



INSPIRE Monitoring and Reporting 2023: Process, results and way forward

Jordi Escriu, Marco Minghini, Alexander Kotsev

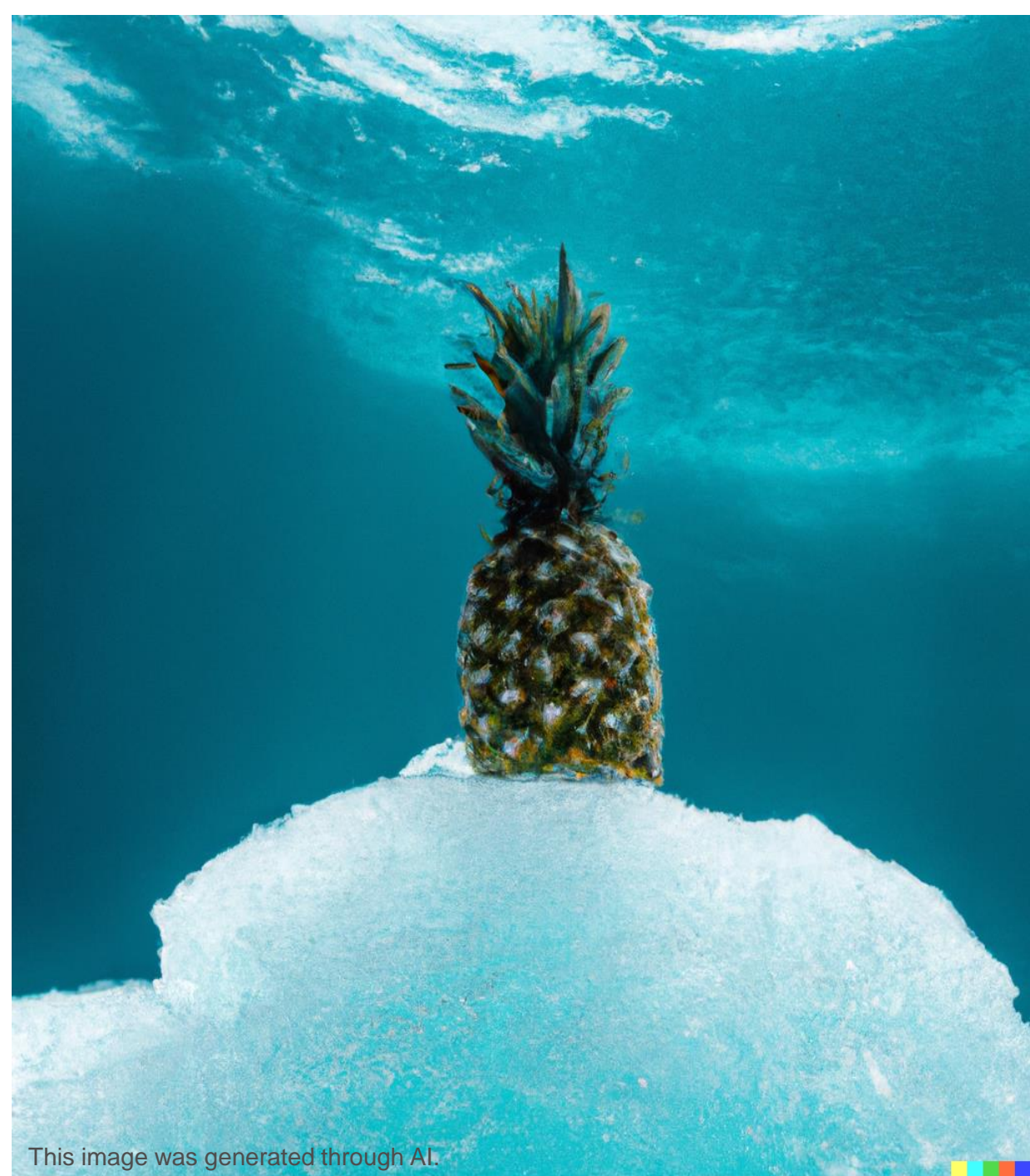
77th MIG-T meeting – February 23, 2024

Context

Context

Data-centric approach

- Ensuring that all possible resources are made **available** through Discovery services are counted
 - Implemented [Part 1. of data-service linking simplification](#)
- Towards a coordinated approach for HVD and INSPIRE implementation



This image was generated through AI.

