



INSPIRE Monitoring and Reporting 2021: Process, results and way forward

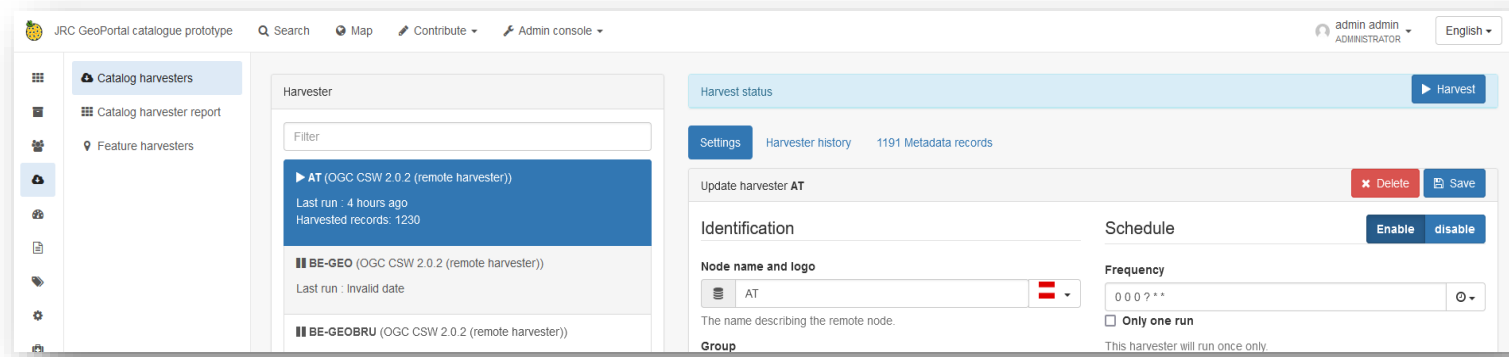
Davide Artasensi, Marco Minghini, Jordi Escriu, Alexander Kotsev

68th MIG-T meeting – February 4, 2022

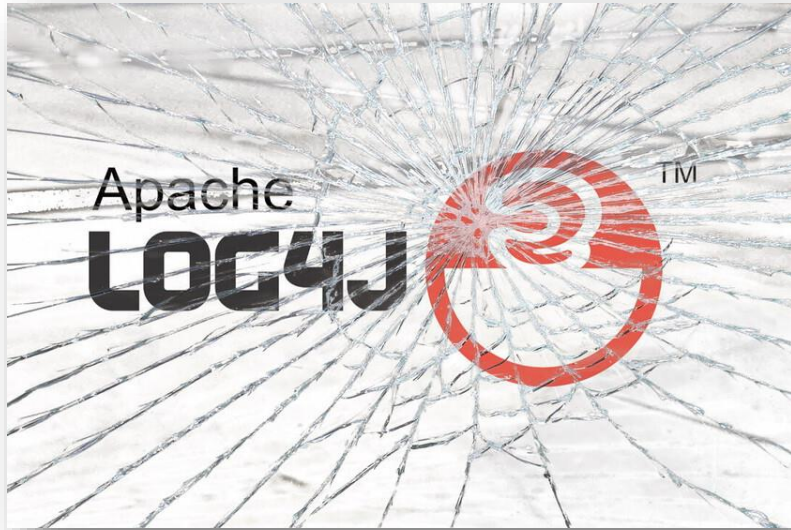
Context

Context

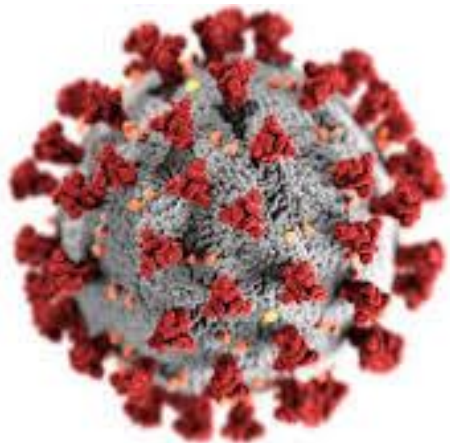
- 2021 is a transitional year
- From 2022 onwards the backend of the INSPIRE Geoportal will be substituted with GeoNetwork
 - Part of 'mainstreaming' and simplifying the central INSPIRE infrastructure
 - Improved transparency and reproducibility of the results
- In preparation for the switch, we **processed in parallel** all MS catalogues with both the old and new solution
 - Results with the two different approaches are very similar
 - Some bugs were discovered



What happened during the M&R window



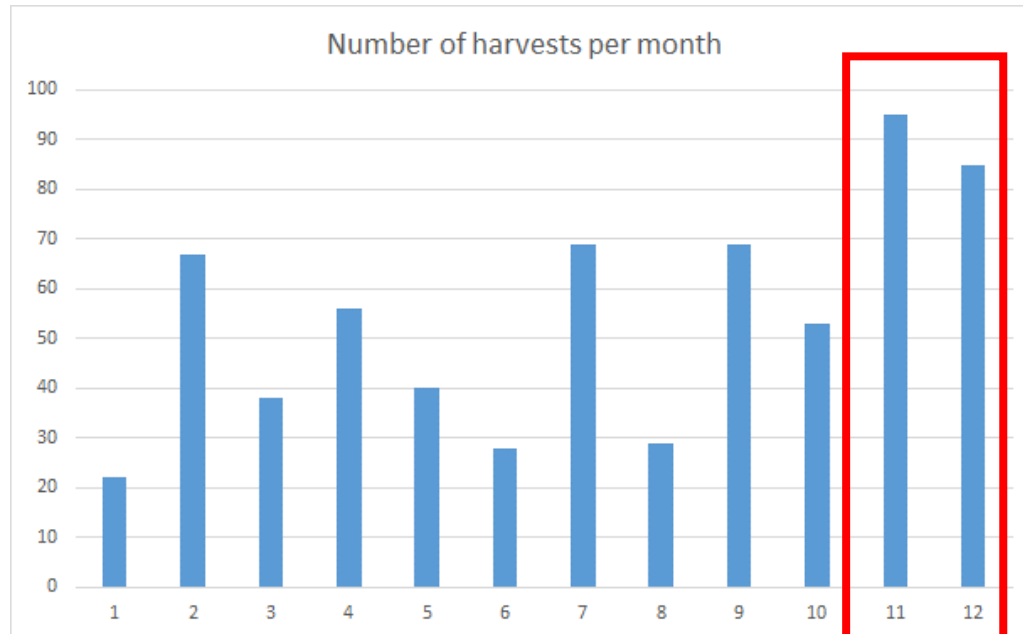
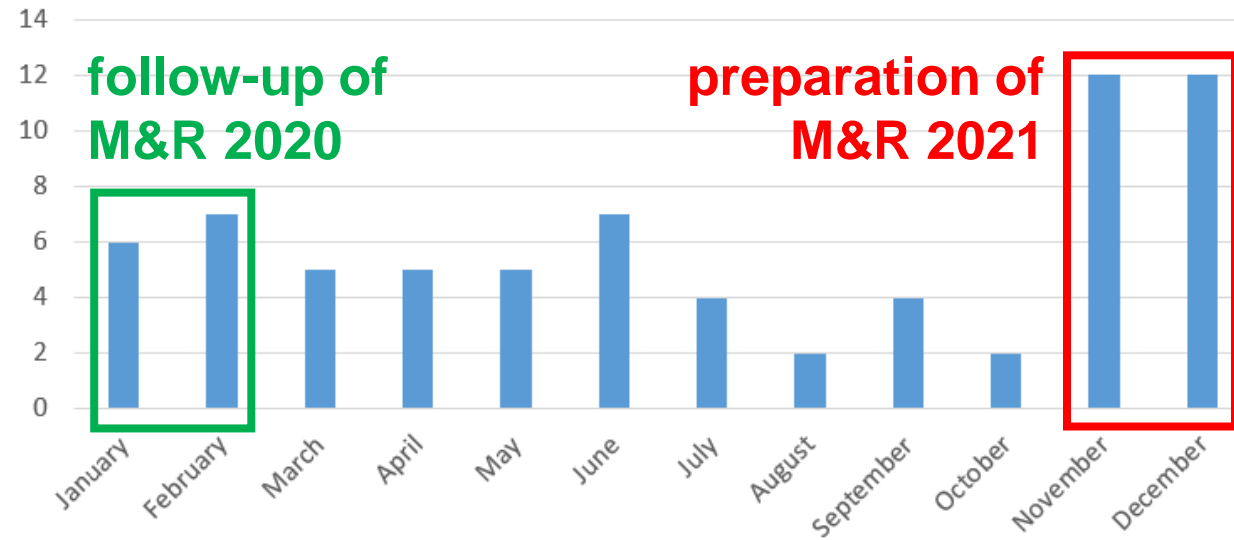
- Log4Shell vulnerability
 - One of the biggest security issues ever recorded
 - Discovered on November 24th
-
- Almost the entire (small) JRC team with Omicron and/or with quarantined children



