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Introduction

The INSPIRE Directive sets the minimum conditions for interoperable sharing and exchange of spatial data across Europe as part of a larger European Interoperability Framework and the e-Government Action Plan that contributes to the Digital Single Market Agenda. Article 21 of INSPIRE Directive defines the basic principles for monitoring and reporting. More detailed implementing rules regarding INSPIRE monitoring and reporting have been adopted as Commission Implementing Decision (EU) 2019/1372 on the 19th August 2019.

This country fiche highlights the progress in the various areas of INSPIRE implementation. It includes information on monitoring 2022 acquired in December 2022 and Member States update.

State Of Play

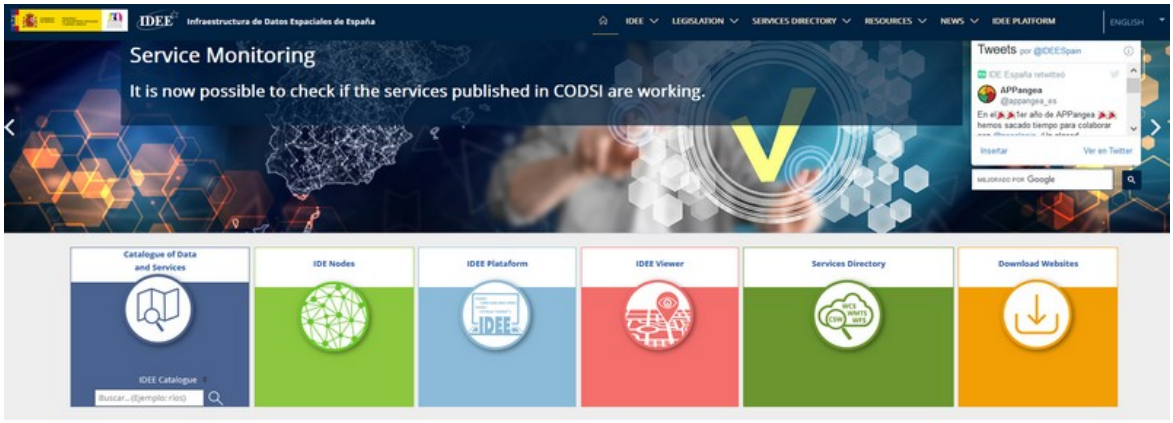
Spanish SDI (Infraestructura de datos Espaciales de España, IDEE)

A high-level view on the governance, use and impact of the INSPIRE Directive in Spain. More detailed information is available on the INSPIRE knowledge base.

Spain transposed INSPIRE Directive into national law since 2010, called **LISIGE "L**aw about **I**nfrastructures and **S**ervices about **G**eographic information in **S**pain", and has been implemented and maintainted the national INSPIRE nodes and regional INSPIRE nodes since then.

All Annex I dataset have been harmonised from the beginning and the harmonisazion of Annex II and III data has been planned in following years road map which is being transposed. All priority datasets have identified and published through view and download services.

Spanish SDI geoportal is the access point national and regional SDI have a geoportal, tools, catalogues and publishes their information thought view and download services.



INSPIRE snig géoportail IDE ANDORRA

Spanish SDI paltform is meeting point for developers in the geospatial community, where different initiatives are brought together and their reuse is made easier:

- Application Programming Interfaces (viewer):
  - API SITNA of Navarre Government
  - API CNIG of National Centre for Geographic Information.
  - MAPEA of Regional Government of Andalusia
  - Municipal Territorial Information System (SITMUN) of Diputació de Barcelona
- Geocoding:
  - Unified Digital Street Map of Andalusia of Regional Government of Andalusia
  - Cartociudad geocoder of National Centre for Geographic Information.
  - Street Map and Coordinate Converter Service. Cadastral

National and Regional SDI nodes

The Spanish SDI is made up of the following main nodes and more SDI nodes here.

NATIONAL NODES	AUTONOMICAL NODES

• Administrator of Railway Infrastructures (ADIF)
• Ministry of Finance
  ◦ Directorate General for Cadastre
• Ministry of Agriculture, Fisheries and Food (MAPA)
• Ministry for the Ecological Transition and the Demographic Challenge (MITECO)
  ◦ Petrol Station Geoportal
  ◦ Mining Cadastre
• Ministry of Science and Innovation
  ◦ Oceanographic Spanish Institute SDI
  ◦ Geological and Mining Institute of Spain
• Ministry of Defense
  ◦ Marine Hydrographic Institute (IHM)
• Ministry of Economic Affairs and Digital Transition
  ◦ National Statistics Institute
• Ministry of Transport, Mobility and Urban Agenda
  ◦ National Geographic Institute (IGN)
  ◦ Spanish National Research Council (CSIC)
  ◦ Directorate General for Architecture, Housing and Land
	• Andalusia SDI: Spatial Data Infrastructure of the Andalusian Regional Government. (**IDEAnalucia**)
	• Aragón SDI: Spatial Data Infrastructure of the Town Council of Aragón. (**IDEAragon**)
	• Balearic Islands SDI: Spatial Data Infrastructure of the Balearic Islands Government. (**IDEIB**)
	• Canary SDI: Spatial Data Infrastructure of the Canary Islands Government. (**IDECanarias**)
	• Cantabria SDI: Spatial Data Infrastructure of Cantabria. **(IDE Cantabria**)
	• Castile and Leon SDI: Spatial Data Infrastructure of the Castile-Leon Regional Government. (**IDEECyL**)
	• Castile–La Mancha SDI: Spatial Data Infrastructure of the Castilla la Mancha Regional Government. (**IDE-CLM**)
	• Catalonia SDI: Spatial Data Infrastructure of Catalonia (**IDEC**)
	• Regional Community of Navarra SDI: Spatial Data Infrastructure of the Government of Navarre. (**IDENA**)
	• Valencian Community SDI: Spatial Data Infrastructure of Valencia. (**IDEV**)
	• Extremadura SDI: Spatial Data Infrastructure of the Extremadura Regional Government. (**IDEextremadura**)
	• Galicia SDI: Spatial Data Infrastructure of the Regional Government of Galicia (**IDEG**)
	• La Rioja SDI: Spatial Data Infrastructure of the Government of La Rioja. (**IDERioja**)
	• Basque Country SDI: Basque Country Spatial Data Infrastructure (**Geoesukadi**)
	• Madrid SDI: Spatial Data Infrastructure of the Community of Madrid. (**IDEM**)
	• Murcia SDI: Spatial Data Infrastructure of the Region of Murcia. (**IDERM**)
	• Principality of Asturias, SDI: Territorial Information System of the Principality of Asturias and the Spatial Data Infrastructure of Asturias from the Principality of Asturias Government (**SITPA-IDEAS**).

