Such information is needed for numerous public- and private-sector activities, including transportation of goods and services; understanding market conditions and demographics; analyzing environmental conditions; producing food; constructing, maintaining, and designing buildings, infrastructure, and communities; providing public safety and defence, etc.

Consequently, the use of spatial data in GIS applications in support of corporate business is growing in many sectors such as:

- **Agriculture & Fisheries**

⁴³ <http://www.ec-gis.org/inspire/>

⁴⁴ <http://www.ec-gis.org/inspire/>

⁴⁵ Frost & Sullivan (1999, p. 5-2).

- **Utility management** (Energy, Telecom, Transport, etc.)
- **Military & Policing** (defence, homeland security)
- **Business GIS** (insurance, banking, etc.)

These communities are of particular interest to the European Spatial Data Infrastructure as they may generate important socio-economic benefits through the creation of new jobs, through environmental sustainable business activities, through cost savings in their day-to-day operations, or by improving the security and safety of our society. For example many utility management entities in the energy, telecom and transport sectors are engaged in mapping activities and often establish public-private and private-private partnerships to recoup their costs and maximise on their investments by trading their spatial data.

It is therefore important to consider mainstream activities in energy and utility corporations where strategies towards corporate spatial data infrastructures are being developed, sometimes also in support of sustainable environmental management. Applications and data acquisition ranging from typical geology and cartography to utility planning and management of pipelines, wind-farms, distribution networks, off-shore GIS, Environmental Data Management GIS and enterprise GIS services and corporate portals should benefit from – and ideally become part of the European Spatial Data Infrastructure.

In addition, “precise mapping” is of extreme importance for security activities. Security activities, in the wider context, include a large number of public, private, and non-profit organizations whose responsibilities range from local to international in geographic scope, and whose potential roles and contributions vary significantly in type and size. Achieving consensus among these different parties is a challenging task, and although beyond the scope of INSPIRE, it can provide a leverage effect which can eventually be further explored in initiatives such as GMES.

The Agricultural sector is of particular importance to INSPIRE both through its economic and environmental dimension. Increase in scale in agriculture is an undeniable source of pressure with important spatial impacts on the environment. Combining economic realities of the global agricultural industry with a growing awareness for environmental pressure have pushed farmers to optimise the yield per area unit. The key to achieving such results is precision farming. GIS is used as a tool in a variety of precision agriculture applications to record and

Utility spatial data management examples:

- Traffic Island
- Property Boundaries
- Entrances to Properties
- Power and Telecom Poles, Pylons, Junction Boxes, Transformers, etc.
- Overhead Power and Telecom Cables
- Buried Power and Telecom Cables
- Manholes
- Underground sewerage and water

Security critical spatial data examples:

- Accessibility information for emergency services.
- Critical infrastructure, including telecommunications; electrical power systems; gas and oil production, storage and distribution; banking and finance; water supply systems; emergency services.
- Accurate employment data tied to specific locations

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analyse agronomy variables, obtain information on crops and soils and also in making decisions on where exactly to apply chemicals or pesticides. Public sector framework spatial data is often enriched by adding regional and field data attribute information on species hybrid/variety entries, optimal tillage practices, pesticide deployment tolerances, crop calendars etc. This wealth of information, often with important environmental relevance, remains locked within the limited community for which it was developed. By participating to the development of the INSPIRE Implementing Rules, the agricultural sector and its GIS service providers, may stimulate the creation of more public-private partnerships, whereby standards, data exchange and (re-)use scenarios and conditions become part of the European Spatial Data Infrastructure.

The integration of environmental requirements into the Common Agricultural Policy (CAP) through the reforms under Agenda 2000, encompasses environmental requirements and incentives integrated into the market policy as well as targeted environmental measures forming part of the Rural Development Programmes. This strategy sets objectives for water, agro-chemicals, land use and soil, climate change and air quality, as well as landscape and biodiversity. The need for rigorous monitoring and evaluation of integration of environmental requirements, based on meaningful environmental indicators is underlined.

