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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 2020](#) acquired in December 2020 and Member States update.

The Norwegian Mapping Authority is responsible for the coordination of the Spatial Data Infrastructure (NSDI) in Norway. The authority has the responsibility for the monitoring and reporting of the INSPIRE directive, and holds the role as the Norwegian National Contact Point.

State Of Play

The Norwegian NSDI cooperation "Norway Digital" was established in 2005. The cooperation now comprises more than 500 parties, including about 50 governmental authorities and ministries with interest in spatial data management, all municipalities, all county administrations and 130 electricity and other utility companies. The participation of each party is formalised by means of an agreement. The Norwegian NSDI has a broad representation from different sector organisations.

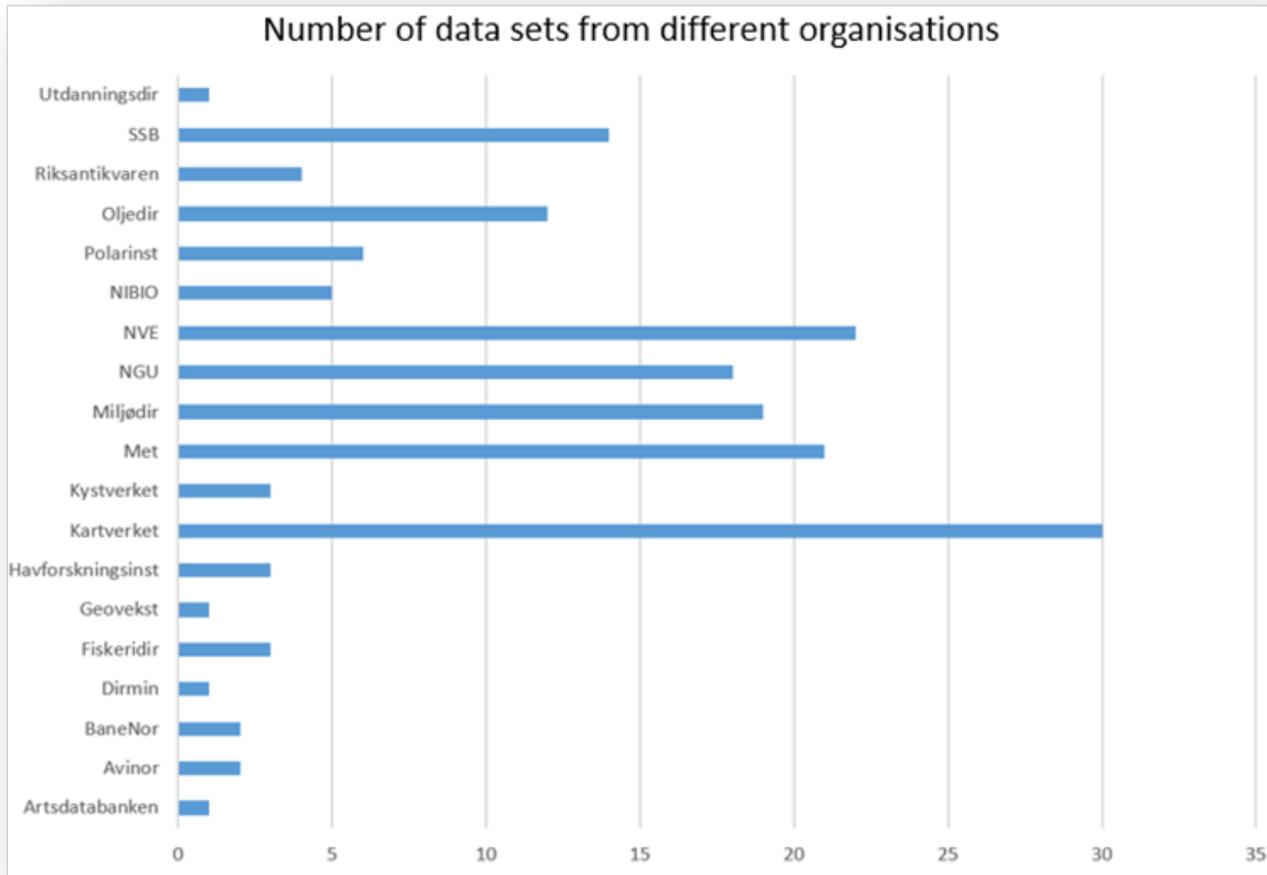
The Ministry of Local Government and Modernisation recommends and mandates Norway Digital to coordinate actions by the parties to fulfil requirements defined in the Norwegian Geodata act (2010). The Geodata act and bylaws implements the Inspire directive in Norwegian law in accordance with the EEA Agreement, cf. point 1j in Chapter I of Annex XX of the Agreement. The Agreement apply a somewhat different implementation timetable for the EEA-EFTA member states. Hence the deadline for Norway on data harmonization is 2020 for Annex I data and 2023 for Annex II and III data.

