Spatial Data Infrastructures in *Portugal:* State of play 2010

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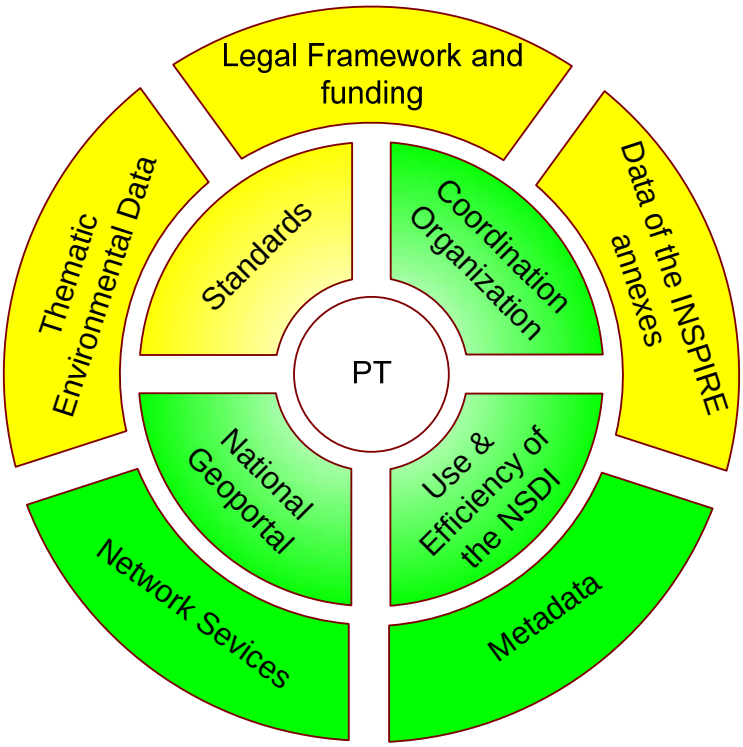
Change matrix 2010 versus 2007

A concise graph is added to indicate changes of the various paragraphs compared to the previous report. Two colours are used: Green and Yellow indicating major and minimum changes respectively compared with the 2007 State of Play. This graph does not reflect the country situation. Merely it represents our findings/changes per section on our preparation of the desktop analysis



Executive summary

Portugal was one of the first countries in the world with an operational NSDI: the SNIG (National Infrastructure for Geographical Information). Since 1995 it is accessible via the Internet.

There was a legal framework both for the SNIG and for the institution that was responsible for its coordination and development, i.e. the National Centre for Geographic Information (CNIG). By spring 2004, CNIG no longer exists because it was merged with the Portuguese National Geodetic, Mapping and Cadastre Agency, a GI data producing institution, to form the National Geographic Institute (IGP).IGP (http://www.igeo.pt) is thus a data producer that has the responsibility, since the merging process, of managing SNIG.

Today, SNIG has a new legal framework, provided by Decree-Law 180/2009. Within these needs, absent in the old law, there is the creation of a Coordination Council (CO-SNIG) for strategic decision regarding SNIG evolution and enabling a more effective stakeholders involvement. The SNIG project is now fully compatible with INSPIRE orientations and the new Portal (http://snig.igeo.pt/portal/), the fourth since the beginning of SNIG, was just launched November 2009. SNIG provides an infrastructure that enables users to identify, visualise and explore Geographic Information, as well as to access databases supported by a harmonized data structure directly provided by their producers and accessible at the geoportal. Moreover, an e-learning platform promoting INSPIRE implementation is also established.

Besides the maintenance of a metadata catalogues that allow users to find where is the information they want and how they can access it, SNIG also makes data available (aerial photos, orthophotos, maps and alphanumeric data) that can be visualised on-line or downloaded. Some data is available free of charge, other is charged for. In 2004 a MIG Editor – Metadados de Informação Geográfica, publisher and explorer was developed to help all the GI stakeholders to edit, publish, maintain and use the spatial metadata. Version 3.1 is currently available.

The transposition of the INSPIRE directive was embedded in the revision of the existing law 53-90 on the SNIG (DL - Decreto-Lei n.º 180/2009, 7 August 2009, http://dre.pt/pdf1sdip/2009/08/15200/0513205139.pdf). It should be noted that Azores and Madeira are autonomous regions developing their own SDI..

At the same time Portuguese and Spanish NSDI has performed some actions to be actually interoperable in terms of geoportal interoperability, trans-border projects and client interoperability.

Table of Contents

Abbreviations and acronyms

APA	Portuguese Environmental Agency
CAOP	Carta Administrativa Oficial de Portugal
CCC	Conselho Coordenador de Cartografia / Council for the Co-ordination of Cartography
CNIG	National Centre for Geographical Information
CO	Coordination Council
CRIF	Fire Risk Assessment Map
CSW	Catalog Service for Web
CT	Core Thematic Data
DGADR	Direcção-Geral de Agricultura e Desenvolvimento Rural
DGOTDU	DirectorateGeneral for Spatial Planningand Urban Development
DL	Decreto-Lei
DSIGIG	Directorate for Investigation and Management of Geographic Information
DTD	Document Type Declaration
EEA	European Environment Agency
ESMI	European Spatial Metadata Infrastructure
FIR	Further Investigation Required
GT M & R	Working Group for Monitoring and Reporting
GEOCID	Portuguese National Geographic Information
GI	Geographical Information
GIS	Geographical Information System
GPS	Global Positioning System
IA	Instituto do Ambiente/ Environmental Institute
ICNB	National Institute for Nature Conservation and Biodiversity
IGP	Instituto Geográfico Português
IH	Hidrográfico/Hidrographical Institute
INAG	Water Institute
INE	National Statistics Institute
INSPIRE	INfrastructure for SPatial InfoRmation in Europe
IPCC	Portuguese National Geodetic, Mapping and Cadastre Agency
ISO	International Organization for Standardization
LNEG	National Laboratory for Energy and Geology
MIG	Metadata Editor for Geographical Information
NCP	Network Control Program
NSDI	National Spatial Data Infrastructures
OGC	Open Geospatial Consortium

PDM	Planos Directores Municipais Regulamentos / Regulations at Municipal-level
PPP	Public-Private Partnerships
PROGIP	Support Program on Computer Management of Municipal Plans
PROSIG	Support Program for the Creation of Local Nodes of SNIG
PSI	Policy and legislation on access to public sector information
REF	Reference data
ROT	Earth Observation Network
SDI	Spatial Data Infrastructures
SIPNAT	National System of Nature
SNIG	Sistema Nacional de Informaçáo Geográfica, National Infrastructure for Geographical Information
SNIRH	National Information System of Water Resources
SNIT	National Territorial Information System
SOA	Service-Oriented Architecture
WCS	Web Coverage Service
WFD	Water Framework Directive
WFS	Web Feature Service
WG	Working Group
WMS	Web Map Service

1 GENERAL INFORMATION

1.1 Method

This report is summarizing the review of SDI in Portugal, and reflects the degree to which the SDI situation in Portugal is similar to the ideas set out in the INSPIRE position papers[1] and in the more recent INSPIRE scoping papers.

The 2002 report was based on the analysis of various documents, project references and web sites readily accessible in Portuguese and - to some extent - in English (See 3.2 for full list of references). Most resources were gathered from the Internet. The report has been completed by integration and consolidation of comments received in spring 2003 and spring 2004 from representatives of CNIG and IGP. The update of spring 2005 was based on input from the representatives from the IGP and on a presentation given by Rui Pedro Julião (SNIG) at the GIS-Planet conference in Estoril in May 2005. The update of 2006 was based on input from the EC GI&GIS workshop and other sources. For the 2007 update information was received on data sets and services, and data sharing practices.

For the 2009 update the survey report was used along with the information extracted from the web, the monitoring report and the various presentations/publications from workshops and conferences. In this version obsolete information was removed, while a conclusion paragraph regarding the status of each indicator was added for each component.

1.2 The SDI-scene in Portugal

The National Infrastructure for Geographical Information SNIG is the apparently non-challenged NSDI-initiative in Portugal. It is operational and covers 100% of the Portuguese territory, except the Azores and Madeira Islands which they develop their own SDI.

[1] INSPIRE position papers, final versions: RDM, ETC, DPLI, ASF, IST, IAS (latest version).

2 Details of SNIG

2.1 General Information

SNIG (http://snig.igeo.pt/portal/) is the core of geospatial data distribution and accessibility in Portugal. In May 1995 -after 5 years of development- SNIG was officially launched on the internet and it was implemented as a fully distributed system where each node represents a producer of geospatial data. Via the SNIG-website, one has direct access to the webpages of each GI-producer. The institutes/agencies are of national, regional or local level according to the competence. The information on this website is the responsibility of each institute.

