



INSPIRE Monitoring and Reporting 2022: Process, results and way forward

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73rd MIG-T meeting – February 17, 2023

Context

Context

- Farewell to custom code
- Welcome to **GeoNetwork** Open Source
 - Migration tougher than anticipated
 - **More than one year** of development, testing and training
 - One of the first **real test cases** for the new GeoNetwork 4.0 based on microservices
 - Very **complex architecture** and unprecedentedly high number of metadata records



Context

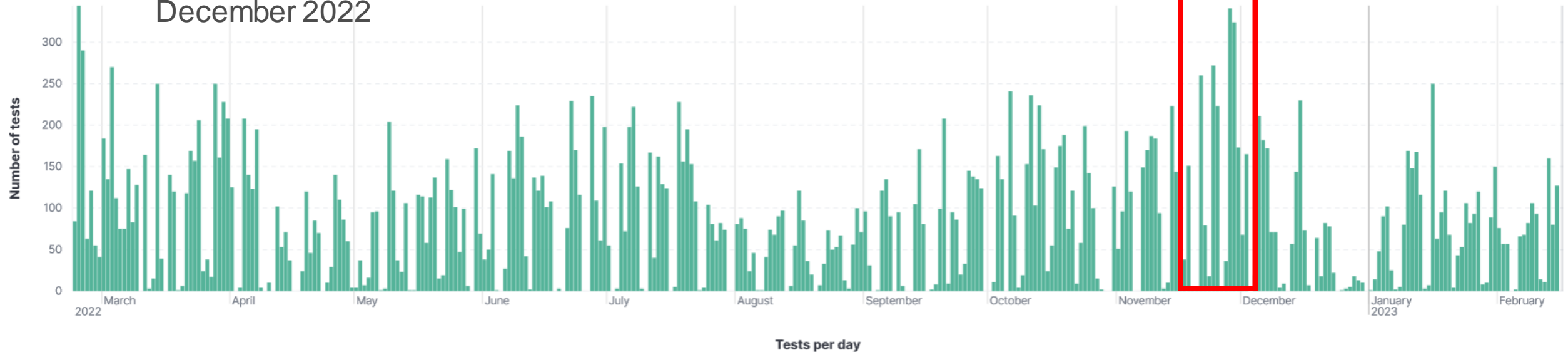
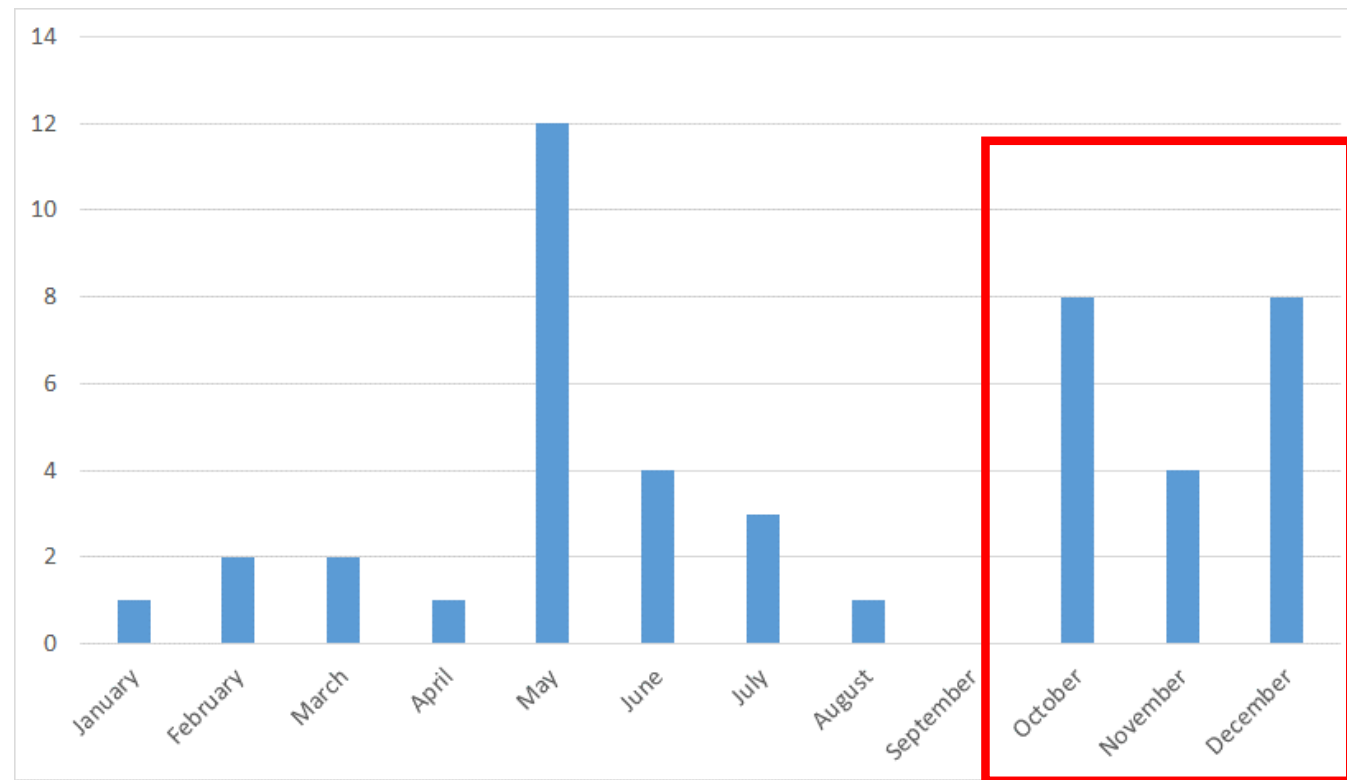
- Strategic decision to go ahead with **open source** technology
 - Part of ‘mainstreaming’ and **simplification** agenda for the central INSPIRE infrastructure
 - Improved **transparency and reproducibility** of the results by the MS
 - Long-term commitment
- New infrastructure and the HVD Implementing Act

Cloud resources

- INSPIRE Geoportal backend
 - Initial: 8 CPUs, 16 GB ram, 200 GB (root) + 1 TB (data)
 - Current: incrementally scaled to 48 CPUs, 384 GB ram, 200GB (root) + 4TB (data)
- INSPIRE Reference Validator
 - ETF instances: up to 8 nodes, 2 vCPUs, 8 GB ram, 100 GB SSD
 - Bulk validation tool: 2 nodes
 - 1 node: 2 vCPUs, 8 GB ram, 124 GB hdd
 - 1 node (used for DE validation): 4 vCPUs, 16 GB ram, 248 GB hdd

Context

- Issues opened in the **Geoportal helpdesk** in 2022
 - Opened by 17 MS (thank you!)
 - 46 issues in total
- Tests run in the **INSPIRE Reference Validator**
 - clear peak between November and December 2022