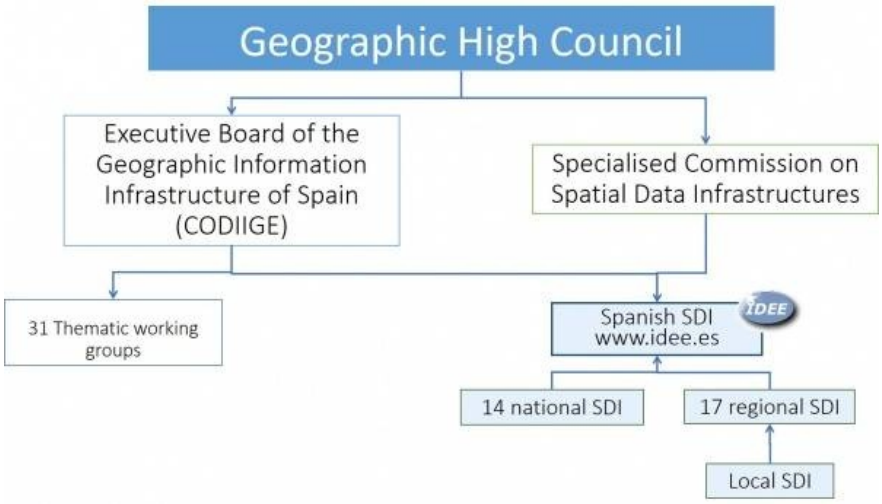
Coordination

National Contact Point

Name of Public Authority: National Geographic Institute

Postal Address: C/ General Ibáñez de Íbero 3, 28003 Madrid - España

Contact Email: Click to email
Telephone Number: 034915979646
Telefax Number: 034915979764
National INSPIRE Website: http://www.idee.es
MIG Contacts: Contact Person: Emilio López Romero
Email: Emilio.lopez@cnig.es
MIG T Contacts: Contact Person: Paloma Abad Power
Email: paloma.abad@cnig.es
Contact Person: María Soledad Gómez Andrés
Email: msgomez@mapa.es



Coordination Structure & Progress:

Coordination Structure

- Geographic High Council is the director body of the **National Cartographic System (SCN)**, having consultation and planning role for the official geographic information and cartography. Geographic High Council is the National Contact Point for INSPIRE and the coordination and direction for the Spanish SDI.
- Geographic High Council created the Executive Board of the Geographic Information Infrastructure of Spain (**CODIIGE**) for managing and controlling IDEE. It takes responsibility for directing Spain's SDI, and immediately began to define the Technical WGs with the objective of analysing the application of the implementing rules of INSPIRE by the Spanish Public Administrations and helping their bodies and Organizations to achieve compliance. Furthermore, it is the body responsible for coordination and management of the SDI of Spain, owing to which it is responsible for its constitution and maintenance, being responsible for:
    1. Proposing to the competent Authorities the actions to be performed by the Administrations or Organizations of the public sector for the establishment of the IDEE.
    2. Guaranteeing its accessibility and interoperability.
    3. Integrating the contributions of other producers or suppliers.
- The CODIIGE deal with interinstitutional coordination the organization of Spanish SDI (IDEE) is based on 14 national and 17 regional nodes; each regional node establishes the necessary coordination with the local administration and other agents.
- Depending on CODIIGE:
    - There are some T**hematic Working Groups (GTT)**, (one per INSPIRE Theme although some themes are grouped) with representation of all institutions with responsibility for data and/ or services under scope of INSPIRE. These Thematic Working Groups (GTT) have translated INSPIRE Technical Guidelines (Data Specifications) and have adapted to the case of Spain. These technical documents are available here.
    - Identification of priority data through environment ministries: The Ministry of Agriculture, Fisheries and Food (**MAPA**) and the Ministry for the Ecological Transition and the Demographic Challenge (**MITERD**).
    - Furthermore, there are four transversal Working Groups (Metadata and catalogue; Network services; Monitoring and reporting; Data and services policy).
    - Finally, there is a Working Group for the NSDI (GTIDEE) with representatives from public and private sector and academia. GTIDEE meets 2 times a year to discuss different aspects of the standars, Technical Guidance, open data and new technologies for the implementation of INSPIRE, Iberian Conference SDI and to coordinate the experts work on INSPIRE.
    - CODIIGE is responsible for **Spanish SDI Geoportal** and their catalogues.
- The **National Cartographic System**, defined in Royal Decree 1545/2007 and promoted by Law 14/2010, which establishes the coordination of data production via the National Cartographic Plan and the sharing of data between the Autonomous Communities that sign the generic agreement and the General State Administration. The Geographic High Council is the management body of the National Cartographic System and and is made up of the following national and regional bodies, see here.
    - On the following web page, you can consult the dates of the agreements of each of the autonomous organisations. see here

Progress

- Law 3/2022, of 6 October, on Geographic Information in Aragon (LIGA).
    - Aragon government has published the law with the aim of establishing a legal regime for the geographical information and cartographic activity of Aragon and its organisational and instrumental mechanisms, through which coordination and collaboration between the different

regional and local public administrations, as well as with the private sector, will be determined with regard to its production, dissemination and access, improving efficiency, transparency, interoperability and speed in its management. LIGA defines the Knowledge Infrastructure of Aragon (ICEARAGON) as the computer system made up of a set of resources dedicated to managing geographic information, available on the Internet, which meet the interoperability conditions (standards, specifications, protocols and interfaces) that allow them to be used, combined and related according to different needs.