Context

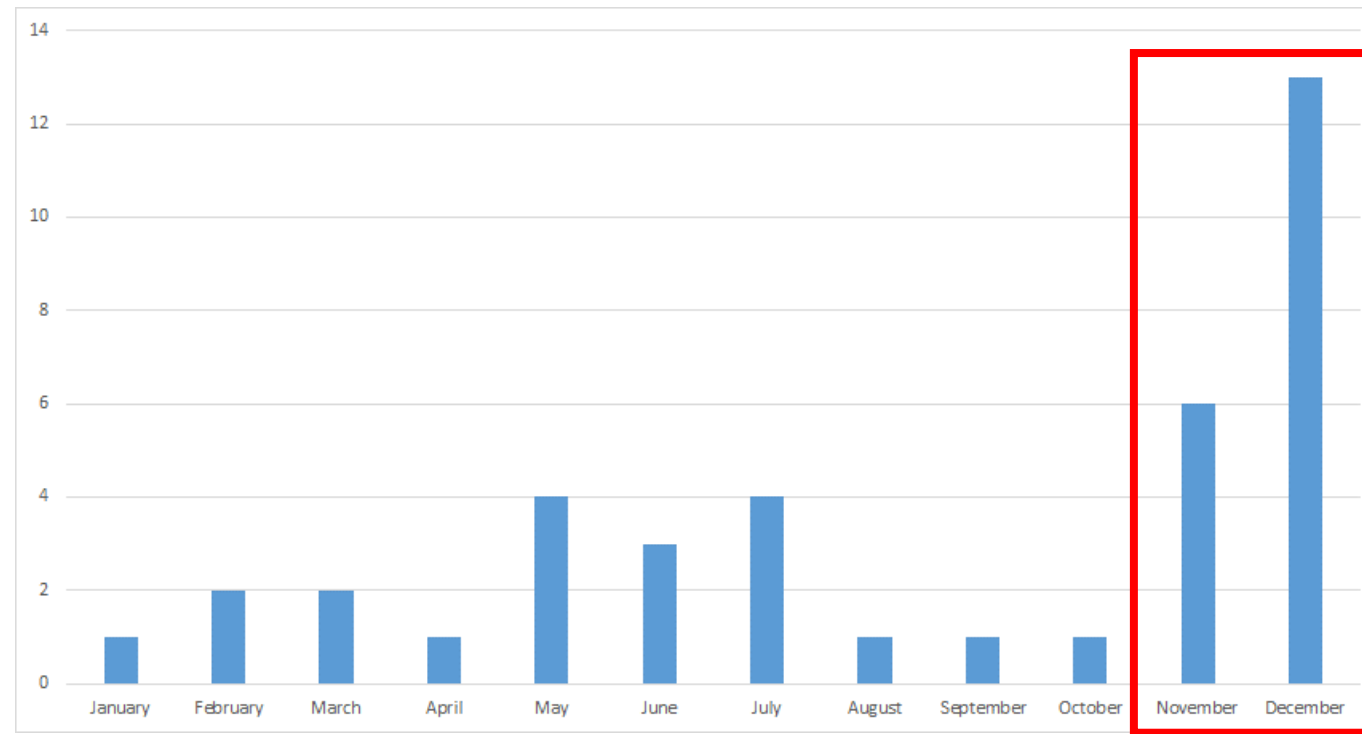


This image was generated through AI.

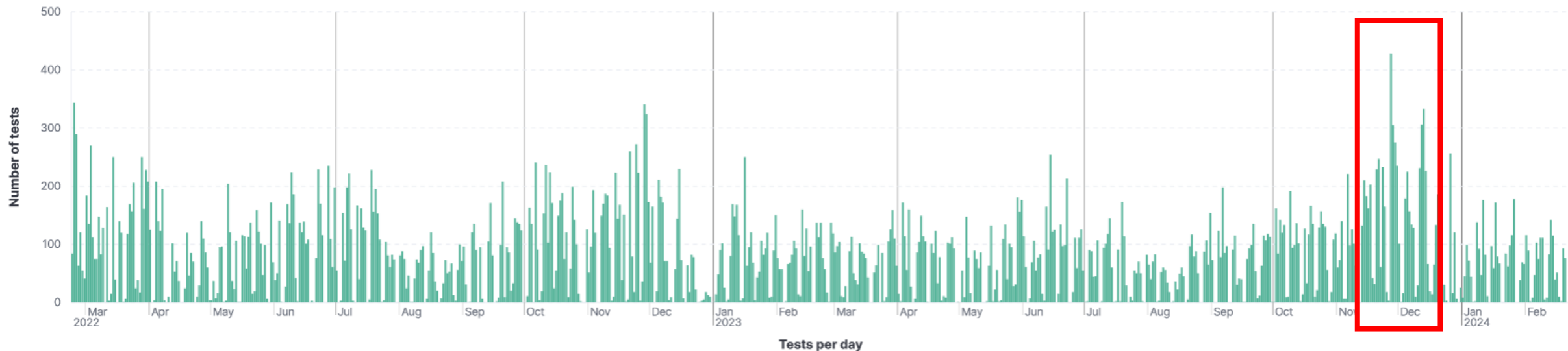
- **GeoNetwork** Open Source v.4 used for a 2nd consecutive year
- Successful harvest of all endpoints in December
 - High complexity
 - Different implementation approaches
 - Heavy processing burden

Context

- 39 issues opened in the **GPT helpdesk** in 2023
- Tests run in the **INSPIRE Reference Validator**
 - clear peak in November and December 2023



