INSPIRE

Infrastructure for Spatial Information in Europe

Guidance document for calculation of indicators in support of Commission Decision (EU) 2019/1372 implementing Directive 2007/2/EC (INSPIRE) as regards monitoring and reporting.

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Actions:

Guidance document for calculation of indicators in support of Commission Decision (EU) 2019/1372 implementing Directive 2007/2/EC (INSPIRE) as regards monitoring and reporting.

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Table of Contents

1. Introduction

Directive 2007/2/EC requires Member States to monitor the implementation and use of their infrastructures for spatial information and to report on a number of issues relating to this. Commission Decision (EU) 2019/1372 implements Directive 2007/2/EC of the European Parliament and of the Council as regards that monitoring and reporting. Monitoring should be based on a set of indicators calculated based on data collected from public authorities. These indicators measure the implementation progress of Directive 2007/2/EC in the Member States and are used to evaluate the success of the Directive against its objectives.

To minimize the administrative burden of monitoring, the indicators shall be calculated based on the metadata for spatial data sets and spatial data services already created and published by Member States pursuant to Article 5 of Directive 2007/2/EC and as provided for in in Decision (EU) 2019/1372. Metadata that have not been published in the Member States registered discovery services are not discoverable and do not contribute to the infrastructure; hence they cannot be taken into account when calculating the indicators for monitoring.

The responsibility to monitor the implementation and use of the infrastructure for spatial information is on the Member States. This is clearly indicated in Article 21(1) of Directive 2007/2/EC. The Member States and the Commission can agree on the use of a centralised common infrastructure to limit the administrative burden on Member States for calculating indicators and publishing the monitoring results (e.g. as part of the INSPIRE knowledge base hosted by the JRC and with full transparency on the calculation methods). Member States are free to decide to use this common infrastructure or not.

2. Overview of indicators

The monitoring indicators are grouped following the categories established in the revised Decision:

- monitoring of the availability of spatial data and services (Art. 3)
- monitoring of the conformity of metadata (Art. 4)
- monitoring of the conformity of spatial data sets (Art. 5)
- monitoring of the accessibility of spatial data sets through view and download services (Art. 6)
- monitoring of the conformity of network services (Art. 7)

2.1 Monitoring of the availability of spatial data and services

Indicator:	**DSi1.1**
Definition:	The number of spatial data sets for which metadata exist
Description:	The number of data set metadata records, published by Member States through their discovery services, corresponding to the themes listed in Annexes I, II and III to Directive 2007/2/EC.
Calculation method	The indicator represents the amount of all data set metadata records published by the Member States in their registered discovery services. Member States should check that there are no duplicate records and that the INSPIRE Geoportal is showing all of the records. For the calculation, metadata records of data set series will also be included. At the EU level, this indicator is calculated as the sum of all Member State data set metadata records

Indicator:	**DSi1.2**
Definition:	The number of spatial data services for which metadata exist
Description:	The number of spatial data services published by Member States through their discovery services.

Calculation method	This is the amount of spatial data services metadata available in the registered discovery services of the Member States[1]. At the EU level, this indicator is calculated as a sum of all Member State service metadata records in their registered discovery services or service accesspoint definitions in data set metadata records.

Indicator:	**DSi1.3**
Definition:	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
Description:	The number of spatial data set metadata records that contain one or more keywords of the priority list of spatial data sets.
Calculation method	This is the number of metadata records where one or more priority data set keywords from the INSPIRE Metadata code list register[2] is provided in the metadata "Keyword" element. Additional guidelines on the tagging of metadata are provided by the subgroup MIG 2016.5 on priority datasets for e-Reporting.[3] At the EU level, this indicator is calculated as the sum of all Member State relevant metadata records.

Indicator:	**DSi1.4**
Definition:	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

1 http://inspire-geoportal.ec.europa.eu/resources/INSPIREResourcesReports/resourcesReport_2019-05-15/).

2 http://inspire.ec.europa.eu/metadata-codelist/PriorityDataset/

3 https://ies-svn.jrc.ec.europa.eu/projects/2016-5/wiki/Implementation

Description:	The number of spatial data set metadata records that contain a keyword "Regional"
Calculation method	This is the amount of metadata records where a keyword "Regional" is provided in the metadata "Keyword" element. The keyword to be used is a value of the spatial scope code list of the INSPIRE Metadata code list register[2]. Guidelines on how to add this keyword into the metadata have been made available[3]. At the EU level, this indicator is calculated as the sum of all Member State relevant metadata records.