- The CODIIGE has carried out a preliminary study of **high-value datasets** to be made available for re-use according to Commision Implementing Regulation (EU) 2023/138 of 21 December 2022 laying down a list of specific high-value datasets and the arrangements for their publication and re-use.
    - Almost all datasets (99 %) are available for re-use under the conditions of the Creative Commons BY 4.0 licence, or any equivalent or less restrictive open licence allowing for unrestricted re-use. Those datasets are accessible through their metadata in the CODSI catalogue and CODSI has 80 download services that allow access to the datasets.
    -

High-value datasets accessible through their metadata in the CODSI catalogue.	**2022**
Geospatial	29 datasets
Earth Observation and enviroment	184 datasets
Mobility	3 datasets

    The NSDI catalogue (IDEE) has 9291 datasets and CODSI has 254 resources where the majority are licensed under CC BY 4.0 and accessible through download services.
- Set up of coordination structure (CODIIGE and GTT- Working groups technical) to generate long term cohesion of thematic communities.
- A Geographic Information Inter-ministerial Group (GIIG) is composed the Ministry of Agriculture, Fisheries and Food (MAPA) and The Ministry for the Ecological Transition and the Demographic Challenge (MITERD). units working with GI and one of its responsibilities is to coordinate INSPIRE activities like the identification of priority data.
    - The Geographic Information Inter-ministerial Group (GIIG) and CODIIGE coordinate environment thematic sub group like Hydrography, Protected sites, Species distribution, Meteorological geographical features, Habitats and biotopes, Environmental monitoring facilities, Agricultural and aquaculture facilities, Area management/restriction/regulation zones and reporting units, Atmospheric conditions, Bio-geographical regions, Energy resources, Production and industrial facilities and Natural risk zones.
    - GIIG provides an unified coordination of inventory of data sets related with INSPIRE themes & their obligations regarding the EEA.
- **Spain's recovery and resilience plan:**
    - Procurement for the modernisation of the Spatial Data Infrastructure for Spain (IDEE) through the Recovery, Transformation and Resilience Plan with an estimated budget of 11 052 000 € for the next 4 years (2021-2024). The contracts cover the following topics
        - Technological platform on the cloud.
        - Adaptation of the IDEE to the new technological specifications such as the implementation and configuration of new network services compliant with INSPIRE Directive based on the API-OGC and development of client applications for their exploitation. (for example here)
        - Postal address service web management system: Working on the creation of national geocoder service to publish official addresses that will be the result of the harmonization and integration of official addresses the main suppliers of information about addresses at national, regional and local government organizations. In this project involves Directorate General for Cadastre, Basque Government, Government of Navarre and another regions like Valencia, Madrid, Andalucía... All of them are supported with the Postal Codes provided by the Post Office Group, names of streets of National Statistics Institute together with the official settlements of National Geographic Institute (IGN Spain).
        - Development of a national vector tile service: Creation of official base map multiscale from official sources national, regional and local sources. Its technology is based on vector tile services.
        - Design and implementation of the processes for the integration of traffic direction information from OSM into the transport network database of Spain
        - Maintenance of national catalogues, validation of metadata and publication on the open data portal
- Strengthening the work carried out between the Cadastre and the Land Registry. The Spanish Law 13/2015 implements an effective coordination of transactions executed by Cadastre and the Property Rights Registry. These institutions are two separate organizations with differentiated mandates and competences, both working in the domain of land administration. The Cadastre, registries and notaries have worked together to design a technologically advanced model of institutional interaction for this coordination purpose based in the INSPIRE GML of the Cadastral Parcel and the position of the Building.
- Navarra Territorial Information System (SITNA) Strategic Plan 2020-2023
- New geoportal of Marine Hydrographic Institute (IHM), Ministry of Defense.

Conferences and workshops in 2022

- The **XIII Iberian Conference on Spatial Data Infrastructures 2022** was held in Seville from 25 to 27 october under the slogan "Experience and Technological Evolution: bringing SDI closer to citizens" with a participation of 780 attendees (face-to-face and virtual assistants) from Spain, Portugal and Andorra.
- The **Free GIS conferences 2022** is an initiative of the SIGTE, a conference dedicated to the free software in the field of the Geographical Information Technologies. This event takes place at the University of Girona, since 2007.
- Holding of two Working Group for the NSDI (GTIDEE) meetings where MIG and MIG-T activities and other topics such as API-OGC are disseminated.

Functioning and coordination of the infrastructure

- To facilitate data and service sharing and use has been developed:

    - Spanish SDI Geoportal (IDEE) provides access to around 46 catalogues from national, regional and local nodes.
    - Official Catalogue of Inspire Data and Services (CODSI) provides access INSPIRE data sets and network services. This catalogue is connected via harvesting or file interchange with the catalogues of national and regional SDI nodes, is the base for the monitoring process and for feeding the INSPIRE Geoportal. All INSPIRE compliant services available in Spain are available in European INSPIRE Geoportal.
    - Spanish Registry
- Much more OGC services are available but not all are INSPIRE compliant services.
- The list of key spatial data sets required for other environmental policies is already identified.
- Big effort on training, seminars, events at regional and local levels; twitter @IDEESpain (2949 followers), electronic monthly bulletin “SobreIDEs” http://www.idee.es/boletin-sobre-ides and Spanish SDI Blog "Blog IDEE" with 88 articles in 2022 (120 articles in 2021, 201 articles in 2020, 238 articles in 2019...)
- Thematic Working Groups (GTT), was asked to produce Guides about how to make compliant with INSPIRE the identified datasets and the already implemented view and download services. These Thematic Working Groups (GTT) have translated INSPIRE Technical Guidelines (Data Specifications) and have adapted to the case of Spain. These technical documents are available here.

INSPIRE priority dataset

- Identification of priority data through environment ministries: The Ministry of Agriculture, Fisheries and Food (MAPA) and the Ministry for the Ecological Transition and the Demographic Challenge (MITECO).
- The MAPA and MITECO SDI Geoportal is the central access point to the INSPIRE priority data set provided for environmental reporting

Cadastral Parcels, Addresses and buildings

- INSPIRE GML used as exchange format of Cadastral Parcels, Addresses and buildings in the real estate traffic in Spain. These themes are downloaded though **ATOM service of General Directorate for Cadastre, Govern of Navarre and Basque government.** These services allow the completed download by municipality of the INSPIRE data set.
- The Spanish Mortgage Law and the revised text of the Law of Real Estate Cadastre, following its reform by Law 13/2015, of 24 June, establish a system of coordination between the Cadastre and the Property Rights Registry, so that Property Rights Registry incorporates the georeferenced graphic description of the registered properties, using the cadastral cartography as a basis.

