

EFFECTS OF E.U. REGULATIONS ON THE DISSEMINATION OF CADASTRAL INFORMATION (II) *

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Having addressed the effects on the dissemination of cadastral data of Directive 2003/98/EC of the European Parliament and the Council, of 17 November 2003, on the re-use of public sector information, the second part of this paper focuses on the study of a regulation that is not yet in force but that will play a decisive role in the future model for dissemination of cadastral data adopted by the institutions responsible for Cadastre in E.U. Member States. We refer to the Directive of the European Parliament and of the Council establishing an infrastructure for spatial information in the Community (INSPIRE).

The decision to focus our analysis on the study of a Directive that is not yet in force is based on two reasons. First, because even before its adoption, the Directive has mobilised numerous task forces and scholars throughout the European Union, in both the public and private sectors, who see it as a powerful tool that will clearly influence the dissemination of geographical information. And second, because the articles of the Proposal for the Directive make reference to several subjects that directly affect matters of Cadastre, meaning that, if the Directive is passed in the same or similar terms, Cadastral institutions in E.U. Member States will have to adopt important decisions that may affect current criteria for the processing and dissemination of information, and even their existing data models. [1]

The purpose of this study, as stated in Part I of this paper, is to analyse the degree to which the model for dissemination of cadastral data, described in Title VI (articles 50 to 54) of Royal Decree Law 1/2004 of 5 March, adopting the Merged Text of the Law of Real Estate Cadastre (hereinafter, *TRLCI*), will be affected by the INSPIRE Directive when the latter is incorporated into the Spanish regulation. A second, but no less important purpose is to contribute to the divulgation of the contents of a future regulation whose importance is unquestionable.

THE PROPOSAL FOR A DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL ESTABLISHING AN INFRASTRUCTURE FOR SPATIAL INFORMATION IN THE COMMUNITY (INSPIRE) [2]

Some background data

The interest of E.U. institutions in the creation of community frameworks to facilitate the access to, and the use and re-use of public sector information, including geographical information, is not a recent phenomenon. A knowledge-based digital economy is exercising a strong impact on the life of all Europeans and in addition to improving the quality of life of E.U. citizens, it may well become a driver of growth, competitiveness and employment. This was emphasised by the European Council held in Lisbon on 23 and 24 March 2000 with the creation of the *e-Europe Action Plan 2002*, “an information society for all”, an agreement ratified by the Heads of State and of government in Feira on 19 and 20 June of the same year. Public sector information is identified in this Action Plan as a key action area.

It is impossible to include even a brief reference to all of the numerous documents generated in the E.U. on the ideas mentioned in the previous paragraph, although we recommend reading the Commission’s Communication to the Council, the European Parliament, the Economic and Social Committee and the Committee of Regions, of 23 of October 2001, titled “*e-Europe 2002: Creation of a community framework for the use of public sector information*” [3]. Two sentences from this Communication, relevant to the contents of this paper, are reproduced below:

“Areas of special interest are **geographical, commercial and traffic information**, as well as economic and social data.”

“Special attention will be given to certain sectors and segments, such as **geographical information and the function of libraries.**”

These guidelines generated several specific actions, the most important of which, taken at Commissioner level, was the Memorandum of Understanding signed on 11 April 2002 by Commissioners Pedro Solbes Mira, Margot Wallström and Philippe Busquin, establishing the terms for cooperation bet-

(*) Part I of this paper was published in number 52 of this magazine.

(1) For more information on the intensity and content of the activities underway with regard to the proposed Directive, visit the official website on <http://www.ec-gis.org/inspire/>

(2) This paper has been written based on the text of the proposed Directive presented by the Commission to the European Parliament and to the Council. Logically, the text finally approved will contain some modifications relative to the matters addressed in this article.

(3) COM(2001) 607 final.

ween EUROSTAT, the Joint Research Centre (JRC) and the General Directorate of the Environment, for development of the INPIRE initiative.

This agreement established a guideline for development of the initiative, focused on defining the role of each of the institutions involved and on obtaining a common legislative framework through the approval of a Directive, to enable work to progress in the coordination of the different existing sources of geographical information in each Member State. The option chosen, to approve a Directive, relinquished the possibility of a more conclusive action – such as the approval of a Community Regulation – but was better than other weaker possibilities, such as a request for voluntary cooperation among the Member States [4].

An Internet consultation of stakeholders took place between 29 March and 6 June 2003. A total of 185 organisations and individuals responded, representing feedback from approximately one thousand different organisations. Additionally, on 10 July 2003 a public hearing took place in Rome for the purpose of providing information on the results of the Internet consultation.

The proposal for the Directive currently in process was drawn up as a result of this work and of other actions.

General principles of the proposal

As indicated in Part I of this paper, INSPIRE is the English acronym for “Infrastructure for Spatial Information in Europe”. As stated in the introduction to the proposed Directive, good policy depends on high-quality information and informed public participation and on this basis, a new approach is needed to deal with monitoring and reporting and with data management and delivery across the different levels of government. Policies need to be employed to reduce duplicated data collection and to assist and promote the harmonisation and the broad dissemination and use of data. Such policies should result in increased efficiency, the benefits of which can be re-invested in improving the availability and quality of information. In turn, the increased availability of information will stimulate innovation among information providers in the commercial sector.

Spatial or geographical information (the two terms are synonymous in this context) will play a special role in this new approach because it allows information to be integrated from a variety of disciplines for a variety of uses. A coherent and widely accessible spatial description of the Community territory would deliver the requisite framework for coordinating information delivery and monitoring across the Community. The proposed Directive creates a legal framework for the establishment and operation of an Infras-

tructure for Spatial Information in Europe, for the purpose of formulating, implementing, monitoring and evaluating Community policies at all levels and providing public information based on increased and more reliable spatial data.

INSPIRE originally focused on environmental policy, as described in the Overview of the proposal. But it is evident that the original idea has extended its boundaries, even before approval, and the text of the proposal itself recognises that INSPIRE is open for use by and future extension to other sectors such as agriculture, transport and energy, to quote the examples given in the overview.

From the perspective of the actions it promotes, INSPIRE will not set off an extensive programme of new spatial data collection in the Member States. Instead, it is designed to optimise the scope for exploiting the data that are already available, by requiring the documentation of existing spatial data, the implementation of services aimed at rendering spatial data more accessible and interoperable, and by dealing with obstacles to the use of spatial data. INSPIRE will therefore pave the road for a progressive harmonisation of spatial data in the Member States.

The need for Community intervention in this area is justified by the fact that without a harmonised framework at Community level, the formulation, implementation, monitoring and evaluation of national and Community policies that directly or indirectly affect the environment will be hindered by the barriers to exploiting the cross-border spatial data needed to address the numerous problems having a cross-border spatial dimension. The proposal also states that its development will complement other Community instruments that already exist, naming among others the Directive on the re-use of public sector information, analysed in Part I of this paper, and will assist their implementation.

It is important to note Article 5 of the Explanatory Memorandum, which indicates that INSPIRE is on the list of proposals of the 2003 Work Programme for which the Commission decided to carry out an “extended impact assessment”. The conclusions of this assessment are that the investment required to develop the preferred option (*creation of a focused regulatory framework backed by an EU framework Directive*) will to a large extent be borne by the public sector and is estimated at an average of €3.6 – 5.4 million per annum per EU Member State (EU25). However, quantifying only the environmental benefits, the average annual benefits per Member State (EU25) amount to €27-42 million. Knowing that these elements only represent a partial view of the whole picture, the conclusion is that the benefits outweigh the investment requirements by a considerable amount.

Legal basis of the proposal and application of the principles of subsidiarity and proportionality

The proposal for the Directive bases its request for approval on Article 175(1) of the EC Treaty, because the spatial data that fall within its scope are needed to support the formulation, implementation, monitoring and evaluation of environmental policies

(4) At practically the same time, in May 2002 creation of the Permanent Committee on Cadastre in the European Union” was agreed, and the Committee was established months later by agreement of the Cadastral authorities in the Member States (numbering 15 at that time). One of the Committee’s principal goals is the creation of channels of voluntary cooperation and communication among said institutions. www.eurocadastre.org

with a view to ensuring a high level of environmental protection.

Furthermore, Article 174 requires the Community to take account of available scientific and technical data. INSPIRE contributes to the implementation of this requirement by helping the Community to access and use available spatial data and also because some of these spatial data are also needed in the context of other national and Community policies, such as agricultural, transport or regional policy.

Applying the principle of subsidiarity, Community intervention is justified by the existence of multiple environmental phenomena, such as migration of species, wind, or the flow of water, that occur irrespective of national borders. Additionally, pressures and impacts on the environment (flooding, air and water pollution, etc.) are also cross-border in nature. Environmental policies therefore require the establishment of environmental management agencies covering the territory of various Member States.

Due to its effects on existing cadastral models, it is extremely important to know how the principle of proportionality is applied in the proposed Directive. Per the proposal, the Directive will not go beyond what is needed to achieve its objectives. In this context – and this is particularly important – it is designed to build upon the variety of existing information systems already in place in the Member States and provides the overall framework for these to be able to work in synergy with each other, forming part of the Infrastructure for Spatial Information in the European Community. INSPIRE will also build upon existing organisations already involved in spatial data use and production, including the existing public agencies responsible for Cadastre in the different Member States [5]. Therefore, as far as organisational issues are concerned, INSPIRE will only provide the overall coordination mechanisms needed for the infrastructure to operate at the European level.