"Norway Digital" is the main mechanism for the Inspire implementation.

The INSPIRE implementation efforts have in the recent years mainly focused on the identification, description and tagging of as-is INSPIRE datasets, and progress has been good. These data are of high-quality and are being used in everyday digital work flows in municipalities, county administrations, national authorities and the private sector. Most of the data are harmonized according to national data specifications, adapted to the national legislation and everyday work in most sector activities, e.g. roads and rail management, crisis management, environmental management at all levels, land use and city planning, coastal zone management, fisheries, agriculture, defence and security. The Norwegian as-is data aims to follow major Inspire regulations, such as data sharing principles and accessibility of network services etc. The quality of data content has increased steadily the last years, as has the use in digital processes. Data and services are well documented with metadata following the INSPIRE principles. The Norwegian implementation may be seen as a model for integration of Inspire spatial data infrastructure into the digital economy and digital public work flows.

Concerning harmonization requirement according to Inspire data models, progress is lower, but Norway has pr. 1.1. 2021 twelve harmonized datasets available in the INSPIRE geoportal.

Many organisations offer sector specific data. 19 organisations offer data that falls under the Inspire directive thematic focus.



The data content that is delivered generally holds a very high quality, with a high level of detail and accuracy. Many of the Norwegian Inspire data services are incorporating or based on detailed data from locally organised data capture. Many of the themes also have a reasonable to high updating frequency.

Issues on conformity - technical requirements

The Inspire directive and underlying regulations define a series of requirements. Norway has a dedicated work on delivering according to the requirements. There is a good overall response on data sharing. The number of services has increased the last years. However, the developments towards all technical requirements is relatively low - particularly when it comes to conformity of services. This may be seen in several validation services offered by the European Commission. The Norwegian Inspire coordinator has identified some issues that is linked up to implementation methods and tools offered by the EC – and that should be looked at on central level in the EU;

1. Norway is offering the metadata in Norwegian. This is the same practice as most EU countries – offering metadata in their own language. Norwegian was accepted as a valid language until 2-3 years back (the old validator), but recent validator are not accepting Norwegian as a main metadata language. The Norwegian metadata also provides title and descriptions in English using the localized language element. The effect is that no metadata of as is data are validated as high quality metadata. As Norway has agreed with EU on implementing Inspire through an European Economic Area-agreement, we should also have the possibility to deliver in Norwegian. The issue has been raised with technical personnel, as we advise to change practice so that Norwegian is accepted as a valid language.
2. The coupling of data sets and services is important for users to find data. The Norwegian reporting values are still relatively low for view services. The method defined by Inspire requires specific implementation in WMS get capabilities, which has not been possible or problematic to implement by many international software vendors, like ESRI. Norwegian implementing organisations find it too resource consuming and troublesome to change well-functioning software by these Inspire-specific requirements. National infrastructure is working well with other ways of coupling data sets and services (coupling in metadata). Inspire should therefore implement other ways of dataset-service coupling, as has been the EU Inspire plan the last years. In addition, EU should put pressure on software vendors to implement full support for Inspire specific features and financially support open source project to implement the features.

3. The Atom Feed download service offered by Norway is according to the Inspire regulation and guidance documents as far as we can see. However, the validation fails when we have several links to downloadable dataset (regionally divided datasets) for each entry in the dataset feed. Norway has reported the problem, however, the Inspire validator has not yet been changed.

Delivery of priority environmental reporting data

EU Commission has defined certain Inspire data sets to be of high priority. A sub-group under the Maintenance and Implementation Work Programme 2017-2020 has developed a list of datasets related to environmental reporting (PDS).