Context

- Issues opened in the **Geoportal helpdesk** in 2021
 - Opened by 20 MS (thank you!)
 - 34% in November and December
 - 53% in Jan, Feb, Nov and Dec.
- Geoportal harvesting requests
 - 180 requests in Nov and Dec.

Total open issues per month

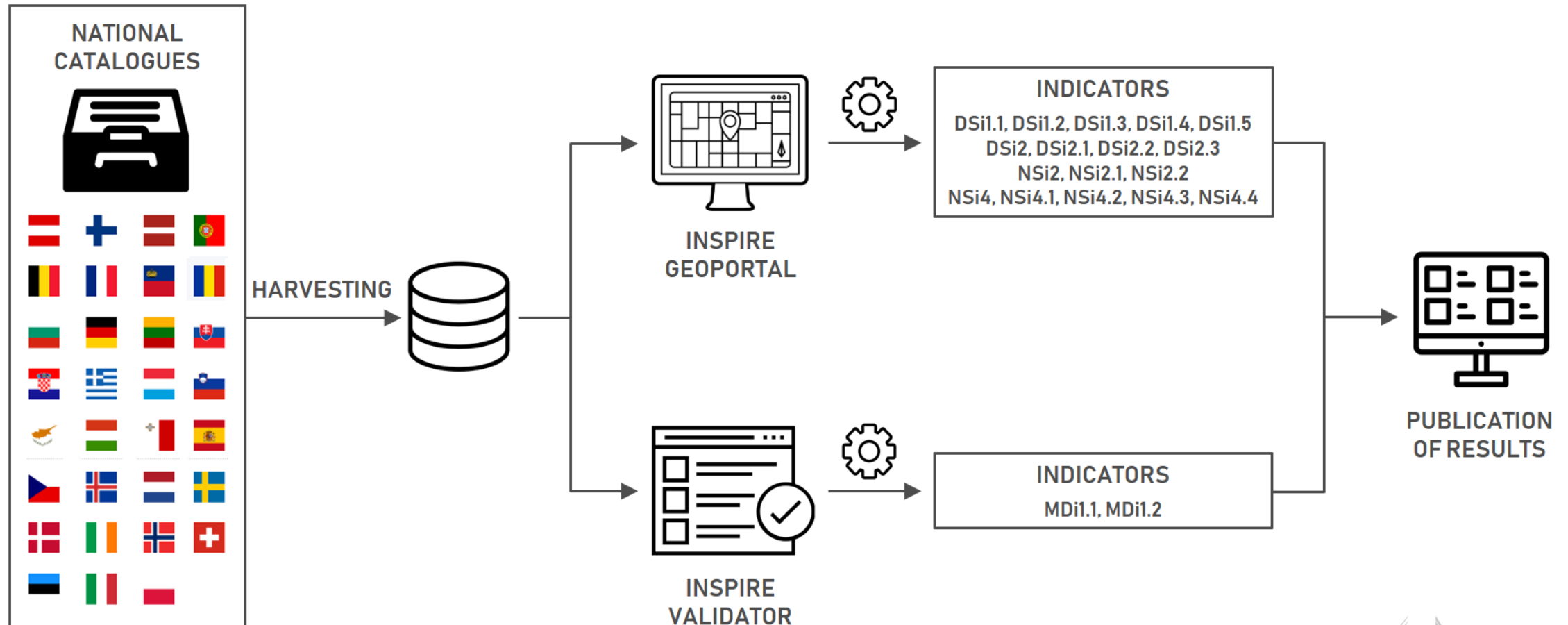


MS	Total open issues per month
AT	5
BE	7
CY	1
CZ	3
DE	10
DK	2
EE	1
ES	3
HR	4
IT	2
LU	3
LV	1
MT	7
NL	5
PL	2
PT	1
RO	2
SE	2
SI	2
SK	8
Total	71

Results

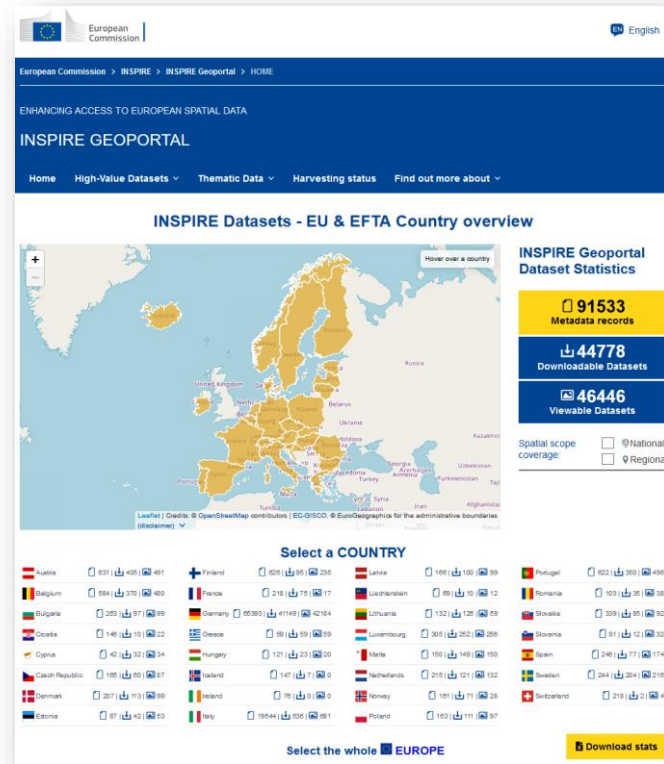
Monitoring and Reporting 2021 – Process

- Overall process:

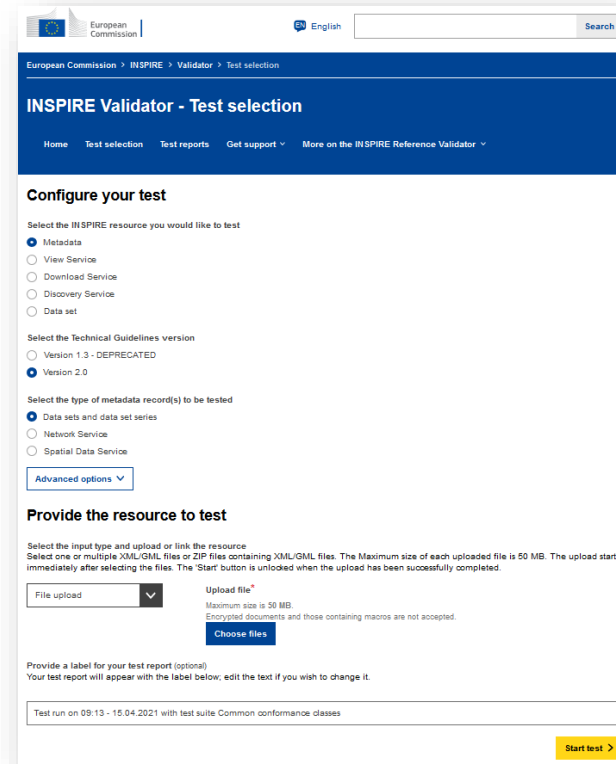


Monitoring and Reporting 2021 – Software

- Software components used:



- **INSPIRE Geoportal v.1.6.1**
(released on 16/12/2021)



- **INSPIRE Reference Validator v.2021.3.1**
(released on 4/10/2021)
- **Bulk validation tool v.2021.1.0**
(released on 5/10/2021)

Monitoring and Reporting 2021 – Indicators

- Indicators grouped into 5 categories:

- availability of spatial data and services

- DSi1.1, DSi1.2, DSi1.3, DSi1.4, DSi1.5

- conformity of metadata

- MDi1.1, MDi1.2

- conformity of spatial data sets

- DSi2, DSi2.1, DSi2.2, DSi2.3

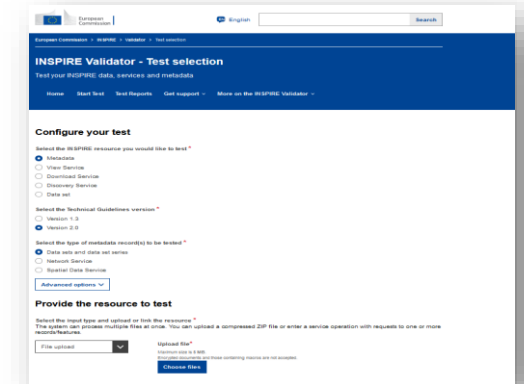
- accessibility of spatial data sets

- NSi2, NSi2.1, NSi2.2

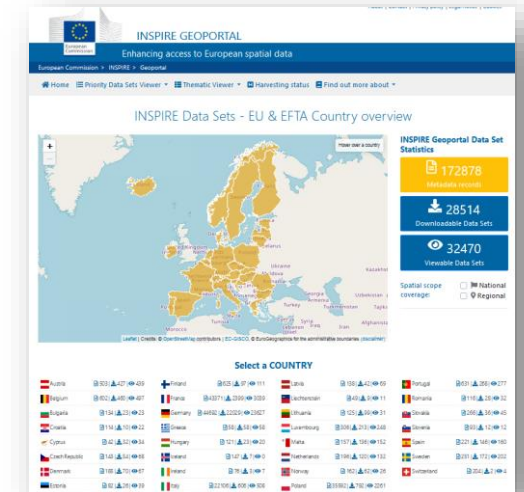
- conformity of network services

- NSi4, NSi4.1, NSi4.2, NSi4.3, NSi4.4

**INSPIRE
Reference
Validator**
(metadata
validation)



**INSPIRE
Geoportal**
(linkages check)



Monitoring and Reporting 2021 – Indicators

- Indicators grouped into 5 categories:

- availability of spatial data and services
 - DSi1.1, DSi1.2, DSi1.3, DSi1.4, DSi1.5

absolute values

- conformity of metadata
 - MDi1.1, MDi1.2
- conformity of spatial data sets
 - DSi2, DSi2.1, DSi2.2, DSi2.3
- accessibility of spatial data sets
 - NSi2, NSi2.1, NSi2.2
- conformity of network services
 - NSi4, NSi4.1, NSi4.2, NSi4.3, NSi4.4

relative values
(percentages)

Monitoring and Reporting 2021 – Results

- Median values of all indicators in the years 2019-2021:
 - overall a huge improvement!

calculated automatically (Validator)

YEAR	DSi1.1	DSi1.2	DSi1.3	DSi1.4	DSi1.5
2019	164	142	47	0	74
2020	161	182	51	0	94
2021	167	192	55	2	109

availability of spatial data and services

YEAR	MDi1.1	MDi1.2
2019	38%	38%
2020	55%	67%
2021	78%	92%

conformity of metadata

YEAR	DSi2	DSi2.1	DSi2.2	DSi2.3
2019	38%	73%	33%	35%
2020	43%	75%	47%	38%
2021	70%	87%	67%	62%

conformity of spatial data sets

calculated automatically (Geoportal)

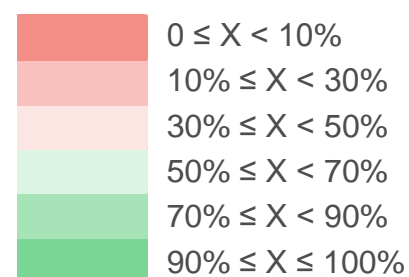
YEAR	NSi2	NSi2.1	NSi2.2
2019	16%	32%	20%
2020	32%	44%	42%
2021	45%	57%	54%

accessibility of spatial data sets

YEAR	NSi4	NSi4.1	NSi4.2	NSi4.3	NSi4.4
2019	49%	50%	46%	51%	0%
2020	71%	67%	67%	83%	0%
2021	92%	100%	94%	92%	100%