Most of the spatial data needed for these tasks are covered by INSPIRE measures. By taking on board the spatial data requirements of the CAP in the development of the Implementing Rule governing access and rights of use to spatial data sets and services for Community institutions and bodies, INSPIRE can contribute significantly to this European policy implementation and evaluation. However, the support of INSPIRE is not limited to monitoring and evaluation alone. In the context of related subsidy regimes, INSPIRE may facilitate the development of information exchange systems between the individual farmers and the governmental organisations tasked with their management. More efficient, less time consuming and more accurate declarations will potentially lead to important cost-savings, justifying the initial investments which will be needed to implement INSPIRE in the EU Member States.

A strong representation from the agricultural sector, both from the private and the public sector, in the development of the INSPIRE Implementing Rules is therefore recommended especially in the agro-environmental domain.

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11. Annex 3: Examples of Projects, Pilots, Prototypes and SDIC

In this section some non-exhaustive examples of projects, pilots, prototypes and SDIC initiatives are given to clarify how they can provide input and fulfil a role in the Implementing Rules development process. A complete list will be produced as a result of the foreseen call for projects.

11.1 Projects

11.1.1 Service Architecture: ORCHESTRA

ORCHESTRA (Open Architecture and Spatial Data Infrastructure for Risk Management) is an integrated project funded under the EU's Sixth Framework Programme for Research in the context of risk management and supports GMES and INSPIRE.

Recent events have underscored the need to be able to consolidate information from disparate systems to support citizen protection and security, disaster management, criminal justice, and other missions, crossing pan-European agency boundaries and extending into National, State and local government areas. One of the most urgent and important challenges currently facing governments is to get these systems to interoperate and share information.

ORCHESTRA is responding to this challenge. The overall goal of ORCHESTRA is to design and implement an open service oriented software architecture that will improve the interoperability among actors involved in Multi-Risk Management. The results of ORCHESTRA will be used to support the development of the INSPIRE and GMES initiatives. In order to realise its vision, the project will:

- design an open service-oriented architecture for risk management. Special attention will be paid to an integrated service and data approach including both their spatial, temporal and thematic characteristics.
- develop the software infrastructure for enabling risk management services
- develop services that are useful for different thematic risk management applications (for instance forest fires or floods, man-made risks)
- validate the ORCHESTRA results in a scenario that involves different risks, both natural and man-made, in a cross-border situation.
- provide software standards for risk management applications.. In particular, the de facto standard of OGC and the "de jure" standards of ISO and CEN are envisaged to be influenced.

ORCHESTRA will not only deliver technical results but will also aim to bring together and consolidate the risk management community. It will do this by integrating the results and recommendations of previous and current European and National projects and initiatives thus harmonizing the technical underpinning of Risk Management.

ORCHESTRA aims to collaborate with other projects in this area, in particular with WIN (Wide Information Network for Risk Management) and OASIS.

ORCHESTRA will also constitute the link to the GMES service requirements.

In summary, ORCHESTRA will especially contribute to the drafting and testing of the INSPIRE network services Implementing Rules. Moreover ORCHESTRA may serve as a pilot for validating and applying the INSPIRE metadata Implementing Rules.

11.1.2 Methodology for data harmonisation: RISE

The Reference Information Specifications of Europe (RISE) project, is a Special Support Action funded under the EU's sixth Framework Programme for Research in the context of GMES and in support to INSPIRE. It is currently in its final negotiation stage.

The overall aim of this project, therefore, is to produce geospatial data implementation specifications consistent with the international and industrial standards that encompass the development of application schema and data product specifications so that Europe may realize its objectives for a sustainable and interoperable functioning of INSPIRE and GMES. For the purpose of this project, a geospatial data implementation specification shall be comprised of the following elements: UML and GML application schema, a (human readable) feature catalogue plus other relevant parts of a data product specification (e.g. data quality, metadata requirements). This proposal details the reasons why schema based on a service regime represent an innovative approach to many of the content and information processing challenges that lie before European governments today at all levels. Given the nature of the project, it will not be possible to develop implementation specifications for all INSPIRE components, or even for all Annex I components. The key outcome from the project, therefore, will be the definition of a process – a repeatable methodology – for developing, adopting and maintaining implementation specifications. Definition of this 'repeatable methodology' will be based upon the implementation specifications developed in the project for a subset of INSPIRE components that meet the priorities identified within the thematic GMES projects. The definition of the repeatable methodology will address issues concerning process and standards to be adopted, organisational models to link the user and producer communities, links to standards bodies for adoption of the specifications, best practice training for testing the specifications through prototyping, and a recommended 'road map' for implementation.