The list defines approximately 90 dataset. Approximately 45-55 of these are relevant for Norway.

So far, the Norway has established 14 dataset with metadata and as-is view-services. This number corresponds to 28 datasets in the list. Download services according to Inspire-standards (WFS and Atom) are not established, and there are technical issues regarding linking between metadata and services that needs to be sorted out.

Data to Eurostat, EU Commission Services, EEA, Copernicus.

The Norwegian Inspire data sets are to serve EU bodies and communities, such as Eurostat, EU Commission Services, European Environment Agency (EEA) and Copernicus services, particularly the Copernicus in-situ (Corda) system. Through 2019 and 2020 the Norwegian Mapping Authority has had contact with representatives for the above mentioned services. Their signals about priority Inspire data are valuable, as efforts then may focus on covering priority needs with these bodies and communities. In this work Norway will have a particular focus on delivering data that fulfils user requirements, e.g. on data quality.

National geospatial strategy and action plan.

A National Geodata strategy was launched in late 2018. In this strategy the government sets an aim to boost the use of spatial data in the Norwegian society, in order fulfil the UN sustainability goals, boost economy and develop an effective and well-functioning public sector. There is a specific focus on developing quality data, with full coverage, up to date information, and accurate localization. User assessment show that data quality is too low to fulfil the existing and planned user needs. An action plan with 29 specific actions has been developed, e.g. on geoportal developments.

Coordination

National Contact Point

Name of Public Authority: Kartverket

Contact Email: [Click to email](#)

National INSPIRE Website: <http://www.kartverket.no>

MIG Contacts: Contact Person: Dag Hogvard

Email: dag.hogvard@kmd.dep.no

MIG T Contacts: Contact Person: Arvid Lillethun

Email: Arvid.Lillethun@kartverket.no

Coordination Structure & Progress:

The Norwegian Mapping Authority is responsible for the coordination of the Spatial Data Infrastructure (NSDI) in Norway. The authority has the responsibility for the monitoring and reporting of the INSPIRE directive, and holds the role as the Norwegian National Contact Point. Responsible ministry is Ministry of Local Government and Modernisation.

The Ministry of Local Government and lands has set a National geodata advisory board, giving high level advice to the ministry.

Both public and private organisations are represented. There is an operative National geodata coordinating committee, as defined in regulation under the geodata act. The latter works on strategic directions, coordinates action and gives advice to the Norwegian Mapping Authority as national coordinator of the spatial data infrastructure. Representatives cover national agencies under each ministry, together with municipality and county representatives. There are underlying technical and thematic working groups.

Functioning and coordination of the infrastructure

The Inspire infrastructure is not seen as an independent infrastructure but as a part of the national spatial data infrastructure.

The implementation is also linked to elements of the national Digital-agenda-implementation.

At national level there is a close follow up of the different stakeholders. Stakeholders are active, delivering according to the Inspire technical requirements where these corresponds the national needs, e.g. sharing data openly and establishing metadata, view services and download services. There is relatively low interest in implementing Inspire harmonized data.