As regards harmonisation, INSPIRE will address only those aspects needed to achieve cross-level and cross-thematic consistency of spatial data and to make them available to support Community policies. For example, INSPIRE does not require Member States to change the format of their spatial data holdings; instead, Member States can provide interfaces that transform heterogeneous data to a uniform model.

Regarding its scope, the proposal takes the form of a framework Directive in order to leave the Member States ample room to tailor the prescribed objectives to their specific situations, imposing only those measures needed to make existing systems interoperable or eliminate existing barriers. Furthermore, specific limitations have been introduced in order to prevent any disproportionate additional administrative burden on Member States. The proposal also introduces safeguards to ensure that it does not stifle innovation, and to guarantee the participation of the private sector.

General Provisions

Article 1 states that the Directive lays down general rules for the establishment of an infrastructure for spatial information in the Community, based on infrastructures for spatial information existing in and operated by the Member States, for the purposes of Community environmental policies and policies or activities which may have a direct or indirect impact on the environment. It is evident that the data contained in both the urban and rustic Cadastres are fully relevant to the development of Community environmental policy, and therefore these territorial information infrastructures can be considered to fall within the scope of application of the Directive.

Developing this point, Article 2 goes on to say that the Directive shall cover identifiable collections of spatial data, hereinafter “spatial data sets” which fulfil the following conditions:

- a) they are related to an area under the jurisdiction of a Member State or to its exclusive economic zone/search and rescue region, or equivalent;
- b) they are in electronic format;
- c) they are in the possession of any of the following:
 - 1) a public authority, having been produced or received by a public authority, or being managed or updated by that authority;
 - 2) ...
 - 3) ...
 - d) they relate to one or more of the themes listed in Annexes I, II or III of the Directive.

Per the terms established above, the Spanish Cadastral database constitutes a “spatial data set”. It is in electronic format and is public in nature, as established in Article 1 of the TRLCI: “*the Real Estate Cadastre is an administrative register dependent on the Ministry of Finance that describes real estate property classified as rustic, urban or special per the definitions contained in this law*”, completing this statement in Article 4 of the same Law: “*the creation and maintenance of the Real Estate Cadastre and the diffusion of cadastral information is exclusively the competence of the State.*” Furthermore, cadastral parcels are specifically included in Annex II of the proposed Directive, to which we will refer later. We therefore have no doubt whatsoever that the Directive, once approved, will be applicable to the database managed by the Spanish General Directorate of Cadastre, and likewise to those administered by the cadastral institutions in the remaining Member States.

Moreover, the same Article applies the scope of the Directive not only to “spatial data sets” but also to “spatial data services”, the term used in the Directive to describe operations which may be performed, by invoking a computer application, on the spatial data contained in the data sets. This means that the Directive is not only applicable to the data, but also to the way in which these are managed, supplied or exchanged.

After establishing in Article 3 that the provisions of the Directive are without prejudice to Directive 2003/4/EC, on public access to environmental information, and to Directive 2003/98/EC, on the re-use of public sector information, Article 4

(5) For services provided by the Spanish e-Cadastre, visit <http://ovc.catastro.minhac.es/>

states that the Directive shall apply only to spatial data sets administered by authorities operating at the government level of a Member State. If the authority operates at a lower level of government of a Member State, the Directive shall apply only to spatial data sets whose collection or dissemination is coordinated by another public authority or is required under national law.

To clarify the preceding rule, Article 5 provides the definition of “public authority” for the purposes of the Directive:

- a) government or other public administration, including public advisory bodies, at national, regional or local level;
- b) any natural or legal person performing public administrative functions under national law, including specific duties, activities or services in relation to the environment;
- c) any natural or legal person having public responsibilities or functions, or providing public services, under the control of a body or person falling within a) or b).

The proposed Directive uses a variety of terms whose meaning is not always generally known. It is therefore advisable to read the contents of Article 6, stating that for the purposes of the Directive, the following definitions shall apply:

- (1) “*spatial data*”, means any data with a direct or indirect reference to a specific location or geographical area;
- (2) “*spatial object*”, means an abstract representation of a real-world entity related to a specific location or geographical area;
- (3) “*metadata*”, means information describing spatial data sets and spatial data services and making it possible to discover, inventory and use them;
- (4) “*third party*”, means any natural or legal person other than a public authority.

These definitions should be remembered, since they are used frequently throughout the proposal, as seen in the following section.

Metadata

This title contains Articles 8 to 10, which together form Chapter II of the regulation.

Metadata are the directories or indexes prepared in accordance with pre-established and commonly accepted standardisation criteria, which describe the characteristics of data contained in other databases - or spatial data sets, to use the terms of the Directive. Member States shall ensure that metadata are created for spatial data sets and services, and that those metadata are kept up to date. Metadata shall include information on the following:

- a) the conformity of spatial data sets with the provisions establishing criteria for harmonisation and exchange set out in the Directive;
- b) rights of use of spatial data sets and services;
- c) the quality and validity of spatial data;

- d) the public authorities responsible for the establishment, management, maintenance and distribution of spatial data sets and spatial data services;
- e) the spatial data sets to which public access is limited in accordance with Article 19 of the Directive and the reasons for such limitation.

The Commission will adopt specific regulations for the application of this Article.

In view of the fact that the existing Spanish Cadastral model adapts to the requirements defined in Directive 2003/98/EC on re-use of public sector information, reviewed in Part I of this paper, the supply of information as required in letters b), c), d) and e) above is not expected to pose any problems. Right of use, quality and validity of cadastral information, and responsible authority are all clearly defined in the Spanish Cadastre, together with the limitations established for access to the data it contains.

The only doubt refers to the conformity of the cadastral database and of the services currently provided by the Spanish cadastral authority and by those of other Member States, with future implementing rules on harmonisation and exchange criteria in matters of spatial data. Articles 12 and 13, reviewed later, provide a variety of information on the criteria for harmonisation of spatial data. In any case, future provisions will probably follow those established in ISO Regulation 19115, dedicated specifically to the definition of international standards in matters of geographical information and metadata.

Article 9 establishes a timetable that must be taken into account: the afore-mentioned metadata shall be created by each Member State within a period of 3 years following the entry into force of the Directive. Although relevant, this requirement is not a cause for concern for the Spanish cadastral model, unless definition of the criteria referred to in the next section were to become particularly complicated.

Interoperability of spatial data sets and services

Article 12, which forms part of Chapter III on the interoperability of spatial data sets and services, states that the implementing rules for establishing harmonised specifications in matters of spatial data shall be designed to “ensure that it is possible for spatial data sets to be combined, or for services to interact, in such a way that the result is a coherent combination of spatial data sets or services that represents added value, without requiring specific efforts on the part of a human operator or a machine”. This is a good definition of interoperability.

It corresponds to these implementing rules to define the model that will guarantee the interoperability of the system. Further, the implementing rules establishing harmonised specifications in matters of spatial data shall cover the definition and classification of spatial objects relevant to the spatial data and the way in which those spatial data are geo-referenced.

Article 13 provides that, in the case of spatial data sets corresponding to one or more of the themes listed in Annex I or II – which include cadastral parcels, as mentioned previously – the implementing rules will address the following aspects of spatial data:

- a) a common system of unique identifiers for spatial objects;
- b) the relationship between spatial objects;
- c) the key attributes and the corresponding multi-lingual thesaurus commonly required for a wide range of thematic policies;
- d) the way in which information on the temporal dimension of the data is to be exchanged;
- e) the way in which updates of the data are to be exchanged.

The implementing rules shall be designed to ensure consistency, both between items of information which refer to the same location, and between items of information which refer to the same object represented at different scales.

Lastly, the implementing rules shall be designed to ensure that information derived from different spatial data sets is comparable as regards the aspects referred to previously.

To what extent will the above articles affect cadastral activity? Clearly to a very great extent, since they prescribe actions that directly affect the established data models in existing cadastral databases. The implementing rules of the Directive, which the Commission must adopt to ensure enactment, must establish "a common system of unique identifiers for spatial objects", in other words, a unique cadastral code or reference applicable to each existing cadastral parcel in the Member States. Moreover, they must establish the relationship between the individual parcels and other cadastral objects included in the parcel, as well as a series of information on their content and update. Obviously, all of these aspects will require a preliminary action to establish a common definition of the parcel and other cadastral objects.

Network services

The proposed Directive grants special relevance to the technical instruments essential to ensure the proper flow and allow the use of information contained in the respective spatial data sets. In this regard, the Directive establishes that it is the responsibility of the Member States to establish and operate upload services to allow access to metadata and to spatial data sets and services which will be made available to public authorities and to third parties upon their request, in the case of the latter, under the terms and conditions established.

Based on this mandate, Article 20 establishes two different levels of service:

- **First Level:** *Discovery services* making it possible to search for spatial data sets and services on the basis of the content of the corresponding metadata and to display the content of the metadata; and *view services* making it possible, as a minimum, to display, navigate, zoom in/out, pan or overlay spatial data sets and to display legend information and any relevant content of metadata. The requirement, in summary, is to facilitate the knowledge of existing data contained in different data sets and of the methods and criteria established to access these data. The

Directive requires that both discovery and view services included in this level be made available to the public free of charge.

- **Second level:** *Download services*, enabling copies of complete spatial data sets, or of parts of such sets, to be downloaded; *transformation services*, enabling transformation of spatial data sets; and *access to "spatial data services"* which enable access to services offering value added data.