Temporal evolution of the number of tests



Thank you 😊

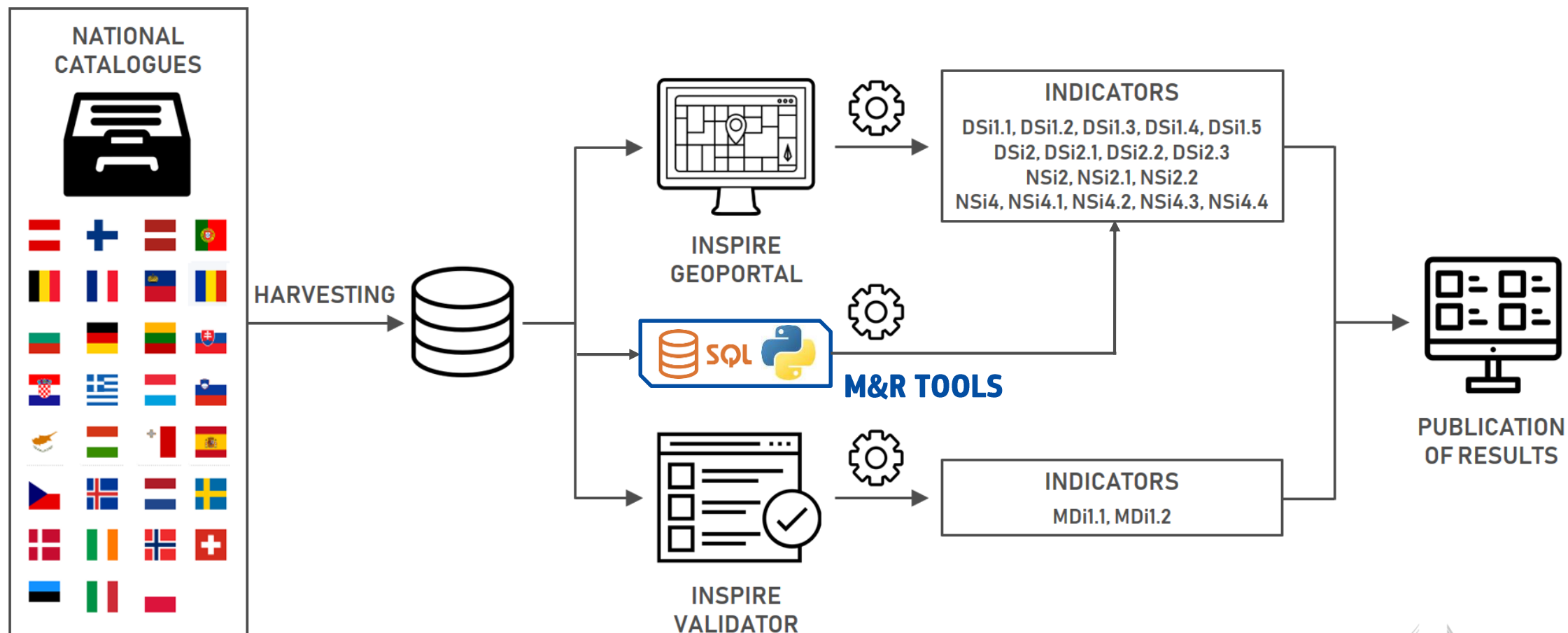
- Slovak colleagues
- Members of the data-service linking simplification sub-group
- All contributions and discussions on GitHub
- JRC T.1 ICT Pool
- Companies supporting the operation of the INSPIRE infrastructure