Key deliverables that will be considered as important input to INSPIRE are the following:

Testing System Design Document, including User Guide	T0+3 (approx March 2005)
Data harmonisation requirements report (final)	T0+6 (approx. June 2005)
Methodology & Standards Guidelines on Use Case & Schema Development	T0+6 (approx June 2005)
General templates and guidelines for describing use cases	T0+8 (approx. August 2005)

11.1.3 Marine data exchange: MOTIIVE

MOTIIVE (Marine Overlays on Topography for Annex II Valuation and Exploitation) is a Special Support Action funded under the EU's sixth Framework Programme for Research in the context of GMES and in support to INSPIRE. It is currently in its final negotiation stage.

The objective of MOTIIVE is to examine the cost benefit of using non-proprietary data standards. MOTIIVE addresses harmonisation requirements between the INSPIRE data

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component “elevation” (terrestrial, bathymetric and coastal) and INSPIRE marine thematic data for “sea regions”, “oceanic spatial features” and “coastal zone management areas”. The project stresses analysis of the cost-benefit implied by strong harmonisation between “core” and “thematic” INSPIRE data, while fulfilling the infrastructure requirements of the GMES “Ocean and Marine Applications” theme, already being determined by GMES Service Element (GSE) pilot projects. The aims of the project are to produce application instances of a series of OpenGIS specifications and use this to support a fully qualified business case for creating a formal OGC Working Group for Marine Data, while actively participating in existing OGC Working Groups within which marine data is an important component of thematic data coverage.

MOTIIVE will cooperate closely with the RISE project – Reference Information Specifications for Europe – which has similar objectives to those of MOTIIVE, but for Annex I and II terrestrial data as opposed to marine/coastal data. OGC validation, verification and testing framework tools created by RISE will be made available to MOTIIVE when needed, to preclude duplication of similar work.

In particular, MOTIIVE is anticipated to deliver the following components to INSPIRE:

ISO 19115 compliant Marine Metadata Profile, UML Marine Data Model & Thesauri Report	T0+8 (approx. August 2005)
Feature Type Catalogue for Marine Data, GML Application Schema and Catalogue Application plus Guide to Using MOTIIVE Specifications	T0+18 (approx. June 2006)

11.1.4 The EuroSpec programme of EuroGeographics

EuroGeographics represents nearly all European National Mapping and Cadastral Agencies (NMCAs). The requirements for implementing the EuroGeographics core mission (achieve interoperability of mapping and other GI data within 10 years) and the initial steps envisaged by INSPIRE for developing the ESDI (European Spatial Data Infrastructure) converge in recognising the need for common specifications for reference data.

This is the challenge that the EuroSpec is endeavouring to meet. EuroSpec is therefore both a major programme within EuroGeographics – reference data being the core business of the Association and of its Members – and a major initiative within the ESDI – a cornerstone for the building of an operational GI infrastructure for Europe. EuroSpec is today at a turning point, between its initial ‘scoping phase’ when the concepts have been developed with the GI community, and its ‘initiation phase’ when an action plan will be actually put to effect. EuroSpec is basically addressing the issue of interoperability by focusing on common or interoperable specifications for what INSPIRE has defined as the “Common Reference Data”, covering 7 main themes:

- Geodetic reference
- Units of administration
- Units of property rights (parcels, buildings)
- Addresses
- Topography (eg. Hydrography, transport, height)

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- Ortho-imagery
- Geographical names

EuroSpec is not about creating a unique pan-European database, and is NOT about developing a uniform specification for all databases and all applications in Europe. It is about creating the conditions for an efficient access and use of distributed data. This implies a common technical language, based on a shared EuroSpec Schema, and a common business language, based on a shared understanding of pricing and licensing terms.