In the beginning the structuring and design of the system was mainly oriented to the professional user.

From 1998 the main developments were concerned with the creation of applications oriented to citizens, to allow them easy and clear access. SNIG thus is a website (http://snig.igeo.pt/portal/) that provides access to GI produced by national public agencies. The website describes the datasets that are available for free and the ones that are not. The information included in SNIG is catalogued to allow an easy and fast access to the data. Through these metadata catalogues the user can find where and what cartographic and alphanumeric data is available. Users can also find the latest innovations and organizations associated with geographic information.

After its creation, the on-line NSDI provided on-line services and was acting as a one-stop shop for the data holdings of more than 100 agencies at national, regional and local level. It supported local authorities in developing and making accessible digital geographic information.

Data collection for the NSDI remains the responsibility of the organizations in charge of the data production. No change in the legal mandate of the several institutions regarding data production was made in result of the creation of the NSDI.

CNIG was also responsible for the management of the Earth Observation Network (ROT) included in SNIG. This network intended to disseminate information on remotely sensed data that includes metadata on satellite images for earth observation, remote sensing projects, bibliography and related events.

CNIG has developed strong networks with key decision-makers in government supporting its mission and has strong linkages with the academic sector.

Within CNIG, since its creation in 1990, there was a major concern about raising the level of awareness and knowledge about GI and its supporting technologies. So, besides a specific section dedicated to educational issues in SNIG homepage, CNIG supported several initiatives to promote the diffusion of information and knowledge on the subject in Portugal. These initiatives included:

- Organisation of Conferences and Seminars;
- Development of GIS courses;
- Training programmes for university students;
- Participation of CNIG staff in educational activities;
- Production of documentation to help the institutions develop their SNIG-nodes;
- Production of GIS manuals and other publications.

The NSDI of Portugal was taken over from the National Centre for GI by the Portuguese Geographic Institute which was created in January 2002. This shift occurred already in 2003.

As one of the results of the INSPIRE initiative some impact can be mentioned, for example within the Conselho Coordenador de Cartografia/Council for the Co-ordination of Cartography (CCC) it was decided to produce a document identifying the aims of INSPIRE and the impacts/requirements within each of the CCC organisations to reach those goals.

Some initiatives have been taking place to disseminate INSPIRE (a Workshop, Conference presentations, papers in national magazines). A web page was created within SNIG dedicated to INSPIRE to disseminate new information on the evolution of INSPIRE (e.g. references to discussions on the European Council Environmental Group; dissemination of initiatives at the European level such as Public Consultations) - http://snig.igeo.pt/inspire/. Additionally SNIG interface was changed in 2004. Currently SNIG involves 158 institutions nationally regionally and locally.

The main facts of SNIG history are presented in figure 1.

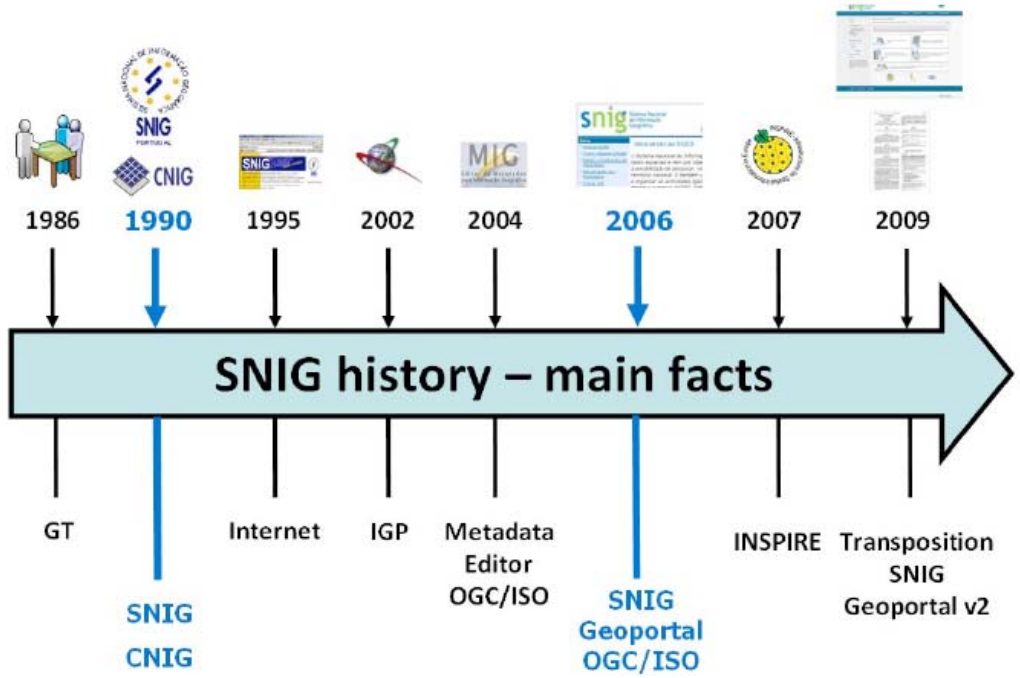


Figure 1. SNIG history

Today SNIG has a fully operational portal. SNIG geoportal has the following implemented components:

- Catalogue
- Viewer
- Applications
- Geo-community

The general idea was to consolidate SNIG as an infrastructure that enables users to identify, visualise and explore Geographic Information, as well as to access databases through three main related components (Metadata, Products & Services and Market) supported by an harmonized data structure directly provided by their producers and accessible at the geoportal (Julião, 2010).

2.2 Component 1: Coordination and organizational issues

The SNIG was created and coordinated by CNIG (National Centre for Geographic Information) and is now coordinated by IGP, being the result of a process involving the main national, regional and local geographical information producers.

The Portuguese Geographic Institute (IGP), within the Ministry of Environment and Spatial Planning, is the body responsible for implementing the policy of geographic information. IGP has taken over all rights, obligations and duties to the defunct National Centre for Geographic Information (CNIG) and the Portuguese Institute of Cartography and Cadastre (IPCC), and it is currently the National Authority of Geodesy, Cartography and Cadastre. Moreover, IGP is appointed as the national contact point for INSPIRE.

The CO-SNIG (SNIG Coordination Council), composed from 12 public authorities at the national level, is the specific coordinating structure/body established to implement INSPIRE. IGP has the lead on this council. Several Portuguese public authorities are following INSPIRE initiative and orientations since an early stage. Some of them were also integrated in SDICs through which they could follow and contribute to the INSPIRE process. Different levels of activity can be found, but in general, public authorities are concerned with their obligations and they are following Implementing Rules (IR) development and publication, organizing their staff, planning the adaptation of their information systems, investing on training (e.g. metadata, geowebservices), producing the metadata on their information.

Some of these public authorities are the Water Institute (INAG), the National Laboratory for Energy and Geology (LNEG), the National Institute for Nature Conservation and Biodiversity (ICNB), the Portuguese Environmental Agency (APA) and the Portuguese Geographical Institute (IGP). Additionally, SNIG always had a significant impact on Municipalities involvement and INSPIRE directive is creating a renovated interest among this community. Several municipalities have registered to be part of INSPIRE Contact Points Network.

Although there is no specific strategy document regarding INSPIRE implementation, there are different approaches referring to the different aspects of INSPIRE implementation within the different SDI components already in place, but no unique document defining a general strategy. This document is now being prepared by IGP to be submitted to SNIG Coordination Council (CO-SNIG).

However, there is an INSPIRE implementation plan that defines general principles in terms of organization, contents, capacity building and dissemination. For these implementation vectors different activities were identified that are being developed with the public authorities involvement (e.g. stakeholders involvement through specific networks, training, dissemination of strategic and technical information through INSPIRE website or mailing lists, creation of working groups, promotion of metadata creation and upload on SNIG catalogue, identification of pilot-projects).

Furthermore, within its role as NCP INSPIRE, the IGP created in March 2008, the Directorate for Investigation and Management of Geographic Information (DSIGIG), a working group (WG INSPIRE) and operational structure to support implementation of the Directive. The team thus formed is intended to ensure the interconnection of developments associated with the implementation of the INSPIRE directive with the European projects in which the IGP is involved (e.g. HUMBOLDT, GIS4EU, EURADIN, Nature-SDIplus), with associated initiatives (e.g. GMES, GEO, SIX) with

other activities in DSIGIG relevant to the process and obviously concerned with the development activities of the National Geographic Information System (SNIG). Another important component of the implementation process is the site INSPIRE-PT website (http://snig.igeo.pt/Inspire) widely used as a gateway to information and documentation process. The site was created in 2003 and redesigned in 2008 allows access to all information on the INSPIRE Directive and its application in Portugal.