This second level of services includes public operations that facilitate access to and transformation of all existing data in a spatial data set or in part of a data set. It also includes services other than those of information in the strictest sense of the term, but which are information-based. The Directive does not rule that these services be provided free of charge, but does establish that they be easy to use and accessible via Internet or any other appropriate means of telecommunication available to the public. Furthermore, should the public authority decide to charge for these services, the Member States must guarantee the availability of e-commerce services.

The current Spanish Cadastral model already allows the download of a wide variety of data free of charge from its web-based e-Cadastre [6]. In its present stage of development, certain restrictions exist relative to the volume of data that can be accessed in a single operation. Private entities or individuals can only access information item by item (estate by estate). Only public authorities can access massive volumes of information in a single operation. However, no restrictions are placed with regard to the number of itemised operations performed by a private entity or individual.

In its current form, the service allows access via Internet to different "spatial data services" linked to cadastral information. Two of these services are particularly relevant: the issue of digital cadastral certificates of alpha-numerical data and cartography, valuable for their validity and effectiveness as legal documents for presentation to public and private authorities alike; and the file exchange, used to circulate massive amounts of data and dedicated both to the maintenance of the cadastral database and to satisfying the data requirements of third party authorities.

Given the current level of service coverage described above, we do not expect to encounter serious issues when faced with providing the compulsory First Level services listed previously as *discovery services* for spatial data sets and services, and *view services*, in the terms described in the proposal, since these services are already being supplied today.

Article 19 of the proposed Directive establishes the causes that will allow Member States to restrict public access to view, download, transform and access "spatial

(6) For more details on this initiative, see the paper titled "The use of the Spanish cadastre for the control and monitoring of EU-CAP subsidies", written by Jerónimo Mirón, in the documents section of the web page of the Permanent Committee on Cadastre in the European Union.

data services". Said limitations are allowed where access would adversely affect any of the following:

- a) the confidentiality of the proceedings of public authorities, where such confidentiality is provided for by law;
- b) international relations, public security or national defence;
- c) the course of justice, the ability of any person to receive a fair trial or the ability of a public authority to conduct an enquiry of a criminal or disciplinary nature;
- d) the confidentiality of commercial or industrial information where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining statistical confidentiality and tax secrecy;
- e) the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided for by national or Community law;
- f) the protection of the environment to which such information relates, such as the location of rare species.

As discussed in Part I of this paper, Article 51 of the TRLCI establishes that for purposes of the Cadastre, protected data includes the name, surnames, company name, identification code and address of those registered in the Real Estate Cadastre as title holders, and the cadastral value of land, and buildings if any, of the individual estate. The law regulating Cadastre in Spain likewise establishes the criteria whereby public authorities and certain citizens may access this information without the prior consent of the title holder. These criteria, which are extremely restrictive, are aimed at ensuring the confidentiality of personal data and tax secrecy, and are fully aligned with the access restriction criteria established in the Directive.

The proposed regulation specifies that the grounds for limiting access shall be interpreted in a restrictive way, taking into account in each case the public interest served by guaranteed access. In each case, the public interest served by disclosure shall be weighed against the interest served by limiting or conditioning access.

Last in regard to this chapter on network services, the proposal charges the Commission with creating a community geo-portal through which the Member States will provide access to the services of discovery, view, download, transformation and access to the services described above, regardless of whether the States also provide their own access points. Likewise, the Commission will define the rules for implementation of access to said services and will establish the technical specifications and minimum performance criteria for those services.

Data sharing and re-use

Chapter V of the proposed Directive, in Articles 23 and 24, introduces important rules governing the re-use of information contained in existing spatial

data sets. Specifically, it establishes that Member States shall adopt measures for sharing spatial data sets and services between public authorities.

These measures will enable the public authorities of Member States, and the institutions and bodies of the Community, to gain access to spatial data sets and services, and to exchange and use those sets and services in the performance of public tasks that may have a direct or indirect impact on the environment. To achieve this objective, the measures described will preclude any restrictions at the point of use, in particular of a transactional, procedural, legal, institutional or financial nature.

Access to this information will also be open to bodies established by international agreement to which the Community or Member States are party, for the performance of tasks that may have a direct or indirect impact on the environment. Additionally, the institutions and bodies of the Community will have access to spatial data and services, in this case omitting any mention of specific limitations related to direct or indirect environmental use.

Analysis of these regulations from the perspective of the present situation of the Spanish Cadastre shows that they are adequately aligned with current usage in matters of dissemination of cadastral data for use in the performance of the public function. Proof of this are the numerous transfers of data carried out free of charge to public bodies requiring information for the performance of their competencies. To quote a few examples related with the environment, cadastral data provides support for the preparation of urban planning projects, parcellary consolidation, control of irrigation areas or the layout of new railway lines. Also noteworthy is the fact that in the two most recent major environmental disasters in Spain - the breakage of the mud reservoir at the Boliden industrial plant, which polluted extensive areas of the Doñana National Park, and the sinking of the Prestige oil tanker, cadastral data has been available to the public authorities responsible for managing these disasters.

But the example that most closely resembles the model for the re-use of data promoted by the proposed Directive is the recent creation of the Geographical Information System for the management of subsidies from the Common Agricultural Policy (SIGPAC). This new data set, created in compliance with the provisions of Council Regulations 1593/2000 and 1782/2003, establishes an efficient system of coordination between the new Integrated System of Administration and Control, to be created, and the existing Cadastre. [7] This system prevents duplication in data capture, and makes a large part of the Cadastre's digital maps available to the authorities responsible for administering public subsidies.

In summary, the Spanish cadastral model already allows the sharing and re-use of its data for the performance of different functions in the public sector. However, it is still necessary to improve the model in

(7) For more information on this initiative, see the document entitled "The Use of the Spanish Cadastre for the Control and Monitoring of EU-CAP Subsidies", by Jerónimo Mirón, located in the documents section of the website of the Permanent Committee on Cadastre in the European Union.

order to enable the download of large volumes of information quickly, easily and securely through Internet.

The proposal establishes specific criteria for the potential commercial use of data by national public authorities, unrelated to their public function. In this case, the Member States will take the appropriate measures to prevent distortion of competition and shall make those measures public.

This situation does not occur in the general model of the Spanish Cadastre, where the dissemination of data is not commercial in nature. It may however affect other cadastral institutions in the European Union, where the existing business model places emphasis on the revenues obtained from the dissemination of cadastral data. In these cases it will be necessary to determine whether or not said commercial activity is related to the performance of their public function, as stated in the proposed Directive.

Lastly, Article 24 reflects the intent of the European legislator to limit the restrictions that may exist regarding the use of information by private entities and citizens, when these are required to obtain a license or other permit before being allowed access. In these cases, the Commission will adopt implementing rules to increase the potential of re-use of spatial data sets and services by third parties, which may include the establishment of common licensing conditions or authorisations.

The present Spanish cadastral model does not require a license for use of cadastral data. The only condition in this regard appears in sections j) and l) of Article 66 of the TRLCI, indicating the elements to be taken into account to calculate the amount of the fee payable for certain cadastral products, which establishes a surcharge per hectare (0.5 euros per hectare for urban maps and 0.04 per hectare for rustic maps, per authorised copy), payable when said maps are to be transformed and distributed by a third party.

Coordination, complementary measures and other provisions

Chapters VI and VII of the proposed Directive (Articles 25 to 32) set out a series of regulations relative to the creation of structures and the establishment of mechanisms to monitor its application. Thus, it establishes that the Member States shall designate appropriate structures and mechanisms for coordinating the contribution of all those with an interest in their infrastructures for spatial information, such as users, producers, added-value service providers and coordinating bodies. These contributions shall include, for example, the identification of user needs, provision of information on existing practices and provision of feedback on the implementation of the Directive. Additionally, each Member State shall designate the public authority responsible for contacts with the Commission in relation to this Directive.

For its part, the Commission will be responsible for coordinating the infrastructure for spatial information in the Community at Community level and shall be assisted for that purpose by the European Environmental Agency, supported by the standards adopted by European standardisation bodies. Also, a Committee will be created to assist the Commission.

As regards monitoring, special obligations are established for the Member States which must also report to the Commission on certain specific aspects relative to the implementation of the Directive and the experience gained in applying it.

None of the regulations established in these Chapters will pose a challenge or require modification to the current Spanish cadastral model. A wide variety of reports describing its activity are routinely issued by the Institution, as part of its strategy of transparent management.

Schedules

To conclude, the proposed Directive includes several schedules that must be taken into account, although some are difficult to determine because they are linked to preliminary actions established by the Directive itself. The schedules are summarised in table 1.

These schedules are sufficient to allow the unhurried adaptation to the new legal framework to be established after approval of the Directive. Nevertheless, it is advisable, in our opinion, to begin to analyse all the various aspects of cadastral activity that will be impacted by the Directive, even before its approval.

Conclusions

Similar to what already occurred with the approval of Directive 2003/98/EC of 17 November on the re-use of public sector information, the proposal for a Directive of the European Parliament and of the Council establishing an infrastructure for spatial information in the Community (INSPIRE) will have a profound effect on the activities carried out by the Cadastre in the Member States. For this reason, the authorities responsible for cadastral information must prepare their institutions to ensure that approval of the new Directive does not cause serious operational difficulties.