conformity of network services

Overall results – 2021 performance

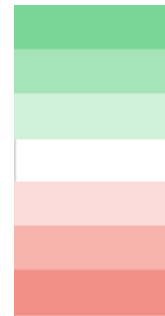


country	DSi1.1	DSi1.2	DSi1.3	DSi1.4	DSi1.5	MDi1.1	MDi1.2	DSi2	DSi2.1	DSi2.2	DSi2.3	NSi2	NSi2.1	NSi2.2	NSi4	NSi4.1	NSi4.2	NSi4.3	NSi4.4
AT	522	596	135	262	258	98%	99%	77%	89%	81%	71%	50%	87%	56%	97%	100%	96%	97%	#N/A
BE	597	242	283	498	85	93%	64%	70%	95%	67%	66%	61%	88%	65%	92%	83%	92%	92%	#N/A
BG	174	35	130	55	109	41%	60%	98%	100%	100%	99%	48%	48%	52%	0%	0%	0%	0%	#N/A
CH	212	33	0	0	7	0%	0%	2%	6%	2%	0%	1%	2%	1%	0%	0%	0%	0%	#N/A
CY	42	61	11	0	0	0%	0%	2%	0%	25%	0%	0%	0%	62%	0%	#N/A	0%	0%	#N/A
CZ	90	192	33	12	78	56%	93%	48%	95%	91%	21%	50%	66%	79%	96%	100%	96%	96%	100%
DE	77193	117891	209	2879	167	71%	94%	74%	57%	60%	74%	60%	66%	63%	99%	100%	98%	99%	#N/A
DK	196	234	61	0	194	62%	57%	61%	95%	63%	57%	24%	51%	29%	95%	100%	94%	96%	#N/A
EE	85	114	23	0	85	95%	73%	100%	100%	100%	100%	55%	65%	55%	96%	100%	94%	98%	#N/A
EL	60	21	55	0	36	97%	100%	3%	40%	#N/A	0%	98%	98%	98%	5%	100%	0%	0%	#N/A
ES	243	301	92	50	180	93%	98%	100%	100%	100%	100%	43%	79%	45%	100%	100%	100%	100%	#N/A
FI	646	205	35	177	153	55%	44%	23%	14%	14%	30%	9%	36%	15%	55%	0%	55%	55%	#N/A
FR	224	56	146	11	101	2%	27%	78%	84%	92%	75%	4%	10%	25%	7%	0%	9%	0%	#N/A
HR	147	224	18	22	98	96%	94%	97%	100%	100%	95%	26%	65%	28%	92%	100%	90%	97%	#N/A
HU	120	63	21	0	9	0%	0%	39%	46%	37%	43%	8%	11%	13%	13%	50%	7%	11%	#N/A
IE	79	21	42	0	79	99%	100%	100%	100%	100%	100%	53%	56%	54%	100%	100%	100%	100%	#N/A
IS	91	27	5	2	86	98%	96%	55%	67%	71%	38%	0%	0%	40%	0%	#N/A	0%	0%	#N/A
IT	4942	1920	236	3168	833	99%	99%	30%	33%	22%	28%	5%	10%	13%	3%	25%	3%	3%	0%
LI	70	3	0	0	51	1%	0%	11%	87%	16%	7%	13%	17%	16%	50%	#N/A	100%	0%	#N/A
LT	132	130	109	0	132	96%	100%	98%	97%	100%	99%	45%	45%	95%	100%	100%	100%	100%	#N/A
LU	309	59	94	0	309	100%	100%	72%	100%	94%	62%	80%	86%	91%	100%	100%	100%	100%	#N/A
LV	167	258	73	0	0	0%	0%	75%	77%	64%	81%	33%	59%	37%	3%	#N/A	5%	2%	#N/A
MT	150	152	48	0	150	99%	99%	100%	100%	100%	100%	99%	100%	99%	100%	100%	100%	100%	#N/A
NL	203	342	59	0	175	56%	65%	50%	65%	67%	42%	55%	67%	58%	94%	100%	94%	94%	#N/A
NO	144	238	14	2	142	1%	0%	10%	11%	11%	8%	15%	19%	46%	15%	100%	16%	14%	#N/A
PL	147	244	55	0	146	100%	100%	94%	100%	50%	92%	50%	54%	56%	97%	100%	95%	99%	#N/A
PT	505	508	149	208	201	100%	97%	50%	63%	49%	49%	57%	79%	66%	69%	#N/A	75%	62%	#N/A
RO	103	76	27	15	88	40%	87%	42%	70%	31%	34%	18%	21%	20%	90%	100%	94%	85%	#N/A
SE	242	215	60	9	240	78%	86%	100%	100%	100%	99%	79%	90%	83%	100%	100%	100%	100%	100%
SI	91	128	9	0	77	69%	92%	88%	100%	79%	90%	1%	57%	9%	98%	#N/A	95%	100%	#N/A
SK	213	367	59	10	180	100%	98%	15%	18%	9%	15%	62%	75%	65%	24%	100%	24%	23%	100%

Overall results: Absolute number indicators

Comparison vs. 2020

country	DSi1.1	DSi1.2	DSi1.3	DSi1.4	DSi1.5
AT	522	596	135	262	258
BE	597	242	283	498	85
BG	174	35	130	55	109
CH	212	33	0	0	7
CY	42	61	11	0	0
CZ	90	192	33	12	78
DE	77193	117891	209	2879	167
DK	196	234	61	0	194
EE	85	114	23	0	85
EL	60	21	55	0	36
ES	243	301	92	50	180
FI	646	205	35	177	153
FR	224	56	146	11	101
HR	147	224	18	22	98
HU	120	63	21	0	9
IE	79	21	42	0	79
IS	91	27	5	2	86
IT	4942	1920	236	3168	833
LI	70	3	0	0	51
LT	132	130	109	0	132
LU	309	59	94	0	309
LV	167	258	73	0	0
MT	150	152	48	0	150
NL	203	342	59	0	175
NO	144	238	14	2	142
PL	147	244	55	0	146
PT	505	508	149	208	201
RO	103	76	27	15	88
SE	242	215	60	9	240
SI	91	128	9	0	77
SK	213	367	59	10	180

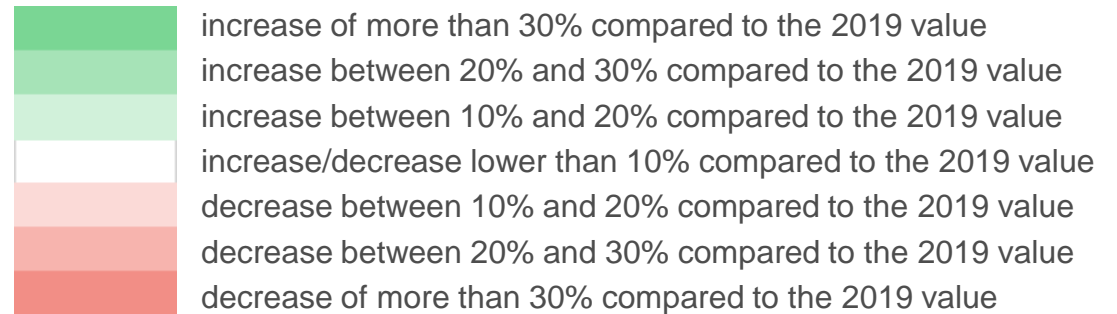


increase of more than 30% compared to the 2020 value
 increase between 20% and 30% compared to the 2020 value
 increase between 10% and 20% compared to the 2020 value
 increase/decrease lower than 10% compared to the 2020 value
 decrease between 10% and 20% compared to the 2020 value
 decrease between 20% and 30% compared to the 2020 value
 decrease of more than 30% compared to the 2020 value

Overall results: Absolute number indicators

Comparison vs. 2019

country	DSi1.1	DSi1.2	DSi1.3	DSi1.4	DSi1.5
AT	522	596	135	262	258
BE	597	242	283	498	85
BG	174	35	130	55	109
CH	212	33	0	0	7
CY	42	61	11	0	0
CZ	90	192	33	12	78
DE	77193	117891	209	2879	167
DK	196	234	61	0	194
EE	85	114	23	0	85
EL	60	21	55	0	36
ES	243	301	92	50	180
FI	646	205	35	177	153
FR	224	56	146	11	101
HR	147	224	18	22	98
HU	120	63	21	0	9
IE	79	21	42	0	79
IS	91	27	5	2	86
IT	4942	1920	236	3168	833
LI	70	3	0	0	51
LT	132	130	109	0	132
LU	309	59	94	0	309
LV	167	258	73	0	0
MT	150	152	48	0	150
NL	203	342	59	0	175
NO	144	238	14	2	142
PL	147	244	55	0	146
PT	505	508	149	208	201
RO	103	76	27	15	88
SE	242	215	60	9	240
SI	91	128	9	0	77
SK	213	367	59	10	180