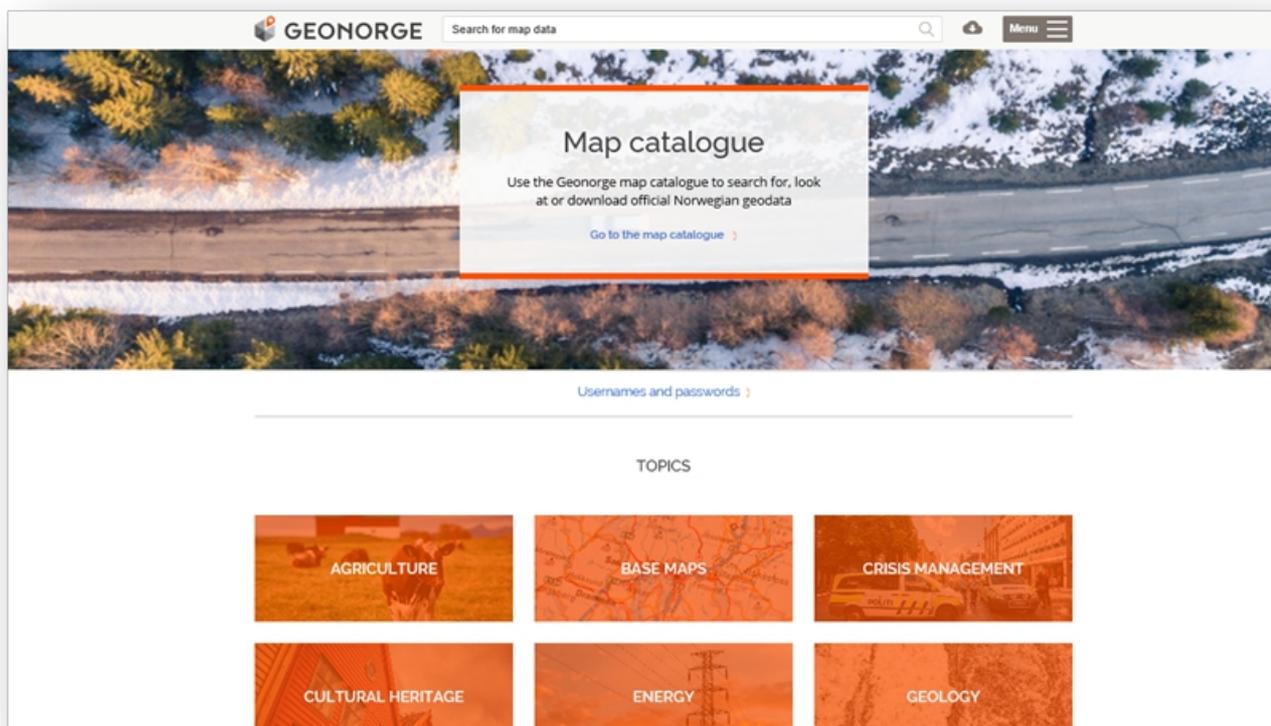
The data content being offered is mostly high quality data. One important initiative in the NSDI is the management of a joint geospatial database with a common set of fundamental geospatial data (called FKB). Data capture and management is being organized by a joint investment program, «Geovekst», lasting for more than 20 years. Most municipalities, roads administration, agricultural sector, energy sector and the mapping authority are parties in the joint program. Recently a national central synchronization service technology has been adopted by a high number of municipalities as part of the joint program. This is an important innovation step allowing data to be continuously being updated in a central database and servicing these most important data as up to date data to the users. Previously, this was a manual process, with updating 1-2 times per year.

Relevant links:

- <https://register.geonorge.no/inspire-statusregister?lang=en>
- <https://www.kartverket.no/geodataarbeid/inspire/>

Usage of the infrastructure for spatial information

The Norwegian geoportal holds a central place in the Norwegian infrastructure. It contains metadata for all datasets and services falling under the INSPIRE directive, as well as other geodata. The portal is free for all to use as a metadata management system and as a discovery service. The portal is developed and maintained by the Norwegian Mapping Authority.



The geoportal www.geonorge.no is a web site but in addition it contains central processing functionalities for data file production, web service production, register management etc. It is becoming an increasingly important element in the general public sector digitalization infrastructure.

Data are available as downloadable files in different formats, e.g. GML, FGDB and Postgis, together with the national format SOSI. Most data sets have corresponding view and download services. The last years there has been a rapid increase in the development of download services being offered through the national geoportal (WFS, Atom Feed, Geonorge download API).

This makes it easy to access data on the fly or subscribe for updated data, e.g. once per day. There is a rapid growth in the use of the subscription tools, by both public sector and private companies. This shows that many users still choose to store data locally, and that on the fly data access is mostly limited to view services.

The use of the data and services is growing. Through regulations in the Planning and Building Act there are expectations in active use of reference data and thematic data in the different phases of land use planning, building permit applications, construction work, environmental impact assessments etc. Advanced checking tools have been introduced the last 3 years, based on spatial overlay analyses in the land use planning tools. This development is depending on the good and growing availability of data and spatial data services.

Municipalities use data and services from the geoportal and spatial data infrastructure, either directly or through systems and cloud services being offered by private companies. The private companies are major users of the infrastructure. Use is also increasing in crisis management, agriculture and forestry, fisheries, transport sector and others.