Special thanks to

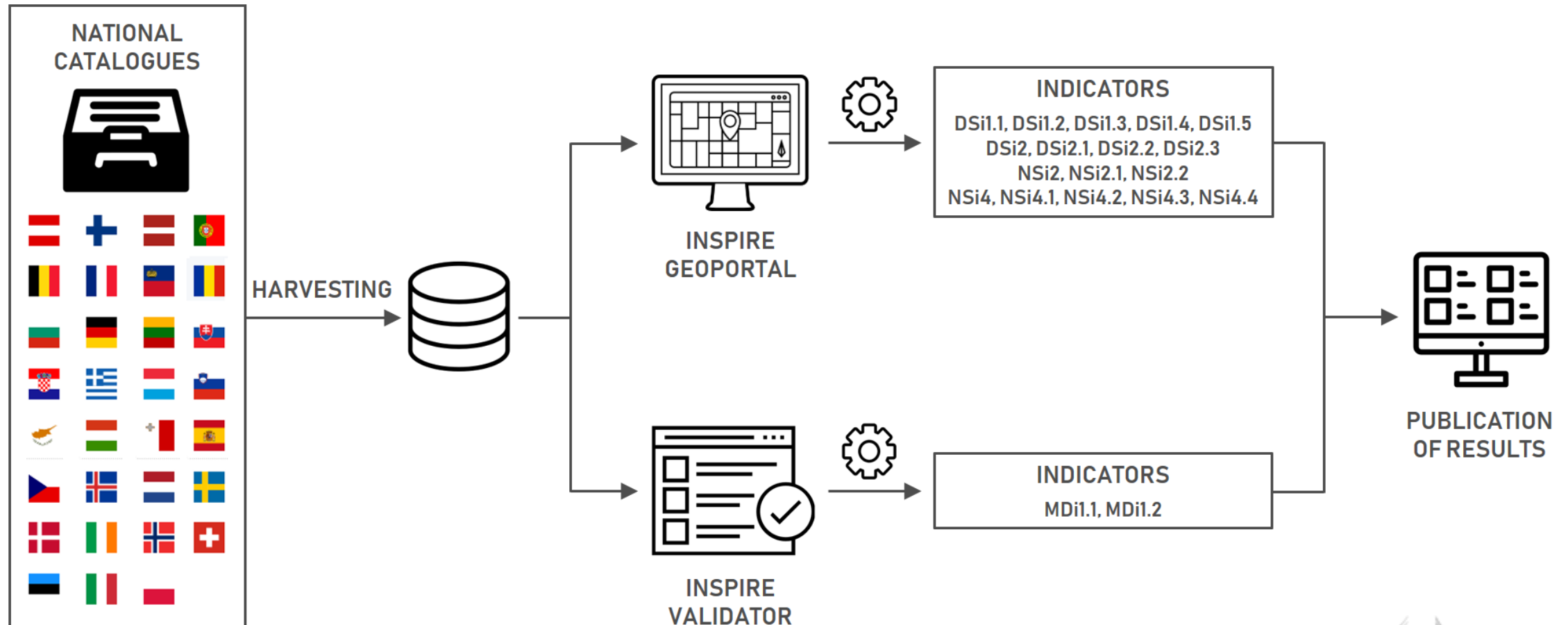
- All the **JRC colleagues** involved in the process
 - Fabiano Spinelli, Davide Artasensi, Loizos Bailas, Andrea Musumeci, Pierpaolo Cira
- The Consortium supporting the operation of the INSPIRE infrastructure



Results

Monitoring and Reporting 2022 – Process

- Overall process:



Monitoring and Reporting 2022 – Software

The screenshot shows the 'My GeoNetwork catalogue' page. It features a map of Europe titled 'INSPIRE Data Sets - EU & EFTA Country overview'. To the right of the map, there are statistics: 93616 Metadata records, 12060 Downloadable Data Sets, and 49769 Viewable Data Sets. Below the map is a 'Select a COUNTRY' section with a grid of country cards, each displaying the country name, flag, and three statistics (represented by a bar chart, a triangle, and a circle).

Country	Metadata records	Downloadable Data Sets	Viewable Data Sets
Austria	830	804	507
Belgium	517	402	478
Bulgaria	158	56	75
Cyprus	42	37	39
Czech Republic	65	44	58
Germany	80269	7393	44878
Denmark	204	94	99
Estonia	88	59	60
Greece	45	44	44
Spain	245	173	218
Finland	583	211	206
France	126	1	18
Croatia	134	44	89
Hungary	101	18	15
Ireland	86	62	52
Latvia	98	0	0
Italy	7447	490	802
Lithuania	95	95	60
Luxembourg	311	305	280
Malta	150	143	148
Netherlands	206	120	133
Poland	152	99	96
Portugal	451	245	252
Romania	106	37	36
Sweden	248	218	213
Slovenia	91	49	52
Slovakia	272	118	178

- INSPIRE Geoportal based on GeoNetwork v.4.2.0

The screenshot shows the 'INSPIRE Validator - Test selection' page. It includes a 'Configure your test' section with radio buttons for 'Metadata', 'View Service', 'Download Service', 'Discovery Service', and 'Data set'. There is also a section for 'Select the Technical Guidelines version' with options for 'Version 1.3 - DEPRECATED' and 'Version 2.0'. Below that, there is a section for 'Select the type of metadata record(s) to be tested' with options for 'Data sets and data set series', 'Network Service', and 'Spatial Data Service'. An 'Advanced options' dropdown is also present. The 'Provide the resource to test' section includes a 'File upload' button and an 'Upload file*' section with a 'Choose files' button. At the bottom, there is a text input field for a test report label and a 'Start test >' button.

- INSPIRE Reference Validator v.2022.3 (released on 21/09/2022)
- Bulk validation tool v.2021.1.0 (released on 5/10/2021)

Monitoring and Reporting 2022 – 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

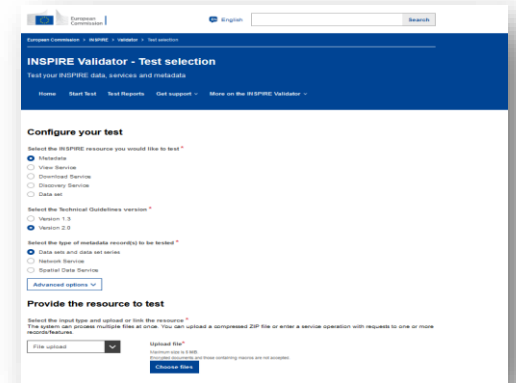
- accessibility of spatial data sets

- NSi2, NSi2.1, NSi2.2

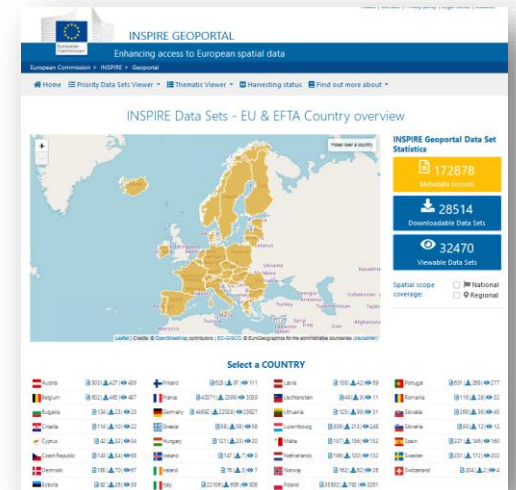
- conformity of network services

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

**INSPIRE
Reference
Validator**
(metadata
validation)



**INSPIRE
Geoportal**
(linkages check)



Monitoring and Reporting 2022 – 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 2022 – Results

- Median values of all indicators in the years 2019-2022:
 - overall: slow but continuous 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
2022	157	193	58	0	101

availability of spatial data and services

YEAR	MDi1.1	MDi1.2
2019	38%	38%
2020	55%	67%
2021	78%	92%
2022	89%	90%

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%
2022	73%	91%	71%	70%

conformity of spatial data sets

calculated automatically (Geoportal)

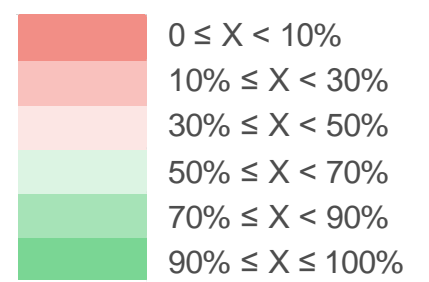
YEAR	NSi2	NSi2.1	NSi2.2
2019	16%	32%	20%
2020	32%	44%	42%
2021	45%	57%	54%
2022	50%	62%	56%