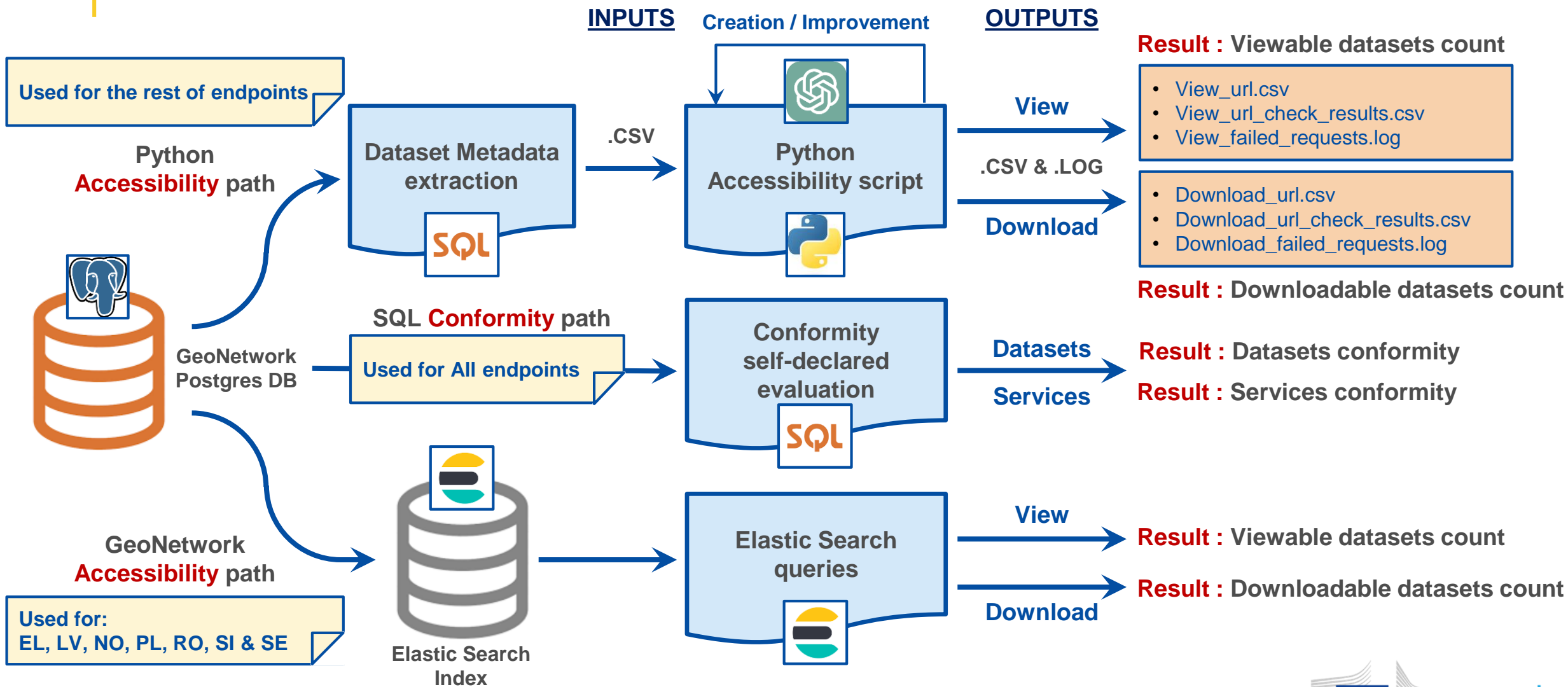
Methodology

Monitoring and Reporting 2023 – Process

- Overall process:



Monitoring and Reporting 2023 – Process



* M&R TOOLS code repository (SQL queries & Python scripts): <https://github.com/INSPIRE-MIF/mr-tools/>

Monitoring and Reporting 2023 – Software

The screenshot shows the 'My GeoNetwork catalogue' page for the European Commission. It features a map of Europe titled 'INSPIRE Data Sets - EU & EFTA Country overview'. To the right of the map, there are statistics for 'INSPIRE Geoportal Dataset Statistics': 93616 Metadata records, 12060 Downloadable Data Sets, and 49769 Viewable Data Sets. Below the map, there is a 'Select a COUNTRY' section with a grid of country flags and their corresponding data set counts.

Country	Count
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	96 62 92
Iceland	98 0 0
Italy	7447 490 802
Lithuania	95 95 60
Luxembourg	311 305 280
Latvia	156 88 93
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 92
Slovakia	272 118 178

- INSPIRE Geoportal based on GeoNetwork v.4.2.6

The screenshot shows a GitHub repository for 'INSPIRE Monitoring and Reporting Tools'. The repository is public and has 2 branches and 0 tags. It was created by alexanderkotsev. The repository contains several folders: 'dataset-accessibility', 'dataset-conformity', 'service-conformity', and 'README.md'. The README file is open, showing the title 'INSPIRE Monitoring and Reporting Tools' and a description: 'This repository includes some tools developed by the Joint Research Centre (JRC) to assist the INSPIRE Monitoring and Reporting (M&R) 2023 process. The tools can be used to calculate different families of Monitoring indicators, as defined in Commission Implementing Decision (EU) 2019/1372:'. Below the description, there are three bullet points listing the directories and their purposes.

- directory `dataset-accessibility`: includes two approaches (based on SQL queries and Python scripts) to calculate indicators NSi2, NSi2.1, NSi2.2
- directory `dataset-conformity`: includes an approach based on SQL queries to calculate indicators DSi2, DSi2.1, DSi2.2, DSi2.3
- directory `service-conformity`: includes an approach based on SQL queries to calculate indicators NSi4, NSi4.1, NSi4.2, NSi4.3, NSi4.4

- M&R Tools (released on 22/02/2024)

The screenshot shows the 'INSPIRE Validator - Test selection' interface. It includes a search bar and navigation links. The main content area is titled 'Configure your test' and contains several sections for selecting test parameters. The 'Select the INSPIRE resource you would like to test' section has radio buttons for 'Metadata', 'View Service', 'Download Service', 'Discovery Service', and 'Data set'. The 'Select the Technical Guidelines version' section has radio buttons for 'Version 1.3 - DEPRECATED' and 'Version 2.0'. The 'Select the type of metadata record(s) to be tested' section has radio buttons for 'Data sets and data set series', 'Network Service', and 'Spatial Data Service'. There is an 'Advanced options' dropdown menu. The 'Provide the resource to test' section has a 'File upload' button and an 'Upload file*' section with a maximum size of 50 MB. There is a 'Choose files' button. At the bottom, there is a text input field for a label and a 'Start test' button.