11.1.5 EU-FLOOD-GIS in support to the European Flood Alert System (EFAS)

Following the disastrous floods in the Elbe and Danube river basins in August 2002, the European Commission launched a Communication (COM (2002)481 final) (Communication of the Commission to the European Parliament and the Council called “Community response to the August flooding in Austria, Germany and several applicant countries”), with several initiatives, such as the establishment of a European Disaster Relief Fund. In this Communication, the Commission also decided to “provide scientific support to a European Flood Warning System containing information on the main European basins and with real-time access to medium-term meteorological forecasts”. In direct response to the Communication the JRC is developing a prototype of a pre-operational European Flood Alert System (EFAS). The system should be applied to the major European trans-national river basins and include a number of novel features that are usually not available for National Water Authorities:

At present the EFAS is being developed in close collaboration with meteorological services and Water Authorities of the Member States, and with strong support from the European Commission (DG Environment – Water and Civil Protection Units, and DG Enterprise – IDA and IDABC programmes). The aim of EFAS is to produce medium to long-term flood forecasts up to 10 days in advance that give an overview of the potential flood situation in Europe on one hand, and that provide National Water Authorities with additional information on potential flood risk and uncertainty of weather and subsequent discharge forecast on the other hand.

The development of such a system requires different data on European scale. Amongst data required from the Member States, observed and forecasted meteorological data, as well as observed hydrological data are needed.

For this purpose a project will be launched to develop the European Flood Geographic Information System (EU-FLOOD-GIS) in support to EFAS. This system would follow as much as possible the principles that have been outlined in the INSPIRE proposal in order to be self-sustainable. The EU-FLOOD-GIS will build on available systems and structures already in place within the Member States and Candidate Countries (e.g. EUMETNET, Global Runoff Data Centre). The development of the EU-FLOOD-GIS is restricted to some trans-national catchments. However, the structure of the EU-FLOOD-GIS should be such that it can be extended to other catchments as well.

The following tasks are foreseen:

- Inventory and specifications of existing hydrological data sets, terms of acquisition of existing hydrological data sets and of data or data access licenses
- Inventory and specifications of existing meteorological data sets and terms of acquisition of data and/or data access licenses

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- Design of the architecture of the system and collection of data and/or data access rights
- Testing and Implementation

The EU-FLOOD-GIS project is funded by the EU Parliament and will be contracted out. The call for tender will be published in autumn 2005.

EU-FLOOD-GIS can be seen as a project relevant for the INSPIRE themes: Transport networks, Hydrography, Elevation, Natural risk zones, Atmospheric conditions, Meteorological geographical features.

11.2 Pilots and Prototypes

11.2.1 Eurostat INSPIRE Pilot Project

SDIGER is the proposal selected within the framework of the call for tender on "Pilot projects on the implementation of the Infrastructure for Spatial Information in Europe (INSPIRE)" launched by EUROSTAT. The project will develop a Spatial Data Infrastructure (SDI) to explore and prove the feasibility of certain aspects of GI interoperability. The reporting obligations for the Water Framework Directive will be applied as a use case scenario in the cross-border context of the Adour-Garonne (FR) and Ebro (ES) river basins. Regional environmental and water authorities, as well as local authorities are the main users involved in this prototype.

The main objectives of the project, as defined in the terms of reference, are:

1. to demonstrate the feasibility and advantages of the **interoperability-based** solutions for sharing geographical information and information services while observing the principles and standards set out in the INSPIRE documents;
2. to acquire experience in implementing interoperable solutions and develop processes able to be re-used when INSPIRE is put into operation;
3. to estimate the costs of implementing interoperability-based solutions on the basis of real cases.