Indicator:	**DSi1.5**
Definition:	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 the national territory
Description:	The number of spatial data set metadata records that contain a keyword "National".
Calculation method	This is the amount of metadata records where a keyword "National" is provided in the metadata "Keyword" element. The keyword to be used is a value of the spatial scope code list of the INSPIRE Metadata code list register[5]. Guidelines on how to add this keyword into the metadata have been made available[4]. At the EU level, this indicator is calculated as the sum of all Member State relevant metadata records.

2.2 Monitoring of the conformity of metadata

Indicator:	**MDi1.1**
Definition:	Percentage of metadata for spatial data sets conformant with Commission

2 http://inspire.ec.europa.eu/metadata-codelist/SpatialScope
3 https://webgate.ec.europa.eu/fpfis/wikis/display/InspireMIG/Spatial+scope+code+list
4 https://webgate.ec.europa.eu/fpfis/wikis/display/InspireMIG/Spatial+scope+code+list
5 http://inspire.ec.europa.eu/metadata-codelist/SpatialScope

	Regulation (EC) No 1205/2008 as regards metadata
Description:	The number of spatial data sets for which metadata are in conformity with Regulation (EC) No 1205/2008 multiplied by a hundred and divided by the number of spatial data sets for which metadata exist as given by indicator "DSi1.1".
Calculation method	This is the number of data set metadata, published in the geoportal, that are in conformance with Regulation (EC) No 1205/2008. Metadata that do not satisfy the requirements laid down by Regulation (EC) No 1205/2008 will be considered non-conformant metadata.. The conformity of the metadata will be assessed centrally and automatically by the Commission with the INSPIRE reference validator using the commonly agreed conformance tests (see Annex 1). This assessment will be performed on the metadata snapshot made by countries every 15th December. The indicator will be calculated based on the validation results of the reference validator. Member States are encouraged to regularly use the INSPIRE reference validator for testing the conformity of their metadata records. At the EU level, this indicator is calculated as the average of all Member States.

Indicator:	**MDi1.2**
Definition:	Percentage of metadata for spatial data services conformant with Commission Regulation (EC) No 1205/2008 as regards metadata
Description:	The number of spatial data services for which metadata are in conformity with Regulation (EC) No 1205/2008 multiplied by a hundred and divided by the number of spatial data services for which metadata exist as given by indicator "DSi1.2"

Calculation method	This is the amount of service metadata published in the geoportal that are in conformity with Regulation (EC) No 1205/2008. Further technical implementation details for the possible service metadata scenarios are described in technical guidance documents. Metadata that do not satisfy the requirements laid down by Regulation (EC) No 1205/2008 will be considered non-conformant. The conformity of the metadata will be assessed centrally and automatically by the Commission with the INSPIRE reference validator using the commonly agreed conformance tests (see Annex 1). This assessment will be performed on the metadata snapshot made by countries every 15th December. The indicator will be calculated based on the validation results of the reference validator. Member States are encouraged to regularly use the INSPIRE reference validator for testing the conformity of their metadata records.
	At the EU level, this indicator is calculated as the average of all Member States.

2.3 Monitoring of the conformity of spatial data sets

Indicator:	**DSi2**
Definition:	Percentage of spatial data sets that are in conformity with Commission Regulation (EU) No 1089/2010 as regards interoperability of spatial data sets
Description:	The number of spatial data sets which are in conformity with Regulation (EU) No 1089/2010 multiplied by a hundred and divided by the number of spatial data sets as given by indicator "DSi1.1"
Calculation method	This is the amount of all metadata dataset records published by Member States with conformity statement expressing the conformity with Regulation (EU) No 1089/2010 in the "Conformity" metadata element. See chapter 2.4.1 of MD TG 2.0[5]. A list of official titles for the legal acts in the 23

[5] https://inspire.ec.europa.eu/id/document/tg/metadata-iso19139

	languages of the EU to be used in the conformity specification is available on EUR-Lex[6]. Member States are encouraged to regularly use the INSPIRE reference validator for testing the conformity of their spatial data sets. The Commission might use reference validator to assess the actual conformity of a sample of Member State resources declared as conformant. At the EU level, this indicator is calculated as the average of all Member States.