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%
2022	92%	100%	93%	91%	0%

conformity of network services

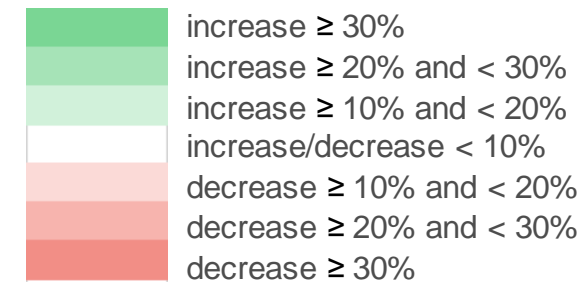
Overall results – 2022 performance



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	830	625	90	260	563	99%	99%	86%	88%	98%	70%	60%	61%	97%	97%	100%	96%	98%	#N/A
BE	558	240	281	467	78	95%	63%	73%	96%	71%	71%	79%	93%	80%	92%	83%	93%	91%	#N/A
BG	166	37	101	56	81	37%	51%	96%	100%	100%	98%	34%	46%	34%	0%	0%	0%	0%	#N/A
CH	207	35	0	0	4	0%	0%	2%	7%	0%	0%	0%	2%	0%	0%	0%	0%	0%	#N/A
CY	42	61	10	0	0	0%	0%	2%	0%	25%	0%	81%	93%	88%	0%	#N/A	0%	0%	#N/A
CZ	90	193	33	12	78	93%	98%	48%	100%	91%	21%	78%	93%	83%	96%	100%	95%	97%	100%
DE	81044	151526	258	2650	212	93%	96%	81%	68%	51%	82%	72%	76%	76%	99%	100%	99%	99%	#N/A
DK	206	246	59	0	202	63%	97%	63%	95%	71%	57%	42%	48%	46%	95%	100%	94%	96%	#N/A
EE	89	117	25	0	89	97%	95%	98%	100%	90%	100%	66%	67%	66%	97%	100%	95%	98%	#N/A
EL	45	98	43	0	45	100%	100%	100%	100%	#N/A	100%	96%	98%	98%	0%	0%	0%	0%	#N/A
ES	245	321	75	43	188	93%	99%	100%	100%	100%	99%	70%	89%	71%	100%	100%	100%	100%	#N/A
FI	661	207	34	232	178	75%	86%	19%	9%	21%	22%	32%	34%	38%	54%	0%	56%	53%	#N/A
FR	228	56	146	11	103	2%	4%	76%	81%	92%	74%	1%	18%	1%	7%	0%	9%	0%	#N/A
HR	151	216	18	22	101	95%	90%	98%	100%	100%	97%	27%	67%	29%	93%	100%	90%	99%	#N/A
HU	111	59	13	0	8	1%	0%	36%	48%	45%	33%	14%	14%	16%	32%	60%	26%	33%	#N/A
IE	83	26	41	0	83	100%	100%	100%	100%	100%	100%	63%	63%	75%	100%	100%	100%	100%	#N/A
IS	98	28	5	2	92	89%	86%	52%	62%	72%	36%	0%	0%	0%	0%	#N/A	0%	0%	#N/A
IT	7671	2231	583	4383	960	99%	96%	31%	34%	20%	27%	6%	10%	6%	5%	14%	6%	2%	0%
LI	72	3	0	0	53	78%	33%	11%	8%	16%	6%	0%	17%	0%	50%	#N/A	100%	0%	#N/A
LT	95	122	72	0	95	93%	100%	98%	97%	100%	99%	63%	63%	100%	100%	100%	100%	100%	#N/A
LU	311	59	96	0	311	100%	100%	73%	100%	94%	62%	90%	90%	98%	100%	100%	100%	100%	#N/A
LV	157	240	72	0	0	0%	0%	76%	83%	55%	81%	54%	59%	56%	0%	#N/A	0%	0%	#N/A
MT	150	150	40	0	148	99%	99%	100%	100%	100%	100%	95%	99%	95%	99%	100%	100%	99%	#N/A
NL	214	352	63	0	192	77%	91%	53%	91%	33%	70%	50%	64%	57%	93%	100%	93%	93%	#N/A
NO	144	239	14	3	140	84%	79%	36%	38%	28%	38%	15%	19%	42%	16%	100%	15%	15%	#N/A
PL	156	258	58	0	155	99%	89%	94%	100%	50%	93%	56%	62%	63%	97%	100%	95%	99%	#N/A
PT	456	508	106	165	199	62%	90%	47%	60%	53%	43%	49%	56%	54%	67%	#N/A	73%	58%	#N/A
RO	107	76	29	15	92	52%	84%	40%	70%	27%	32%	33%	34%	35%	90%	100%	94%	85%	#N/A
SE	248	227	64	0	237	83%	83%	100%	100%	100%	100%	83%	86%	88%	100%	100%	100%	100%	#N/A
SI	98	131	9	0	84	64%	90%	82%	100%	81%	90%	40%	60%	50%	100%	#N/A	100%	100%	#N/A
SK	274	430	59	10	192	99%	46%	21%	16%	29%	19%	43%	65%	43%	30%	100%	30%	29%	0%

Absolute number indicators

Comparison vs. 2021, 2020, 2019



country	DSi1.1	DSi1.2	DSi1.3	DSi1.4	DSi1.5
AT	830	625	90	260	563
BE	558	240	281	467	78
BG	166	37	101	56	81
CH	207	35	0	0	4
CY	42	61	10	0	0
CZ	90	193	33	12	78
DE	81044	151526	258	2650	212
DK	206	246	59	0	202
EE	89	117	25	0	89
EL	45	98	43	0	45
ES	245	321	75	43	188
FI	661	207	34	232	178
FR	228	56	146	11	103
HR	151	216	18	22	101
HU	111	59	13	0	8
IE	83	26	41	0	83
IS	98	28	5	2	92
IT	7671	2231	583	4383	960
LI	72	3	0	0	53
LT	95	122	72	0	95
LU	311	59	96	0	311
LV	157	240	72	0	0
MT	150	150	40	0	148
NL	214	352	63	0	192
NO	144	239	14	3	140
PL	156	258	58	0	155
PT	456	508	106	165	199
RO	107	76	29	15	92
SE	248	227	64	0	237
SI	98	131	9	0	84
SK	274	430	59	10	192

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CH	207	35	0	0	4
CY	42	61	10	0	0
CZ	90	193	33	12	78
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FI	661	207	34	232	178
FR	228	56	146	11	103
HR	151	216	18	22	101
HU	111	59	13	0	8
IE	83	26	41	0	83
IS	98	28	5	2	92
IT	7671	2231	583	4383	960
LI	72	3	0	0	53
LT	95	122	72	0	95
LU	311	59	96	0	311
LV	157	240	72	0	0
MT	150	150	40	0	148
NL	214	352	63	0	192
NO	144	239	14	3	140
PL	156	258	58	0	155
PT	456	508	106	165	199
RO	107	76	29	15	92
SE	248	227	64	0	237
SI	98	131	9	0	84
SK	274	430	59	10	192

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HR	151	216	18	22	101
HU	111	59	13	0	8
IE	83	26	41	0	83
IS	98	28	5	2	92
IT	7671	2231	583	4383	960
LI	72	3	0	0	53
LT	95	122	72	0	95
LU	311	59	96	0	311
LV	157	240	72	0	0
MT	150	150	40	0	148
NL	214	352	63	0	192
NO	144	239	14	3	140
PL	156	258	58	0	155
PT	456	508	106	165	199
RO	107	76	29	15	92
SE	248	227	64	0	237
SI	98	131	9	0	84
SK	274	430	59	10	192

Relative number indicators Comparison vs. 2021

increase of more than 10 percentage points compared to 2021
 increase/decrease of less than 10 percentage points compared to 2021
 decrease of more than 10 percentage points compared to 2021