To achieve these objectives the consortium will perform the following tasks:

- Creation of a generic metadata profile for discovery of data and a metadata profile for the WFD;
- Development of a common data model to be applied to all the basic data sets and development of procedures to transform from the individual data models to the common data model to allow for seamless integration of datasets coming from both sides of the border;
- Use of multilingual thesauri (GEMET, UNESCO etc) in the metadata to facilitate description of metadata elements and search procedures;
- Use of online translation system (SYSTRAN Links Silver 2) to translate metadata in other languages;
- Use of multilingual gazetteer to facilitate search of place names;

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- Development of multilingual portal which will integrate the information and services from 7 nodes distributed in Spain and France;
- Based on the above an internet application is proposed to visualise the ecological and chemical status of the water bodies according to the WFD terms;
- Business plan for implementation of INSPIRE at European level. This includes cost analysis on all the items above as well as configuration and maintenance of the servers and software licenses.

11.2.2 The EU Geo-portal prototype

According to the INSPIRE proposal the Commission shall establish a Community Geo-portal (EU Geo-portal) and the Member States shall provide access to the services defined in the proposal through the EU Geo-portal.

The EU Geo-portal will provide on-line access to collections of spatial data and services supplied by multiple public and private organisations.

An experimental prototype of the EU Geo-portal is currently under development at the JRC. This currently includes search and viewing facilities through gazetteer, catalog and web mapping services. All services are based on standards and specifications from European, International and industry consensus building processes (ISO, CEN, OGC, W3C).

An important value of the prototype EU Geo-portal is to demonstrate what can already be achieved by making (public sector) spatial information more visible and accessible.

The EU Geo-portal is not designed to store or maintain the data. These are distributed in many National and Thematic servers across Europe. Each server is maintained by the organisation responsible for the data. Therefore the EU geo-portal is an application aggregating a number of instances of specific geospatial information services and as such links to national portals in the Member States and other participating countries and to sector specific data and services.

All connections to distributed services are based on international standards and specifications. The EU Geoportal will include in its operational phase the following services:

- **CatalogService:** Catalogue services realize functionality to publish meta-information on geoinformation resources and to search and query this information, respectively.
- **GazetteerService:** These services offer geo-coding functionalities to relate a geographic name, spatial code, etc. to an adequate spatial, geometric representation and vice versa.
- **ThesaurusService:** Services that help to provide harmonised vocabularies for the publishing of resources as well as for queries and analysis on geographic information. The capability of a ThesaurusService to map between synonyms in vocabularies related to different subjects can be seen as an important functionality needed for semantic interoperability.
- **FeatureService:** These services provide access to geospatial data.
- **PortrayalService:** Often also simply referred to as mapping services, realize the cartographic representation or visualisation of geospatial data.
- **ProcessingService:** The Processing Service denotes a super class for various services to process geographic information (e.g. coordinate transformation, classification, statistical analysis, generalisation etc).

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The JRC will develop a first prototype for the EU geo-portal in close collaboration with National Portal developments and with some selected European Thematic Services (e.g. EEA). The EU geo-portal will be used to test the services specifications and will also benefit from the results EU pilot implementations, for example the EUROSTAT INSPIRE pilot project.

11.2.3 The EEA shared European integrated spatial information system

Within the EEA strategy for 2004-2008, a number of projects will support the development of a European Spatial Data Infrastructure as an important component of a shared European integrated spatial information system for the environment. The EEA strategy is aligned with the 6th environment action programme. The Agency works across four major thematic areas: tackling climate change, tackling biodiversity loss/understanding spatial change, protecting human health and quality of life, use and management of natural resources and waste. Each of these is influenced by a range of societal and sectorial processes.