In addition in a meeting of CO-SNIG held on 16.12.2009, the Working Group for Monitoring and Reporting of CO-SNIG (GT M & R CO-SNIG) originated. The group contributes to the identification of public institutions responsible for the CDG themes of the INSPIRE Directive and the Annexes to validate the list of CDG and services to submit to the CO-SNIG and the European Commission.

2.2.1 Conclusions of Component 1

The Portuguese SDI approach is truly national. SDI building blocks have reached a significant level of operationality. The CO-SNIG (SNIG Coordination Council), composed from 12 public authorities at the national level, is the specific coordinating structure/body established to implement INSPIRE. IGP has the lead on this council. Several Portuguese public authorities are following INSPIRE initiative and orientations since an early stage. Some of them were also integrated in SDICs through which they could follow and contribute to the INSPIRE process.

Based on these conclusions we score the indicators as follows:

- The approach and territorial coverage of the SDI is truly national
- One or more components of the SDI have reached a significant level of operationality (5)
- The officially recognised or de facto coordinating body of the SDI is a NDP, i.e. a NMA or a comparable organisation
- The officially recognised or de facto coordinating body for the SDI is an organisation controlled by data users (No)
- An organisation of the type ‘national GI-association’ is involved in the coordination of the SDI (Not so clear)
- Producers and users of spatial data are participating in the SDI
- Only public sector actors are participating in the SDI (Not so clear)

2.3 Component 2: Legal framework and funding

2.3.1 Legal framework

Currently, Portugal does not have a comprehensive legal framework for SDI. The process of establishing SNIG (*Sistema Nacional de Informação Geográfica*) started in February 1986, with the publication of decision SEIC 2/86 of the Secretary of State for Research and Development. It created a task force -consisting of the representatives of the main actors in the GI area- whose mission was to study the creation of a national SDI and to propose to the Secretary of State the corresponding actions to be taken by the Government. As a result of the studies and activities carried out by this task force, the Portuguese SNIG was created in 1990 through Decree-Law no. 53/90. This law also established the CNIG (*Centro Nacional de Informação Geográfica*) as a governmental research centre with the mission of coordinating and implementing the SNIG (CNIG-website is no longer online). Since its inception, the SNIG was intended to become the heart of geospatial data distribution and accessibility in Portugal. It was conceived as fully distributed system consisting of nodes that serve data or metadata online, and was launched on the Internet in May 1995.

[15]

In 2001 the Portuguese government -in order to improve the efficiency of the public administration- decided to create the *Instituto Geográfico Português* (IGP) by merging CNIG with IPCC (Portuguese National Geodetic, Mapping and Cadastre Agency). The IGP was created in January 2002 and its organic law published by the Decree-Law no. 53/2002.

The transposition of the INSPIRE directive was embedded in the revision of the existing law 53-90 on the SNIG (DL - Decreto-Lei n.º 180/2009, 7 August 2009, http://dre.pt/pdf1sdip/2009/08/15200/0513205139.pdf). It should be noted that Azores and Madeira are autonomous regions developing their own SDI.

2.3.2 Public-private partnerships (PPP's)

No information available.

2.3.3 Policy and legislation on access to public sector information (PSI)

Article 268 of the Constitution determines that citizens shall enjoy the right to have access to administrative records and files, subject to the legal provisions with respect to internal and external security, investigation of crime and personal privacy. Law no. 65/93 (Lei de Acesso aos Documentos Administrativos) of 26 August 1993 (as amended by Law no. 8/95 of 29 March 1995 and by Law no. 94/99 of 16 July 1999) provides for this access to government records. The law is overseen by the Commission for Access to Administrative Documents (Comissão de Acesso aos Documentos Administrativos), an

independent parliamentary agency. This Commission can examine complaints, give opinions on access, and decide on classification of systems (http://www.cada.pt).

Directive 2003/4 on access to environmental information has been transposed into Portuguese law by Law 19/2006 of 19 June 2006 (http://www.cada.pt/uploads/7f000001-a20b-9451.pdf). Directive 2003/98 on the re-use of PSI was transposed by Law 46/2007 of 24 August 2007 (http://ec.europa.eu/information_society/policy/psi/docs/laws/portugal/pt_transposition_law.pdf).

2.3.4 Legal protection of GI by intellectual property rights

The Portuguese Copyright Act (Code of Copyright and Related Rights no. 45/85) dates from 17 September 1985 and has been revised since. It practically lists the same works eligible for protection as the Berne Convention. This includes geographical maps and illustrations and works related to geography or other sciences.

The general description of the copyrighted material is: intellectual creations in the area of literature science and art. Collections of data are not specifically mentioned. The law only speaks of works such as anthologies and encyclopaedias. It is however doubtful whether GI datasets fall within the scope of the copyright act, since they are a collection of facts and not a collection of works. For GI in the form of digital maps, it may be argued that since paper maps enjoy protection, the same should apply to digital maps.

Photographic work (e.g. aerial photograph) only qualifies for copyright protection if the selection of the object to be photographed and/or the way in which it is made, results in a personal artistic creation. Photography that is the basis for map production will in general not meet these demands. This does not necessarily mean that the map that results from the photography is not protected.

The law on the production of products of cartography (Law no. 193/95 of 28 July 1995) states explicitly that copyright law applies to cartographic information. Notwithstanding copyright protection (for which originality is one of the requirements), article 14 sub 2 of this new law states that it is forbidden to use, supply to others, reproduce, divulge or commercialize cartographic products or the corresponding technical data without permission of the entity of which it is the property. It is clear that this law aims to give producers of GI additional protection besides copyright.

By Decree Law 122/2000 of 4 July 2000 the EU Directive on the protection of databases was implemented into Portuguese law. The 2001 directive on copyright in the information society has also been transposed into Portuguese law.

2.3.5 Restricted access to GI further to the legal protection of privacy

The system for access to personal information is regulated by both the Constitution (articles 37, 48 and 268 of the Constitution) and the law. Law no. 67/98 on the Protection of Personal Data of 26 October 1998 implements Directive 95/46/EC of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the

free movement of such data. The supervisory authority is the National Data Protection Commission (*Comissão Nacional de Protecção de Dados* - http://www.cnpd.pt). The applicability of the above privacy legislation to the processing of GI depends largely on the interpretation of the concept of "personal data".

The 2002 Directive on privacy and electronic communications has been implemented in Portuguese law.

2.3.6 Licensing framework

Data from the IGP can be requested by filling out a standard form provided on the website (http://www.igeo.pt/Frameset-egeo.htm). . Sometimes when the ownership of the data is shared between IGP and another public organization, the use by third parties is regulated by a pre-established protocol. For the Soil and Soil Capacity of Use Maps (1: 25 000), public authorities have to sign a Term of Responsibility, emitted by the *Direcção-Geral de Agricultura e Desenvolvimento Rural* (DGADR), to be able to use that cartography. DGADR has different levels of charging for different users (e.g. public authorities with cooperation agreements, university and research, private companies, students).

2.3.7 Funding model for SDI and pricing policy

Funding

The Portuguese government mainly provides the funding for the NSDI coordination and development through:

- The annual budget of the Portuguese Public Administration, which covers personnel and current expenses;
- The Central Administration Investment Plan, which covers investment projects for developing the NSDI and

R&D contracts awarded through competitive invitations to tender, namely from the Directorates-General, EUROSTAT, EEA, the Portuguese Foundation for Science and Technology and others, can also be considered as a source of funding for SNIG.

IGP (ex-CNIG) -being a public administration research agency- has an annual budget from the State budget. It however also gets revenues out of the services it performs and the R&D projects it carries out.

Pricing

The access to GI is provided through the SNIG homepage (http://snig.igeo.pt), which is mainly intended for institutional and technical users, and through the GEOCID homepage (http://geocid-snig.igeo.pt), which aims to make relevant GI easily available to citizens.

Each GI producer defines the way GI users can access their respective GI. Within SNIG some information is hence available free of any costs (e.g. Corine Land Cover), whereas

for other information a fee should be paid. CNIG has always tried to promote the access to GI at low cost or even free of costs, but it nevertheless always depends on what the accessibility policy of each GI producer is.

Some information held by IGP can be viewed and downloaded free of charge, while other data are charged for, based on a list of standard charges published on the website (http://www.igeo.pt/Frameset-egeo.htm).