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	99%	99%	86%	88%	98%	70%	60%	61%	97%	97%	100%	96%	98%	#N/A
BE	95%	63%	73%	96%	71%	71%	79%	93%	80%	92%	83%	93%	91%	#N/A
BG	37%	51%	96%	100%	100%	98%	34%	46%	34%	0%	0%	0%	0%	#N/A
CH	0%	0%	2%	7%	0%	0%	0%	2%	0%	0%	0%	0%	0%	#N/A
CY	0%	0%	2%	0%	25%	0%	81%	93%	88%	0%	#N/A	0%	0%	#N/A
CZ	93%	98%	48%	100%	91%	21%	78%	93%	83%	96%	100%	95%	97%	100%
DE	93%	96%	81%	68%	51%	82%	72%	76%	76%	99%	100%	99%	99%	#N/A
DK	63%	97%	63%	95%	71%	57%	42%	48%	46%	95%	100%	94%	96%	#N/A
EE	97%	95%	98%	100%	90%	100%	66%	67%	66%	97%	100%	95%	98%	#N/A
EL	100%	100%	100%	100%	#N/A	100%	96%	98%	98%	0%	0%	0%	0%	#N/A
ES	93%	99%	100%	100%	100%	99%	70%	89%	71%	100%	100%	100%	100%	#N/A
FI	75%	86%	19%	9%	21%	22%	32%	34%	38%	54%	0%	56%	53%	#N/A
FR	2%	4%	76%	81%	92%	74%	1%	18%	1%	7%	0%	9%	0%	#N/A
HR	95%	90%	98%	100%	100%	97%	27%	67%	29%	93%	100%	90%	99%	#N/A
HU	1%	0%	36%	48%	45%	33%	14%	14%	16%	32%	60%	26%	33%	#N/A
IE	100%	100%	100%	100%	100%	100%	63%	63%	75%	100%	100%	100%	100%	#N/A
IS	89%	86%	52%	62%	72%	36%	0%	0%	0%	0%	#N/A	0%	0%	#N/A
IT	99%	96%	31%	34%	20%	27%	6%	10%	6%	5%	14%	6%	2%	0%
LI	78%	33%	11%	8%	16%	6%	0%	17%	0%	50%	#N/A	100%	0%	#N/A
LT	93%	100%	98%	97%	100%	99%	63%	63%	100%	100%	100%	100%	100%	#N/A
LU	100%	100%	73%	100%	94%	62%	90%	90%	98%	100%	100%	100%	100%	#N/A
LV	0%	0%	76%	83%	55%	81%	54%	59%	56%	0%	#N/A	0%	0%	#N/A
MT	99%	99%	100%	100%	100%	100%	95%	99%	95%	99%	100%	100%	99%	#N/A
NL	77%	91%	53%	91%	33%	70%	50%	64%	57%	93%	100%	93%	93%	#N/A
NO	84%	79%	36%	38%	28%	38%	15%	19%	42%	16%	100%	15%	15%	#N/A
PL	99%	89%	94%	100%	50%	93%	56%	62%	63%	97%	100%	95%	99%	#N/A
PT	62%	90%	47%	60%	53%	43%	49%	56%	54%	67%	#N/A	73%	58%	#N/A
RO	52%	84%	40%	70%	27%	32%	33%	34%	35%	90%	100%	94%	85%	#N/A
SE	83%	83%	100%	100%	100%	100%	83%	86%	88%	100%	100%	100%	100%	#N/A
SI	64%	90%	82%	100%	81%	90%	40%	60%	50%	100%	#N/A	100%	100%	#N/A
SK	99%	46%	21%	16%	29%	19%	43%	65%	43%	30%	100%	30%	29%	0%

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	99%	99%	86%	88%	98%	70%	60%	61%	97%	97%	100%	96%	98%	#N/A
BE	95%	63%	73%	96%	71%	71%	79%	93%	80%	92%	83%	93%	91%	#N/A
BG	37%	51%	96%	100%	100%	98%	34%	46%	34%	0%	0%	0%	0%	#N/A
CH	0%	0%	2%	7%	0%	0%	0%	2%	0%	0%	0%	0%	0%	#N/A
CY	0%	0%	2%	0%	25%	0%	81%	93%	88%	0%	#N/A	0%	0%	#N/A
CZ	93%	98%	48%	100%	91%	21%	78%	93%	83%	96%	100%	95%	97%	100%
DE	93%	96%	81%	68%	51%	82%	72%	76%	76%	99%	100%	99%	99%	#N/A
DK	63%	97%	63%	95%	71%	57%	42%	48%	46%	95%	100%	94%	96%	#N/A
EE	97%	95%	98%	100%	90%	100%	66%	67%	66%	97%	100%	95%	98%	#N/A
EL	100%	100%	100%	100%	#N/A	100%	96%	98%	98%	0%	0%	0%	0%	#N/A
ES	93%	99%	100%	100%	100%	99%	70%	89%	71%	100%	100%	100%	100%	#N/A
FI	75%	86%	19%	9%	21%	22%	32%	34%	38%	54%	0%	56%	53%	#N/A
FR	2%	4%	76%	81%	92%	74%	1%	18%	1%	7%	0%	9%	0%	#N/A
HR	95%	90%	98%	100%	100%	97%	27%	67%	29%	93%	100%	90%	99%	#N/A
HU	1%	0%	36%	48%	45%	33%	14%	14%	16%	32%	60%	26%	33%	#N/A
IE	100%	100%	100%	100%	100%	100%	63%	63%	75%	100%	100%	100%	100%	#N/A
IS	89%	86%	52%	62%	72%	36%	0%	0%	0%	0%	#N/A	0%	0%	#N/A
IT	99%	96%	31%	34%	20%	27%	6%	10%	6%	5%	14%	6%	2%	0%
LI	78%	33%	11%	8%	16%	6%	0%	17%	0%	50%	#N/A	100%	0%	#N/A
LT	93%	100%	98%	97%	100%	99%	63%	63%	100%	100%	100%	100%	100%	#N/A
LU	100%	100%	73%	100%	94%	62%	90%	90%	98%	100%	100%	100%	100%	#N/A
LV	0%	0%	76%	83%	55%	81%	54%	59%	56%	0%	#N/A	0%	0%	#N/A
MT	99%	99%	100%	100%	100%	100%	95%	99%	95%	99%	100%	100%	99%	#N/A
NL	77%	91%	53%	91%	33%	70%	50%	64%	57%	93%	100%	93%	93%	#N/A
NO	84%	79%	36%	38%	28%	38%	15%	19%	42%	16%	100%	15%	15%	#N/A
PL	99%	89%	94%	100%	50%	93%	56%	62%	63%	97%	100%	95%	99%	#N/A
PT	62%	90%	47%	60%	53%	43%	49%	56%	54%	67%	#N/A	73%	58%	#N/A
RO	52%	84%	40%	70%	27%	32%	33%	34%	35%	90%	100%	94%	85%	#N/A
SE	83%	83%	100%	100%	100%	100%	83%	86%	88%	100%	100%	100%	100%	#N/A
SI	64%	90%	82%	100%	81%	90%	40%	60%	50%	100%	#N/A	100%	100%	#N/A
SK	99%	46%	21%	16%	29%	19%	43%	65%	43%	30%	100%	30%	29%	0%