During the preparatory phase 2005-2006 of INSPIRE, EEA will further develop its infrastructure towards an important geo-node for European environmental data exchange. The infrastructure will enable easy exchange of environmental geospatial information within the European community. EEA's priorities for developing the spatial data infrastructure during the INSPIRE Preparatory Phase are:

- Further development of the EEA SDI architecture in line with the INSPIRE proposal; providing an implementation plan during the first half of 2005.
- Processing of existing European datasets to prepare a set of foundation data (i.e. transport infrastructure, hydrography, coastline, urban morphological zones) to support integrated environmental assessments at European scale (supporting the INSPIRE Implementing Rules for environmental data specifications and harmonisation).
- Implementation of a view service for geo-spatial data managed within the Agency's data warehouse (supporting the INSPIRE Implementing Rules for network services). A first operational view service was launched at EEA in 2004, the European pollution emissions register (EPER)⁴⁶, providing geo-referenced information on individual regulated industries. A prototype service on near real time air quality monitoring and flood risk mapping is scheduled for end 2005.
- Continue to operate processing and application service for areas included in the EEA strategy 2004-2008.
- Preparation of an EEA spatial data catalogue, with quality labelling of available datasets (supporting the INSPIRE Implementing Rules for metadata and network services).
- Support the Commission on consolidation of the draft INSPIRE Implementing Rules.

EEA will also contribute to the Commission led review of reporting and extend the EEA/Eionet information system to a node in the shared European integrated spatial data infrastructure, in line with the INSPIRE and the GMES initiative. The EEA/Eionet information system has been established to support all EEA and Eionet activities related to the flows of data and information from countries and others to the EEA, through to the

⁴⁶ <http://eper.cec.eu.int>

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assessments and knowledge provided back to countries, the Community institutions and other clients. The system comprises the people and organisations in the network, their networking activities, as well as the supporting infrastructure and electronic tools. It could be considered a SDIC for environmental monitoring and reporting.

The Agency's priorities for the coming years will be to improve the system to support more effectively the development of EEA products and services and to extend the network and the capacities needed by users. Quality assurance procedures will be introduced and strengthened to ensure standardisation, homogenisation and clearer data definitions for users. The electronic tools and infrastructure and review of business processes under the ReportNet⁴⁷ umbrella will continue to be developed in order to make information flows more efficient, transparent and available for many purposes. The EEA data service⁴⁸ will be populated with more and more geo-referenced data, also to underpin the core set of indicators and provide a setting for integrated assessments. Interactive tools enabling users to analyse environmental data in its geographic context, produce spatial assessments for their own purposes and refer to best practice will be implemented.

11.3 Examples of SDIC

11.3.1 Water Framework Directive

A particular opportunity to test several aspects related to the implementation of INSPIRE can be found in the actual implementation of the Water Framework Directive.

The common vision on reporting for water, as set out during the Water Directors meeting⁴⁹ states that the European Commission (DG ENV, Eurostat and JRC) and the EEA are committed to continue the development of a new, comprehensive and shared European data and information management system for water, including river basins. A participatory approach towards the MS is followed, in order to have it operational as soon as possible and to implement it by 2010.

GIS issues in relation to water policy reporting needs have been discussed with the Reporting Steering Committee, focusing in particular on the reporting prototype development, testing and maintenance, and the decision on use of a common GIS dataset. A workshop in Brussels on the 4th June 2004, involving GIS experts from the Member States and members of the Reporting Steering Committee recognised the need for the adoption of a common GIS dataset by the Commission but gave an even higher priority to the harmonisation of an encoding system. A decision has been taken, therefore, to revitalise a GIS expert network in order to discuss harmonisation issues in the light of the WFD and other requirements (in particular INSPIRE, Eurowaternet, etc.).

The importance of including the WFD activities in the INSPIRE Preparatory Phase is first of all in the legal framework of the WFD being in place, and hence the need to work out solutions respecting the time limits as required by the Directive. Secondly, there is a necessity to address the official authorities within the MS, responsible for the national, respectively regional water management information systems. Addressing these key

⁴⁷ <http://reportnet.eionet.eu.int>

⁴⁸ <http://dataservice.eea.eu.int>

⁴⁹ Rome, November 2003: Reporting for water – concept report

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stakeholders/expert users involved in the field of water management offers the best chances to establish the hydrography theme in an ESDI on the officially used hydrographical datasets within the MS.

The WFD GIS expert network can be considered as an important SDIC eligible to contribute actively to the definition of data specifications for the hydrography theme. Cross reference of this network with the INSPIRE prototype project.