2.3.8 Conclusions of Component 2

INSPIRE was transposed in national legislation. There is no specific strategy document regarding INSPIRE implementation. Accordingly there are different approaches referring to the different aspects of INSPIRE implementation within the different SDI components already in place, but no unique document defining a general strategy. There is such document being prepared by IGP to be submitted to SNIG Coordination Council (CO-SNIG). On the other hand, there is an INSPIRE implementation plan that defines general principles in terms of organization, contents, capacity building and dissemination. Sharing arrangements is still variable depending on the themes and on the type of information. IGP being a public administration research agency- has an annual budget from the State budget. It however also gets revenues out of the services it performs and the R&D projects it carries out There is no overall pricing framework.

Based on these conclusions we score the indicators as follows:

- There is a legal instrument or framework determining the SDI-strategy or –development
- There are true PPP's or other co-financing mechanisms between public and private sector bodies with respect to the development and operation of the SDI-related projects (No Information found)
- There is a freedom of information (FOI) act which contains specific FOI legislation for the GI-sector (No Information found)
- GI can specifically be protected by copyright (In Preparation)
- Privacy laws are actively being taken into account by the holders of GI (In Preparation)
- There is a framework or policy for sharing GI between public institutions (No)
- There are simplified and standardised licences for personal use
- The long-term financial security of the SDI-initiative is secured (Partially)

- There is a pricing framework for trading, using and/or commercialising GI (No)

2.4 Component 3: Data for themes of the INSPIRE annexes

2.4.1 Scale and resolution: European, National, Regional, Local, Other

The supported scale levels are:

- very large scale: 1:2 000
- large scale 1:10 000
- regional scale 1:50 000
- national scale: 1:100 000, 1:250 000
- European and global scales: 1:500 000, 1:1 000 000, 1:2 500 000

Extended information on cartographic products can be found at:
http://www.igeo.pt/produtos/Inf_cartografica.htm

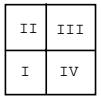
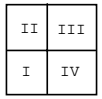
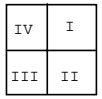
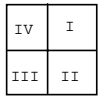
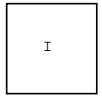
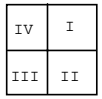
2.4.2 Data by resolution or scale range for the INSPIRE themes

Regarding the three INSPIRE annexes addressing the 34 spatial data themes, Portugal is providing (http://snig.igeo.pt/Portal/, IGP, DGOTDU, APA, etc) discovery and view services for most of them while a number of them can be also downloaded. A complete list will be presented in the updated report including the information provided by the country in 2010.

2.4.3 Geodetic reference systems and projections

Spatial referencing is done by coordinates, but not according to ISO 19111.

Name and nature of the geodetic coordinate system

Reference System	Bessel-Puissant (1853-1904)	Bessel-Bonne	Hayford-Gauss Datum Lisboa (1890)	Hayford-Gauss Datum Lisboa (c1937)	Hayford-Gauss Datum Lisboa Militar (c1937)	Hayford-Gauss Datum 73
ID (EPSG)	-	-	-	20791	20790	27429
Datum	Castelo S. Jorge	Castelo S. Jorge	Castelo S. Jorge	Datum Lisboa	Datum Lisboa	Datum 73 (Melriça)
ID (Eurogeographics)	-	DLX(BES)	-	DLX(HAY)	DLX(HAY)	D73
φ	38°42'43.631"	38°42'43.631"	38°42'43.631"	38°42'43.631"	38°42'43.631"	39°41'37.300"
λ	-9°07'54.806"	-9°07'54.806"	-9°07'54.806"	-9°07'54.862"	-9°07'54.862"	-8°07'53.310"
Ellipsoid	Puissant	Bessel	Internacional 1924 (Hayford 1909)	Internacional 1924 (Hayford 1909)	Internacional 1924 (Hayford 1909)	Internacional 1924 (Hayford 1909)
Projection	Bonne	Bonne	Gauss-Krüger (Transversa Mercator)	Gauss-Krüger (Transversa Mercator)	Gauss-Krüger (Transversa Mercator)	Gauss-Krüger (Transversa Mercator)
φ	38°42'56.73"	39°40'00.000"	39°40'00.000"	39°40'00.000"	39°40'00.000"	39°40'00.000"
λ	-8°07'54.806"	-8°07'54.806"	-8°07'54.862"	-8°07'54.862"	-8°07'54.862"	-8°07'54.862"
Scale Factor	-	1	1	1	1	1
False M (Easting)	0 m	0 m	0 m	0 m	200 000 m	180.598m
False P (Norting)	0 m	0 m	0 m	0 m	300 000 m	-86.990m
Quadrant						
Observations: (Map Producers) Map Scales	Spatial coverage: Portugal Continental Historical maps 1:100 000 (IGP)	Spatial coverage: Portugal Continental 1:50 000 (IGP) 1:100 000 (IGP) CORINE Land Cover (IGP)	Spatial coverage: Portugal Continental Historical maps	Spatial coverage: Portugal Continental	Spatial coverage: Portugal Continental Orto-imagery 1:10 000 (IGP ex-CNIG) Maps 1:25 000 (IGeoE) 1:1 000 000 (IA – ATLAS Maps)	Spatial coverage: Portugal Continental Most recent maps produced by IGP Maps 1:10 000 (IGP) Orto-imagery 1:10 000 (IGP ex-IPCC)
φ (DD)	38.7157583	39.6666667	39.6666667	39.6666667	39.6666667	39.6666667
λ (DD)	-8.1318906	-8.1318906	-8.1319061	-8.1319061	-8.1319061	-8.1319061

Reference System	UTM 25N Açores Ocidental (1939)	UTM 26N Açores Central (1948)	UTM 26N Açores Oriental (1940)	UTM 28N Madeira (1936)	UTM 29N Datum 73	UTM 29N Datum Europeu	UTM 29N WGS84
ID (EPSG)	2188	2189	2190	2191	27429	23029	32629
Datum	Datum Ocidental (Obs. Astr. Flores)	Datum Ocidental (Graciosa Base SW)	Datum Oriental (Forte de S. Braz, na Ilha de S. Miguel)	Datum Madeira 1936 (Porto Santo)	Datum 73 (Melriça)	Datum Europeu (ED50, Postam)	World Geodetic System 1984
ID (Eurogeographics)	AZO_OCCI	AZO_CENT	AZO_ORIE	MAD	D73	?	?
φ	?	?	?	?	39°41'37.30"	52º22'51.4456"	- geocêntrico -
λ	?	?	?	?	-8°07'53.31"	13º03'58.9283"	- geocêntrico -
Ellipsoid	Internacional 1924 (Hayford 1909)	Internacional 1924 (Hayford 1909)	Internacional 1924 (Hayford 1909)	Internacional 1924 (Hayford 1909)	Internacional 1924 (Hayford 1909)	Internacional 1924 (Hayford 1909)	WGS84
Projection	Gauss-Krüger (Transversa Mercator)	Gauss-Krüger (Transversa Mercator)	Gauss-Krüger (Transversa Mercator)	Gauss-Krüger (Transversa Mercator)	Gauss-Krüger (Transversa Mercator)	Gauss-Krüger (Transversa Mercator)	Gauss-Krüger (Transversa Mercator)
φ	0º	0º	0º	0º	0º	0º	0º
λ	-33º	-27º	-27º	-15º	-9º	-9º	-9º
Scale Factor	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996
False M (Easting)	500 000 m	500 000 m	500 000 m	500 000 m	500 000 m	500 000 m	500 000 m
False P (Norting)	0 m	0 m	0 m	0 m	0 m	0 m	0 m
Quadrant	I	I	I	I	I	I	I
Observations: **(Map Producers)** **Map Scales**	Spatial coverage: Flores and Corvo islands 1:50 000 (IGP) 1:200 000 (IGP) 1:25 000 (IGeoE) -> the 2nd edition of this map series uses WGS84 Ellipsoid	Spatial coverage: Pico, Faial, S.Jorge, Graciosa and Terceira islands 1:50 000 (IGP) 1:200 000 (IGP) 1:25 000 (IGeoE) -> the 2nd edition of this map series uses WGS84 Ellipsoid	Spatial coverage: S. Miguel and Sta. Maria islands 1:50 000 (IGP) 1:200 000 (IGP) 1:25 000 (IGeoE) -> the 2nd edition of this map series uses WGS84 Ellipsoid	Spatial coverage: Madeira and Porto Santo islands 1:50 000 (IGP) 1:200 000 (IGP)	Spatial coverage: Portugal Continental	Spatial coverage: Portugal Continental	Spatial coverage: Portugal Continental 1:250 000 (IGeoE) 1:500 000 (IGeoE)

2.4.4 Quality of the data

Data quality is a matter of the 158 agencies at national, regional and local level which provide data through SNIG. The metadata system has provisions to document the various aspects of geographic data quality.