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	99%	99%	86%	88%	98%	70%	60%	61%	97%	97%	100%	96%	98%	#N/A
BE	95%	63%	73%	96%	71%	71%	79%	93%	80%	92%	83%	93%	91%	#N/A
BG	37%	51%	96%	100%	100%	98%	34%	46%	34%	0%	0%	0%	0%	#N/A
CH	0%	0%	2%	7%	0%	0%	0%	2%	0%	0%	0%	0%	0%	#N/A
CY	0%	0%	2%	0%	25%	0%	81%	93%	88%	0%	#N/A	0%	0%	#N/A
CZ	93%	98%	48%	100%	91%	21%	78%	93%	83%	96%	100%	95%	97%	100%
DE	93%	96%	81%	68%	51%	82%	72%	76%	76%	99%	100%	99%	99%	#N/A
DK	63%	97%	63%	95%	71%	57%	42%	48%	46%	95%	100%	94%	96%	#N/A
EE	97%	95%	98%	100%	90%	100%	66%	67%	66%	97%	100%	95%	98%	#N/A
EL	100%	100%	100%	100%	#N/A	100%	96%	98%	98%	0%	0%	0%	0%	#N/A
ES	93%	99%	100%	100%	100%	99%	70%	89%	71%	100%	100%	100%	100%	#N/A
FI	75%	86%	19%	9%	21%	22%	32%	34%	38%	54%	0%	56%	53%	#N/A
FR	2%	4%	76%	81%	92%	74%	1%	18%	1%	7%	0%	9%	0%	#N/A
HR	95%	90%	98%	100%	100%	97%	27%	67%	29%	93%	100%	90%	99%	#N/A
HU	1%	0%	36%	48%	45%	33%	14%	14%	16%	32%	60%	26%	33%	#N/A
IE	100%	100%	100%	100%	100%	100%	63%	63%	75%	100%	100%	100%	100%	#N/A
IS	89%	86%	52%	62%	72%	36%	0%	0%	0%	0%	#N/A	0%	0%	#N/A
IT	99%	96%	31%	34%	20%	27%	6%	10%	6%	5%	14%	6%	2%	0%
LI	78%	33%	11%	8%	16%	6%	0%	17%	0%	50%	#N/A	100%	0%	#N/A
LT	93%	100%	98%	97%	100%	99%	63%	63%	100%	100%	100%	100%	100%	#N/A
LU	100%	100%	73%	100%	94%	62%	90%	90%	98%	100%	100%	100%	100%	#N/A
LV	0%	0%	76%	83%	55%	81%	54%	59%	56%	0%	#N/A	0%	0%	#N/A
MT	99%	99%	100%	100%	100%	100%	95%	99%	95%	99%	100%	100%	99%	#N/A
NL	77%	91%	53%	91%	33%	70%	50%	64%	57%	93%	100%	93%	93%	#N/A
NO	84%	79%	36%	38%	28%	38%	15%	19%	42%	16%	100%	15%	15%	#N/A
PL	99%	89%	94%	100%	50%	93%	56%	62%	63%	97%	100%	95%	99%	#N/A
PT	62%	90%	47%	60%	53%	43%	49%	56%	54%	67%	#N/A	73%	58%	#N/A
RO	52%	84%	40%	70%	27%	32%	33%	34%	35%	90%	100%	94%	85%	#N/A
SE	83%	83%	100%	100%	100%	100%	83%	86%	88%	100%	100%	100%	100%	#N/A
SI	64%	90%	82%	100%	81%	90%	40%	60%	50%	100%	#N/A	100%	100%	#N/A
SK	99%	46%	21%	16%	29%	19%	43%	65%	43%	30%	100%	30%	29%	0%

Monitoring and Reporting 2022 – 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/mr2022.html>



Monitoring and Reporting 2022 – 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 2022 indicators

<https://inspire-geoportal.ec.europa.eu/mr2022.html>

Poland

85a23ec3-62d5-4c15-875d-b6802485b629

MD Catalogue URL: <http://mapy.geoportal.gov.pl/wss/service/CSWINSP/guest/CSWStartup>

Endpoint ID: 85a23ec3-62d5-4c15-875d-b6802485b629

The date of harvest metadata: 2022-12-16, 20:41:11

Overview statistics of the harvested metadata

Dataset: 152	Series: 4	Services: 258
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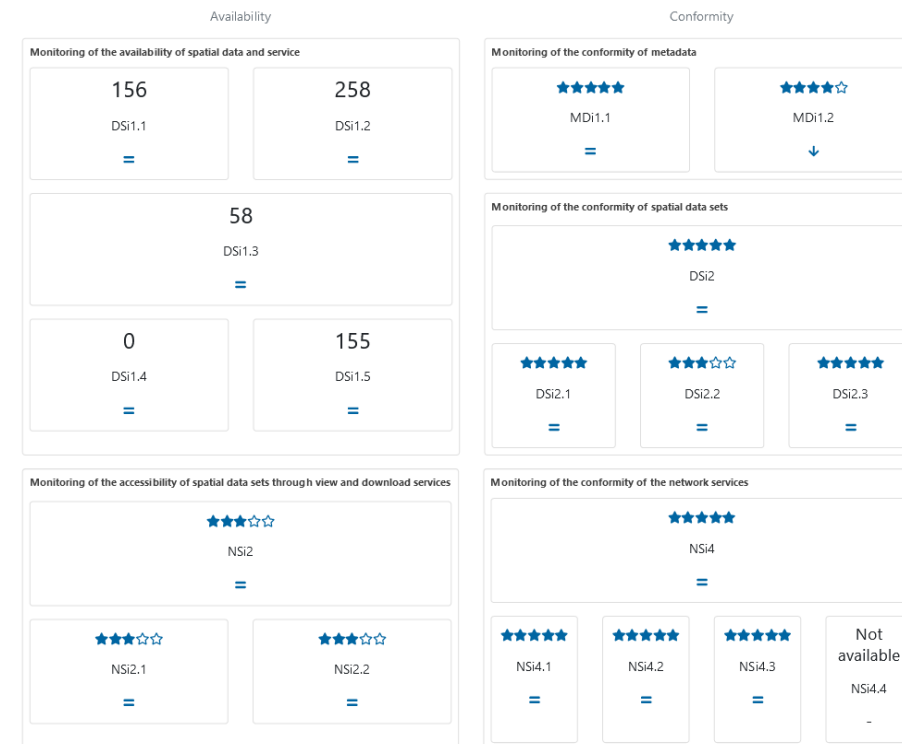
Results of evaluation using INSPIRE Reference Validator

Metadata Dataset		Metadata Services	
Conformant: 155	NOT Conformant: 1	Conformant: 230	NOT Conformant: 28
Click to download the test reports of failed records		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 2022



Download the calculated indicators for this country

Monitoring and Reporting 2022 – Dashboard

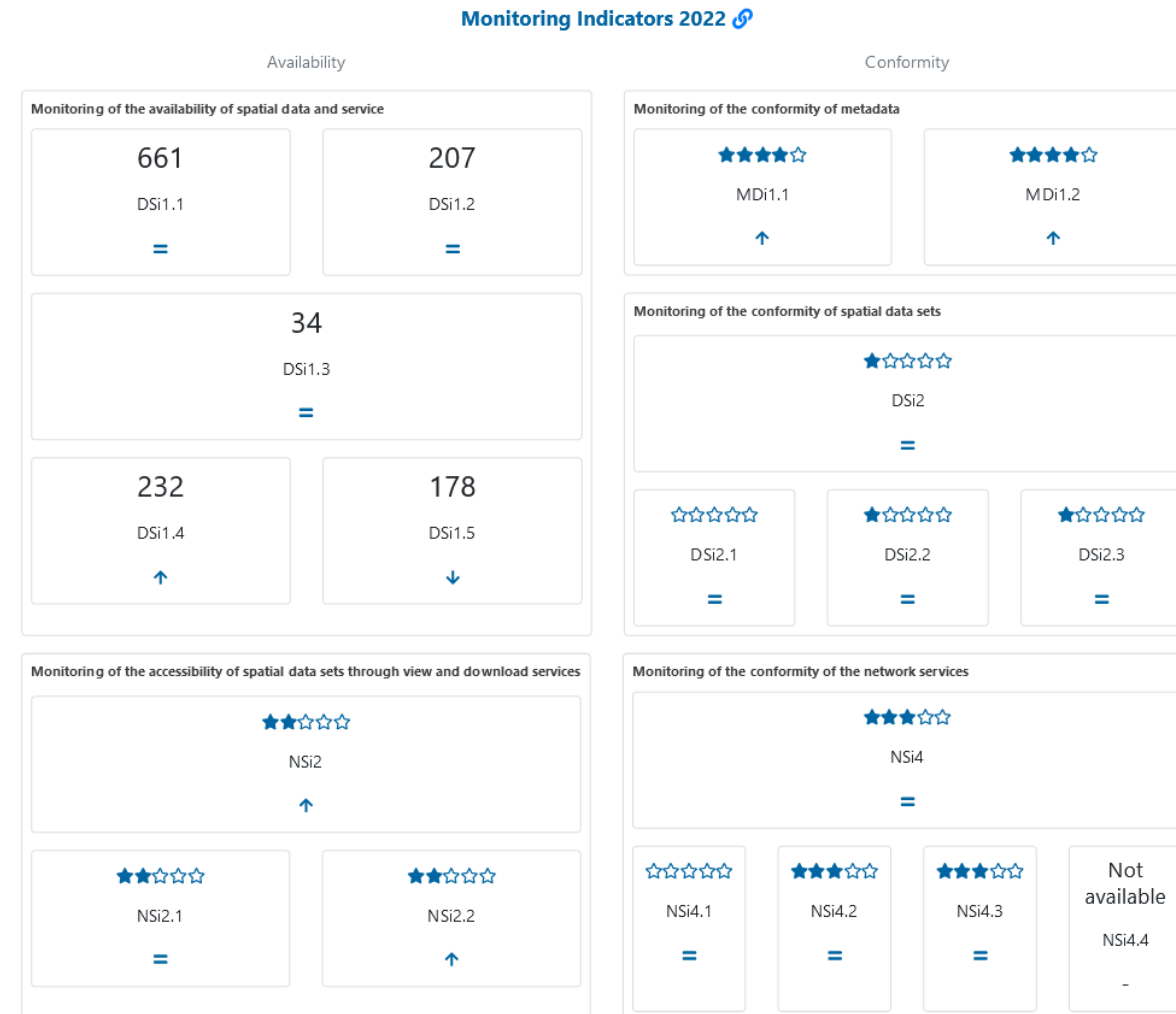
- Visualization of indicators
 - star-based scoring system (for percentage indicators):