It is advisable to prepare for the entry into force of the Directive by anticipating its effects in advance of its approval. This preparatory work should address, at the very least, the following aspects:

- The authorities responsible for cadastre in the Member States should make their information available to all potential users via Internet as soon as possible.
- A review should be conducted of the definition used in national laws of basic cadastral objects, particularly the cadastral parcel. Several public documents exist which include definitions unanimously accepted by doctrine: these should serve as a reference to achieve a shared definition.
- The various existing data models should be studied, to reflect on how well they adapt to the new strategies established in the proposed Directive.
- Lastly, it is necessary to review the procedures and criteria established to delimitate access, download and re-use of information, with particular emphasis on fee and licence policies, on intellectual property rights, and on the limitations to data access. In our opinion it is this

Table 1

Article	Activity	Period
9	Creation of metadata.	For purposes of spatial data sets related to the cadastral parcel, three years following entry into force of the Directive.
14	Period in which the Commission will adopt the specifications in matters of spatial data described in article 11.1.a.	For purposes of spatial data sets related to the cadastral parcel, five years following entry into force of the Directive.
15	Period in which the spatial data sets collected or updated after the date of approval of specifications on spatial data described in article 11.1.a, must adapt to said specifications.	Two years following the date of adoption of the mentioned specifications.
29	Delivery of the report to the Commission by the Member States on application of the Directive and the experience gained in its application.	Every three years, starting three years after the entry into force of the Directive.
31	Period in which the Commission will present to the European Parliament and to the Council its report on the application of the Directive.	7 years following the date of its entry into force, and every six years thereafter.
32	Period in which the Member States will adopt the legal, regulatory and administrative provisions necessary to comply with the provisions of the Directive. a lo dispuesto en la presente Directiva.	2 years following the date of entry into into force.

aspect of the project, commonly known as the “business model”, and not the technological aspects, where the greatest difficulties to coordinate the Member States will arise.

In closing, one last conclusion regarding the main purpose of this paper, which was to analyse the extent to which the proposed Directive will affect the present Spanish cadastral model. In general terms, we can say that its approval will not represent a threat to the existing model, since a large part of the Directive’s main

contributions have already been adopted by the General Directorate of Cadastre. As an example, information is already provided free of charge to any public authority that requests it, and a large part of cadastral information can be viewed and downloaded via Internet, also free of charge. Nevertheless, we must pay careful attention to the specific regulations passed by the Commission to implement this Directive, because it is there that new developments will arise that may require change, such as the definition of a unique cadastral code or reference. ■

DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
establishing an infrastructure for spatial information in the Community
(INSPIRE)
[SEC(2004) 980]
(presented by the Commission)

1. INTRODUCTION

Good policy depends on high-quality information and informed public participation. Policymakers have recognised the growing interconnection and complexity of the issues affecting the quality of life today, and this recognition is influencing the way new policies are now being formulated. For instance, the **Sixth Environment Action Programme (6th EAP)** [1] emphasises that environment policy needs to be based on sound knowledge and informed participation, and this new approach is transforming the way EU environment policy decisions are being taken.

A new approach is therefore needed to deal with monitoring and reporting and with data management and delivery across the different levels of government. Policies need to be employed to reduce duplicated data collection and to assist and promote the harmonisation, broad dissemination and use of data. Such policies should result in increased efficiency, the benefits of which can be reinvested in improving the availability and quality of information. In turn, the increased availability of information will stimulate innovation among information providers in the commercial sector.

Spatial information can play a special role in this new approach because it allows information to be integrated from a variety of disciplines for a variety of uses. A coherent and widely accessible spatial description of the Community territory would deliver the requisite framework for coordinating information delivery and monitoring across the Community. Spatial information may also be used to produce maps, which are a good way of communicating with the public. Unfortunately, the technical and socio-economic characteristics of spatial information make the problems of coordination, information gaps, undefined quality and barriers to accessing and using the information particularly acute.

The Commission has therefore decided to submit to the European Parliament and the Council of the European Union the present proposal to make interoperable spatial information readily available in support of both national and Community policy and to enable the public to access to this information. This initiative derives from the commitment of several Commission services in particular DG Environment, Eurostat and the Joint Research Centre, who have already and will continue to play an important role in the adoption and implementation of this Directive.

2. OVERVIEW OF THE PROPOSAL

The proposed Directive creates a legal framework for the establishment and operation of an Infrastructure for Spatial Information in Europe, for the purpose of formulating, implementing, monitoring and eva-

luating Community policies at all levels and providing public information.

A key objective of INSPIRE is to make more and better spatial data available for Community policy-making and implementation of Community policies in the Member States at all levels. INSPIRE focuses on environmental policy but is open for use by and future extension to other sectors such as agriculture, transport and energy.

The proposal focuses specifically on information needed in order to monitor and improve the state of the environment, including air, water, soil and the natural landscape. Much of this information needs to be underpinned by "multi-purpose" spatial data. In an infrastructure for spatial information, not all spatial data themes need to be subject to the same degree of harmonisation, nor can they be brought within the infrastructure at the same pace. This Directive therefore contains three distinct annexes, all of which refer to spatial data needed by a broad range of environmental policies. Depending on whether spatial data is to be used for geo-referencing other spatial data, on whether harmonised spatial data is needed within the context of policies that directly or indirectly affect the environment and on the degree to which harmonisation is already underway within the Community, different target dates for implementing INSPIRE requirements and different stringency levels for harmonisation apply. It should be noted that the spatial data themes in the annexes determine only the scope of the directive and of the measures referred to. They do not determine how spatial information should be organised or harmonised.

INSPIRE will not set off an extensive programme of new spatial data collection in the Member States. Instead, it is designed to optimise the scope for exploiting the data that are already available, by requiring the documentation of existing spatial data, the implementation of services aimed at rendering the spatial data more accessible and interoperable and by dealing with obstacles to the use of the spatial data. INSPIRE will pave the road for a progressive harmonisation of spatial data in the Member States.

The main beneficiaries of this proposal will therefore be those involved in the **formulation, implementation, monitoring and evaluation of policies** – at the European, national and local level. These are public authorities, legislators and citizens and their organisations. However, other user groups are also expected to benefit, including the private sector, universities, researchers and the media. The proposal will support the formulation and implementation of a wide range of environmental and other policies.

3. THE NEED FOR COMMUNITY INTERVENTION

Detailed spatial information is available in Europe to support a broad range of policies. Indeed,

(1) OJ L 242, 10.9.2002, p. 1.

map-based information is used in many reporting, analysis, evaluation and forecasting tools and activities. In addition, the emergence of the Internet has allowed widespread and low-cost distribution of this type of information and could contribute to better public understanding and awareness of various policy issues.

Despite these many initiatives, widespread access to and use of spatial information is still a problem in Europe. The main problems relate to data gaps, missing documentation, incompatible spatial data sets and services due e.g. to varying standards, and barriers to the sharing and reuse of spatial data.

Fortunately, awareness is growing at national and EU level that quality geo-referenced information is needed in order to understand the complexity of ever-increasing human activity in the EU and to contain its adverse impact, and many regional and national initiatives are being taken. Furthermore, new instruments such as the GALILEO navigation system [2] will improve precision and reliability in elaborating spatial information. Yet even in these circumstances, action at Community level is necessary because:

- Few Member States have developed a framework for establishing a national infrastructure for spatial information that addresses operational, organisational and legal issues. [3] Where steps have been taken, they have often been restricted to specific regions or specific sectors.
- In most Member States where a framework has been adopted, not all problems have been addressed or initiatives are not compatible.
- Without a harmonised framework at Community level, the formulation, implementation, monitoring and evaluation of national and Community policies that directly or indirectly affect the environment will be hindered by the barriers to exploiting the cross-border spatial data needed for policies which address problems with a cross-border spatial dimension.

4. CONSISTENCY WITH OTHER POLICIES

Several other Community instruments designed to promote the availability of public sector information already exist or are being developed. The most important are the Directive on public access to environmental information [4], the Directive on the reuse of public sector information [5], GMES [6] and GALILEO.

However, additional measures are needed to fuse and streamline policy-relevant spatial data from different sectors and at different levels in order to exploit the full potential of spatial information. The INSPIRE proposal therefore complements these instruments and will assist their implementation.

Account will also need to be taken of the existing legal framework in relation to data protection and copyright.

5. EXTENDED IMPACT ASSESSMENT

In June 2002, the Commission introduced a new integrated procedure for impact assessment to improve the quality and coherence of the policy development process. [7] INSPIRE is on the list of proposals of the 2003 Work Programme for which the Commission decided to carry out an extended impact assessment. [8] An extended impact assessment has therefore been carried out for INSPIRE, which considered six policy options. [9]

The required investment of the preferred option - *a focused framework backed by an EU framework Directive* - will to a large extent be borne by the public sector and is estimated at an average of €3.6-5.4 million per annum per EU Member State (EU25). This would represent only 1% of the total expenditure on spatial information.

The benefits include environmental gains, wider social benefits and gains by the private sector. Only the environmental benefits have been quantified. The average annual benefits per Member State (EU25) amount to €27-42 million. Knowing that these elements only represent a partial view of the whole picture, the conclusion is that the benefits outweigh the investment requirements by a considerable amount.

6. STAKEHOLDERS CONSULTATION ON INSPIRE

6.1. Internet consultation

The purpose of the Internet consultation was to inform stakeholders about the INSPIRE initiative and to receive their opinions and comments about the different key points that need to be covered by the proposed INSPIRE framework directive. The Internet consultation took place between 29 March and 6 June 2003.