Overall results: Relative number indicators

Comparison vs. 2020

increase of more than 10 percentage points compared to 2020
 increase/decrease of less than 10 percentage points compared to 2020
 decrease of more than 10 percentage points compared to 2020

country	MDi1.1	MDi1.2	DSi2	DSi2.1	DSi2.2	DSi2.3	NSi2	NSi2.1	NSi2.2	NSi4	NSi4.1	NSi4.2	NSi4.3	NSi4.4
AT	98%	99%	77%	89%	81%	71%	50%	87%	56%	97%	100%	96%	97%	#N/A
BE	93%	64%	70%	95%	67%	66%	61%	88%	65%	92%	83%	92%	92%	#N/A
BG	41%	60%	98%	100%	100%	99%	48%	48%	52%	0%	0%	0%	0%	#N/A
CH	0%	0%	2%	6%	2%	0%	1%	2%	1%	0%	0%	0%	0%	#N/A
CY	0%	0%	2%	0%	25%	0%	0%	0%	62%	0%	#N/A	0%	0%	#N/A
CZ	56%	93%	48%	95%	91%	21%	50%	66%	79%	96%	100%	96%	96%	100%
DE	71%	94%	74%	57%	60%	74%	60%	66%	63%	99%	100%	98%	99%	#N/A
DK	62%	57%	61%	95%	63%	57%	24%	51%	29%	95%	100%	94%	96%	#N/A
EE	95%	73%	100%	100%	100%	100%	55%	65%	55%	96%	100%	94%	98%	#N/A
EL	97%	100%	3%	40%	#N/A	0%	98%	98%	98%	5%	100%	0%	0%	#N/A
ES	93%	98%	100%	100%	100%	100%	43%	79%	45%	100%	100%	100%	100%	#N/A
FI	55%	44%	23%	14%	14%	30%	9%	36%	15%	55%	0%	55%	55%	#N/A
FR	2%	27%	78%	84%	92%	75%	4%	10%	25%	7%	0%	9%	0%	#N/A
HR	96%	94%	97%	100%	100%	95%	26%	65%	28%	92%	100%	90%	97%	#N/A
HU	0%	0%	39%	46%	37%	43%	8%	11%	13%	13%	50%	7%	11%	#N/A
IE	99%	100%	100%	100%	100%	100%	53%	56%	54%	100%	100%	100%	100%	#N/A
IS	98%	96%	55%	67%	71%	38%	0%	0%	40%	0%	#N/A	0%	0%	#N/A
IT	99%	99%	30%	33%	22%	28%	5%	10%	13%	3%	25%	3%	3%	0%
LI	1%	0%	11%	87%	16%	7%	13%	17%	16%	50%	#N/A	100%	0%	#N/A
LT	96%	100%	98%	97%	100%	99%	45%	45%	95%	100%	100%	100%	100%	#N/A
LU	100%	100%	72%	100%	94%	62%	80%	86%	91%	100%	100%	100%	100%	#N/A
LV	0%	0%	75%	77%	64%	81%	33%	59%	37%	3%	#N/A	5%	2%	#N/A
MT	99%	99%	100%	100%	100%	100%	99%	100%	99%	100%	100%	100%	100%	#N/A
NL	56%	65%	50%	65%	67%	42%	55%	67%	58%	94%	100%	94%	94%	#N/A
NO	1%	0%	10%	11%	11%	8%	15%	19%	46%	15%	100%	16%	14%	#N/A
PL	100%	100%	94%	100%	50%	92%	50%	54%	56%	97%	100%	95%	99%	#N/A
PT	100%	97%	50%	63%	49%	49%	57%	79%	66%	69%	#N/A	75%	62%	#N/A
RO	40%	87%	42%	70%	31%	34%	18%	21%	20%	90%	100%	94%	85%	#N/A
SE	78%	86%	100%	100%	100%	99%	79%	90%	83%	100%	100%	100%	100%	100%
SI	69%	92%	88%	100%	79%	90%	1%	57%	9%	98%	#N/A	95%	100%	#N/A
SK	100%	98%	15%	18%	9%	15%	62%	75%	65%	24%	100%	24%	23%	100%

Overall results: Relative number indicators Comparison vs. 2019

increase of more than 10 percentage points compared to 2019
 increase/decrease of less than 10 percentage points compared to 2019
 decrease of more than 10 percentage points compared to 2019

country	MDi1.1	MDi1.2	DSi2	DSi2.1	DSi2.2	DSi2.3	NSi2	NSi2.1	NSi2.2	NSi4	NSi4.1	NSi4.2	NSi4.3	NSi4.4
AT	98%	99%	77%	89%	81%	71%	50%	87%	56%	97%	100%	96%	97%	#N/A
BE	93%	64%	70%	95%	67%	66%	61%	88%	65%	92%	83%	92%	92%	#N/A
BG	41%	60%	98%	100%	100%	99%	48%	48%	52%	0%	0%	0%	0%	#N/A
CH	0%	0%	2%	6%	2%	0%	1%	2%	1%	0%	0%	0%	0%	#N/A
CY	0%	0%	2%	0%	25%	0%	0%	0%	62%	0%	#N/A	0%	0%	#N/A
CZ	56%	93%	48%	95%	91%	21%	50%	66%	79%	96%	100%	96%	96%	100%
DE	71%	94%	74%	57%	60%	74%	60%	66%	63%	99%	100%	98%	99%	#N/A
DK	62%	57%	61%	95%	63%	57%	24%	51%	29%	95%	100%	94%	96%	#N/A
EE	95%	73%	100%	100%	100%	100%	55%	65%	55%	96%	100%	94%	98%	#N/A
EL	97%	100%	3%	40%	#N/A	0%	98%	98%	98%	5%	100%	0%	0%	#N/A
ES	93%	98%	100%	100%	100%	100%	43%	79%	45%	100%	100%	100%	100%	#N/A
FI	55%	44%	23%	14%	14%	30%	9%	36%	15%	55%	0%	55%	55%	#N/A
FR	2%	27%	78%	84%	92%	75%	4%	10%	25%	7%	0%	9%	0%	#N/A
HR	96%	94%	97%	100%	100%	95%	26%	65%	28%	92%	100%	90%	97%	#N/A
HU	0%	0%	39%	46%	37%	43%	8%	11%	13%	13%	50%	7%	11%	#N/A
IE	99%	100%	100%	100%	100%	100%	53%	56%	54%	100%	100%	100%	100%	#N/A
IS	98%	96%	55%	67%	71%	38%	0%	0%	40%	0%	#N/A	0%	0%	#N/A
IT	99%	99%	30%	33%	22%	28%	5%	10%	13%	3%	25%	3%	3%	0%
LI	1%	0%	11%	87%	16%	7%	13%	17%	16%	50%	#N/A	100%	0%	#N/A
LT	96%	100%	98%	97%	100%	99%	45%	45%	95%	100%	100%	100%	100%	#N/A
LU	100%	100%	72%	100%	94%	62%	80%	86%	91%	100%	100%	100%	100%	#N/A
LV	0%	0%	75%	77%	64%	81%	33%	59%	37%	3%	#N/A	5%	2%	#N/A
MT	99%	99%	100%	100%	100%	100%	99%	100%	99%	100%	100%	100%	100%	#N/A
NL	56%	65%	50%	65%	67%	42%	55%	67%	58%	94%	100%	94%	94%	#N/A
NO	1%	0%	10%	11%	11%	8%	15%	19%	46%	15%	100%	16%	14%	#N/A
PL	100%	100%	94%	100%	50%	92%	50%	54%	56%	97%	100%	95%	99%	#N/A
PT	100%	97%	50%	63%	49%	49%	57%	79%	66%	69%	#N/A	75%	62%	#N/A
RO	40%	87%	42%	70%	31%	34%	18%	21%	20%	90%	100%	94%	85%	#N/A
SE	78%	86%	100%	100%	100%	99%	79%	90%	83%	100%	100%	100%	100%	100%
SI	69%	92%	88%	100%	79%	90%	1%	57%	9%	98%	#N/A	95%	100%	#N/A
SK	100%	98%	15%	18%	9%	15%	62%	75%	65%	24%	100%	24%	23%	100%