2.4.5 Interoperability

The dominating GIS-software used are the ESRI-product family and MicroStation. These software's provide data converters.

Raster imagery is distributed in different formats among which TIFF and JPEG.

From the SNIG-website the administrative boundaries can be downloaded for free - Carta Administrativa Oficial de Portugal (CAOP) using following exchange formats:

- drawing eXchange Format (.dxf)
- MicroStation (.dgn)
- AutoCad (.dwg)
- ArcView (.shp)
- GeoMedia (.mdb)

2.4.6 Language and culture

Metadata, documents are mainly provided in Portuguese (at this moment the actual version of SNIG is not available in English).

2.4.7 Data Content

A data dictionary is available related to urban planning mainly: PDM (Planos Directores Municipais Regulamentos): Regulations at Municipal-level concerning definitions of urban planning (urban areas, industrial area…).

2.4.8 Geographical names

Geographical names are managed mainly in Portuguese.

2.4.9 Conclusions of Component 3

Already from the previous PT's SoP report Geodatasets existed which provide a basis for contributing to the coverage of pan-Europe for the INSPIRE-selected data themes and components while the geodetic reference system and projection systems are standardised, documented and interconvertable. The INSPIRE 2010 MR confirms the statement. 435 data sets have been reported 182, 63 and 90 for Annex I, Annex II and Annex III

respectively. Data quality is a matter of the 158 agencies at national, regional and local level which provide data through SNIG.

Based on these conclusions we score the indicators as follows:

- Geodatasets exist which provide a basis for contributing to the coverage of pan-Europe for the INSPIRE-selected data themes and components
- The geodetic reference system and projection systems are standardised, documented and interconvertable
- There is a documented data quality control procedure applied at the level of the SDI (No)
- Concern for interoperability goes beyond conversion between different data formats
- The national language is the operational language of the SDI
- English is used as secondary language

2.5 Component 4: Metadata

2.5.1 Availability of metadata

Exploration metadata are available for all of the reference and core thematic geodatasets.

Information is provided on:

- General characteristics (Title, Label, Scale, Resolution, Themes, Résumé, Area covered, info consulted by (NUTS-level), period of reference);
- Distribution (format, operational system, software, restrictions, price);
- Access to information (on-line, import…);
- Other characteristics (map type, data model (raster, vector), reference points, equidistance, objective of information, state of development, frequency of actualization, methods/processes used to produce the map, language, observations);
- Geographical Reference;
- Projection-system (Planimetric Datum, Altimetry Datum, Ellipsoid, Rectangular coordinates (max, min), Altimetry coverage/vertical);

- Institutions and persons associated to the data (Contact for further information).
- Completeness of the metadata is satisfactory for a significant part of the data only.

A network of metadata managers has been created involving most public authorities responsible for the datasets associated to INSPIRE Annex themes. The identification of the metadata manager is mandatory according to the new SNIG legislation. A mandatory national metadata repository for all GI related data and services produced by public authorities exists, which is being updated by the data producers. The national metadata profile was updated to conform all INSPIRE metadata requirements.

2.5.2 Metadata catalogues availability + standard

Within SNIG implementation, metadata standards became increasingly important for the exchange of and search for GI among institutions. Since 1996, due to SNIG's participation in the European Spatial Metadata Infrastructure (ESMI) project, the metadata structure is CEN/TC287 compliant, but it covers more information, namely metadata about remote sensing imagery. The Metadata catalogue conforms to the standards ISO 19115 (logical model of metadata for spatial information), ISO 19139 (Model for Implementing Metadata) and ISO 19119 (extension of the ISO 19115 standard for metadata mapping services)

Besides strict GI-catalogues, two other catalogues containing information relevant for the GI market such as data on the GI market actors and a description of the GIS software were maintained within SNIG. These catalogues are presently not available.

An editor for building metadata catalogues has been developed, called MIG. The MIG Editor – Metadados de Informação Geográfica (IGP)(Metadata for GI):

- Is a tool developed at IGP to support the creation of GI metadata according to ISO 19115 and the recommendations of the group that is developing ISO 19139 associated to informatics implementation.
- Objectives:
    - To produce XML documents for metadata to be easily shared within GI community and integrated in their computer systems.
    - To produce metadata to SNIG (Portuguese NSDI) and to The National Register for Cartography.

The MIG environment consists also in a MIG publisher and MIG explorer to publish/maintain and view the metadata. Currently version 3.1 of the MIG Editor is available.

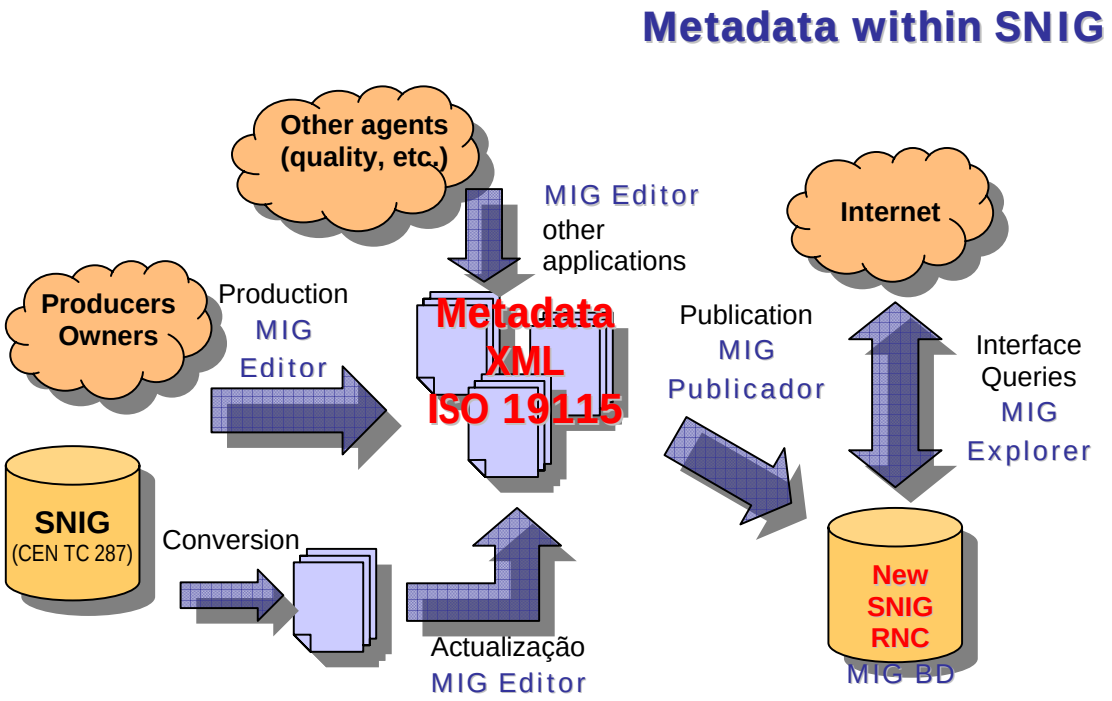


Figure 2: Metadata within SNIG

MIG editor represents a change in standards. SNIG metadata catalogues. Created by CNIG in 1995, used the CEN TC 287 standard for metadata. In 1999-2000 it was evolving to the ISO standard and to a distributed solution. MIG editor, finished in 2005, uses ISO 19115 for IG metadata.

IGP, as coordinator and promoter of SNIG, recognized that a good metadata catalogue is a critical point of a SDI. That is why their first option was to create MIG (ISO 19115, ISO 19119 and ISO 19139 compliant) and provide free training to users.

The metadata catalogue has more that 9.000 records about data, data services and applications. These records are increasing every day, mainly due to the creation of a specific tool (ISO and OGC compliant) to support metadata production: MIG is an open source application and is available for free download from SNIG website (http://sourceforge.net/projects/migeditor/). Moreover, MIG is compatible with all other metadata applications that are OGC and ISO compliant. Its interface can either be in Portuguese or English.

One of the objectives was to provide a tool that enables users to document spatial data in a structured way, through an easy learning and friendly user's environment. The Catalogue interface enables users to create a set of multi-options queries. It is possible to select based on free text, keywords, temporal and spatial frames, and also geographic names using a detailed gazetteer. The new metadata catalogue application is now being used by the public authorities involved in the NSDI network, to input the metadata concerning their information into the system, following INSPIRE standards.

2.5.3 Dublin core metadata standards for GI-discovery

Implementation is planned.