Data sharing arrangements

Norway has an open data policy. Most spatial data sets (more than 90%) are classified as open. There are good overviews of open data in the Norwegian geoportal and open data licenses have been attached or linked up to the metadata. In Norway mostly two open data licenses are being used, the national open data license (NLOD) <http://data.norge.no/nlod/no/2.0> and the international license Creative Commons (CCBY).

The screenshot shows the Geonorge Map Catalogue interface. At the top, there is a search bar and a menu icon. Below the search bar, the text "Geonorge Map Catalogue" is displayed. A large heading "Map Catalogue" is followed by a sub-heading: "Here is an overview of data sets in Geonorge with information about available formats, associated services and APIs." Below this, there are navigation tabs for "All map data 5258", "Dataset 4023", "Service 1003", "Application 232", and "Articles 23". The main content area is a table with columns: TITLE, DATA OWNER, OPEN DATA, SHOW IN MAP, and DOWN-LOAD. The table lists various data sets such as "TFO Omsøkbart", "Bedrock, scale 1:250,000", "Bedrock structures N250", "FKB-AR5 (Land resource map 1:5.000) - Forest site class", "FKB-AR5 (Land resource map 1:5.000) - Tree types", "FKB-AR5 (Land resource map 1:5.000)", "Atlantic salmon", "Fishery activities - Norwegian fishing vessels", "DMK Historical Digital Land Type Map (1:5.000)", and "D250 Map data". To the right of the table, there is a "FILTER SEARCH ON:" section with expandable categories like "Topic", "Cooperation and laws", "Area", "Distribution form", "Organization", and "Access to data". Below this is a "PAGES" section with links to "Map Catalogue - main page", "Departmental overview", "What is in municipality/county?", and "Open data". At the bottom right, there is a "SAVE AS:" section with a dropdown menu set to "CSV" and a "Save" button.

Metadata contains information if data sets are open or not. This information is harvested by the Inspire geoportal, The European open data portal and the Norwegian open data portal. www.data.norge.no

FAIR implementation in Norway

The Norwegian geospatial infrastructure has coupled the FAIR principles and the OGC and ISO-based requirements defined in Inspire and the national geodata act. The system evaluates the different data set resources according to the FAIR principles. The criteria are adapted also to interpretation in the Open Data Catalogue and the Norwegian Open Data Catalogue (www.data.norge.no). The system is easy to use and gives valuable feedback to both delivery organisations and end users. Examples are found here: <https://register.geonorge.no/mareano-statusregister>, <https://register.geonorge.no/mareano-statusregister/marine-landformer/fedfe0b0-ffe6-4c30-a363-027a66db423d>

Costs and benefits

Norwegian Mapping Authority has a small and effective secretariat coordinating NSDI development in general and Inspire in particular. Implementation is done by the principle of distributed responsibilities, where each stakeholder/organisation holding data is to implement according to documentation and data flow requirements. Most organisations are active and with satisfactory resource use.

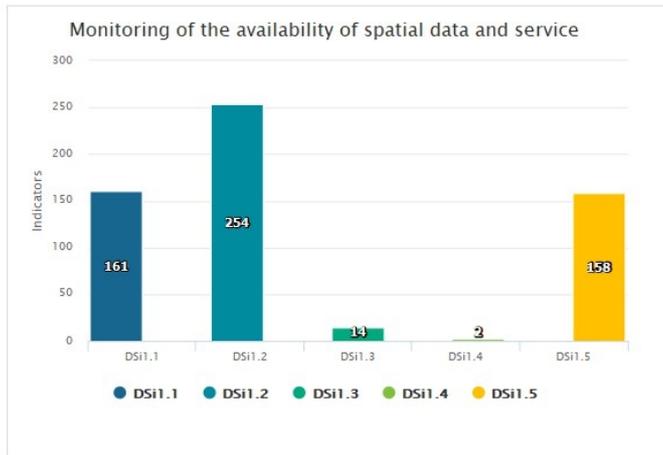
Benefits have been increasing rapidly the last years, particularly on the as-is-data, as mentioned above, while the utilization of the Norwegian harmonized Inspire data sets is low. A broad set of public bodies in many sectors, municipalities, consulting firms and value-adders are setting up advanced systems for consuming data from the infrastructure. They are now showing an increasing trust in and use of the access services, probably because the services are open and freely available, they are stable and they receive data of importance to their work.