Monitoring and Reporting 2021 – Dashboard

- Landing page:
 - number of data sets, data set series & services for all countries
 - documentation to help understand the results

<https://inspire-geoportal.ec.europa.eu/mr2021.html>



Documentation:

Commission Implementing Decision (EU) 2019/1372 of 19 August 2019 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards monitoring and reporting [↗](#)

Technical Report including guidance for the calculation of indicators and description of the Monitoring process (Chapter 2) [↗](#)

Indicators calculation [↗](#)

Guidance on indicator visualisation in the dashboard [↗](#)

Information on the software used to calculate the indicators [↗](#)

Monitoring and Reporting 2021 – Dashboard

- Country-specific page:
 - overview statistics: number of data sets, data set series & services, number of conformant & non conformant metadata
 - values of Monitoring and Reporting 2021 indicators

<https://inspire-geoportal.ec.europa.eu/mr2021.html>

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

Croatia 🇧🇪

INSPIRE-697db035-9af0-11e3-8508-52540004b857

MD Catalogue URL: <https://geoportal.nipp.hr/geonetwork/srv/hrv/csw-inspire>
Endpoint ID: INSPIRE-697db035-9af0-11e3-8508-52540004b857
The date of harvest metadata: Fri, 17 Dec 2021 21:14:02 GMT

Overview statistics of the harvested metadata

Dataset: 132	Series: 15	Services: 224
--------------	------------	---------------

Results of evaluation using [INSPIRE Reference Validator](#)

Metadata Dataset		Metadata Services	
Conformant: 141	NOT Conformant: 6	Conformant: 211	NOT Conformant: 13

[Click to download the test reports of failed records](#)

Summary of metadata failing validation in [this endpoint](#) (batch file identifier, metadata identifier, metadata type, total number and ids of failed test assertions)
Summary of metadata failing validation in [all endpoints](#) (see "readme" sheet for details)

Monitoring Indicators 2021

Availability		Conformity	
Monitoring of the availability of spatial data and service			
147 DSi1.1 ↑	224 DSi1.2 ↑	Monitoring of the conformity of metadata	
18 DSi1.3 ↑		★★★★★ MDI1.1 ↑	★★★★★ MDI1.2 =
22 DSi1.4 ↑	98 DSi1.5 ↑	Monitoring of the conformity of spatial data sets	
★★★★★ DSi2 ↑			
Monitoring of the accessibility of spatial data sets through view and download services		★★★★★ DSi2.1 ↑	★★★★★ DSi2.2 ↑
★★★★★ NSi2 ↑		★★★★★ DSi2.3 ↑	★★★★★ NSi4 ↑
★★★★★ NSi2.1 ↑	★★★★★ NSi2.2 ↑	★★★★★ NSi4.1 ↑	★★★★★ NSi4.2 ↑
		★★★★★ NSi4.3 ↑	Not available NSi4.4 -

[Download the calculated indicators for this country](#)

Monitoring and Reporting 2021 – Dashboard

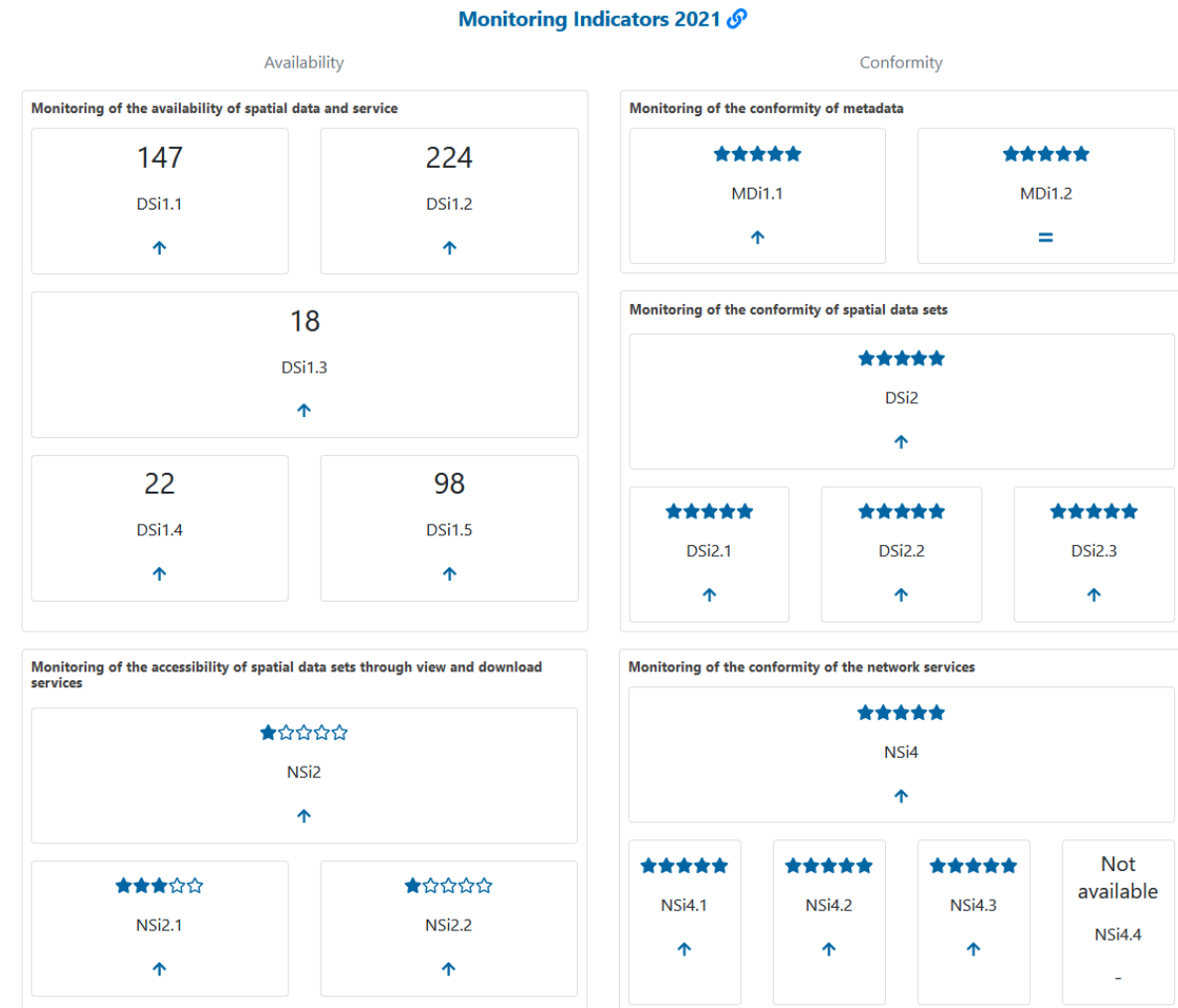
- Visualization of indicators
 - star-based scoring system (for percentage indicators):