- INSPIRE Reference Validator v.2023.3 (released on 18/09/2023)
- Bulk validation tool v.2021.1.0 (released on 5/10/2021)

Results

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

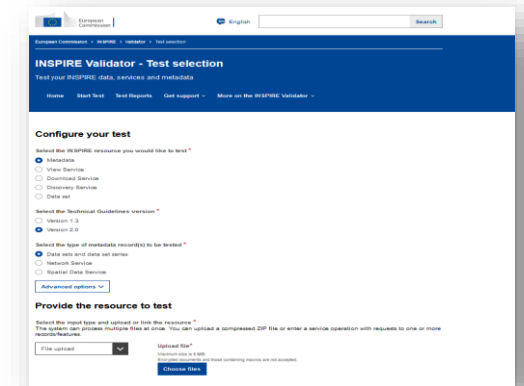
- accessibility of spatial data sets

- NSi2, NSi2.1, NSi2.2

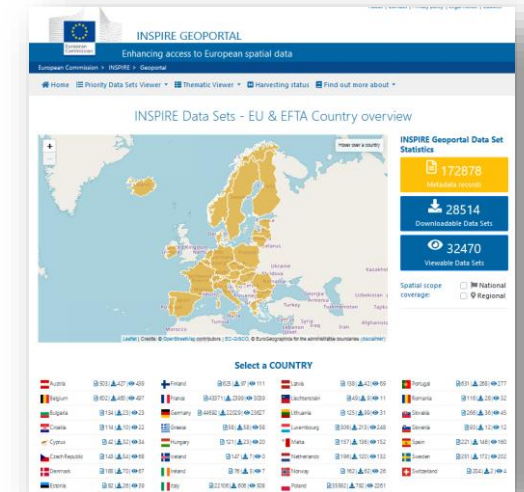
- conformity of network services

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

**INSPIRE
Reference
Validator**
(metadata
validation)



**INSPIRE
Geoportal +
M&R tools**
(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 2023 – Results

- Median values of all indicators in the years 2019-2023:
 - overall: slow but continuous improvement

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%
2023	61%	68%	58%	59%

conformity of spatial data sets

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
2023	158	205	49	0	100

availability of spatial data and services

calculated automatically (Geoportal + M&R Tools)

YEAR	NSi2	NSi2.1	NSi2.2
2019	16%	32%	20%
2020	32%	44%	42%
2021	45%	57%	54%
2022	50%	62%	56%
2023	56%	67%	63%

accessibility of spatial data sets

YEAR	MDi1.1	MDi1.2
2019	38%	38%
2020	55%	67%
2021	78%	92%
2022	89%	90%
2023	87%	92%

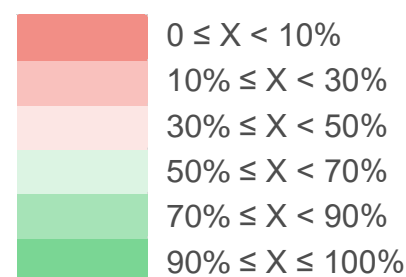
conformity of metadata

calculated automatically (Validator)