Mineral Resources and Energy Resources

- Mining Cadastre: Article 4 of Law 6/1977, of 4 January, on the Promotion of Mining, establishes that the Ministry of Industry, currently the Ministry for the Ecological Transition and the Demographic Challenge (MITECO), will have a Mining Register, which will consist of a permanently updated public archive of all existing mining rights in the national territory, territorial sea and continental shelf, with their corresponding map. The competence over mining rights lies with the Autonomous Communities, which manage the data in their respective mining cadastres.
- Petrol Stations Geoportal: The Petrol Stations Geoportal is based on the information submitted on the basis of Order ITC/2308/2007, which determines the form of submission of information to the Ministry of Industry, Tourism and Trade, on the supply activities of petroleum products, which involves the development of Art. 5 of Royal Decree Law 6/2000 of 23 June, on urgent measures to intensify competition in goods and services markets.
  Geoportal is a collaborative project between different administrations (National Geographic Institute, General Directorate for Cadastre, Ministry of industry, trade and tourism, National Energy Regulator (CNE) and Competition Authority (CDC) in Spain) and enterprises of the energy sector (operators in gas stations businesses: Repsol, Cepsa,BP, etc.). Petrol Station Geoportal (Hydrocarbons) allows to citizens savings of 60 million €/year.
- Hydrocarbon Technical Archive: This archive is regulated in Article 12 of Law 34/1998, of 7 October, on the hydrocarbon sector and in section 2.3 of Article 11 of Royal Decree 2362/1976, of 30 July, approving the Regulations for the application of the Law on hydrocarbon research and exploitation of 27 June 1974, applicable in accordance with the Second Transitional Provision of Law 34/1998, of 7 October. The infrastructure associated with the archive also makes it possible to comply with the provisions of Article 3 of Directive 94/22/EC of the European Parliament and of the Council of 30 May 1994 on the conditions for granting and exercising authorisations for the prospection, exploration and production of hydrocarbons, with information on geographical areas subject to applications and available areas being permanently available and up to date.

Geospatial Code

- The Geospatial Code is a compendium of the principal national and European laws and regulations of interest to the Cartography, Geographic Information and Topography sectors and to Lawyers, Notaries, the Cadastre and the Property Registry. It is included in the Electronic Code Library of the Official State Gazette (BOE). The standards included are those officially published by the BOE, mainly being Laws or Royal Decrees.

Usage of the infrastructure for spatial information

Some figures about metadata and catalogues

- Registers are published through the following national catalogues
    -

National Catalogues Number of resources	**2019**	**2020**	**2021**	**2022**	**Type of dataset**	**Description**
IDEE Catalogue	10500	11461	13120	14155	Most datasets have minimum use and access restrictions like CC BY 4.0	This catalogue is connected to each of the national, regional and local SDI node catalogues.
Official Catalogue of Inspire Data and Services (CODSI	457	527	543	245 datasets 321 services	All of them resources have minimum use and access restrictions like CC BY 4.0	Catalogue prepared for the harvesting of the European Commission on the 15 th of December each year. (Publish all priority data)

Spanish Open Data	-	-	543 of out 58.000	543 of out 68.492	All resurces are open data	Promoting the openig of public and development advanced services based on data.
Ministry of Agriculture, Fisheries and Food (MAPA) and Ministry for the Ecological Transition and the Demographic Challenge (MITECO) Catalogue	84	91	92	155 datasets 192 services	75 (2022) Priority datasets for reporting under the enviromental legislation.	Publish priority dataset

Note: On this website you can consult all the catalogues of the other Spanish SDI nodes.

Regional Catalogues	**URL Geographic catalogue**	**2022** Number of resources
Andalusia SDI	here	5610
Aragón SDI	here	16724
Balearic Islands SDI	here	208
Canary SDI	here	505
Cantabria SDI		150
Castile and Leon SDI	here	128
Castile–La Mancha SDI	here1, here 2	69, 85
Catalonia SDI	here	4377
Regional Community of Navarra SDI	here	1597
Valencian Community SDI	here	1124
Extremadura SDI	here	309
Galicia SDI	here	430
La Rioja SDI		700
Basque Country SDI	here	232
Madrid SDI	here	135
Murcia SDI	here	225
Principality of Asturias, SDI	here	109
Total		**32617 regional resources**

- There are hundreds of visualizers in Spain that use the WMS/WMTS of national orthoimages according with Regulation Nº 976/2009 as regards the Network Services. These aerial images are co-financed by the autonomous administrations and national organizations.
- Mobiles are using increasingly WMTS each year, apps for searching, locating, viewing... produces approximately half of request traffic of Spanish SDI node web services.

Some figures on the use of netwrok services:

- The number of service request always has been greater than the year before. Some examples:

The central **Spanish SDI (IDEE)** which is coordinated by the National Center of Geographic Information (CNIG) which provides and publishes many of the core geospatial datasets of the National Cartographic System (SCN) used by many user organizations.

Total number of GB download:

- 2019: 529.966 GB
- 2020: 715.817 GB
- 2021: 884.107 GB
- 2022: 661.099 GB

Total number of requests		**2019**	**2020**	**2021**	**2022**
Total: WMS, WMTS, WCS, WFS and TMS (only 2021)		15.071.997.840	19.108.299.985	23.249.367.348	27.494.671.216
Orthoimagery* * It is the most visited service	1 WMTS	5.006.315.444	6.172.695.458	WMTS: 5.090.382.142 TMS 2.477.149.500	WMTS:1.667.410.816 TMS:5.831.266.215
	1	397.077.414	545.300.882	664.010.265	821.319.939

	WMS				
Land cover and Land use	1 WMTS	17.703.744	20.000.000	21.000.000	7.468.356
	1 WMS	4.729.773	-	-	1.653.821
DTM 5 m and 25 m	1 WMTS	10.112.663	1.547.555	3.431.200	
	1 WCS	-	-	-	61.268.050
MDS (LiDAR)	1 WMTS	-	-	-	17.943.075
	1 WCS	-	-	-	86.615
Transport network, hydrography, building, administrative units, etc.	1 WMTS	4.596.328.242	6.149.213.927	WMTS: 5.898.834.762 TMS:1.227.220.741	WMTS: 1.667.410.816 TMS:2.529.489.180
	1 WMS	103.754.109	84.380.152	98.354.255	133.351.994
Administrative units	1 WMS	109.179.792	154.411.665	280.994	601.384.827
	1 WFS	376.367	532.906	389.069	368.380
Addresses	1 WMS	.	.	280.994	11.286.887
	1 WFS	24.956.455	28.722.339	19.133.844	8.347.561
NATIONA GEOGRAPHIC INSTITUTE (IGN) NODE					
TOTAL NUMBER OF REQUESTS		**2019**	**2020**	**2021**	**2022**
22 WMS		386.792.657	1.086.603.543	1.190.443.472	1.908.622.017
7 WFS		31.010.430	41.859.494	19.589.574	10.453.976
7 WMTS		14.033.236.624	17.898.104.072	16.642.860.898	6.733.287.150
TMS		.	.	5.339.072.517	18.780.864.538
Ministry of Agriculture, Fisheries and Food (MAPA) and the Ministry for the Ecological Transition and the Demographic Challenge (MITERD) SDI					
Total number of requests				**2021**	**2022**
WMS				150.449.599	112.104.591
WMTS				38.262.839	34.003.746
WFS				579.592	447.999
Total WMS/WMTS/WFS				189.292.030	146.558.358
CSW				282.782	346.393
Mineral Resources and Energy Resources					
WMS, WMTS, WFS, WCS					11.688.717