- ☆☆☆☆☆ $0 \leq X < 10\%$
- ★☆☆☆☆ $10\% \leq X < 30\%$
- ★★☆☆☆ $30\% \leq X < 50\%$
- ★★★☆☆ $50\% \leq X < 70\%$
- ★★★★☆ $70\% \leq X < 90\%$
- ★★★★★ $90\% \leq X \leq 100\%$

- comparison against 2020 results:

- for relative number indicators:
 - ↑ increase of at least 10%
 - ↓ decrease of at least 10%
 - = increase or decrease of less than 10%
- for absolute number indicators:

same rule but considering 10% of the 2020 values



Monitoring and Reporting 2021 – Dashboard

- Documentation

- ▼ Notes on calculation of MDi1.1 and MDi1.2

The evaluation of these indicators involves a validation of the collected metadata through the [INSPIRE Reference Validator](#) (v2021.3.1).

All metadata records are validated against the Conformance Classes corresponding to the [INSPIRE MD TG v2.0](#):

- ✓ if the recognized INSPIRE Resource Type is "**dataset**" or "**series**", the applied executable test suites are "**Conformance Class 2: INSPIRE data sets and data set series interoperability metadata**" and "**Conformance Class 2b: INSPIRE data sets and data set series metadata for Monitoring**";
- ✓ if the recognized INSPIRE Resource Type is "**service**", the applied executable test suite is:
 - ✓ "Conformance Class 4: INSPIRE Network Services metadata", if the service is a Network Service (service type equal to "view", "download", "discovery" or "transformation")
 - ✓ "Conformance Class 5: INSPIRE Invocable Spatial Data Services metadata", if the service is an Invocable Spatial Data Service (service type equal to "other")

Implementing Decision

Documentation:

[Commission Implementing Decision \(EU\) 2019/1372 of 19 August 2019 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards monitoring and reporting](#)

[Technical Report including guidance for the calculation of indicators and description of the Monitoring process \(Chapter 2\)](#)

Technical Report on M&R

[Indicators calculation](#)

explanation of how indicators are calculated

[Guidance on indicator visualisation in the dashboard](#)

explanation of indicator visualisation

[Information on the software used to calculate the indicators](#)


info on the versions of Geoportal & Validator used


Results from the metadata validation

Results of evaluation using [INSPIRE Reference Validator](#) 

Metadata Dataset	
Conformant: 141	NOT Conformant: 6
Click to download the test reports of failed records	

Metadata Services	
Conformant: 211	NOT Conformant: 13
Click to download the test reports of failed records	

Summary of metadata failing validation in [this endpoint](#)  (batch file identifier, metadata identifier, metadata type, total number and ids of failed test assertions)

Summary of metadata failing validation in [all endpoints](#)  (see "readme" sheet for details)

ZIP files including failed reports in HTML and JSON

Results from the metadata validation

Results of evaluation using [INSPIRE Reference Validator](#)

Metadata Dataset

Conformant: 141

NOT Conformant: 6

[Click to download the test reports of failed records](#)

Metadata Services

Conformant: 211

NOT Conformant: 13

[Click to download the test reports of failed records](#)

Summary of metadata failing validation in [this endpoint](#) (batch file identifier, metadata identifier, metadata type, total number and ids of failed test assertions)

Summary of metadata failing validation in [all endpoints](#) (see "readme" sheet for details)

	A	B	C	D	E	F
1	file_id	md_id	type	error_count	errors	
2	121-140/1	59630bde-6361-4175-8f7b-1791ecfa78cf	dataset	1	1.4	
3	281-300/17	e02e7c33-818a-463e-a565-3847f2b8cb30	dataset	1	2.5	
4	341-360/14	aac1ad8b-4fb3-4bea-803c-64c8a22b33fc	dataset	1	C.16	
5	341-360/2	326ef9d6-78fb-496e-9215-07ae1d96afec	dataset	2	C.1 C.16	
6	361-371/5	eeeba0a6-0fe8-4be3-8392-39851d3f98c3	service	1	C.16	
7	361-371/8	f62e9051-5374-4d1d-89db-522f71839a7f	service	1	C.16	
8	41-60/6	242a54d1-9857-4582-9236-68b69ff8695a	service	2	C.1 C.22	
9	281-300/6	d6892cc7-7c63-4d74-a86e-71a2196f9c16	service	2	C.1 C.22	
10	281-300/12	d9e282b1-d016-4eaf-b2b6-ad7ce2fe528a	service	2	C.1 C.22	
11	341-360/3	368e2919-0bfa-43be-89bd-45e91d047cc3	service	1	C.16	
12	321-340/17	10d86cd3-93d6-4056-906b-01c9bedcf6f0	service	1	C.16	
13	341-360/9	77a3b667-68fd-4250-9b26-8ee62e32046f	service	1	C.16	
14	341-360/12	8079e314-508c-4b8e-83ae-e56b518db50c	service	1	C.16	
15	341-360/5	37473a91-068e-4950-a3cd-8bcc0b453ffd	service	1	C.16	
16	341-360/8	7480a470-c674-46c2-91ee-5f342d967678	service	1	C.16	
17	361-371/3	e81e37e8-3c68-42cf-9e78-9e70fe4f2209	dataset	1	C.16	

Results from the metadata validation

Results of evaluation using [INSPIRE Reference Validator](#)

Metadata Dataset

Conformant: **141**

NOT Conformant: **6**

[Click to download the test reports of failed records](#)

Metadata Services

Conformant: **211**

NOT Conformant: **13**

[Click to download the test reports of failed records](#)

Summary of metadata failing validation in [this endpoint](#) (batch file identifier, metadata identifier, metadata type, total number and ids of failed test assertions)