2.5.4 Metadata implementation

SNIG is only coordinating the dissemination of and access to metadata. Metadata are produced and implemented by the data producers.

To publish metadata in SNIG a user must be a registered by email to metadados.snig@igeo.pt.

On the geoportal platform there are three ways to publish metadata:

- Creation of metadata through the form on this site. (This option should be used only for occasional publishers).
- Upload documents created by the MIG Editor 2 or according to standard ISO 19139. (This option only allows uploading individual documents, while for larger amount of documents; the portal administrator has to be contacted).
- Harvesting of metadata. (This option is to be used by other IDE).

In order for the metadata to become public, they have to go through the acceptance of the system administrator, which usually takes 24 hours.

2.5.5 Conclusions of Component 4

Metadata are produced for a significant fraction of geodatasets of the themes of the INSPIRE annexes. The 2010 MR reveals that for the reported datasets of INSPIRE (67%, 73% and 67% of the data sets have metadata, for each Annex respectively). The IGP is coordinating the efforts of the data custodians. A network of metadata managers has been created involving most public authorities responsible for the datasets associated to INSPIRE Annex themes. SNIG is only coordinating the dissemination of and access to metadata. Metadata are produced and implemented by the data producers.

Based on these conclusions we score the indicators as follows:

- Metadata are produced for a significant fraction of geodatasets of the themes of the INSPIRE annexes
- One or more standardised metadata catalogues are available covering more than one data producing agency
- There is a coordinating authority for metadata implementation at the level of the SDI (Not so clear)

2.6 Component 5: Network Services

The existing SNIG geoportal (http://snig.igeo.pt/portal/) and its components which are evolving to better comply with INSPIRE, addresses the broader NSDI, is updated daily and 11120 datasets can be discovered while at least 13 can be viewed and 7 can be downloaded. Within the geoportal, the metadata catalogue, the searching mechanisms, the geowebservices (WMS and WFS), the Virtual Earth and Google Earth agreements, may be identified as measures that contribute to improve access to and sharing of spatial data.

Access to Spatial data is variable depending on the themes and on the type of information. Analytically:

Unrestricted public access
Water resources – (e.g. SNIRH - INAG) (Annex I - Theme 8)
Administrative limits (e.g. CAOP - IGP) (Annex I - Theme 4)
Protected Areas – (e.g. SPA, SCI - ICNB) (Annex I - Theme 9)

Unavailable for external use
Some meteorological data (Annex III – Theme 13 and 14)

Selective / limited by policy
Cadastral Parcels (Annex I– Theme 6)

Ad hoc/ by individual request
Species data (e.g. Bird Atlas Map - ICNB) (Annex III - Theme 19)

It should be mentioned that different public authorities have different positions in terms of data sharing. A discussion on this issue will occur in CO-SNIG along with changes in pricing mechanisms. Moreover, restrictions to datasets are due to international relations, public security, national defence, confidentiality and intellectual property rights.

2.6.1 On-line access service for metadata: discovery services

The service of a centralized database that contains the metadata and the GI in digital format is available on the SNIG website (http://snig.igeo.pt/portal/) since 1995.

The available services are:

Search and visualization

- CSW 2.0.1 Core and REST for the catalogue
- WFS-G for a gazetteer
- Several WMS - WFS services.
- Download service for the Administrative Boundaries.

Users are possible to search metadata by free text, date, thematic category, geographical extension and resource type. It is possible to access to an accurate and complete metadata presentation using a style sheet and a brief presentation were it is possible to see the geographical extension for each metadata record (bounding box) in a reference map.

Harvesting tools are available supporting different protocols (OAI, Z39.50, CSW, WAF). At the moment the integration of metadata from the National Territorial Information System (SNIT), a thematic SDI, is being tested using the WAF protocol.

The viewer also allows the integration of data services from different OGC compliant servers.

WMS and WFS services are available (http://mapas.igeo.pt/), providing the visualization of different spatial data (e.g. administrative limits of Portugal, forest fire risk areas, digital terrain model). Moreover, training sessions on geowebservices started in the end of 2009.

The Geoportal has evolved into an SOA (Service Oriented Architecture), in that it allows users to search through not only evaluate the services and resources available by viewing the metadata, but also use the services and resources available, such as viewing maps available through the Geo Web Services (WMS, WFS, WCS). The Geoportal works well primarily as a broker that allows users to find and use services. Note that the GeoPortal can also be customer service catalogue, type CSW (Catalogue Service for Web). Services may be provided by any entity, domestic or international.

The table on the next page lists the available services. Some remarks should be made.

In terms of services the situation is similar as to the data sets and metadata. Part of the capabilities already stated in previous reports are not included in the provided template as they are not services in INSPIRE terms. As a result several public authorities that have datasets available for viewing and download are not identified in the services template has they do not provide standardized network services.

Nevertheless, several applications (37) involving digital data are accessible through SNIG, corresponding in general terms to the use of web mapping tools, allowing the visualization and exploration of diversified digital contents from several national, regional and local authorities. A list of these applications with URLs and public authorities' identification is provided in the table below, grouped in topics.

Table 1 – Public Authorities applications available through SNIG.

Topic	Application
Geoprocessing	-- Transformação de coordenadas – CRIF, Instituto Geográfico Português, **http://scrif.igeo.pt/asp/coordenadas/main.asp** - Rede Nacional de Estações Permanentes – RENEP, Instituto Geográfico Português, **http://www.igeo.pt/produtos/geodesia/vg/renep/renep.asp#**

	-.Utilitários para Optimização da produção/verificação da Série Cartográfica Nacional à escala 1:10 000, **http://www.igeo.pt/Frameset-produtos.htm?/produtos/Cartografia/download/download_caixa_de_ferramentas.htm**
Visualization/Exploration	Localização de arruamentos, toponímias e coordenadas, Instituto Geográfico Português, **http://scrif.igeo.pt/servicos/localiz/** Mapas on line, Instituto Geográfico Português, **http://mapas.igeo.pt/** - SIG Online do e-Geo, Laboratório Nacional de Energia e Geologia (LNEG), **http://e-geo.ineti.pt/maps.aspx** - IGeoE-SIG, Instituto Geográfico do Exército, **http://www.igeoe.pt/igeoesig/ifr_igeoesig.htm** Roteiro Digital de Portugal, Instituto Geográfico do Exército, **http://www.mapadventure.com.pt/????**
Cadastral parcels	- Consulta do Cadastro Geométrico da Propriedade Rústica, Instituto Geográfico Português, http://www.igeo.pt/servicos/cic/cad_seccoes.asp Projecto-Piloto do SiNErGIC, Instituto Geográfico Português, http://www.igeo.pt/sinergic/portugues/SiNErGIC.html -
Geodesy and GPS	- Rede Nacional de Estações Permanentes – RENEP, Instituto Geográfico Português, **http://www.igeo.pt/produtos/geodesia/vg/renep/renep.asp#** - Rede Geodésica Nacional, Instituto Geográfico Português, http://www.igeo.pt/Framesetprodutos.htm?/produtos/geodesia/vg/rgn/rgn.asp
Geology	SIG Online do e-Geo, Laboratório Nacional de Energia e Geologia (LNEG), http://e-geo.ineti.pt/maps.aspx
Planning Land Use Planning	- PDM Interactivo, Instituto Geográfico Português, http://snig.igeo.pt/Portal/pdm_digitais.html - Planos Directores Municipais, Direcção Geral de Ordenamento do Território e Desenvolvimento Urbano, http://www.territorioportugal.pt/pnpot/ - Localização geográfica da rede educativa pública do ME, Gabinete de Estatística e Planeamento (GEPE) do Ministério da Educação, http://www.gepe.min-edu.pt/ - Localização Geográfica dos Centros de Novas