Norway

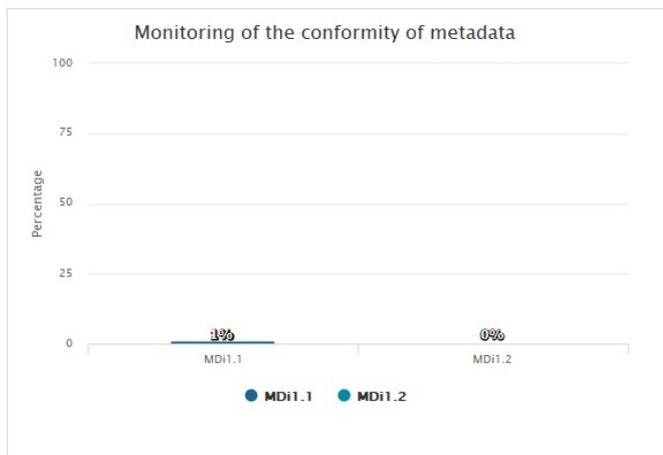
Indicators in support of [Commission Decision \(EU\) 2019/1372](#) implementing Directive 2007/2/EC (INSPIRE) as regards to monitoring and reporting

Graphs generated with data taken from: https://inspire-geoportal.ec.europa.eu/mr2020_details.html?country=no

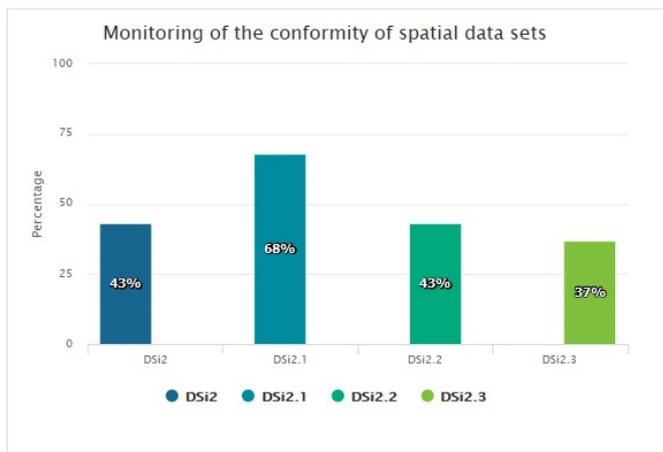
The date of harvest metadata: 16/12/2020



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 or more 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

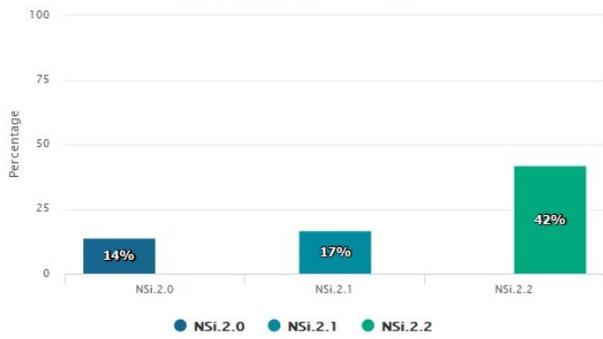


Legend	
Indicator	Definition
MDi1.1	Percentage of metadata for spatial data sets conformant with Commission Regulation (EC) No 1205/2008 as regards metadata
MDi1.2	Percentage of metadata for spatial data services conformant with Commission Regulation (EC) No 1205/2008 as regards metadata



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 1089/2010 as 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

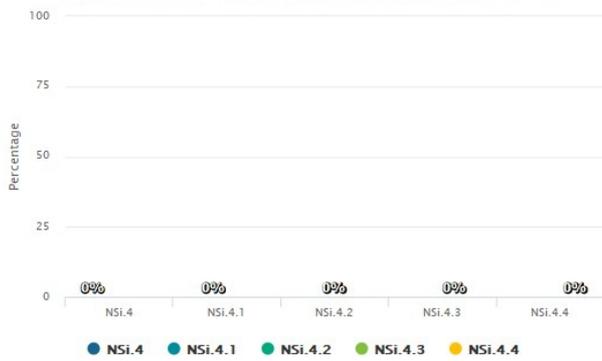
Monitoring of the accessibility of spatial data sets through view and download services



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

Monitoring of the conformity of the network 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