11.3.2 Regional Spatial Data Infrastructures of the Region Lombardia

Agreements with National/Regional Spatial Data Infrastructures need to be established to test the concepts envisioned by INSPIRE.

An example of such an agreement is the one established by the JRC and the government of Region Lombardia. The objective of this collaboration is to help the Region Lombardia to identify the more appropriate scenario to migrate the existing Territorial Information System (SIT) to a modern SDI as required by the future INSPIRE Directive.

This project will be articulated in several phases:

- Assessment of the state of the art of the SIT of the Region Lombardia (analysis and description of the users requirements and comparison with analogous experiences already realized or in course of realization in Italy and Europe)
- Definition of possible scenarios to migrate from the existing SIT to SDI through a comparative analysis of existing SIT and collected user requirements
- Definition of different models of SDI and preparation of the assessment matrix to measure the distance between the current SIT and the objectives of future SDI: selection of possible migration scenarios.
- Cost benefit/analysis for the different scenarios according to different levels of interoperability between the SIT of the several public administrations involved. The result will be used to define the organizational model for the SDI.
- Test of the selected migration scenario in a pilot area and predisposition of an organizational model business duplicable in other regional areas.
- Final quantitative assessment of the costs and identification of the problems related to the migration towards the SDI identified in the pilot exercise.
- Final proposal to migrate the whole system.

In particular the pilot will address the technological and organizational conditions in order to realize, in a stepwise approach, the SDI such that

- It will be a component in the national (and European) SDI
- It will be based on a distributed network of public and private nodes and will involve all stakeholders actively in the definition of service requirements and the regional implementing Rules;
- It will be based on specifications proposed by INSPIRE and will be compliant with the existing National specifications developed by the IntesaGIS initiative.

The pilot project will provide input to establish INSPIRE specifications and guidelines, it will create awareness and will be used as basis to test the INSPIRE principle helping in identifying possible problems to be further considered in the Implementation Phase.

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12. Annex 4: Roles and responsibilities within Commission Services

DG-ENV, assisted by EEA will ensure the co-ordination with Environmental policies. DG-ENV and EEA will be responsible for/to:

- the development of user/data requirements for environmental policies
- establish of priorities for the implementation according to the analysis of EU environmental policies
- the interlinking with specification development in other SDICs
- ensure the coherence between environmental policy development and INSPIRE

Eurostat will be responsible for:

- the development of guidelines concerning organisational and administrative implementation issues
- support to the INSPIRE Committee (from the transitional phase onwards)
- the overall coherence of the INSPIRE implementation process
- the interlinking with the COGI

The JRC will take up his role of Scientific and Technical co-ordinator and will be responsible for:

- the development of guidelines for the technical specification process
- to assist SDICs in the drafting of technical specifications
- the overall coherence between all technical specifications
- to facilitate SDIC work to ensure the cross-thematic coherence
- the interlinking with developments in standardisation bodies (e.g. CEN, ISO)
- the liaison and synchronisation with other relevant international initiatives dedicated to harmonisation efforts in the field of GI (e.g. OGC, GSDI, Digital Earth, UNGIWG...)

The three EC services will contribute to awareness raising and information dissemination, through the INSPIRE web site and joint organisation of European workshops.