	Oportunidades, Gabinete de Estatística e Planeamento (GEPE) do Ministério da Educação, http://www.novasoportunidades.gov.pt/rvcc.aspx -
Municipal GIS and Guides	- Roteiro Municipal de Odivelas, C. M. Odivelas, http://urano.cm-odivelas.pt/alodigitalviewer/Viewer.aspx?serviceName=roteiro&host=urano.cm-odivelas.pt - Plano Director Municipal de Odivelas, C. M. Odivelas, http://urano.cm-odivelas.pt/alodigitalviewer/Viewer.aspx?serviceName=pdm&host=urano.cm-odivelas.pt - Obras Municipais de Odivelas, C. M. Odivelas, http://urano.cm-odivelas.pt/alodigitalviewer/Viewer.aspx?serviceName=obras&host=urano.cm-odivelas.pt - Plantas de Localização de Odivelas, C. M. Odivelas, http://urano.cm-odivelas.pt/alodigitalviewer/Viewer.aspx?serviceName=plantas&host=urano.cm-odivelas.pt - Mapa Interactivo de Loures, C. M. Loures, http://www.cm-loures.pt/ap_CartografiaMapas1.asp - Planta de Ordenamento de Vila Franca de Xira, http://sig.cm-vfxira.pt/Viewer.aspx?serviceName=ORDENAMENTO&HOST=SRVSIG01 - Património Cultural de Vila Franca de Xira, http://sig.cm-vfxira.pt/Viewer.aspx?serviceName=PATRIMONIOCULTURAL&host=SRVSIG01 - Emissão de Plantas de Localização de Vila Franca de Xira, http://sig.cm-vfxira.pt/ - Roteiro Municipal de Vila Franca de Xira, http://sig.cm-vfxira.pt/Viewer.aspx?serviceName=SERVICOS&HOST=SRVSIG01 - Planta de Condicionantes de Vila Franca de Xira, http://sig.cmvfxira.pt/Viewer.aspx?serviceName=CONDICIONANTES&HOST=SRVSIG01 - S.I.G. Municipal de Espinho - Intervenções Urbanísticas, C. M. Espinho, http://www.cm-espinho.pt/website/planos/viewer.htm - - S.I.G. Municipal de Espinho – Equipamentos, C. M. Espinho, http://www.cm-espinho.pt/website/roteiro/viewer.htm - S.I.G. Municipal de Espinho - Consulta de Toponímia/ N.º de Polícia, C. M. Espinho, http://www.cm-espinho.pt/website/edificio/viewer.htm - Sistema Municipal de Informação Geográfica de Aveiro, C. M. Aveiro, http://sig.cm-aveiro.pt/portal/default.aspx S.I.G. Municipal de Espinho - Plano Director Municipal de

	Espinho, C. M. Espinho, http://www.cm-espinho.pt/website/pdm/viewer.htm
Natural Risk (Forest Fires)	- Pontos de água, Instituto Geográfico Português, http://scrif.igeo.pt/servicos/pagua/ - Corporações de Bombeiros, Instituto Geográfico Português, http://scrif.igeo.pt/servicos/cbs/ - Cartografia de Risco de Incêndio Florestal – Nova série 200, Instituto Geográfico Português, http://scrif.igeo.pt/cartografiacrif/2007/crif07.htm - Postos de Vigia, Instituto Geográfico Português, http://scrif.igeo.pt/servicos/pvigia/ - Pistas e Helipistas, Instituto Geográfico Português, http://scrif.igeo.pt/servicos/pistas/ - Matérias Perigosas, Instituto Geográfico Português, http://scrif.igeo.pt/asp/materias.asp Dados On-line – Dados de Campo, Instituto Geográfico Português, http://scrif.igeo.pt/asp/enviadados.asp

Services						
	Service[2]	**Organisation responsible**	**Type of service[3]**	**Metadata (N/Y/ISO)[4]**	**Open for Public (Y/N)**	**Free/Not free[5] (Y/N)**
	Carta de Portugal 1:500 000 http://mapas.igeo.pt/ http://mapas.igeo.pt/wms/sc500k	Instituto Geográfico Português (IGP)	WMS Image Service	ISO	Y	Y
	Carta Administrativa Oficial de Portugal (CAOP - Continente) - Versão 6.0 http://mapas.igeo.pt/ http://mapas.igeo.pt/wms/caop/continente	Instituto Geográfico Português (IGP)	WMS Image Service	ISO	Y	Y
	Carta Administrativa Oficial de Portugal (CAOP - Madeira) - Versão 6.0 http://mapas.igeo.pt/ http://mapas.igeo.pt/wms/caop/madeira	Instituto Geográfico Português (IGP)	WMS Image Service	ISO	Y	Y
	Carta Administrativa Oficial de Portugal (CAOP - Açores) - Versão 6.0 http://mapas.igeo.pt/ http://mapas.igeo.pt/wms/caop/acores	Instituto Geográfico Português (IGP)	WMS Image Service	ISO	Y	Y
	Carta de Risco de Incêndio Florestal	Instituto	WMS Image	ISO	Y	Y

[2] List the names/IDs and where possible the link (URL) of all the discover, view, download, transformation and invoking services that are part of your infrastructure
[3] Indicate the type (discover, view, download, transformation and invoking services)
[4] Indicate whether the service has no metadata (N), or metadata according to ISO 19119 (ISO).
[5] Whether or not the service is free for use.

	(CRIF) http://mapas.igeo.pt/ http://mapas.igeo.pt/wms/crif	Geográfico Português (IGP)	Service			
	Carta Administrativa Oficial de Portugal (CAOP - Continente) - Versão 6.0 http://mapas.igeo.pt/ http://mapas.igeo.pt/wfs/caop/continente	Instituto Geográfico Português (IGP)	WFS Vector Data Service	ISO	Y	Y
	Carta Administrativa Oficial de Portugal (CAOP - Madeira) - Versão 6.0 http://mapas.igeo.pt/ http://mapas.igeo.pt/wfs/caop/madeira	Instituto Geográfico Português (IGP)	WFS Vector Data Service	ISO	Y	Y
	Carta Administrativa Oficial de Portugal (CAOP - Açores) - Versão 6.0 http://mapas.igeo.pt/ http://mapas.igeo.pt/wfs/caop/acores	Instituto Geográfico Português (IGP)	WFS Vector Data Service	ISO	Y	Y

A complete list of the available services can be found at:
http://mapas.igeo.pt/
and
http://snig.igeo.pt/portal/index.php?option=com_content&view=article&id=40&Itemid=44&lang=pt

2.6.2 On-line access service for data: download services

Besides the metadata catalogues that allow users to find where is the information they want and how they can access it, SNIG also includes data (aerial photos, orthophotos, maps and alphanumeric data) that can be visualised or downloadable on-line. Some data is available free of charge and other is charged for.

2.6.3 Inter-linkages of on-line access services for metadata data

No information was found.

2.6.4 OpenSource software and access services

see 2.6.1

2.6.5 Availability of viewing services

The national geoportal of the Portuguese NSDI can be regarded as a SDI-dependent user application for discovery, exploration (evaluation, ordering and downloading of (a subset of) geodatasets available through SNIG. Other applications and tools related to specific groups of users are also available at SNIG, such as the emergency situations thematic network.

SNIG is currently delivering several data web services, most of them provided by IGP, like CAOP (Official Administrative Boundaries Map), CRIF (Fire Risk Assessment Map) and Atlas (a set of maps produced for the Atlas of Portugal).

2.6.6 Availability of catalogue services to regulate access

FIR

2.6.7 Availability of catalogue services that perform payment operations

FIR

2.6.8 Availability of catalogue services to extract and send data to a user application

FIR

2.6.9 SDI user applications

see 2.6.5

2.6.10 Availability of geo-processing services

Free access is provided to GI produced by a fixed GPS-station-network which can be used to correct data obtained by a mobile GPS-station.

2.6.11 Conclusions of Component 5

The existing SNIG geoportal (http://snig.igeo.pt/portal/) and its components which are evolving to better comply with INSPIRE, addresses the broader NSDI, is updated daily and 11120 datasets can be discovered while at least 13 can be viewed and 7 can be downloaded. Within the geoportal, the metadata catalogue, the searching mechanisms, the geowebservices (WMS and WFS), the Virtual Earth and Google Earth agreements, may be identified as measures that contribute to improve access to and sharing of spatial data. The MR confirms the above statement. Two discoveries, 21 view and 7 download services are reported.

Based on these conclusions we score the indicators as follows:

- There are one or more discovery services making it possible to search for data and services through metadata
- There are one or more view services available for to visualise data from the themes of the INSPIRE annexes
- There are one ore more on-line download services enabling (parts of) copies of datasets
- There are one or more transformation services enabling spatial datasets to be transformed to achieve interoperability (No information found)
- There are middleware services allowing data services to be invoked (Not so clear)

2.7 Component 6: Thematic environmental data

The SNIG is also providing metadata about thematic environmental datasets produced and managed by the competent administrations.

The main fields of thematic applications are:

Climatology;

Geology;

Hydrology.