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%
2023	80%	100%	93%	91%	50%

conformity of network services

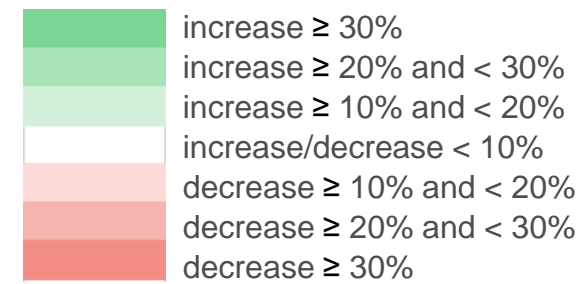
Overall results – 2023 performance



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	988	567	99	280	702	99%	99%	89%	88%	87%	87%	44%	52%	91%	96%	100%	99%	97%	#N/A
BE	601	299	308	509	89	92%	81%	75%	68%	77%	74%	72%	78%	88%	93%	83%	94%	93%	#N/A
BG	170	41	104	59	80	28%	46%	95%	98%	92%	97%	27%	33%	27%	0%	0%	0%	0%	#N/A
CH	217	33	0	0	7	0%	0%	3%	6%	2%	4%	0%	60%	2%	3%	#N/A	100%	0%	#N/A
CY	43	60	10	0	0	0%	0%	2%	0%	25%	0%	98%	98%	100%	0%	#N/A	0%	0%	#N/A
CZ	90	183	33	12	78	90%	98%	47%	57%	53%	47%	92%	96%	96%	97%	100%	97%	97%	100%
DE	108521	187403	274	2721	245	74%	79%	61%	53%	52%	53%	65%	72%	67%	99%	100%	99%	99%	#N/A
DK	194	247	59	0	190	59%	93%	63%	100%	71%	47%	52%	71%	54%	91%	100%	91%	91%	#N/A
EE	91	117	25	0	91	97%	96%	56%	80%	58%	58%	74%	77%	76%	91%	100%	90%	91%	#N/A
EL	45	102	43	0	45	100%	100%	100%	100%	100%	100%	98%	98%	100%	0%	0%	0%	0%	#N/A
ES	285	379	78	44	220	92%	94%	47%	63%	54%	47%	84%	97%	85%	96%	100%	97%	92%	#N/A
FI	457	209	34	239	104	97%	100%	25%	25%	23%	39%	34%	55%	47%	53%	100%	57%	52%	#N/A
FR	200	25	151	0	170	3%	60%	77%	100%	76%	74%	19%	37%	60%	16%	#N/A	7%	0%	#N/A
HR	158	205	14	22	115	98%	99%	59%	58%	58%	59%	56%	73%	62%	80%	100%	65%	97%	#N/A
HU	93	66	14	0	33	42%	97%	70%	68%	85%	73%	51%	57%	63%	45%	0%	91%	3%	#N/A
IE	83	26	40	0	81	98%	4%	36%	79%	37%	37%	65%	65%	75%	96%	100%	100%	100%	#N/A
IS	104	31	5	2	98	87%	77%	50%	54%	51%	51%	50%	78%	55%	0%	#N/A	0%	0%	#N/A
IT	8207	2454	744	4596	985	99%	96%	24%	22%	21%	22%	26%	50%	34%	5%	14%	6%	3%	0%
LI	81	4	0	0	62	77%	25%	7%	7%	8%	3%	0%	1%	0%	25%	#N/A	100%	0%	#N/A
LT	96	122	72	0	96	96%	100%	79%	55%	79%	79%	61%	63%	98%	100%	100%	100%	100%	#N/A
LU	312	59	94	0	312	100%	100%	75%	100%	75%	75%	0%	91%	0%	100%	100%	100%	100%	#N/A
LV	158	250	73	0	0	0%	0%	77%	83%	55%	81%	56%	60%	58%	0%	#N/A	0%	0%	#N/A
MT	151	298	26	0	126	100%	100%	99%	99%	99%	99%	80%	98%	85%	100%	#N/A	100%	100%	#N/A
NL	243	426	55	3	198	75%	98%	42%	91%	88%	82%	59%	69%	64%	76%	0%	93%	93%	#N/A
NO	143	242	14	2	141	86%	74%	6%	14%	7%	1%	14%	19%	41%	3%	0%	5%	1%	#N/A
PL	178	327	61	0	177	97%	91%	81%	76%	93%	79%	60%	65%	65%	97%	100%	96%	99%	#N/A
PT	459	498	92	165	181	73%	88%	46%	52%	34%	44%	43%	67%	60%	65%	#N/A	73%	54%	#N/A
RO	115	94	37	15	100	57%	95%	45%	100%	33%	100%	38%	38%	39%	91%	100%	98%	93%	#N/A
SE	250	228	67	0	240	84%	92%	100%	100%	100%	100%	83%	87%	88%	100%	100%	100%	100%	#N/A
SI	82	129	9	0	82	77%	91%	81%	100%	53%	44%	46%	67%	52%	100%	#N/A	100%	100%	#N/A
SK	137	238	49	0	90	99%	92%	66%	59%	85%	59%	85%	91%	87%	61%	#N/A	65%	63%	#N/A

Absolute number indicators

Comparison vs. 2020, 2021, 2022



country	DSi1.1	DSi1.2	DSi1.3	DSi1.4	DSi1.5
AT	988	567	99	280	702
BE	601	299	308	509	89
BG	170	41	104	59	80
CH	217	33	0	0	7
CY	43	60	10	0	0
CZ	90	183	33	12	78
DE	108521	187403	274	2721	245
DK	194	247	59	0	190
EE	91	117	25	0	91
EL	45	102	43	0	45
ES	285	379	78	44	220
FI	457	209	34	239	104
FR	200	25	151	0	170
HR	158	205	14	22	115
HU	93	66	14	0	33
IE	83	26	40	0	81
IS	104	31	5	2	98
IT	8207	2454	744	4596	985
LI	81	4	0	0	62
LT	96	122	72	0	96
LU	312	59	94	0	312
LV	158	250	73	0	0
MT	151	298	26	0	126
NL	243	426	55	3	198
NO	143	242	14	2	141
PL	178	327	61	0	177
PT	459	498	92	165	181
RO	115	94	37	15	100
SE	250	228	67	0	240
SI	82	129	9	0	82
SK	137	238	49	0	90