Some figures on regional SDI nodes:

SDI Basque Country known geoEuskadi accessible through its geoportal www.geo.euskadi.eus, is the reference geoportal for geographic information iof the Spatial Data Infrastructure (SDI) of the Basque Country with the aim of guaranteeing the reuse and easy and efficient access to the geographic information. It facilitates the publication of geographic data and services to the bodies and entities of the public sector of Basque Country, as well as allowing easy and efficient access to this information and other information published by other SDI nodes at State, Foral and local level. GeoEuskadi coordinates SDI Provincial Council of Álava (GeoAraba), SDI Gipuzkoa and SDI Bizkaia (GeoBizkaia)

Total number of requests of network service	**2021**	**2022**
WMS, WMTS, WFS	232.676.357	113.245.651
Other services	38.349.996	50.559.269
Resources (Catalogue)	232	232

- a) Provincial Council of Gipuzkoa: SDI Gipuzkoa

Total number of requests of network service	**2021**	**2022**
WMS, WMTS/TMS, WFS	53.092.026	39.263.421
Other services	1.329.023	1.599.830
Total number of GB download	4.888,13	7.369,84
Features download (GML)	586	302

Resources (Catalogue)	18	18

- b) Provincial Council of Álava (GeoAraba): GeoAraba is the project for the management of cartographic maps promoted by the Town Planning area belonging to the Environment and Town Planning Directorate and the Alava Calculation Centre.

Total number of requests of network service	**2021**	**2022**
12 WMS	19.129.597	26.505.980
Cadastre WFS	50.368	43.704
Resources (Catalogue)	39 datasets / 20 services	39 datasets / 20 services

- c) SDI Bizkaia (GeoBizkaia): GeoBizkaia is the Spatial Data Infrastructure (SDI) of Bizkaia that seeks to provide homogeneity and transparency to the Geographic Information System of the Provincial Council of Bizkaia.

	2022
Resources (Catalogue)	118 datasets / 7 services

Territorial Information System and Spatial Data Infrastructure of Asturias (SITPA--IDEAS): SITPA-IDEAS is the reference geoportal where all the geographic information of interest of the Principality of Asturias is concentrated.

Total number of requests of network service	**2021**	**2022**
WMS / WFS	3.808.501	7.460.261
WMTS	1.273.510	1.531.647
Features download (GML)	1526 out of 76200	706 out of 76200

Aragón Government (IDEAragon): The Spatial Data Infrastructure of Aragón (IDEAragon) is a technological solution developed by the Geographic Institute of Aragón (IGEAR). IGEAR is a dependent service of the Directorate General of Territory Planning of the Aragón Government. IGEAR is dedicated to manage the production, obtain and treatment of the territorial documentation, as well as the diffusion of territory planning information. Now IDEAragon is called ICEARAGON.

Total number of requests of network service	**2020**	**2021**	**2022**
WMS / WFS (WMTS in 2022)	18.132.970	19.433.170	20.003.306
CSW / WCS	928.669	824.119	951.563
GB download (WMS, WFS)	9.027,420 GB	8.174,670 GB	18.148,23 GB
Features download (GML)	2.557	1.872	1.606

The SDI of Aragon is working to include the knowledge graph in the geographic information search clients. The development is expected to be published in 2023. Example: https://icearagon.aragon.es/Buscador/inicio

- Monitoring INSPIRE of 300 network services There is a website, on Spanish SDI geoportal, where you can know if Spanish network services are available twice a day.

Although view services (WMS/WMTS) are used by many users and, the key is web mapping applications. It is complicated to know more about the individual end-users of those applications, it says something about how the value is generated. In some cases the applications are general web mapping viewers, in other cases they support dedicated work processes of public authorities.

Data sharing arrangements

There are hundreds agreements or conventions co-financed by the autonomous administrations and national organizations. These agreements usually are collaborationand institutional between national, regional anl local organizations. Many of these agreements are reflected in the National Cartographic System (SCN). Another good example is agreements between environmental organisations and departments of MAPA and MITECO.

National Cartographic System (SCN)

- Existence of big projects of collaborative data production and harmonisation under the umbrella of **National Cartographic System (SCN)**, which include sharing of resulting data; the on-going production of georeferenced reference data increased the sharing of data between public admin. The web site of SCN has a list of public bodies collaborating in the production of geographic data products each year as a result of collaboration agreements with IGN Spain.
  - For example: The following national and regional organisations have collaborated in the capture of the orthoimagery: National Geographic Institute, Spanish Agrarian Guarantee Fund (FEGA), General Direction of Cadastre, Autonomous Communities of Aragon, Canary Islands, Catalonia, Valencian Community, Andalusia, Extremadura, Murcia, Galicia, Castile and León, Castile La Mancha, Asturias, Cantabria, Rioja, Navarre, Basque Country, Balearic Islands and Madrid.
  - Basque Country: Agreement signed on 17 May 2021, by which the Basque Country joins the National Cartographic System and no specific agreements, but there are several initiatives to share geographic data of different kinds between the administrations of the Autonomous

Community of the Basque Country and other public entities.

- As part of the Open Data initiative, the open licence format adopted by the SCN is the Creative Commons Attribution (CC-BY 4.0) licence, which allows for maximum dissemination and use of licensed resources.Final products are shared and published on NSDI network services under a CC BY 4.0 license.
    - Some examples of Spanish collaborative projects aimed at obtaining a full coverage of products considered as basic reference data and represent “Geospatial Reference Information Data Base (GRI)”: Aerial Orthophoto National Plan, PNOA - High resolution coverage of aerial orthophotos, digital elevation models, Spanish Land Cover Information System, SIOSE - Land cover information system, Transport networks, Hydrography..
- **Official Geographic Information basemap**, for use in displays with vector tiles technology is a project to develop an official vector tile service of the Spanish national territory will be offered based on official geographic information are generated by all Public Administrations, gathered in the Spanish National Cartographic System. The objective is to produce a distributed collection of multi-scale vector tiles services containing the geographical elements necessary for the representation of different cartographic products in of the Spanish territory and also in the global scope. https://sgtmapabaseigo.github.io/MapaBaseIGO/
- Some regions have signed collaboration agreements with all the municipalities in their territory.
- There is a wide sharing and reusing data culture. Some public bodies use to share geodata among them without any formal agreement.