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

- comparison against 2021 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 2021 values



Monitoring and Reporting 2022 – 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")

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](#)

Implementing Decision

Technical Report on M&R

explanation of how indicators are calculated

explanation of indicator visualisation

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	

Lessons learnt

Monitoring and Reporting 2022 – Lessons learnt

General conclusions

- Overall, **slight improvement** of results compared to the **2021** exercise.
- **Significant improvement** comparing with previous years M&R baselines, increasing from 2020 to **2019**, respectively.
- **Heterogeneity in performance** of the different countries still 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 (the same as in 2021) declared values equal or close to 100% for all the indicators on the conformity of datasets and services.

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	99%	99%	86%	88%	98%	70%	60%	61%	97%	97%	100%	96%	98%	#N/A
BE	95%	63%	73%	96%	71%	71%	79%	93%	80%	92%	83%	93%	91%	#N/A
BG	37%	51%	96%	100%	100%	98%	34%	46%	34%	0%	0%	0%	0%	#N/A
CH	0%	0%	2%	7%	0%	0%	0%	2%	0%	0%	0%	0%	0%	#N/A
CY	0%	0%	2%	0%	25%	0%	81%	93%	88%	0%	#N/A	0%	0%	#N/A
CZ	93%	98%	48%	100%	91%	21%	78%	93%	83%	96%	100%	95%	97%	100%
DE	93%	96%	81%	68%	51%	82%	72%	76%	76%	99%	100%	99%	99%	#N/A
DK	63%	97%	63%	95%	71%	57%	42%	48%	46%	95%	100%	94%	96%	#N/A
EE	97%	95%	98%	100%	90%	100%	66%	67%	66%	97%	100%	95%	98%	#N/A
EL	100%	100%	100%	100%	#N/A	100%	96%	98%	98%	0%	0%	0%	0%	#N/A
ES	93%	99%	100%	100%	100%	99%	70%	89%	71%	100%	100%	100%	100%	#N/A
FI	75%	86%	19%	9%	21%	22%	32%	34%	38%	54%	0%	56%	53%	#N/A
FR	2%	4%	76%	81%	92%	74%	1%	18%	1%	7%	0%	9%	0%	#N/A
HR	95%	90%	98%	100%	100%	97%	27%	67%	29%	93%	100%	90%	99%	#N/A
HU	1%	0%	36%	48%	45%	33%	14%	14%	16%	32%	60%	26%	33%	#N/A
IE	100%	100%	100%	100%	100%	100%	63%	63%	75%	100%	100%	100%	100%	#N/A
IS	89%	86%	52%	62%	72%	36%	0%	0%	0%	0%	#N/A	0%	0%	#N/A
IT	99%	96%	31%	34%	20%	27%	6%	10%	6%	5%	14%	6%	2%	0%
LI	78%	33%	11%	8%	16%	6%	0%	17%	0%	50%	#N/A	100%	0%	#N/A
LT	93%	100%	98%	97%	100%	99%	63%	63%	100%	100%	100%	100%	100%	#N/A
LU	100%	100%	73%	100%	94%	62%	90%	90%	98%	100%	100%	100%	100%	#N/A
LV	0%	0%	76%	83%	55%	81%	54%	59%	56%	0%	#N/A	0%	0%	#N/A
MT	99%	99%	100%	100%	100%	100%	95%	99%	95%	99%	100%	100%	99%	#N/A
NL	77%	91%	53%	91%	33%	70%	50%	64%	57%	93%	100%	93%	93%	#N/A
NO	84%	79%	36%	38%	28%	38%	15%	19%	42%	16%	100%	15%	15%	#N/A
PL	99%	89%	94%	100%	50%	93%	56%	62%	63%	97%	100%	95%	99%	#N/A
PT	62%	90%	47%	60%	53%	43%	49%	56%	54%	67%	#N/A	73%	58%	#N/A
RO	52%	84%	40%	70%	27%	32%	33%	34%	35%	90%	100%	94%	85%	#N/A
SE	83%	83%	100%	100%	100%	100%	83%	86%	88%	100%	100%	100%	100%	#N/A
SI	64%	90%	82%	100%	81%	90%	40%	60%	50%	100%	#N/A	100%	100%	#N/A
SK	99%	46%	21%	16%	29%	19%	43%	65%	43%	30%	100%	30%	29%	0%

Conformity of datasets and services

Self-declared conformity

- A random, **manual QC of conformity** was performed on a small sample of datasets and services from these countries using the INSPIRE Reference Validator.
 - The overall result of the JRC manual conformity check was very low:
 - Almost equal to 0%!
 - Despite no conclusions could be derived, we proved that the calculated values for the conformity indicators are not reliable:
 - **Conformity of spatial data sets**: DSi1.1, DSi1.2, DSi1.3, DSi1.4, DSi1.5
 - **Conformity of network services**: 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

Metadata records with indexation errors present in national catalogues

- Metadata records with XML (ISO 19139) encoding errors, failed to be indexed by GeoNetwork.

The screenshot displays the 'Internal INSPIRE Geoportal' Admin console. The interface is divided into several sections:

- Status:** A sidebar menu with options like 'Record links analysis', 'Information', 'Versioning', and 'Content statistics'.
- Critical System Checks:** A green box containing 'CSW GetCapabilities operation' (OK), 'Database Connection' (OK), and 'Remote index' (OK).
- Non-critical System Checks:** A yellow box containing 'Dashboard application' (OK), 'Dead locked threads' (OK), 'Sufficient free file handles' (OK), 'Available connections in database' (ERROR), 'No harvesting errors' (OK), 'Index is in readonly mode' (OK), and 'Metadata index errors' (ERROR). The 'Metadata index errors' entry is highlighted with a red box.
- Metadata with indexing errors:** A red box containing a list of 19 records, each with the message '- Record with no title / wrongly indexed -'. This list is also highlighted with a red box.

At the bottom of the page, it shows 'Records in index/db = 254189/254189'.

→ Consequences:

- a) Metadata records not available in the INSPIRE Geoportal (not processed by Elasticsearch).
- b) Possible decrease in indicators.

Issues identified Opportunities for improvement

Non-INSPIRE metadata records present in national catalogues

- Example metadata records coming within standard GeoNetwork installations.
- Metadata records with `<gmd:hierarchyLevel>` different from dataset / service.

The screenshot shows a metadata record for 'Geoscience Australia's Open Day Photographs 26th August 2007'. The title is highlighted with a red box. The record includes a description, a table with 'Language' (English) and 'Legal constraints' (The images are only available in thumbnail size for privacy reasons.), and technical information. A 'Filter' panel on the right shows a donut chart for 'Type of resources' with a legend: Dataset (166), Service (37), and collectionSession (3). The 'collectionSession (3)' option is highlighted with a red box and a red arrow points to it.

Language	• English
Legal constraints	The images are only available in thumbnail size for privacy reasons.