A total of 185 organisations and individuals from the EU Member States and the accession countries responded to the Internet consultation. Their replies represent feedback from over 1 000 organisations.

The results of the Internet consultation showed a very high level of agreement of the stakeholders with the assessment of the obstacles and their consequences and demonstrated a high level of support of the stakeholders for the proposed INSPIRE initiative. Over 90% of the respondents replied positively to many of the questions asked on the existence of obstacles and on the need for the measures to be developed in the framework of INSPIRE. An extensive analysis of the results of the Internet consultation is available on the Internet (<http://inspire.jrc.it/>).

(2) COM(2004) 112 final.

(3) SDI in Europe, State of Play Spring 2003.

(4) OJ L 41, 14.2.2003, p. 26.

(5) OJ L 345, 31.12.2003, p. 90.

(6) COM(2004) 65 final.

(7) COM(2002) 276.

(8) COM(2002) 590.

(9) Commission staff working document "Extended impact assessment of INSPIRE".

6.2. Public hearing

The public hearing took place in Rome on 10 July 2003. The objective of the public hearing was to inform parties interested in INSPIRE about the results of the Internet consultation and to obtain feedback on the draft extended impact assessment of INSPIRE. The report of the hearing is available on the Internet (<http://inspire.jrc.it/>).

7. LEGAL ELEMENTS OF THE PROPOSAL

7.1. Legal basis

Article 175(1) of the EC Treaty is the appropriate legal basis because the spatial data that fall within its scope are needed to support the formulation, implementation, monitoring and evaluation of environmental policies with a view to ensuring a high level of environmental protection. Furthermore, Article 174 requires the Community to take account of available scientific and technical data. INSPIRE contributes to the implementation of this requirement by helping the Community to access and use available spatial data.

Some of these spatial data are also needed in the context of other national and Community policies, such as agricultural, transport or regional policy. The choice of legal basis is consistent with the need to integrate environmental considerations into these other policies, with a view to promoting sustainable development.

7.2. Subsidiarity and proportionality

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

Environmental phenomena such as migration of species, wind, flows of water happen irrespective of national borders. In addition, pressures and impacts on the environment (flooding, air and water pollution, etc.) often cross national borders. Environmental policies therefore require the establishment of environmental management entities covering the territory of various Member States, such as the river basin districts established under the Water Framework Directive [10]. Efficient implementation and monitoring of such policies require interoperable spatial information across national borders and streamlined access and use of this information by all concerned stakeholders. The proposed Directive will provide consistent Community-wide documentation of spatial data and data quality, more Community-wide spatial information of greater consistency, integrated Community-wide services to find, access this information and Community-wide rules related to access, sharing and use of the information. Without this Directive, Member States would have great difficulties making their existing

systems interoperable, accessible and useable across borders. This would lead to more duplication and inefficient data collection, and would hamper formulation, implementation, monitoring and evaluation of national and Community policies that directly or indirectly affect the environment.

The proposed Directive does not go beyond what is needed to achieve its objectives. It is designed to build upon the variety of existing information systems already in place in the Member States and provides the overall framework for them to be able to work in synergy with each other, forming part of the Infrastructure for Spatial Information in the European Community. INSPIRE will also build upon existing organisations already involved in spatial data use and production and provide, as far as organisational issues are concerned, only the overall coordination mechanisms needed for the infrastructure to operate at the European level. As regards harmonisation, INSPIRE will address only those aspects needed to achieve cross-level and cross-thematic consistency of spatial data and to make them available to support Community policies. For instance, INSPIRE does not require Member States to change the format of their spatial data holdings; instead, Member States can provide interfaces that transform heterogeneous data to a uniform model.

The present proposal takes the form of a framework Directive in order to leave the Member States ample room to ensure that the requisite measures for achieving the prescribed objectives are tailored to their specific situations. Implementing rules of a technical and more prescriptive nature are to be adopted through the committee procedure. These are necessary to ensure the overall coherence the Infrastructure for Spatial Information in Europe needs in order to meet the objective of supporting Community policies. Use of the committee procedure also ensures sufficient flexibility to adapt the Infrastructure for Spatial Information in Europe to technological progress and to emerging policy priorities.

The proposal tackles only those aspects that need to be regulated at EU level to ensure that the objectives of the EC Treaty are met. Most of the measures allow the Member States to continue to operate their existing systems and organisational set-up, by requiring only those measures needed to make existing systems interoperable or eliminate existing barriers. Furthermore, specific limitations have been introduced in order to prevent any disproportionate additional administrative burden on Member States and the proposal also introduces safeguards to ensure that it does not stifle innovation, by guaranteeing openness to private sector participation

7.3. How have the results of the consultation of stakeholders and of the extended impact assessment been taken into account in the proposal?

The results of the extended impact assessment and the comments made by interested parties served as the basis for a review of the measures set out in the INSPIRE Internet consultation document and the draft extended impact assessment, resulting in a proposal based upon option 4 of the extended impact

(10) OJ L 327, 22.12.2000, p. 1.

assessment. Compared with the measures set out in the INSPIRE Internet consultation document:

- The proposal's scope has been reduced, in response to concerns over budgetary issues and the level of ambition of INSPIRE. The revision of the scope amounts to a 35% reduction in terms of the number of spatial data themes covered by INSPIRE.
- The requirements relating to the collection of new multi-thematic spatial data on the state of the environment have been dropped.
- Harmonisation requirements are reduced for certain spatial datasets mostly of a thematic nature, allowing greater exploitation of the synergies between INSPIRE and existing harmonisation activities.
- The openness of the Infrastructure for Spatial Information in Europe is guaranteed by providing the private sector with the possibility of uploading relevant spatial data and services on a voluntary basis under certain conditions.
- The interlinkages between INSPIRE and GMES have been clarified.
- The organisation of the annexes and the descriptions of the spatial data themes have been revised.
- Provisions have been introduced on monitoring and reporting.

Many of the comments relate, however, to implementation, and will be taken into account for the implementation of INSPIRE.

Proposal for a

DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

establishing an infrastructure for spatial information in the Community (INSPIRE)

Text with EEA relevance

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 175(1) thereof,

Having regard to the proposal from the Commission, [11]

Having regard to the opinion of the European Economic and Social Committee, [12]

Having regard to the opinion of the Committee of the Regions, [13]

Acting in accordance with the procedure laid down in Article 251 of the Treaty, [14]

Whereas:

(1) Community policy on the environment must aim at a high level of protection taking into account the diversity of situations in the various regions of the Community. In preparing its policy on the environment, the Community is required to take account of available scientific and technical data, environmental conditions in the various regions of the Community, the economic and social development of the Community as a whole and the balanced development of its regions. Many information themes related to spatial features are required for a broad range of environmental policies. Moreover, the same information is often needed for the formulation and implementation of other Community policies, which must integrate environmental protection requirements, in accordance with Article 6 of the Treaty. In order to bring about such integration, it is necessary to establish a measure of coordination between the users and providers of the information on those themes so that information and knowledge from different sectors can be combined.

(2) The Sixth Environment Action Programme adopted by Decision No 1600/2002/EC of the European Parliament and of the Council [15] requires full consideration to be given to ensuring that the Community's environmental policy-making is undertaken in an integrated way, taking into account regional and local differences. That Programme further calls for emphasis on the development of European initiatives to raise the awareness of the public and of local authorities and to improve scientific knowledge of and data and information on the state and trends of the environment. It also requires the following priority actions to be pursued: ex-ante and ex-post evaluation of policy measures, development of bridges between environmental and other actors in the fields of information, training, research, education and policies, ensuring regular information inter alia to inform the wider public and reviewing and regularly monitoring information and reporting systems. It additionally requires monitoring and data collection to be addressed efficiently in future environmental legislation and the development to be stepped up of earth monitoring applications and tools to support Member States in setting up adequate data collection systems. A number of serious problems exist regarding the availability, quality, organisation and accessibility of spatial information needed in order to achieve the objectives set out in the Sixth Environment Action Programme.

(3) The problems regarding the availability, quality, organisation and accessibility of spatial information are common to a large number of policy and information themes and are experienced across the various levels of public authority. Solving these problems requires measures that address exchange, sharing, access and use of interoperable spatial data and spatial data services from across the various levels of public authority and from across different sectors. An infrastructure for spatial information in the Community should therefore be established.

(4) The Infrastructure for Spatial Information in the European Community, also referred to as INSPIRE, should be based on the infrastructures for spatial

[11] OJ C [...], [...], p. [...].

[12] OJ C [...], [...], p. [...].

[13] OJ C [...], [...], p. [...].

[14] OJ C [...], [...], p. [...].

[15] OJ L 242, 10.9.2002, p. 1.

information that are created by the Member States and that are made compatible with common rules and are supplemented with measures at Community level. These measures should ensure that the infrastructures for spatial information created by the Member States are compatible and are useable in a transboundary context.

(5) The infrastructures for spatial information in the Member States should be designed to ensure that spatial data are stored, made available and maintained at the most appropriate level; that it is possible to combine spatial data from different sources across the Community in a consistent way and share them between several users and applications; that it is possible for spatial data collected at one level of public authority to be shared between all the different levels of public authorities; that spatial data are made available under conditions that do not restrict their extensive use; that it is easy to discover available spatial data, to evaluate their fitness for purpose and to know the conditions applicable to their use.