Property and land administration:

- In Spain, the Cadastre and the Property Rights Registry are two separate institutions with differentiated mandates and competences, both working in the domain of land administration. The Spanish Law 13/2015 implements an effective coordination of transactions executed by both institutions. The Cadastre, registries and notaries have worked together to design a technologically advanced model of institutional interaction for this coordination purpose based in the INSPIRE GML of the Cadastral Parcel and the position of the Buildings.

  Any modification of the physical characteristics of the cadastral parcels must be done taking as reference the Cadastral Cartography, that it is the unique official geographic representation of the cadastral parcels. Therefore the cadastre offers freely the INSPIRE GML of the parcels in several ways :WFS, ATOMS, embedded in the cadastral certificates or even through interactive tools in the Electronic Office of the Cadastre that provides, between other tools, cartographic viewer that allows access to all cadastral information and the parcel edition (INSPIRE GML) or a “Cadastral Editor” to use for the modification of the parcels.

  The citizens and the public authorities that work in the territory have the duty to communicate to the Cadastre any change of the parcel (segregation, union, new construction, etc..) or when the cadastral cartography does not sufficiently reflect the physical reality, procedures have been defined for updating the graphic data of the parcel involved through the use of alternative georeferenced graphic representations. These alternative representations are expressed also in the INSPIRE GML Cadastral Parcel format and are validated in the system providing a graphic validation report with the INSPIRE GML of the new parcels.

  In order to register a building in the Property Rights Registry, the georeferenced of its position is also required by the law 13/2015 and therefore we have done a step further, creating the mechanism to use for that the INSPIRE GML BU too.

  The INSPIRE GML of the graphic situation of the cadastral parcel as certified by the Directorate General for Cadastre is embedded in the cadastral certification and the graphic validation report. The Directorate ensures the authenticity and integrity of its contents. Both products are electronic documents, signed using a secure 16-digit verification code (CSV). This code unequivocally identifies the document in the Directorate General for Cadastre’s catalogue. The exchange between the various stakeholders requires only the 16-digit barcodes. This avoids the need to physically exchange computer files, allows the visualisation of the new representation without GIS tools and enables the automated capture of its contents, thus preventing possible transcription errors.

  The georeferencing of the parcels, expressed through the INSPIRE GML format of a cadastral parcel, is now widely used by all agents involved in property transactions in Spain. This is intended to give greater security to the data on the location, delimitation and surface area of the registered properties that are the subject of legal transactions. In this way we are enhancing interoperability between Directorate General for Cadastre and Property Rights Registry, simplifying administrative procedures and reducing costs.

References to INSPIRE or other relevant standards in procurement documents

- More and more national, regional and local organizations have realised that INSPIRE play a key role in the standardized way publication and their benefits, therefore more and more procurement documents in recent years, where references to INSPIRE or other relevant standards are made. These procurement documents are for national, regional and local organizations. (See https://contrataciondelestado.es).

Costs and benefits

Costs:

Some figures:

A study performed in 2019 has roughly evaluated the annual cost of the national node of Spanish SDI in 120,000 € and the social benefits provide society with publishing viewing services in 1 M €, of a published map tile using its API. An approximated not very accurate estimation of cost-benefits ratio gives a result of at least 1:8 which must be only considered as an idea of the order of magnitude.

Spanish SDI (IDEE)	**2020**	**2021**	**2022**
Estimated annual cost per web service	2.670 €	2.670 €	2.670 €
Estimated annual cost of maintaining a Spanish SDI geoportal.	50.000 € (new)	25.000 €	25.000 €
Develop and maintenance of Open Source API	400.000 € (new)	100.000 €	100.000 €
Publication of SCNE datasets via OGC APIs	-	-	87.139 €
NSDI Catalogue (IDEE), CODSI and another tasks		18.076 €	22.093 €
MAPA and MITERD SDI is the central access point to the INSPIRE priority data set provided for environmental reporting.	**2020**	**2021**	**2022**
Estimated annual cost per web service	1.047 €	1.375 €	1.374,59 €

Estimated annual cost of maintaining a geoportal	-	1.371.837 €	1.371.837 €
Estimated total annual cost (including maintenance of geoportals, clients and services, developments, operation, etc.)	1.020.016 €	1.371.837 €	1.371.837 €
Basque Country SDI:Estimated total annual cost (including maintenance of geoportals, clients and services, developments, operation, etc.)	-	-	850.000 €
ICEARAGON		60.920 €	88.935 €
Territorial Information System and Spatial Data Infrastructure of Asturias (SITPA--IDEAS): Estimated annual cost per web service (71 OGC services =Total 9454 €)			133 € /service
	2020 (savings)	**2021 (savings)**	**2022 (savings)**
Aragón Government (IGEAR): The free network services provided by Aragón Government (IGEAR) have generated the following savings to the companies:			
EU average session cost: €6.11 according to EU/IGN source	Gross savings: 111.873.667€ Actual savings: 593.683 €	Gross savings: 111.873.667€ Actual savings: 593.683 €	Gross savings: 12.240.199€ Actual savings: 612,009 €
Average session cost in Spain 5.5 € according to INE source	Potential savings: 10.688.243 € Actual savings: 534.412 €	Potential savings: 10.688.243 € Actual savings: 534.412 €	Potential savings: 11.018.183 € Actual savings: 550.909 €
Service of ARAGEA	-	928.699 €.	-
IGEAR estimates € per request/service.	-	0,33 €	0,33 €

Spain's recovery and resilience plan

- Procurement for the modernisation of the Spatial Data Infrastructure for Spain (IDEE) through the Recovery, Transformation and Resilience Plan with an estimated budget of 11.052.000 € for the next 4 years (2021-2024). The contracts cover the following topics
  - Technological platform on the cloud
  - Adaptation of the IDEE to the new technological specifications such as the implementation and configuration of new network services compliant with INSPIRE Directive based on the API-OGC and development of client applications for their exploitation.
  - Postal address service web management system.
  - Development of a national vector tile service.
  - Development and implementation of integrated technological solutions for use cases.
  - Design and implementation of the processes for the integration of traffic direction information from OSM into the transport network database of Spain
  - Maintenance of national catalogues, validation of metadata and publication on the open data portal