Indicator:	**DSi2.1**
Definition:	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
Description:	The number of spatial data sets corresponding to the themes listed in Annex I to Directive 2007/2/EC which are in conformity with Regulation (EU) No 1089/2010 multiplied by a hundred and divided by the number of spatial data sets corresponding to the themes listed in that Annex.
Calculation method	This is the amount of metadata dataset records, published by Member States, which contains a keyword in the metadata element "Keyword" indicating that the dataset belongs to a theme from Annex I, with conformity statement expressing the conformity with Regulation (EU) No 1089/2010 in the "Conformity" metadata element. A list of official titles for the legal acts in the 23 languages of the EU to be used in the conformity specification is available on EUR-Lex[7]. Member States are encouraged to regularly use the INSPIRE reference validator for testing the conformity of their spatial data sets. The Commission might use reference validator to assess the actual conformity of a sample of Member State resources declared as conformant. At the EU level, this indicator is calculated as the average of all Member States.

Indicator:	**DSi2.2**

[6] https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:32007L0002
[7] https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:32007L0002

Definition:	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
Description:	The number of spatial data sets corresponding to the themes listed in Annex II to Directive 2007/2/EC which are in conformity with Regulation (EU) No 1089/2010 multiplied by a hundred and divided by the number of spatial data sets corresponding to the themes listed in that Annex.
Calculation method	This is the amount of metadata dataset records published by MS, contains a keyword in the metadata element "Keyword" indicating that the dataset belongs to a theme from Annex II, with conformity statement expressing the conformity with Regulation (EU) No 1089/2010 in the "Conformity" metadata element. A list of official titles for the legal acts in the 23 languages of the EU to be used in the conformity specification is available on EUR-Lex[8]. Member States are encouraged to regularly use the INSPIRE reference validator for testing the conformity of their spatial data sets. The Commission might use reference validator to assess the actual conformity of a sample of Member State resources declared as conformant. At the EU level, this indicator is calculated as the average of all Member States.

Indicator:	**DSi2.3**
Definition:	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
Description:	The number of spatial data sets corresponding to the themes listed in Annex III to Directive 2007/2/EC which are in conformity with Regulation (EU) No 1089/2010 multiplied by a hundred and divided by the number of spatial data sets corresponding to the themes listed in that Annex.

[8] https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:32007L0002

Calculation method	This is the amount of metadata dataset records published by MS, contains a keyword in the metadata element "Keyword" indicating that the dataset belongs to a theme from Annex III, with conformity statement expressing the conformity with Regulation (EU) No 1089/2010 in the "Conformity" metadata element. A list of official titles for the legal acts in the 23 languages of the EU to be used in the conformity specification is available on EUR-Lex[9]. Member States are encouraged to regularly use the INSPIRE reference validator for testing the conformity of their spatial data sets. The Commission might use reference validator to assess the actual conformity of a sample of Member State resources declared as conformant. At the EU level, this indicator is calculated as the average of all Member States.

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

Indicator:	**NSi2**
Definition:	The percentage of spatial data sets that are accessible through view and the download services
Description:	The number of spatial data sets for which both view and download services exist multiplied by a hundred and divided by the number of spatial data sets as given by indicator DSi1.1
Calculation method	The sum of all data sets that are indicated as both viewable and downloadable in the Geoportalwill be divided by the sum of the data sets for which metadata are published in the Geoportal (DSi1.1). Building on the existing guidelines, a document has been provided to clarify how the linkages between the services and datasets are established in metadata.[10]. At the EU level, this indicator is calculated as the average of all Member States.