country	DSi1.1	DSi1.2	DSi1.3	DSi1.4	DSi1.5
AT	988	567	99	280	702
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BG	170	41	104	59	80
CH	217	33	0	0	7
CY	43	60	10	0	0
CZ	90	183	33	12	78
DE	108521	187403	274	2721	245
DK	194	247	59	0	190
EE	91	117	25	0	91
EL	45	102	43	0	45
ES	285	379	78	44	220
FI	457	209	34	239	104
FR	200	25	151	0	170
HR	158	205	14	22	115
HU	93	66	14	0	33
IE	83	26	40	0	81
IS	104	31	5	2	98
IT	8207	2454	744	4596	985
LI	81	4	0	0	62
LT	96	122	72	0	96
LU	312	59	94	0	312
LV	158	250	73	0	0
MT	151	298	26	0	126
NL	243	426	55	3	198
NO	143	242	14	2	141
PL	178	327	61	0	177
PT	459	498	92	165	181
RO	115	94	37	15	100
SE	250	228	67	0	240
SI	82	129	9	0	82
SK	137	238	49	0	90

country	DSi1.1	DSi1.2	DSi1.3	DSi1.4	DSi1.5
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CH	217	33	0	0	7
CY	43	60	10	0	0
CZ	90	183	33	12	78
DE	108521	187403	274	2721	245
DK	194	247	59	0	190
EE	91	117	25	0	91
EL	45	102	43	0	45
ES	285	379	78	44	220
FI	457	209	34	239	104
FR	200	25	151	0	170
HR	158	205	14	22	115
HU	93	66	14	0	33
IE	83	26	40	0	81
IS	104	31	5	2	98
IT	8207	2454	744	4596	985
LI	81	4	0	0	62
LT	96	122	72	0	96
LU	312	59	94	0	312
LV	158	250	73	0	0
MT	151	298	26	0	126
NL	243	426	55	3	198
NO	143	242	14	2	141
PL	178	327	61	0	177
PT	459	498	92	165	181
RO	115	94	37	15	100
SE	250	228	67	0	240
SI	82	129	9	0	82
SK	137	238	49	0	90

Relative number indicators Comparison vs. 2022

increase of more than 10 percentage points compared to 2022
 increase/decrease of less than 10 percentage points compared to 2022
 decrease of more than 10 percentage points compared to 2022

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%	89%	88%	87%	87%	44%	52%	91%	96%	100%	99%	97%	#N/A
BE	92%	81%	75%	68%	77%	74%	72%	78%	88%	93%	83%	94%	93%	#N/A
BG	28%	46%	95%	98%	92%	97%	27%	33%	27%	0%	0%	0%	0%	#N/A
CH	0%	0%	3%	6%	2%	4%	0%	60%	2%	3%	#N/A	100%	0%	#N/A
CY	0%	0%	2%	0%	25%	0%	98%	98%	100%	0%	#N/A	0%	0%	#N/A
CZ	90%	98%	47%	57%	53%	47%	92%	96%	96%	97%	100%	97%	97%	100%
DE	74%	79%	61%	53%	52%	53%	65%	72%	67%	99%	100%	99%	99%	#N/A
DK	59%	93%	63%	100%	71%	47%	52%	71%	54%	91%	100%	91%	91%	#N/A
EE	97%	96%	56%	80%	58%	58%	74%	77%	76%	91%	100%	90%	91%	#N/A
EL	100%	100%	100%	100%	100%	100%	98%	98%	100%	0%	0%	0%	0%	#N/A
ES	92%	94%	47%	63%	54%	47%	84%	97%	85%	96%	100%	97%	92%	#N/A
FI	97%	100%	25%	25%	23%	39%	34%	55%	47%	53%	100%	57%	52%	#N/A
FR	3%	60%	77%	100%	76%	74%	19%	37%	60%	16%	#N/A	7%	0%	#N/A
HR	98%	99%	59%	58%	58%	59%	56%	73%	62%	80%	100%	65%	97%	#N/A
HU	42%	97%	70%	68%	85%	73%	51%	57%	63%	45%	0%	91%	3%	#N/A
IE	98%	4%	36%	79%	37%	37%	65%	65%	75%	96%	100%	100%	100%	#N/A
IS	87%	77%	50%	54%	51%	51%	50%	78%	55%	0%	#N/A	0%	0%	#N/A
IT	99%	96%	24%	22%	21%	22%	26%	50%	34%	5%	14%	6%	3%	0%
LI	77%	25%	7%	7%	8%	3%	0%	1%	0%	25%	#N/A	100%	0%	#N/A
LT	96%	100%	79%	55%	79%	79%	61%	63%	98%	100%	100%	100%	100%	#N/A
LU	100%	100%	75%	100%	75%	75%	0%	91%	0%	100%	100%	100%	100%	#N/A
LV	0%	0%	77%	83%	55%	81%	56%	60%	58%	0%	#N/A	0%	0%	#N/A
MT	100%	100%	99%	99%	99%	99%	80%	98%	85%	100%	#N/A	100%	100%	#N/A
NL	75%	98%	42%	91%	88%	82%	59%	69%	64%	76%	0%	93%	93%	#N/A
NO	86%	74%	6%	14%	7%	1%	14%	19%	41%	3%	0%	5%	1%	#N/A
PL	97%	91%	81%	76%	93%	79%	60%	65%	65%	97%	100%	96%	99%	#N/A
PT	73%	88%	46%	52%	34%	44%	43%	67%	60%	65%	#N/A	73%	54%	#N/A
RO	57%	95%	45%	100%	33%	100%	38%	38%	39%	91%	100%	98%	93%	#N/A
SE	84%	92%	100%	100%	100%	100%	83%	87%	88%	100%	100%	100%	100%	#N/A
SI	77%	91%	81%	100%	53%	44%	46%	67%	52%	100%	#N/A	100%	100%	#N/A
SK	99%	92%	66%	59%	85%	59%	85%	91%	87%	61%	#N/A	65%	63%	#N/A