Benefits:

Economic benefits of the SDI central node (CNIG and University of Leuven)

- A study about the benefits and value of the Central SDI-node of Spain by KU Leuven and CNIG to develop and test a methodology for quantifying the benefits or value of the central SDI-node of Spain by comparing WMS/WMTS using figures with the fee-models applied by some Member States (France, Finland and Sweden) and the feed-model applied by Google for its Google Maps API's. Moreover, also the value of the geospatial datasets downloaded is quantified based on the fee-models applied in some of the Member States.
  - The major objective of this study is to develop and test a methodology to estimate the economic benefits generated by the central SDI-node of Spain, which is coordinated by the National Geographic Institute of Spain (IGN-ES). Benefits estimation is understood as an approximate calculation - as accurate as possible - in monetary terms of the value of the web services and data in the central SDI-node based on a set of objective considerations and criteria. The central SDI node comprises all the SDI resources published on the web by the same organization, IGN-ES, as coordinator of the Spanish SDI.
    The benefits produced by documents, utilities, tools, links and communication channels are considered much smaller and even negligible than the benefits derived from the use of spatial data sets and services, therefore the study approximates the total benefits by the benefits of the use of geographic web services and geographic data. In this study the most used services, i.e. for visualization (WMS and WMTS), and the datasets download services implemented in the National Centre of Geographic Information (CNIG-ES) download centre1 are taken into account. The contribution to the benefits of other types of services (e.g. WFS, WCS) is considered negligible and they are therefore not in the scope of this study. In practice, the most used WMTS (6), WMS (13) and downloaded datasets (4) are considered.
  - All figures of the study have been brought together in an XLS template with calculations represented in two ways:
    1. All the key WMTS and WMS are listed in the spreadsheet as rows with their name, URL and the measured number of requests, and with all the calculations according to the different scenarios.
    2. A summary table providing an overview per year in which the value of the parameters can be changed providing immediately the corresponding figures.
- Other benefits are:
  - Improving the access to geographic information, establishing core reference data, providing society with the skills and knowledge necessary for handling geographic information, transparency, transversality, be combined with other datasets.
  - Identify where official geographic information can be localised.
  - Official geographic information integrate with broader public data infrastructures and external data sources.
  - Adopt an open and collaborative methodology to design and improve digital public services.
  - Allow to reuse existing official data sets, networks services and relevant technical solutions where possible.
  - Facilitate the use official datasets and network services by non-governmental actors to stimulate innovation in products and services and enable job creation and growth.
  - Adopt an open and collaborative methodology to design and improve network services.

    - The balance cost/benefits are positive although in many cases the benefits are difficult or impossible to quantify.
    - Facilitating the availability and free access to the Administration's geographic information.
- Spanish network services becoming daily working tools in many public administration and private companies. Generalised culture of sharing data and information, increasing of open data available in the web, and a strong incentive to regularly and collaboratively to produce very expensive data (like the national coverage of LiDAR and ortophoto) are among the benefits.

The Data Economy in the Infomediary field

ASEDIE, Multisectorial Information Association, brings together infomediary companies, which use, re-use and distribute information from different sectors, creating value-added products that contribute to greater security for global merchant traffic by boosting the economy through the application of methods that favor the reliability and transparency of commercial transactions in the business world. **ASEDIE's annual report** highlights the following conclusions:

- ASEDIE, brings together, among others, the main companies in the Economic and Financial Information subsector, this allows Asedie to have easier access to the most complete commercial information databases in the market, due to this for the elaboration of the report Asedie counts on an exhaustive universe of companies operating in Spain.
- "**Geographic Information**" is the subsector that groups most of the infomediary companies. The "**Geographic Information**", "Market Research", "Economic & Financial" and "Infomediation Technology" subsectors account for **76% of the infomediary companies**, uniting a total of 540 entities.
- Sales: "**Geographic Information**" and "Economic & Financial" subsectors, account for **46% of the sale**s volume.
- Employees: Four subsectors represent 75% of the total amount of employees in the Sector, "**Geographic Information**" stands out with **30% of the tota**l. After that with silimar percentages are the "Economic & Financial", "Technical Consulting" and "Market Research" subsectors. The rest represent 25%, all having below 10% of the total amount of employees.
- Subscribed Capital: The three most capitalized subsectors are "Market Research" , "Economic & Financial" and "**Geographic Information**", which account for **66% of the total capitalization**. The two with the lowest are "Tourism" and "Meteorológical" with barely 0,4%.
- 100% of those surveyed confirm positively that the **standardization of geographic information** is essential for the development of efficient geospatial solutions. With more than 60% strongly agreeing with the statement.

Key facts and figures

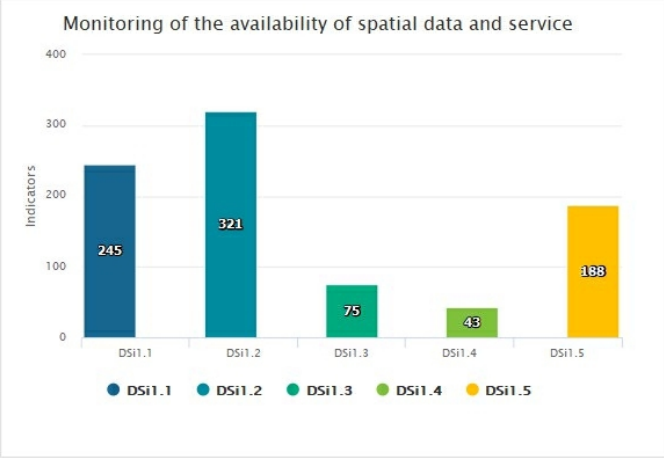
Spain

Indicators in support of Commission Decision (EU) 2019/1372 implementing Directive 2007/2/EC (INSPIRE) as regards to monitoring and reporting

Graphs generated with data taken from: https://inspire-geoportal.ec.europa.eu/mr2022_details.html?country=es