Indicator:	**NSi2.1**

[9] https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:32007L0002
[10] http://inspire-geoportal.ec.europa.eu/files/INSPIRE_Geoportal_process_for_data-service_linking_v1.0.pdf

Definition:	The percentage of spatial data sets that are accessible through view services
Description:	The number of spatial data sets for which a view service exist multiplied by a hundred and divided by the number of spatial data sets as given by indicator DSi1.1
Calculation method	The sum of all data sets that are indicated as viewable in the Geoportal will be divided by the sum of the data sets for which metadata is published in the Geoportal (DSi1.1). At the EU level, this indicator is calculated as the average of all Member States

Indicator:	**NSi2.2**
Definition:	The percentage of spatial data sets that are accessible through download services
Description:	The number of spatial data sets for which a download service exist multiplied by a hundred and divided by the number of spatial data sets as given by indicator DSi1.1
Calculation method	The sum of all data sets that are indicated as downloadable n the Geoportal will be divided by the sum of the data sets for which metadata is published in the Geoportal (DSi1.1). Building on the existing guidelines, a document has been provided to clarify how the linkages between the services and datasets are established in metadata.[11] At the EU level, this indicator is calculated as the average of all Member States.

2.5 Monitoring of the conformity of network services

Indicator:	**NSi4**
Definition:	The percentage of the network services that are in conformity with Commission Regulation (EC) No 976/2009 as regards the Network Services

[11] http://inspire-geoportal.ec.europa.eu/files/INSPIRE_Geoportal_process_for_data-service_linking_v1.0.pdf

Description:	The number of network services which are in conformity with Regulation (EC) No 976/2009 multiplied by a hundred and divided by the total number of network services
Calculation method	For this indicator only discovery, view, download and transformation network services will be taken into account. The identification of the type of network services will be done based on the "spatial data service type" metadata element when service metadata is provided, based on the definition of the service access points if these service access points are defined in data set metadata and based on the registered service endpoints for discovery network services. The conformity with Regulation (EU) No 976/2009 should be expressed in the "Conformity" metadata element. See chapter 2.4.1 of MD TG 2.0[12]. A list of official titles for the legal acts in the 23 languages of the EU to be used in the conformity specification is available on EUR-Lex[13]. Member States are encouraged to regularly use the INSPIRE reference validator for testing the conformity of their network services. The Commission might use reference validator to assess the actual conformity of a sample of Member State resources declared as conformant.
	At the EU level, this indicator is calculated as the average of all Member States.

Indicator:	**NSi4.1**
Definition:	The percentage of the discovery services that are in conformity with Commission Regulation (EC) No 976/2009 as regards the Network Services
Description:	The number of discovery services which are in conformity with Regulation (EC) No 976/2009 multiplied by a hundred and divided by the total number of discovery services
Calculation method	For this indicator only discovery network services that are registered by the Member State will be taken into account. The conformity with Regulation (EU) No 976/2009 should be expressed in the "Conformity" metadata

[12] https://inspire.ec.europa.eu/id/document/tg/metadata-iso19139
[13] https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:32007L0002

	element. A list of official titles for the legal acts in the 23 languages of the EU to be used in the conformity specification is available on EUR-Lex[14]. Member States are encouraged to regularly use the INSPIRE reference validator for testing the conformity of their network services. The Commission might use reference validator to assess the actual conformity of a sample of Member State resources declared as conformant. At the EU level, this indicator is calculated as the average of all Member States.

Indicator:	**NSi4.2**
Definition:	The percentage of the view services that are in conformity with Commission Regulation (EC) No 976/2009 as regards the Network Services
Description:	The number of view services which are in conformity with Regulation (EC) No 976/2009 multiplied by a hundred and divided by the total number of view services
Calculation method	For this indicator only view network services will be taken into account. The identification of the type of network services will be done based on the "spatial data service type" metadata element when service metadata is provided or based on the definition of the service access points if these service access points are defined in data set metadata. Statement in metadata should express the conformity with Regulation (EU) No 976/2009 in the "Conformity" metadata element. A list of official titles for the legal acts in the 23 languages of the EU to be used in the conformity specification is available on EUR-Lex[15]. Member States are encouraged to regularly use the INSPIRE reference validator for testing the conformity of their network services. The Commission might use reference validator to assess the actual conformity of a sample of Member State resources declared as conformant. At the EU level, this indicator is calculated as the average of all Member States.