(6) There is a degree of overlap between the spatial information covered by this Directive and the information covered by Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information [16]. However, the technical and economic aspects of spatial information hamper its use in support of environmental policies and of the integration of environmental considerations into other policies. Consequently, it is necessary to make specific provisions for spatial information in terms of obligations, exceptions and safeguards. This Directive is without prejudice to Directive 2003/4/EC except with respect to certain provisions that address the grounds for limiting access to the spatial data covered by this Directive, avoiding the possibility of undue limitations of access to the spatial data covered by this Directive.

(7) This Directive should be without prejudice to Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information, [17] the objectives of which are complementary to those of this Directive. However, the Commission should take further measures to address issues relevant for the re-use of the specific category of public sector information covered by this Directive.

(8) The establishment of an Infrastructure for Spatial Information in the European Community will represent significant added value for –and will also benefit from– other Community initiatives such as Council Regulation (EC) No 876/2002 of 21 May 2002 setting up the Galileo Joint Undertaking [18] and Global Monitoring for Environment and Security (GMES): Establishing a GMES capacity by 2008. [19] In order to exploit the synergies between these initiatives, Member States should consider using the data and services resulting from Galileo and GMES as they become available, in particular those related to the time and space references from Galileo.

(9) Many initiatives are taken at national and Community level to collect, harmonise or organise the dissemination or use of spatial information. Such initiatives may be established by Community legislation (for example by Commission Decision 2000/479/EC of 17 July 2000 on the implementation of a European pollutant emission register (EPER) according to Article 15 of Council Directive 96/61/EC concerning integrated pollution prevention and control (IPPC) [20], Regulation (EC) No 2152/2003 of the European Parliament and of the Council of 17 November 2003 concerning monitoring of forests and environmental interactions in the Community (Forest focus) [21], in the framework of Community funded programmes (for example CORINE land cover, European Transport Policy Information System) or may emanate from initiatives taken at national or regional level. Not only will this Directive complement such initiatives by providing a framework that will enable them to become interoperable, it will also build upon existing experience and initiatives rather than duplicate the work that has already been done.

(10) This Directive should apply to spatial data held by or on behalf of public authorities and to the use of spatial data by public authorities in the performance of their public tasks. Subject to certain conditions, however, it should also apply to spatial data held by natural or legal persons other than public authorities, provided that these natural or legal persons request this.

(11) This Directive should not set requirements for the collection of new data on the state of the environment, or for reporting such information to the Commission, since those matters are regulated by other legislation related to the environment.

(12) The implementation of the national infrastructures should be progressive and, accordingly, the spatial data themes covered by this Directive should be accorded different levels of priority. The implementation should take account of the extent to which spatial data is needed for a wide range of applications in various policy areas, of the priority of actions provided for under Community policies that need harmonised spatial data and of the progress already made by the harmonisation efforts undertaken in the Member States.

(13) The loss of time and resources in searching for existing spatial data or in discovering if they may be used for a particular purpose is a key obstacle to the full exploitation of the data available. Member States should therefore provide descriptions of available spatial data sets and services in the form of metadata.

(14) Since the wide diversity of formats and structures in which spatial data are organised and accessed in the Community hampers the efficient formulation, implementation, monitoring and evaluation of Community legislation that directly or indirectly affect the environment, implementing measures should be provided for in order to facilitate the use of spatial data from different sources across the Member States. Those measures should be designed to make the spatial data sets interoperable and Member States should

(16) OJ L 41, 14.2.2003, p. 26.

(17) OJ L 345, 31.12.2003, p. 90.

(18) OJ L 138, 25.5.2002, p. 1.

(19) COM(2004) 65 final.

(20) OJ L 192, 28.7.2000, p.36.

(21) OJ L 324, 11.12.2003, p. 1.

ensure that any data or information needed for the purposes of achieving interoperability is not restricted in any way.

(15) Network services are necessary for sharing spatial data between the various tiers of public authorities in the Community. Those network services should make it possible to discover, transform, view and download spatial data and to invoke spatial data and e-commerce services. The services of the network should work in accordance with commonly agreed specifications and minimum performance criteria in order to ensure the interoperability of the infrastructures established by the Member States. The network of services should also include upload services to enable public authorities to make their spatial data sets and services available.

(16) Experience in the Member States has shown that it is important, for the successful implementation of an infrastructure for spatial information, that a minimum number of services be made available to the public free of charge. Member States should therefore make available, as a minimum and free of charge, the services for discovering and viewing spatial data sets.

(17) Certain spatial data sets and services relevant to Community policies that directly or indirectly affect the environment are held and operated by third parties. Member States should therefore offer third parties the possibility of contributing to the national infrastructures, provided that the cohesion and ease of use of the spatial data and spatial data services covered by those infrastructures is thereby not impaired.

(18) In order to assist the integration of the national infrastructures into the infrastructure for spatial information in the Community, Member States should provide access to their infrastructures through a Community geo-portal operated by the Commission, as well as through any access points they themselves decide to operate.

(19) In order to make available information from various levels of public authority, Member States should remove the barriers faced in that regard by public authorities at national, regional and local level when performing their public tasks that may have a direct or indirect impact on the environment. These barriers should be removed at the point where the information is to be used for the public task. Where public authorities carry out commercial activities as well as public tasks, Member States should take appropriate measures to prevent distortion of competition.

(20) Frameworks for the sharing of spatial data between public authorities should be neutral in respect not only of the public authorities within a Member State, but also of the public authorities in other Member States and of the Community institutions. Since the Community institutions and bodies frequently need to integrate and assess spatial information from all the Member States, they should be able to gain access to and use spatial data and spatial data services in accordance with harmonised conditions.

(21) With a view to stimulating the development of added-value services by third parties, for the benefit both of public authorities and the public, it is necessary to facilitate access to and re-use of spatial data that extend over administrative or national borders.

(22) The effective implementation of infrastructures for spatial information requires coordination by all those with an interest in the establishment of such infrastructures, whether as contributors or users. Appropriate coordination structures should therefore be established both in the Member States and at Community level.

(23) In order to benefit from the relevant experience of European Standardisation bodies, it is appropriate that the measures necessary for the implementation of this Directive could be supported by standards adopted by European standardisation bodies in accordance with the procedure laid down in Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations [22].

(24) Since the European Environment Agency set up by Council Regulation (EEC) No 1210/90 of 7 May 1990 on the establishment of the European Environment Agency and the European Environment Information and Observation Network [23] has the task of providing the Community with objective, reliable and comparable environmental information at Community level, and aims *inter alia* to improve the flow of policy-relevant environmental information between Member States and the Community institutions; it should contribute actively to the implementation of this Directive.

(25) This being a framework Directive, its implementation requires further decisions that take into account the evolving political, institutional and organisational context and the rapid technological progress in relation to spatial data systems and services. The measures necessary for the implementation of this Directive should therefore be adopted in accordance with Council Decision 1999/468/EC of 28 June 1999 laying down the procedures for the exercise of implementing powers conferred on the Commission [24].

(26) Preparatory work for decisions concerning the implementation of this Directive and for the future evolution of the infrastructure for spatial information in the Community requires continuous monitoring of the implementation of the Directive and regular reporting.

(27) The objective of this Directive, namely the establishment of an infrastructure for spatial information in the Community, cannot be sufficiently achieved by the Member States because of the transnational aspects and because of the general need within the Community to co-ordinate the conditions of access to spatial information. It can therefore be better achieved at Community level, and the Community may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty. In accordance with the principle of proportionality, as set out in that Article, this Directive does not go beyond what is necessary in order to achieve those objectives.

(22) OJ L 204, 21.7.1998, p. 37.

(23) OJ L 120, 11.05.1990, p. 1. Regulation as last amended by Regulation (EC) No 1641/2003 of European Parliament and of the Council (OJ L 245, 29.9.2003, p. 1).

(24) OJ L 184, 17.7.1990, p. 23.

HAVE ADOPTED THIS DIRECTIVE:

CHAPTER I. General provisions

Article 1

1. This Directive lays down general rules for the establishment of an infrastructure for spatial information in the Community, for the purposes of Community environmental policies and policies or activities which may have a direct or indirect impact on the environment.

2. The infrastructure for spatial information in the Community shall be based on infrastructures for spatial information established and operated by the Member States.

The component elements of those infrastructures shall include metadata, spatial data sets and spatial data services; network services and technologies; agreements on sharing, access and use; and coordination and monitoring mechanisms, processes and procedures.

Article 2

1. This Directive shall cover identifiable collections of spatial data, hereinafter "spatial data sets", which fulfil the following conditions:

- (a) they are related to an area under the jurisdiction of a Member State or to its exclusive economic zone/search and rescue region, or equivalent;
- (b) they are in electronic format;
- (c) they are in the possession of either of the following:
 - (i) a public authority, having been produced or received by a public authority, or being managed or updated by that authority;
 - (ii) a natural or legal person on behalf of a public authority;
 - (iii) a third party to whom upload services have been made available in accordance with Article 17(3);
- (d) they relate to one or more of the themes listed in Annexes I, II or III.

2. This Directive shall cover, in addition to the spatial data sets specified in paragraph 1, the operations which may be performed, by invoking a computer application, on the spatial data contained in those data sets or on the related metadata, hereinafter "spatial data services".

3. In the case of spatial data sets which comply with the condition set out in point (c) of paragraph 1, but in respect of which a third party holds intellectual property rights, the public authority may take action under this Directive only with the consent of that third party.