At the same time there are a number of national portals with thematic information:

- National Information System of Water Resources (SNIRH) (http://snirh.pt/). SNIRH is an information system on water resources.
- InterSIG (http://intersig-web.inag.pt/intersig/) InterSIG is a manager of geographic information whose purpose is to centralize and organize all existing spatial data in INAG, promoting its availability, both internally and to the general public, according to access levels and using a common interface. Through this platform INAG provides all the basic themes for the Water Framework Directive (WFD) and other official themes of responsibility of the Water Institute (protected areas of water law, subjects of the Urban Waste Water Directive, reservoirs of the National Dam with High Potential Hydropower, etc.)..
- National System of Nature (SIPNAT) (http://www.icn.pt/sipnat).The SIPNAT is an information system characterization and mapping of species occurrence and characterization of Hazardous (Mainland)

Geographical location	Type	Inspire priority	Avai Labi lity	Organisation responsible for collection, production, management	Legal issues and funding	Ref.data characteristics	Metadata specifications	Standards	Update procedure
Monitoring sites	ENV	H		INAG+IM		Climate monitoring network			
Administrative units									
Sector management & reporting units	E/S	H							
Ocean and seas									
Sea regions	ENV	L							
Biota/biodiversity									
Habitats and biotopes	ENV	M		ICN					
Species distribution	ENV	M		ICN					
Natural resource									
Water resources	E/S	M		INAG					
Water Quality				INAG		Water quality monitoring network			
Economy									
Economic statistics/local statistics	E/S	H		INE					
Area regulation									
Sector regulation (env. sector/ other sector)	E/S	H							
Natural and technological risks									
Natural risk vulnerability zones	ENV	H							
Erosion risk zones	ENV			DISMED Project		4 maps characterizing the sensivity to erosion			
Coastal eroion	ENV								
Technological risk vulnerability zones	ENV	H							
Technological accidents/ natural disasters	ENV	L							
Polluted									

areas/areas under anthropogenic stress									
Local contaminated areas	ENV	H							
Diffuse contamination	ENV	M							
Noise zones	ENV	L							
Society									
Green urban areas	ENV	M							
Derelicted urban land	ENV	M							
Cultural heritage	ENV	L							
Natural amenities	ENV	L							

Data Producers:

INE = INSTITUTO NACIONAL DE ESTATÍSTICA

IA = INSTITUTO DO AMBIENTE

INAG = INSTITUTO DA ÁGUA

ICN = INSTITUTO DE CONSERVAÇÃO DA NATUREZA

DGOTDU = DIRECÇÃO GERAL DO ORDENAMENTO DO TERRITÓRIO E DESENVOLVIMENTO URBANO

DGF = DIRECÇÃO GERAL DAS FLORESTAS

HERA = INSTITUTO DE HIDRÁULICA, ENGENHARIA RURAL E AMBIENTE, PRESENTLY IDRHa : INSTITUTO DE DESENVOLVIMENTO RURAL E HIDRÁULICA)

IGM = INSTITUTO GEOLÓGICO E MINEIRO

2.7.1 Conclusions of Component 6

The SNIG is also providing metadata about thematic environmental datasets produced and managed by the competent administrations. At the same time there are a number of national portals with thematic information.

Based on the information provided on the previous paragraph we score the indicator as follows:

- Thematic environmental data are covered by the described SDI-initiative or there is an independent thematic environmental SDI

2.8 Standards

SNIG is compliant with international OGC and ISO standards (e.g. WCS, WFS, WMS, ISO 19115, ISO19119, ISO 19139. Moreover, harvesting tools are supporting different protocols (OAI, Z39.50, CSW, WAF).

2.8.1 Conclusions of Component 7

SNIG is compliant with international OGC and ISO standards.

Based on these conclusions we score the indicator as follows:

- The SDI-initiative is devoting significant attention to standardisation issues

2.9 Use and efficiency of SDI

This SNIG is to be considered as the NSDI for Portugal: operational, up to date, efficient, not a GI producing agency, legally backed-up by legislation and financially by public funding. The provision of metadata was well structured and centrally co-ordinated by CNIG. SNIG is now coordinated by IGP, a data producing agency that inherited CNIG competencies.

The assessment of user expectations on the NSDI was strongly considered as a relevant task by CNIG and now by IGP. Since SNIG's creation several user-testing procedures were performed including the implementation of focus groups analysis, with users from the academic, private and public sectors and also with the citizens.

Moreover, interoperability towards an Iberic SDI is being set forward between Spain and Portugal. This interoperability involves a number of actions and projects such as data integration in both viewers and translation of contents.

A number of other projects could be mentioned as usage and efficiency examples:

OTALEX (http://www.ideotalex.eu/), the Territorial Observatory of ALenteixo (Portugal) and Extremadura (Spain), defined as a translational, multilingual SDI based on the collaboration of ten public bodies from Spain and Portugal.

SIGN II (www.proyectosign.org), an SDI project involving seven partners and covering the area of 56 municipalities from Galiza and the Northern part of Portugal.

Terra Douro (www.sitcyl.jcyl.es/sitcyl/), a trans-border territorial observatory for the definition and evaluation of policies of sustainable development, defined as an SDI project, involving seven partners and covering the area of 4 NUTS III, Salamanca and Zamora in Spain, and Alto Trás-Os-Montes and Douro in Portugal.

The three projects have been developed under the umbrella of INTERREG III A

Program (Julião et al., 2009).

Furthermore, an e-learning platform promoting INSPIRE implementation is established. The training will be available through the IGP e-learning platform, developed in moodle freeware (http://mapas.igeo.pt/moodle/). It will be a long distance course through presentations, texts and forums with discussion. These courses will be free of charge and in Portuguese.

3 Annexes

3.1 List of SDI addresses / contacts for Portugal

Table: SDI contact list			
SDI Name (full)	Web address	Organisational mailing address	Over-all contact person: tel./fax/e-mail
National			
CNIG - Centro Nacional de Informação Geográfica	http://cnig.igeo.pt/index_old.html	TagusPark, Av. Jacques Delors, Ed. Inovação III, Sala 614 2780-920 Porto Salvo OEIRAS	E-mail: frias.santos@igeo.pt (Director de Departamento: Adelino Frias dos Santos) igeo@igeo.pt office : from Monday-Friday : 10u00 -18u00 Tel: 351 214219800 Fax: 351 214219856
IGP - INSTITUTO GEOGRÁFICO PORTUGUÊS	http://www.igeo.pt/index_old.html	Rua Artilharia Um, 107 1099-052 LISBOA Tel: (+351) 21.381.96.00; Fax: (+351) 21.381.96.99	Rui Pedro Julião Tel: 00351-213819691 rpj@igeo.pt João Geirinhas Tel: 00351-213819600 joao.geirinhas@igeo.pt

3.2 List of references for Portugal

Table: list of references used to compile the Country Report	
Web sites:	
	www.sogi.ch/Profiles.pdf [1]
	http://www.privacyinternational.org/survey/phr2002/phr2002-part3.pdf [2]
	http://www.spatial.maine.edu/~onsrud/GSDI_surveys/portugal/portugal.htm [3]
	http://www.igeo.pt [4]
	http://snig.igeo.pt/ [5]
	http://geocid-snig.igeo.pt [6]
	http://www.gsdi.org/pubs/cookbook/ [7]
	http://www.urisa.org/Journal/accepted/1PPGIS/crampvoets/world_status_of_national_spatial_data.htm [8]
	http://codazzi4.igac.gov.co/gsdi5/documentos/Uta_Wehn_paper.pdf [9]
	http://www.shef.ac.uk/~scgisa/MADAMENew/Defaultb1.htm [10]
	http://www.gisvlaanderen.be/http://www.shef.ac.uk/~scgisa/MADAMENew/Deliverables/d1a.htm www.sogi.ch/Profiles.pdf [11]
	http://wwwlmu.jrc.it/ginie/doc/SDI_final_en.pdf [12]

Publications:	
	Uta When de Montalvo, 2001. Survey for SDI implementation: a survey of national experiences. [13]
	GINIE: Geographic Information Network in Europe. Spatial data

	infrastructures: Country Reports FINAL D 5.3.2(b). September 2002 [14] GINIE - GI in the Wider Europe Complete Book, October 2003 http://wwwlmu.jrc.it/ginie/doc/ginie_book.pdf [15] R., P., Julião, 2010. Low-Cost SDI. The Portuguese example of building a SDI for small countries. FIG Congress 2010, Facing the Challenges – Building the Capacity, Sydney, Australia, 11-16 April 2010 R.P., Julião, S., M. Mayoral, A.R., Pascual, D., Furtado, 2009. Portugal and Spain twin SDI's From national projects to an Iberian SDI. GSDI 11 world conference, 2009.
Other sources:	
	Internet : Presentation of CNIG about SNIG : moving from CEN TC 287 to ISO/TC 211 – no date Article : Company Information about CNIG – 1999 Presentation at the GIS-Planet Conference in May 2005, Estoril, Portugal: *Rebuilding a SDI: the Portuguese experience,* SNIG.