Technical information

Metadata information

Download metadata

harvestDates
• Harvest Date: 2023-01-30, 16:05:17

Resource events
Revision
25-08-2007 23:00

Provided by

Updated:
4 months ago

Similar records
Geoscience Australia's Open Day Photographs 26th August 2007
Geoscience Australia's Open Day Photographs 26th August 2007

Type of resources

- Dataset (166)
- Service (37)
- collectionSession (3)

Filter

facet-resourceType

- Dataset (168)
- Service (37)
- Collection session (3)

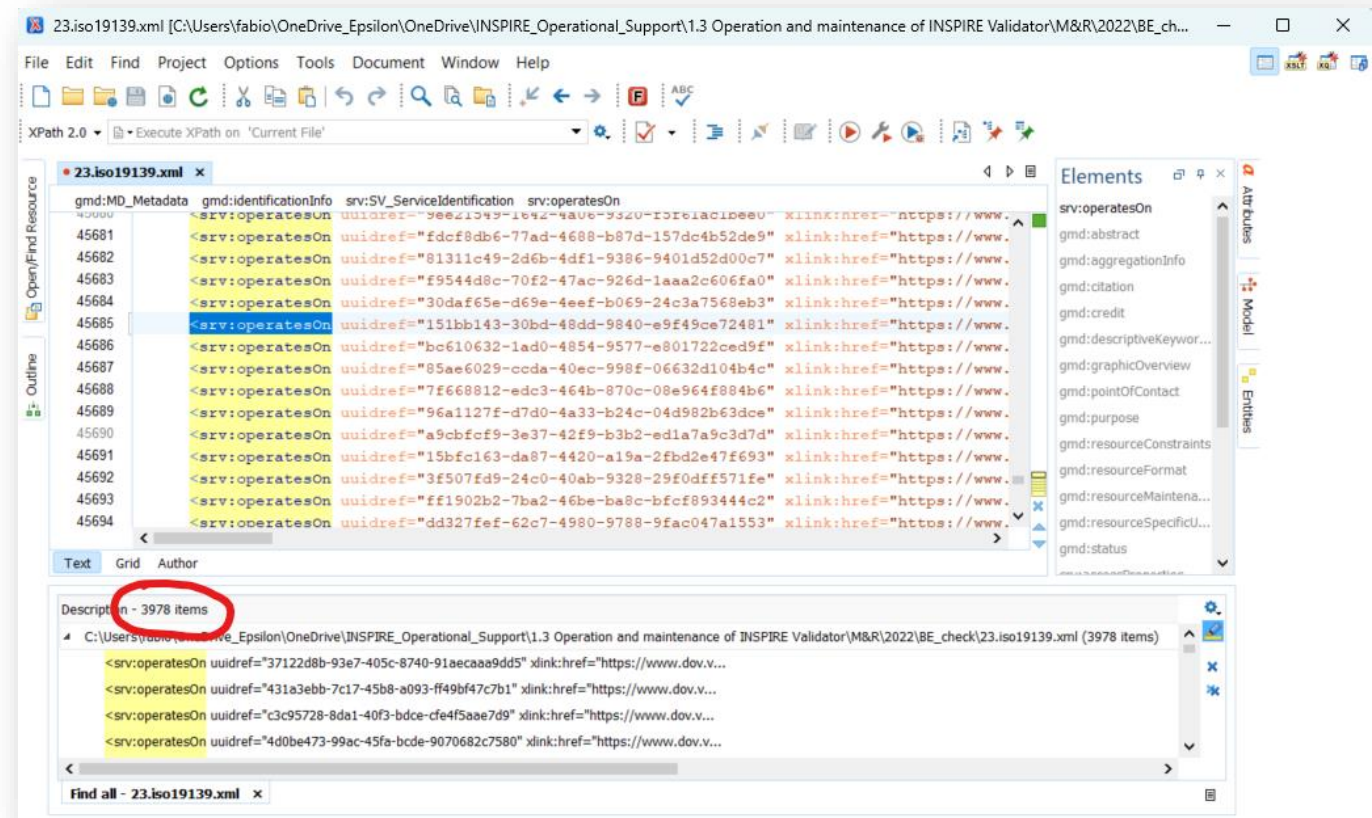
→ Consequences:

- a) Non-INSPIRE metadata records harvested by the INSPIRE Geoportal.
- b) Possible decrease in indicators.

Issues identified Opportunities for improvement

Practices breaking functionality of infrastructure tools

- Using one service to serve thousands of datasets - Example:
 - About 4000 `<srv:operatesOn>` occurrences used in a service metadata record.
- Usability of (some) ATOM services is questioned - Examples:
 - ATOM services with thousands of sub-feed entries (e.g. +6000, +13000).
 - Repetitions: Harvesting a single endpoint / Endpoints from several countries / Year.



The screenshot shows a web browser displaying an XML file named '23.iso19139.xml'. The browser interface includes a menu bar (File, Edit, Find, Project, Options, Tools, Document, Window, Help), a toolbar with various icons, and a search bar. The XML content is displayed in a table-like view with columns for 'gmd:MD_Metadata', 'gmd:identificationInfo', 'srv:SV_ServiceIdentification', and 'srv:operatesOn'. The 'srv:operatesOn' column contains a large number of entries, each with a 'uuidref' and an 'xlink:href' attribute. The browser also shows a list of elements on the right side, including 'srv:operatesOn', 'gmd:abstract', 'gmd:aggregationInfo', 'gmd:citation', 'gmd:credit', 'gmd:descriptiveKeywor...', 'gmd:graphicOverview', 'gmd:pointOfContact', 'gmd:purpose', 'gmd:resourceConstraints', 'gmd:resourceFormat', 'gmd:resourceMaintena...', 'gmd:resourceSpecificU...', and 'gmd:status'. The search results show a large number of items (3978 items) and a list of <srv:operatesOn> entries with their respective UUIDs and hrefs.

→ Consequences: Reduced performance and/or system failures.

Issues identified Opportunities for improvement

Conformity of network services non properly declared

Example:

- Incorrect use of elements to declare the conformity using <DQ_DomainConsistency> report.

```
<gmd:report>
  <gmd:DQ_DomainConsistency xsi:type="gmd:DQ_DomainConsistency_Type">
    <gmd:Result>
      <gmd:DQ_ConformanceResult xsi:type="gmd:DQ_ConformanceResult_Type">
        <gmd:specification>
          <gmd:CI_Citation>
            <gmd:title xsi:type="gmd:PT_FreeText_PropertyType">
              <gmx:Anchor xlink:href="http://data.europa.eu/eli/reg/2010/1089">&#x39A;&#x391;&#x39D;&#x39F;&#x39D;&#x399;&#x3A3;&#x39C;&#x39F;&#x3A3;&#x395;&#x395;&#x3B1;&#x3C1;&#x3B9;&#x3B8;. 976/2009 &#x3A4;&#x397;&#x3A3;&#x395;&#x3A0;&#x399;&#x3A4;&#x3A1;&#x39F;&#x3A0;&#x397;&#x3A3;&#x3C4;&#x3B7;&#x3C2; 19&#x3B7;&#x3C2;
&#x39F;&#x3BA;&#x3C4;&#x3C9;&#x3B2;&#x3C1;&#x3AF;&#x3BF;&#x3C5; 2010 &#x3C3;&#x3C7;&#x3B5;&#x3C4;&#x3B9;&#x3BA;&#x3AC; &#x3BC;&#x3B5; &#x3C4;&#x3B7;&#x3BD;
&#x3B5;&#x3C6;&#x3B1;&#x3C1;&#x3BC;&#x3BF;&#x3B3;&#x3AE; &#x3C4;&#x3B7;&#x3C2; &#x3BF;&#x3B4;&#x3B7;&#x3B3;&#x3AF;&#x3B1;&#x3C2; 2007/2/&#x395;&#x39A; &#x3C4;&#x3BF;&#x3C5;
&#x395;&#x3C5;&#x3C1;&#x3C9;&#x3C0;&#x3B1;&#x3CA;&#x3BA;&#x3BF;&#x3CD; &#x39A;&#x3BF;&#x3B9;&#x3BD;&#x3BF;&#x3B2;&#x3BF;&#x3C5;&#x3BB;&#x3AF;&#x3BF;&#x3C5;
&#x3BA;&#x3B1;&#x3B9; &#x3C4;&#x3BF;&#x3C5; &#x3A3;&#x3C5;&#x3BC;&#x3B2;&#x3BF;&#x3C5;&#x3BB;&#x3AF;&#x3BF;&#x3C5; &#x3CC;&#x3C3;&#x3BF;&#x3C5;
&#x3B1;&#x3C6;&#x3BF;&#x3C1;&#x3AC; &#x3C4;&#x3B9;&#x3C2; &#x3B4;&#x3B9;&#x3BA;&#x3C4;&#x3C5;&#x3B1;&#x3BA;&#x3AD;&#x3C2;
&#x3C5;&#x3C0;&#x3B7;&#x3C1;&#x3B5;&#x3C3;&#x3AF;&#x3B5;&#x3C2;</gmx:Anchor>
            <gmd:TextGroup>
              <gmd:LocalisedCharacterString locale="#_..._">&#x39A;&#x391;&#x39D;&#x39F;&#x39D;&#x399;&#x3A3;&#x39C;&#x39F;&#x3A3;&#x395;&#x395;&#x3B1;&#x3C1;&#x3B9;&#x3B8;. 976/2009
&#x3A4;&#x397;&#x3A3;&#x395;&#x3A0;&#x399;&#x3A4;&#x3A1;&#x39F;&#x3A0;&#x397;&#x3A3;&#x3C4;&#x3B7;&#x3C2; 19&#x3B7;&#x3C2;
&#x39F;&#x3BA;&#x3C4;&#x3C9;&#x3B2;&#x3C1;&#x3AF;&#x3BF;&#x3C5; 2010 &#x3C3;&#x3C7;&#x3B5;&#x3C4;&#x3B9;&#x3BA;&#x3AC; &#x3BC;&#x3B5; &#x3C4;&#x3B7;&#x3BD;
&#x3B5;&#x3C6;&#x3B1;&#x3C1;&#x3BC;&#x3BF;&#x3B3;&#x3AE; &#x3C4;&#x3B7;&#x3C2; &#x3BF;&#x3B4;&#x3B7;&#x3B3;&#x3AF;&#x3B1;&#x3C2; 2007/2/&#x395;&#x39A;
&#x3C4;&#x3BF;&#x3C5; &#x395;&#x3C5;&#x3C1;&#x3C9;&#x3C0;&#x3B1;&#x3CA;&#x3BA;&#x3BF;&#x3CD; &#x39A;&#x3BF;&#x3B9;&#x3BD;&#x3BF;&#x3B2;&#x3BF;&#x3C5;&#x3BB;&#x3AF;&#x3BF;&#x3C5; &#x3BA;&#x3B1;&#x3B9; &#x3C4;&#x3BF;&#x3C5;
&#x3A3;&#x3C5;&#x3BC;&#x3B2;&#x3BF;&#x3C5;&#x3BB;&#x3AF;&#x3BF;&#x3C5; &#x3CC;&#x3C3;&#x3BF;&#x3C5; &#x3BA;&#x3B1;&#x3B9; &#x3C4;&#x3BF;&#x3C5;
&#x3B4;&#x3B9;&#x3BA;&#x3C4;&#x3C5;&#x3B1;&#x3BA;&#x3AD;&#x3C2; &#x3C5;&#x3C0;&#x3B7;&#x3C1;&#x3B5;&#x3C3;&#x3AF;&#x3B5;&#x3C2;</gmd:LocalisedCharacterString>
            </gmd:textGroup>
          </gmd:TextGroup>
        </gmd:title>
        <gmd:date>
          <gmd:CI_Date>
            <gmd:date>
              <gco:Date>2009-10-20</gco:Date>
            </gmd:date>
          </gmd:CI_Date>
        </gmd:date>
      </gmd:DQ_ConformanceResult>
    </gmd:Result>
  </gmd:DQ_DomainConsistency>
</gmd:report>
```

→ Consequences: Non-representative indicators on conformity of network services.

Good practices identified

Finland (FI)

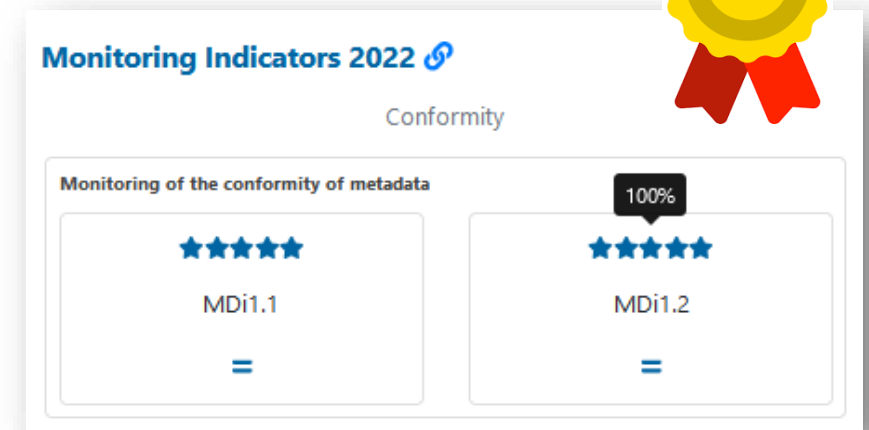
- Addressing the transition to the TG Metadata 2.0 (from TG Metadata 1.3) – including local level - despite affecting indicators in different way:
 - Positive impact on metadata conformity indicators.
 - Potential negative impact in other indicators due to variety of implementation status.

Ireland (IE), Greece (EL), Luxembourg (LU)

- 100% Conformity of INSPIRE metadata.

Other countries effectively using the INSPIRE Reference Validator

- Some countries with metadata conformity near to 100%.



Good practices identified

Belgium (BE), Malta (MT), Spain (ES)

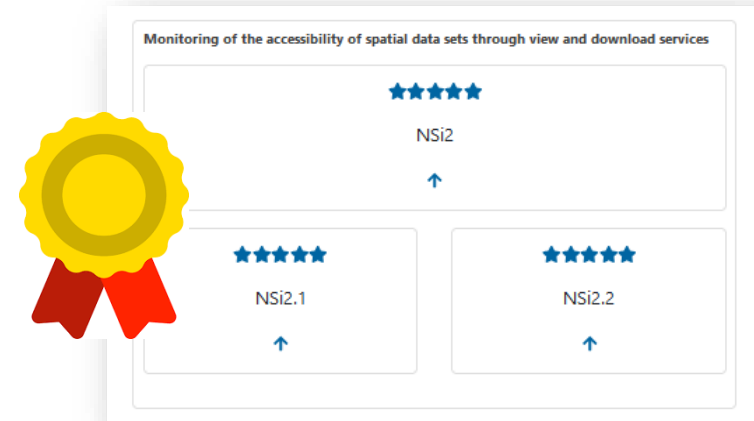
- Network services accessibility winners!

Overall improvement of M&R indicators (2022 vs. 2021)

- Belgium (BE), Denmark (DK), Estonia (EE), Spain (ES), Ireland (IE), Malta (MT), Norway (NO), Poland (PL), Romania (RO), Sweden (SE), Slovenia (SI).

Slovakia

- Proactive attitude and continuous feedback to the INSPIRE Geoportal team (e.g. issues detected, potential solutions, active participation in GitHub helpdesks).



Revamped INSPIRE Geoportal

Next steps

Revamped INSPIRE Geoportal rollout

- Resolve system vulnerabilities identified during the security assessment.

Fine tuning of the GeoNetwork backend

- Improve performance of the system (ATOM feeds processing, database data ingestion) –
Meanwhile, harvesting bandwidths for each country are suggested.

Harvester

- Improve support for (complex) OGC Filters in GeoNetwork.

Link-checker tool

- Solve the anomaly on accessibility of datasets (downloadable and viewable indicators).

Data-service Linking Simplification

- Support the good practice in the GeoNetwork backend

→ A joint effort with GeoCat is key for achieving these steps.

Thank you!



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