4. Annexes I, II and III may be adapted by the Commission in accordance with the procedure referred to in Article 30(2) to take into account the evolving needs for spatial data in support of Community policies that directly or indirectly affect the environment.

Article 3

1. This Directive is without prejudice to Directive 2003/4/EC, save where otherwise provided.

2. This Directive is without prejudice to Directive 2003/98/EC.

Article 4

In the case of spatial data sets held by or on behalf of a public authority in accordance with Article 2(1)(c), where that authority operates at the lowest level of government within a Member State, this Directive shall apply only to spatial data sets the collection or dissemination of which is coordinated by another public authority or is required under national law.

Article 5

The following shall be regarded as a public authority for the purposes of this Directive:

- (a) government or other public administration, including public advisory bodies, at national, regional or local level;
- (b) any natural or legal person performing public administrative functions under national law, including specific duties, activities or services in relation to the environment;
- (c) any natural or legal person having public responsibilities or functions, or providing public services, under the control of a body or person falling within (a) or (b).

Member States may provide that when bodies or institutions are acting in a judicial or legislative capacity, they are not to be regarded as public authorities for the purposes of this Directive.

Article 6

For the purposes of this Directive, the following definitions shall apply:

- (1) "spatial data" means any data with a direct or indirect reference to a specific location or geographical area;
- (2) "spatial object" means an abstract representation of a real-world entity related to a specific location or geographical area;
- (3) "metadata" means information describing spatial data sets and spatial data services and making it possible to discover, inventory and use them;
- (4) "third party" means any natural or legal person other than a public authority.

Article 7

Member States shall establish and operate infrastructures for spatial information in accordance with this Directive.

CHAPTER II. **Metadata***Article 8*

1. Member States shall ensure that metadata are created for spatial data sets and services, and that those metadata are kept up to date.

2. Metadata shall include information on the following:

- (a) the conformity of spatial data sets with the implementing rules referred to in Article 11(1);
- (b) rights of use of spatial data sets and services;
- (c) the quality and validity of spatial data;
- (d) the public authorities responsible for the establishment, management, maintenance and distribution of spatial data sets and spatial data services;
- (e) the spatial data sets to which public access is limited in accordance with Article 19 and the reasons for such limitation.

3. Member States shall take the necessary measures to ensure that metadata are complete and of high quality.

Article 9

Member States shall create the metadata referred to in Article 8 in accordance with the following timetable:

- (a) by [3 years after the entry into force of this Directive] in the case of spatial data sets corresponding to one or more of the themes listed in Annexes I and II;
- (b) by [6 years after the entry into force of this Directive] in the case of spatial data sets corresponding to one or more of the themes listed in Annex III.

Article 10

The Commission shall, in accordance with the procedure referred to in Article 30(2), adopt rules for the implementation of Article 8.

CHAPTER III. **Interoperability of spatial data sets and services***Article 11*

1. The Commission shall, in accordance with the procedure referred to in Article 30(2), adopt implementing rules laying down the following:

- (a) harmonised spatial data specifications;
- (b) arrangements for the exchange of spatial data.

2. Persons with an interest in the spatial data concerned by virtue of their role in the spatial information infrastructure that includes user, producer, added

value service provider or coordinating body shall be given the opportunity to participate in the preparation of the implementing rules provided for in paragraph 1.

Article 12

1. The implementing rules provided for in Article 11(1)(a) shall be designed to ensure that it is possible for spatial data sets to be combined, or for services to interact, in such a way that the result is a coherent combination of spatial data sets or services that represents added value, without requiring specific efforts on the part of a human operator or a machine.

2. The implementing rules provided for in Article 11(1)(a) shall cover the definition and classification of spatial objects relevant to the spatial data and the way in which those spatial data are geo-referenced.

Article 13

1. In the case of spatial data sets corresponding to one or more of the themes listed in Annex I or II, the implementing rules provided for in Article 11(1)(a) shall meet the conditions laid down in paragraphs 2, 3 and 4.

2. The implementing rules shall address the following aspects of spatial data:

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

3. The implementing rules shall be designed to ensure consistency as between items of information which refer to the same location or between items of information which refer to the same object represented at different scales.

4. The implementing rules shall be designed to ensure that information derived from different spatial data sets is comparable as regards the aspects referred to in Article 12(2) and in paragraph 2 of this Article.

Article 14

The implementing rules provided for in Article 11(1)(a) shall be adopted in accordance with the following timetable:

- (a) by [2 years after the entry into force of this Directive] in the case of spatial data sets corresponding to one or more of the themes listed in Annex I;
- (b) by [5 years after the entry into force of this Directive] in the case of spatial data sets corresponding to one or more of the themes listed in Annex II or III.

Article 15

Member States shall ensure that spatial data sets collected or updated later than two years after the date of adoption of the corresponding specifications provided for in Article 11(1)(a) are brought into conformity with those specifications, either through the adaptation of the spatial data sets or through their transformation.

Article 16

1. Member States shall ensure that any information or data needed for compliance with the implementing rules provided for in Article 11(1) are made available to public authorities or third parties in accordance with conditions that do not restrict their use for that purpose.

2. In order to ensure that spatial data relating to a spatial feature the location of which spans the frontier between two Member States are coherent, Member States shall, where appropriate, decide by mutual consent on the depiction and position of such common features.

CHAPTER IV. Network services

Article 17

1. Member States shall establish and operate upload services for making metadata and spatial data sets and services accessible through the services referred to in Article 18(1).

2. The upload services referred to in paragraph 1 shall be made available to the public authorities.

3. The upload services referred to in paragraph 1 shall be made available to third parties upon their request, provided that their spatial data sets and services comply with implementing rules laying down obligations with regard, in particular, to metadata, network services and interoperability.

Article 18

1. Member States shall establish and operate a network of the following services for the spatial data sets and services for which metadata have been created in accordance with this Directive:

- (a) discovery services making it possible to search for spatial data sets and spatial data services on the basis of the content of the corresponding metadata and to display the content of the metadata;
- (b) view services making it possible, as a minimum, to display, navigate, zoom in/out, pan, or overlay spatial data sets and to display legend information and any relevant content of metadata;
- (c) download services, enabling copies of complete spatial data sets, or of parts of such sets, to be downloaded;
- (d) transformation services, enabling spatial data sets to be transformed;

- (e) “invoke spatial data services” services, enabling data services to be invoked.

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

2. For the purposes of the services referred to in point (a) of paragraph 1, as a minimum the following combination of search criteria shall be implemented:

- (a) keywords;
- (b) classification of spatial data and services;
- (c) spatial data quality and accuracy;
- (d) degree of conformity with the harmonised specifications provided for in Article 11;
- (e) geographical location;
- (f) conditions applying to the access to and use of spatial data sets and services;
- (g) the public authorities responsible for the establishment, management, maintenance and distribution of spatial data sets and services.

3. The transformation services referred to in point (d) of paragraph 1 shall be combined with the other services referred to in that paragraph in such a way as to enable all those services to be operated in conformity with the implementing rules provided for in Article 11.

Article 19

1. By way of derogation from Article 4(2) of Directive 2003/4/EC and Article 18(1) of this Directive, Member States may limit public access to the services referred to in points (b) to (e) of Article 18(1), or to the e-commerce services referred to in Article 20(2), where such access would adversely affect any of the following:

- (a) the confidentiality of the proceedings of public authorities, where such confidentiality is provided for by law;
- (b) international relations, public security or national defence;
- (c) the course of justice, the ability of any person to receive a fair trial or the ability of a public authority to conduct an enquiry of a criminal or disciplinary nature;
- (d) the confidentiality of commercial or industrial information where such confidentiality is provided for by national or Community law to protect a legitimate economic interest, including the public interest in maintaining statistical confidentiality and tax secrecy;
- (e) the confidentiality of personal data and/or files relating to a natural person where that person has not consented to the disclosure of the information to the public, where such confidentiality is provided for by national or Community law;
- (f) the protection of the environment to which such information relates, such as the location of rare species.

2. The grounds for limiting access, as provided for in paragraph 1, shall be interpreted in a restrictive way,

taking into account for the particular case the public interest served by providing this access. In every particular case, the public interest served by disclosure shall be weighed against the interest served by the limiting or conditioning the access. Member States may not, by virtue of paragraph 1(a), (d), (e) and (f), limit access to information on emissions into the environment.

Article 20

1. Member States shall ensure that the services referred to in Article 18(1)(a) and (b) are available to the public free of charge.

2. Where public authorities levy charges for the services referred to in Article 18(1)(c) or (e), Member States shall ensure that e-commerce services are available.

Article 21

1. The Commission shall establish and operate a Community geo-portal.

2. Member States shall provide access to the services referred to in Article 18(1) through the Community geo-portal.

Member States may also provide access to those services through their own access points.

Article 22

The Commission shall, in accordance with the procedure referred to in Article 30(2), adopt rules for the implementation of this Chapter, and shall in particular lay down the following:

- (a) technical specifications for the services referred to in Articles 17(1), 18(1) and 20(2) and, taking into account technological progress, minimum performance criteria for those services;
- (b) the obligations referred to in Article 17(3).

CHAPTER V. Data-sharing and re-use

Article 23

1. Member States shall adopt measures for the sharing of spatial data sets and services between public authorities. Those measures shall enable the public authorities of Member States, and the institutions and bodies of the Community, to gain access to spatial data sets and services, and to exchange and use those sets and services, for the purposes of public tasks that may have a direct or indirect impact on the environment.