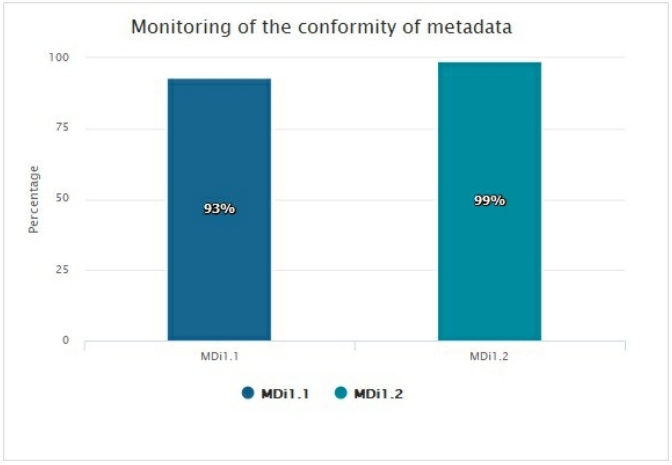
The date of harvest metadata: *2022-12-16, 19:03:39*

Endpoint: *917ecef2-030d-4f61-a874-a8fa45dbb1e5*



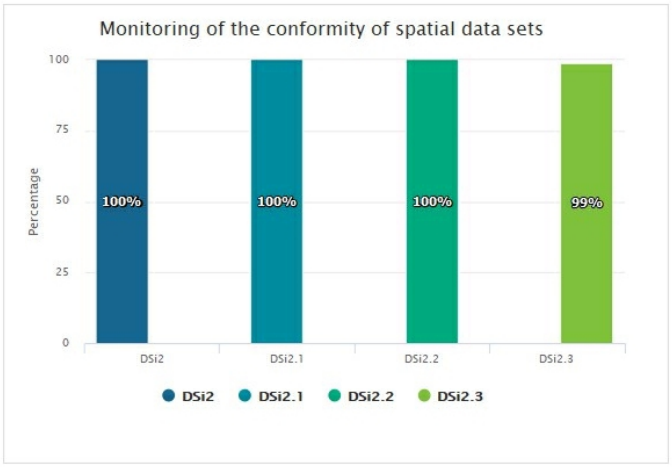
Legend

Indicator	Definition
DSi1.1	The number of spatial data sets for which metadata exist
DSi1.2	The number of spatial data services for which metadata exist
DSi1.3	The number of spatial data sets for which the metadata contains one ormore keywords from a register provided by the Commission indicating that the spatial data set is used for reporting under the environmental legislation
DSi1.4	The number of spatial data sets for which the metadata contains a keyword from a register provided by the Commission indicating that the spatial data set covers regional territory
DSi1.5	The number of spatial data sets for which the metadata contains a keyword from a register provided by the Commission indicating that the spatial data set covers national territory



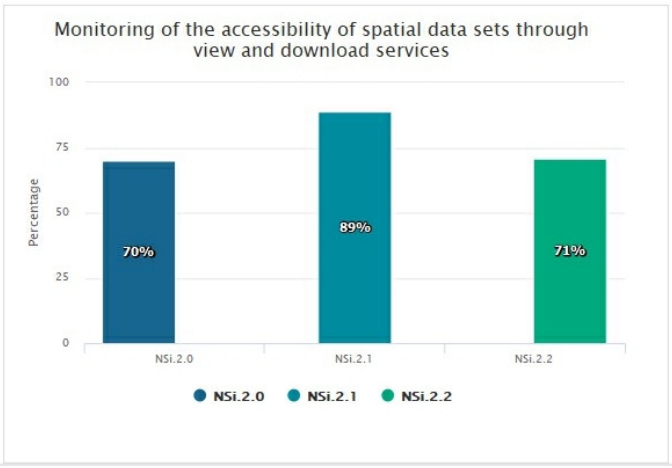
Legend

Indicator	Definition
MDi1.1	Percentage of metadata for spatial data sets conformant with Commission Regulation (EC) No 1205/2008 as regards metadata
MDi1.2	Percentage of metadata for spatial data services conformant with Commission Regulation (EC) No 1205/2008 as regards metadata



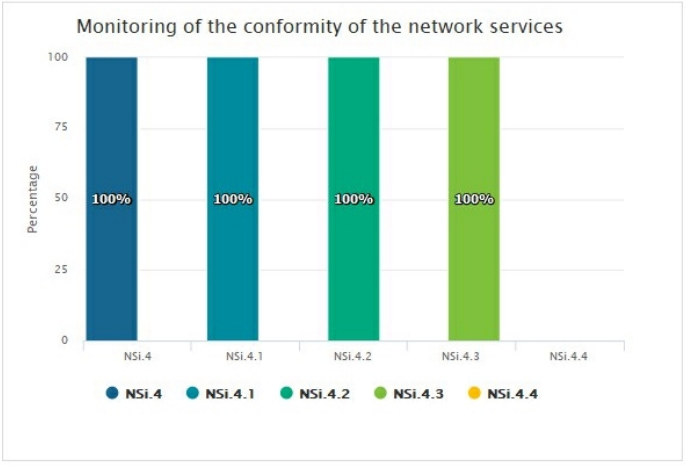
Legend

Indicator	Definition
DSi2	Percentage of spatial data sets that are in conformity with Commission Regulation (EU) No 1089/2010 as regards interoperability of spatial data sets
DSi2.1	Percentage of spatial data sets, corresponding to the themes listed in Annex I,that are in conformity with Commission Regulation (EU) No 1089/2010 as regards interoperability of spatial data sets
DSi2.2	Percentage of spatial data sets, corresponding to the themes listed in Annex II, that are in conformity with Commission Regulation (EU) No 1089/2010as regards interoperability of spatial data sets
DSi2.3	Percentage of spatial data sets, corresponding to the themes listed in Annex III,that are in conformity with Commission Regulation (EU) No 1089/2010 as regards interoperability of spatial data sets



Legend

Indicator	Definition
NSi.2.0	The Percentage of spatial data sets that are accessible through view and the download services
NSi.2.1	The Percentage of spatial data sets that are accessible through view services
NSi.2.2	The Percentage of spatial data sets that are accessible through download services



Legend

Indicator	Definition
NSi.4	Percentage of the network services that are in conformity with Commission Regulation (EC) No 976/2009 as regards the Network Services
NSi.4.1	Percentage of the discovery services that are in conformity with Commission Regulation (EC) No 976/2009 as regards the Network Services
NSi.4.2	Percentage of the view services that are in conformity with Commission Regulation (EC) No 976/2009 as regards the Network Services
NSi.4.3	Percentage of the download services that are in conformity with Commission Regulation (EC) No 976/2009 as regards the Network Services
NSi.4.4	Percentage of the transformation services that are in conformity with Commission Regulation (EC) No 976/2009 as regards the Network Services