Summary of metadata failing validation in [all endpoints](#) (see "readme" sheet for details)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	Country	Endpoint ID	md_failed	C.1	C.2	C.5	C.6	C.7	C.8	C.9	C.10	C.11	C.12	C.13	C.14	C.15	C.16	C.17	C.18	C.19	C.20
2	AT	INSPIRE-61494	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
3	BE	INSPIRE-21055	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	BE	INSPIRE-b285f0	28	12	0	0	0	0	0	0	0	0	0	0	0	1	0	3	11	0	0
5	BE	INSPIRE-f5201e	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	BE	INSPIRE-f0c917	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	52	0	0	0
7	BG	INSPIRE-365cf7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	CH	INSPIRE-7a076	33	0	0	0	22	0	0	0	3	0	0	0	0	0	5	33	33	0	30
9	CY	INSPIRE-db3ec	61	0	0	61	0	0	0	0	0	0	0	0	0	0	0	61	0	0	0
10	CZ	INSPIRE-16542	14	1	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0
11	DE	INSPIRE-4fed3e	7128	0	0	373	2	0	0	0	2	0	1	21	11	796	36	2435	397	0	12
12	DK	INSPIRE-6e835	101	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
13	EE	INSPIRE-608e4	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	EL	INSPIRE-b4838	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	ES	INSPIRE-c6f329	5	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
16	FI	INSPIRE-f67070	115	23	0	78	26	0	5	5	10	0	0	3	3	5	1	114	18	0	3
17	FR	INSPIRE-e9451	41	0	0	13	2	0	0	0	5	0	0	0	0	9	0	41	15	0	14

Lessons learnt

Monitoring and Reporting 2021 – Lessons learnt

General conclusions

- Overall, slight improvement of results compared to the 2020 exercise.
- Significant improvement compared to M&R 2019 baseline.
- Heterogeneity in performance of the different countries clearly remains.
- Concerns about the reliability of indicators on the conformity of datasets and services (self-declarations).
- Several issues were identified in the INSPIRE infrastructure during the M&R process, which may turn into opportunities for future improvement.
- But also good practices!

Conformity of datasets and services

Self-declared conformity

- Many countries with values equal or close to 100% for the indicators on the conformity of datasets.

country	MDi1.1	MDi1.2	DSi2	DSi2.1	DSi2.2	DSi2.3	NSi2	NSi2.1	NSi2.2	NSi4	NSi4.1	NSi4.2	NSi4.3	NSi4.4
AT	98%	99%	77%	89%	81%	71%	50%	87%	56%	97%	100%	96%	97%	#N/A
BE	93%	64%	70%	95%	67%	66%	61%	88%	65%	92%	83%	92%	92%	#N/A
BG	41%	60%	98%	100%	100%	99%	48%	48%	52%	0%	0%	0%	0%	#N/A
CH	0%	0%	2%	6%	2%	0%	1%	2%	1%	0%	0%	0%	0%	#N/A
CY	0%	0%	2%	0%	25%	0%	0%	0%	62%	0%	#N/A	0%	0%	#N/A
CZ	56%	93%	48%	95%	91%	21%	50%	66%	79%	96%	100%	96%	96%	100%
DE	71%	94%	74%	57%	60%	74%	60%	66%	63%	99%	100%	98%	99%	#N/A
DK	62%	57%	61%	95%	63%	57%	24%	51%	29%	95%	100%	94%	96%	#N/A
EE	95%	73%	100%	100%	100%	100%	55%	65%	55%	96%	100%	94%	98%	#N/A
EL	97%	100%	3%	40%	#N/A	0%	98%	98%	98%	5%	100%	0%	0%	#N/A
ES	93%	98%	100%	100%	100%	100%	43%	79%	45%	100%	100%	100%	100%	#N/A
FI	55%	44%	23%	14%	14%	30%	9%	36%	15%	55%	0%	55%	55%	#N/A
FR	2%	27%	78%	84%	92%	75%	4%	10%	25%	7%	0%	9%	0%	#N/A
HR	96%	94%	97%	100%	100%	95%	26%	65%	28%	92%	100%	90%	97%	#N/A
HU	0%	0%	39%	46%	37%	43%	8%	11%	13%	13%	50%	7%	11%	#N/A
IE	99%	100%	100%	100%	100%	100%	53%	56%	54%	100%	100%	100%	100%	#N/A
IS	98%	96%	55%	67%	71%	38%	0%	0%	40%	0%	#N/A	0%	0%	#N/A
IT	99%	99%	30%	33%	22%	28%	5%	10%	13%	3%	25%	3%	3%	0%
LI	1%	0%	11%	87%	16%	7%	13%	17%	16%	50%	#N/A	100%	0%	#N/A
LT	96%	100%	98%	97%	100%	99%	45%	45%	95%	100%	100%	100%	100%	#N/A
LU	100%	100%	72%	100%	94%	62%	80%	86%	91%	100%	100%	100%	100%	#N/A
LV	0%	0%	75%	77%	64%	81%	33%	59%	37%	3%	#N/A	5%	2%	#N/A
MT	99%	99%	100%	100%	100%	100%	99%	100%	99%	100%	100%	100%	100%	#N/A
NL	56%	65%	50%	65%	67%	42%	55%	67%	58%	94%	100%	94%	94%	#N/A
NO	1%	0%	10%	11%	11%	8%	15%	19%	46%	15%	100%	16%	14%	#N/A
PL	100%	100%	94%	100%	50%	92%	50%	54%	56%	97%	100%	95%	99%	#N/A
PT	100%	97%	50%	63%	49%	49%	57%	79%	66%	69%	#N/A	75%	62%	#N/A
RO	40%	87%	42%	70%	31%	34%	18%	21%	20%	90%	100%	94%	85%	#N/A
SE	78%	86%	100%	100%	100%	99%	79%	90%	83%	100%	100%	100%	100%	100%
SI	69%	92%	88%	100%	79%	90%	1%	57%	9%	98%	#N/A	95%	100%	#N/A
SK	100%	98%	15%	18%	9%	15%	62%	75%	65%	24%	100%	24%	23%	100%

Conformity of datasets and services

Self-declared conformity

- A random, manual QC of conformity was performed on a small sample (where results were close to 100%) using the INSPIRE Reference Validator.
 - The overall result of the JRC manual conformity is very low:
 - Between 0 and 10%!
 - Despite no conclusions could be derived, we proved that the calculated values for the conformity indicators are not reliable:
 - DSi1.1, DSi1.2, DSi1.3, DSi1.4, DSi1.5
 - NSi4, NSi4.1, NSi4.2, NSi4.3, NSi4.4
 - The INSPIRE Reference Validator was probably not used to check the conformity in many cases.

Issues identified / Opportunities for improvement

Encapsulation of many download services in a single ATOM Feed

- Usability of this services is questioned - Examples:
 - ATOM service with thousands of sub-feed entries (e.g. +6000, +13000).
 - Repetition of cases: Harvesting a single endpoint / Endpoints from several countries.

Relevance of URLs (Word, PDF, generic webpages) linked through the Resource Locator (gmd:CI_OnlineResource)

- Without declaring the format within the 'applicationProfile' MD field.
- Hard for the INSPIRE Geoportal to distinguish them from valid INSPIRE services.

Availability of INSPIRE discovery services during the harvesting process

→ All hindered the functionality and performance of the INSPIRE Geoportal.

Good practices identified

Germany (DE)

- Paradigmatic case because of the number of resources reported, hence the own size of the catalogue.
- Continuous feedback to the INSPIRE Geoportal team on issues detected.
- Granularity of reporting could be improved.

Other cases of early warning on issues (e.g. BE, DE, AT)

- Rigorous analyses performed at national level (based on real metadata / data).
- Giving chance to analyze them, draw preventive and corrective actions.

Regular harvests during the year (e.g. AT, BE, MT, SE, DK, PL, CZ, ES)

- Without waiting for the proximity of the yearly M&R deadline.

Thank you!



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