The measures provided for in the first subparagraph shall preclude, at the point of use, any restrictions, in particular of a transactional, procedural, legal, institutional or financial nature.

2. The possibility of sharing spatial data, as provided for in paragraph 1, shall be open to bodies established by international agreement to which the Community or Member States are party, for the

performance of tasks that may have a direct or indirect impact on the environment.

3. Member States shall take appropriate measures to prevent distortion of competition in cases where public authorities also carry out commercial activities unrelated to the performance of their public tasks, and shall make those measures public.

4. The institutions and bodies of the Community shall have access to spatial data sets and services additional to that provided for in paragraph 1. The Commission shall, in accordance with the procedure referred to in Article 30(2), adopt implementing rules governing such access and the related rights of use.

Article 24

The Commission shall, in accordance with the procedure referred to in Article 30(2), adopt implementing rules to increase the potential of re-use of spatial data sets and services by third parties. These implementing rules may include the establishment of common licensing conditions.

CHAPTER VI. Coordination and complementary measures

Article 25

1. Member States shall designate appropriate structures and mechanisms for coordinating the contributions of all those with an interest in their infrastructures for spatial information, such as users, producers, added-value service providers and coordinating bodies.

Those contributions shall include identification of user needs, provision of information on existing practices and provision of feedback on the implementation of this Directive.

Article 26

1. The Commission shall be responsible for coordinating the infrastructure for spatial information in the Community at Community level and shall be assisted for that purpose by the European Environmental Agency.

2. Each Member State shall designate the public authority to be responsible for contacts with the Commission in relation to this Directive.

Article 27

The standards adopted by European standardisation bodies in accordance with the procedure laid down in Directive 98/34/EC may support the implementation of this Directive.

CHAPTER VII. Final provisions

Article 28

1. Member States shall monitor the implementation and use of their infrastructures for spatial information.

2. The monitoring provided for in paragraph 1 shall be carried out in accordance with implementing rules adopted by the Commission in accordance with the procedure referred to in Article 30(2).

3. The information resulting from the monitoring provided for in paragraph 1 shall be made accessible to the Commission on a permanent basis.

Article 29

1. Member States shall report to the Commission on the implementation of this Directive and on the experience gained in applying it. The report shall include:

- (a) a description of how public sector providers and users of spatial data sets and services and intermediary bodies are coordinated, and of the relationship with the third parties and of the organisation of quality assurance;
- (b) a description of the contribution made by public authorities or third parties to the functioning and coordination of the infrastructure for spatial information;
- (c) a summary of the availability and quality of spatial data sets and the availability and performance of spatial data services;
- (d) a summary of information on the use of the infrastructure for spatial information;
- (e) a description of the sharing agreements between public authorities;
- (f) a summary of the costs and benefits of implementing this Directive.

2. The report referred to in paragraph 1 shall be sent to the Commission every three years, starting in [three years after the entry into force of this Directive].

3. The Commission shall, in accordance with the procedure referred to in Article 30(2), adopt rules for the implementation of paragraph 1.

Article 30

1. The Commission shall be assisted by a Committee.

2. Where reference is made to this paragraph, Articles 5 and 7 of Decision 1999/468/EC shall apply, having regard to the provisions of Article 8 thereof.

The period laid down in Article 5(6) of Decision 1999/468/EC shall be set at three months.

3. The Committee shall adopt its rules of procedure.

Article 31

The Commission shall present to the European Parliament and to the Council by [7 years after the date of entry into force] and every six years thereafter a report on the application of this Directive.

Where necessary, the report shall be accompanied by proposals for Community action.

Article 32

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by [2 years after the date of entry into force]. They shall forthwith communicate the Commission the text of those provisions and a correlation table between those provisions and this Directive.

When Member States adopt these provisions, they shall contain a reference to this Directive or be accompanied by such reference on the occasion of their official publication. Member States shall determine how such reference is to be made.

2. Member States shall communicate to the Commission the text of the main provisions of national law which they adopt in the field covered by this Directive.

Article 33

This Directive shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

Article 34

This Directive is addressed to the Member States.

Done at Brussels,

For the European Parliament
The President

For the Council
The President

ANNEX I

SPATIAL DATA THEMES REFERRED TO IN ARTICLES 9(A), 13(1) AND 14(A)

1. Coordinate reference systems

Systems for uniquely referencing spatial information in space as a set of coordinates (x,y,z) and/or latitude and longitude and height, based on a geodetic horizontal and vertical datum

2. Geographical grid systems

Harmonised multi-resolution grid with a common point of origin and standardised location and size of grid cells.

3. Geographical names

Names of areas, regions, localities, cities, suburbs, towns or settlements, or any geographical or topographical feature of public or historical interest.

4. Administrative units

National territory divided into units of administration for local, regional and national governance. The administrative units are separated by administra-

tive boundaries. Also includes the boundaries of national territory and the coastline.

5. Transport networks

Road, rail, air and water transport networks and related infrastructure. Includes links between different networks. Also includes the trans-European transport network as defined in Decision 1692/96/EC [25] and the future revisions of this decision.

6. Hydrography

Hydrographic elements, both natural and artificial including rivers, lakes, transitional waters, reservoirs, aquifers, channels or other water bodies, where appropriate in the form of networks and linked with other networks. Includes river basins and sub-basins as defined in Directive 2000/60/EC. [26]

7. Protected sites

Area designated or regulated and managed to achieve specific conservation objectives.

ANNEX II

SPATIAL DATA THEMES REFERRED TO IN ARTICLES 9(A), 13(1) AND 14(B)

1. Elevation

Digital elevation models for land, ice and ocean surface. Includes terrestrial elevation, bathymetry and shoreline.

2. Identifiers of properties

Geographic location of properties based on address identifiers, usually by road name, building number, postal code.

3. Cadastral parcels

Areas defined by cadastral borders, with specific legal status of ownership.

4. Land cover

Physical and biological cover of the earth's surface including artificial surfaces, agricultural

areas, forests, (semi-)natural areas, wetlands, water bodies.

5. Orthoimagery

Geo-referenced image data of the Earth's surface, from either satellite or airborne sensors.

ANNEX III

SPATIAL DATA THEMES REFERRED TO IN ARTICLES 9(B) AND 14(B)

1. Statistical units

Units for referencing census or other statistical information.

2. Buildings

Geographical location of buildings.

3. Soil

Soils and subsoil characterised according to depth, texture, structure and content of particles and organic material, stoniness, where appropriate mean slope and anticipated water storage capacity.

4. Geology

Geology characterised according to composition and structure. Includes bedrock and geomorphology.

5. Land use

Territory characterised according to its current and future functional dimension or socioeconomic purpose (e.g. residential, industrial, commercial, agricultural, forestry, recreational).

6. Human health and safety

Geographical distribution of occurrence of diseases linked directly (epidemics, spread of diseases, health effects due to environmental stress, air pollution, chemicals, depletion of the ozone layer, noise, etc.) or indirectly (food, genetically modified organisms, stress, etc.) to the quality of the environment.

7. Government service and environmental monitoring facilities

Sites for governmental services, location of hospitals and medical treatment locations, schools, kindergartens, etc. Includes sewage, waste and energy facilities, production sites and environmental monitoring facilities operated by or for public authorities.

(25) Decision n° 1692/96/EC on Community guidelines for the development of trans-European transport network.

(26) Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, OJ L 327, 22.12.2000, p. 1.

8. Production and industrial facilities

Industrial production sites. Includes water abstraction facilities, mining, storage sites.

9. Agricultural and aquaculture facilities

Farming equipment and production facilities (including irrigation systems, greenhouses and stables).

10. Population distribution – demography

Geographical distribution of people aggregated by grid, region, administrative unit or other analytical unit.

11. Area management/restriction/regulation zones & reporting units

Areas managed, regulated or used for reporting at European, national, regional and local levels. Includes dumping sites, restricted areas around drinking water sources, nitratevulnerable zones, regulated fairways at sea or large inland waters, OSPAR areas for the dumping of waste, noise restriction zones, prospecting and mining permit areas, river basin districts, OSPAR reporting units and coastal zone management areas.

12. Natural risk zones

Vulnerable areas characterised according to natural hazards (all atmospheric, hydrologic, seismic, volcanic and wildfire phenomena that, because of their location, severity, and frequency, have the potential to seriously affect society), e.g. floods, landslides, avalanches, forest fires, earthquakes, volcanic eruptions.

13. Atmospheric conditions

Physical conditions in the atmosphere. Includes spatial data based on measurements, on models or on

a combination thereof and includes measurement locations.

14. Meteorological geographical features

Weather conditions and their measurements; precipitation, temperature, evapotranspiration, wind speed and direction.

15. Oceanographic geographical features

Physical conditions of oceans (currents, salinity, wave heights, etc.).

16. Sea regions

Physical conditions of seas and saline water bodies divided into regions and sub-regions with common characteristics.

17. Bio-geographical regions

Areas of relatively homogeneous ecological conditions with common characteristics.

18. Habitats and biotopes

Geographical areas characterised by specific ecological conditions and physically supporting the organisms that live there. Includes terrestrial or aquatic areas distinguished by geographical, abiotic and biotic features, whether entirely natural or semi-natural. Includes small features of the rural landscape – hedgerows, brooks, etc.

19. Species distribution

Geographical distribution of occurrence of animal and plant species aggregated by grid, region, administrative unit or other analytical unit.