Indicator:	**NSi4.3**

[14] https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:32007L0002
[15] https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:32007L0002

Definition:	The percentage of the download services that are in conformity with Commission Regulation (EC) No 976/2009 as regards the Network Services
Description:	The number of download services which are in conformity with Regulation (EC) No 976/2009 multiplied by a hundred and divided by the total number of download services
Calculation method	For this indicator only download network services will be taken into account. The identification of the type of network services will be done based on the "spatial data service type" metadata element when service metadata is provided or based on the definition of the service access points if these service access points are defined in data set metadata. Statement in metadata should express the conformity with Regulation (EU) No 976/2009 in the "Conformity" metadata element. A list of official titles for the legal acts in the 23 languages of the EU to be used in the conformity specification is available on EUR-Lex[16]. Member States are encouraged to regularly use the INSPIRE reference validator for testing the conformity of their network services. The Commission might use reference validator to assess the actual conformity of a sample of Member State resources declared as conformant. At the EU level, this indicator is calculated as the average of all Member States.

Indicator:	**NSi4.4**
Definition:	The percentage of the transformation services that are in conformity with Commission Regulation (EC) No 976/2009 as regards the Network Services
Description:	The number of transformation services which are in conformity with Regulation (EC) No 976/2009 multiplied by a hundred and divided by the total number of transformation services
Calculation method	For this indicator only transformation network services will be taken into account. The identification of the type of network services will be done based on the "spatial data service type" metadata element when service metadata is provided or based on the definition of the service access points if these service access points are defined in data set metadata. Statement

[16] https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:32007L0002

	in metadata should express the conformity with Regulation (EU) No 976/2009 in the "Conformity" metadata element. A list of official titles for the legal acts in the 23 languages of the EU to be used in the conformity specification is available on EUR-Lex[17]. Member States are encouraged to regularly use the INSPIRE reference validator for testing the conformity of their network services. The Commission might use reference validator to assess the actual conformity of a sample of Member State resources declared as conformant. At the EU level, this indicator is calculated as the average of all Member States.

[17] https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:32007L0002

Annex 1 – The INSPIRE Reference Validator for the calculation of the indicators MDi1.1 and MDi1.2

All the Abstract Test Suites (ATS) for testing the conformity of metadata are publicly available online, and hosted on GitHub. Below is a brief explanation on how to access the ATS for MD TG v.1.3 and MD TG v.2.0. Please note that the deadline for the migration from MD TG v1.3 towards MD TG v2.0 is 19 December 2019. For the monitoring exercise 2019, both version 1.3 and 2.0 will be accepted. As of 19 December 2019 onwards, only version 2.0 will be accepted.

1.1 MD TG v.1.3

There are 2 conformance classes:

- INSPIRE Profile based on EN ISO 19115 and EN ISO 19119 Metadata for interoperability

whose ATS are available from the following GitHub pages, respectively:

- https://github.com/inspire-eu-validation/metadata/tree/master/iso-19115-19119
- https://github.com/inspire-eu-validation/data/tree/master/interoperability-metadata

Each of these pages contains the list of all the TG requirements and the corresponding tests. For example, from the GitHub page of the conformance class INSPIRE Profile based on EN ISO 19115 and EN ISO 19119, take the first TG requirement (Req #1). The test description is "hierachyLevel mandated" and the test is called "Hierachy" and points to this page: https://github.com/inspire-eu-validation/metadata/blob/master/iso-1911519119/hierarchy.md. Here you can find the ATS for this specific test, i.e. the textual description of what the reference validator is actually testing.

1.2 MD TG v.2.0

In this case, there are 3 conformance classes for data set and data set series metadata, and 6 conformance classes for spatial data service metadata (one of which is in common, i.e. there is a total of 8 different conformance classes). The main page to access the ATS for all these conformance classes is https://github.com/inspire-eu-validation/metadata/tree/2.0.

By clicking on one conformance class, and then on one specific test (in the list), you can access again the corresponding ATS.

1.3 Start testing

The conformance classes, and their single tests, are also accessible through the landing page of the INSPIRE Reference Validator at http://staging-inspire-validator.eu-west1.elasticbeanstalk.com/etf-webapp (this is the new cloud staging version, which also includes MD TG 2.0).

On this landing page, you can:

- see the 2 conformance classes under "Metadata (TG version 1.3)" and the 8 conformance classes under "Metadata (TG version 2.0) - BETA"
- select the conformance class(es) you want to test, using the button on the right
- upload a metadata record and start the conformance test
- visualize the results: for each test, there is a link in the test report to the corresponding ATS (i.e. to its GitHub page).