13. Annex 5: List of acronyms

AGILE	Association of Geographic Information Laboratories in Europe
ANZLIC	Australia, New Zealand Spatial Information Council
CAP	Common Agricultural Policy
CDS	Catalog of Data Sources
CEN	European Committee for Standardisation
CGDI	Canadian Geospatial Data Infrastructure
CIRCA	Communication & Information Resource Centre Administrator
CLGE	Council of European Geodetic Surveyors
COGI	Interservice Group on Geographic Information at the Commission
DG ENV	Directorate-general Environment
DG INFSO	Directorate-general Information Society
DG TREN	Directorate-general Transport and Energy
DPAG	Data Policy Advisory Group
DPLI	Data Policy and Legal Issues (position paper)
EAP	Environmental Action Programme
EDRF	European Disaster Relief Fund
EEA	European Environment Agency
EFAS	European Flood Alert System
EFTA	European Free Trade Association
EFWS	European Flood Warning System
EIONET	European Environment Information and Observation Network
EPER	European Pollution Emissions Register
ESA	European Space Agency
ESDI	European Spatial Data Infrastructure
ESDP	European Spatial Development Perspective
ESPON	European Spatial Observatory Network
ETRS	European Terrestrial Reference System
EULIS	European Land Information Service
Eumetnet	The Network of 19 European National Meteorological Services
Eurocadastre	Permanent Committee on Cadastre in the European Union
EuroDicAutom	European Terminology Database
Eurogeographics	Association of European National Mapping and Cadastral Agencies
Eurogeosurveys	Association of the Geological Surveys of the European Union
Eurogi	European Umbrella Organisation for Geographic Information

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Eurospec	Project on Common Specifications for Reference Data (Eurogeographics)
EUROSTAT	Statistical Office of the European Communities
Eurowaternet	The European Environment Agency's Monitoring and Information Network for Inland Water Resources
FGDC	Federal Geographic Data Committee
FIG	International Federation of Surveyors
Galileo	European Global Navigation Satellite System (ESA)
GBIF	Global Biodiversity Information Facility
GCOS	Global Climate Observing System
GEMET	General Multilingual Environmental Thesaurus
GEO	Group on Earth Observation
GEODAS	Global Marine Geophysical Database
GEOSS	Global Earth Observation System of Systems
GMES	Global Monitoring for Environment and Security
GML	Geography Markup Language
GSDI	Global Spatial Data Infrastructure
GSE	GMES Service Element
ICSU	International Council for Science
IDA	Interchange of Data between Administrations
IDABC	interoperable delivery of pan-European e-Government services to public administrations, businesses and citizens
IHO	International Hydrographic Organization
INSPIRE	INfrastructure for SPatial InfoRmation in Europe
IntesaGIS	State-Region agreement on the Cartographic Reference System
IOC	Intergovernmental Oceanographic Commission
IODE	International Oceanographic Data and Information Exchange
ISO	International Organization for Standardization
JCOMM	Joint Technical Commission for Oceanography and Marine Meteorology
JRC	Joint Research Centre
LMO	Legally Mandated Organisations
MOTIIVE	Marine Overlays on Topography for Annex II Valuation and Exploitation project
NATURA2000	European Ecological Network established by the 'Habitats' directive and embracing areas established by the 'Birds' directive
NMCA	National Mapping and Cadastral Agencies
NSDI	National Spatial Data Infrastructure
OASIS	Organization for the Advancement of Structured Information

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Systems

OGC	Open Geospatial Consortium
OMG	Object Management Group
ORCHESTRA	Open Architecture and Spatial Data Infrastructure for Risk Management project
OXYGEN	ESA's Earth Observation Open Operational system project
PSI	Public Sector Information
ReportNet	Integrated suite of IT tools optimised to support the business processes of the European Environmental Information System and building on a shared information infrastructure
RISE	Reference Information Specifications for Europe project
RSDI	Regional Spatial Data Infrastructure
RTD	Research and Technological Development
SDI	Spatial Data Infrastructure
SDIC	Spatial Data Interest Community
SDIGER	A cross-border inter-administration Spatial Data Infrastructure to support WFD information access for Adour-Garonne and Ebro River basins
Sea-search	Gateway project of partnership of 33 institutes/centres from 30 different European coastal states, highly skilled in management and added-value services on a wide range of oceanographic and marine data and information
SIT	Territorial Information System
SSA	Specific Support Action
SYSTRAN	Language Translation Technologies
UML	Unified Modelling Language
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climatic Change
W3C	World Wide Web Consortium
WCS	Web Coverage Service specification
WFD	Water Framework Directive
WFS	Web Feature Service Specification (OGC)
WGS	World Geodetic System
WIN	Wide Information Network for Risk Management project
WMO	World Meteorological Organisation
WMS	Web Map Service specification
WS-I	Web Services Interoperability Organization