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%	89%	88%	87%	87%	44%	52%	91%	96%	100%	99%	97%	#N/A
BE	92%	81%	75%	68%	77%	74%	72%	78%	88%	93%	83%	94%	93%	#N/A
BG	28%	46%	95%	98%	92%	97%	27%	33%	27%	0%	0%	0%	0%	#N/A
CH	0%	0%	3%	6%	2%	4%	0%	60%	2%	3%	#N/A	100%	0%	#N/A
CY	0%	0%	2%	0%	25%	0%	98%	98%	100%	0%	#N/A	0%	0%	#N/A
CZ	90%	98%	47%	57%	53%	47%	92%	96%	96%	97%	100%	97%	97%	100%
DE	74%	79%	61%	53%	52%	53%	65%	72%	67%	99%	100%	99%	99%	#N/A
DK	59%	93%	63%	100%	71%	47%	52%	71%	54%	91%	100%	91%	91%	#N/A
EE	97%	96%	56%	80%	58%	58%	74%	77%	76%	91%	100%	90%	91%	#N/A
EL	100%	100%	100%	100%	100%	100%	98%	98%	100%	0%	0%	0%	0%	#N/A
ES	92%	94%	47%	63%	54%	47%	84%	97%	85%	96%	100%	97%	92%	#N/A
FI	97%	100%	25%	25%	23%	39%	34%	55%	47%	53%	100%	57%	52%	#N/A
FR	3%	60%	77%	100%	76%	74%	19%	37%	60%	16%	#N/A	7%	0%	#N/A
HR	98%	99%	59%	58%	58%	59%	56%	73%	62%	80%	100%	65%	97%	#N/A
HU	42%	97%	70%	68%	85%	73%	51%	57%	63%	45%	0%	91%	3%	#N/A
IE	98%	4%	36%	79%	37%	37%	65%	65%	75%	96%	100%	100%	100%	#N/A
IS	87%	77%	50%	54%	51%	51%	50%	78%	55%	0%	#N/A	0%	0%	#N/A
IT	99%	96%	24%	22%	21%	22%	26%	50%	34%	5%	14%	6%	3%	0%
LI	77%	25%	7%	7%	8%	3%	0%	1%	0%	25%	#N/A	100%	0%	#N/A
LT	96%	100%	79%	55%	79%	79%	61%	63%	98%	100%	100%	100%	100%	#N/A
LU	100%	100%	75%	100%	75%	75%	0%	91%	0%	100%	100%	100%	100%	#N/A
LV	0%	0%	77%	83%	55%	81%	56%	60%	58%	0%	#N/A	0%	0%	#N/A
MT	100%	100%	99%	99%	99%	99%	80%	98%	85%	100%	#N/A	100%	100%	#N/A
NL	75%	98%	42%	91%	88%	82%	59%	69%	64%	76%	0%	93%	93%	#N/A
NO	86%	74%	6%	14%	7%	1%	14%	19%	41%	3%	0%	5%	1%	#N/A
PL	97%	91%	81%	76%	93%	79%	60%	65%	65%	97%	100%	96%	99%	#N/A
PT	73%	88%	46%	52%	34%	44%	43%	67%	60%	65%	#N/A	73%	54%	#N/A
RO	57%	95%	45%	100%	33%	100%	38%	38%	39%	91%	100%	98%	93%	#N/A
SE	84%	92%	100%	100%	100%	100%	83%	87%	88%	100%	100%	100%	100%	#N/A
SI	77%	91%	81%	100%	53%	44%	46%	67%	52%	100%	#N/A	100%	100%	#N/A
SK	99%	92%	66%	59%	85%	59%	85%	91%	87%	61%	#N/A	65%	63%	#N/A

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%	89%	88%	87%	87%	44%	52%	91%	96%	100%	99%	97%	#N/A
BE	92%	81%	75%	68%	77%	74%	72%	78%	88%	93%	83%	94%	93%	#N/A
BG	28%	46%	95%	98%	92%	97%	27%	33%	27%	0%	0%	0%	0%	#N/A
CH	0%	0%	3%	6%	2%	4%	0%	60%	2%	3%	#N/A	100%	0%	#N/A
CY	0%	0%	2%	0%	25%	0%	98%	98%	100%	0%	#N/A	0%	0%	#N/A
CZ	90%	98%	47%	57%	53%	47%	92%	96%	96%	97%	100%	97%	97%	100%
DE	74%	79%	61%	53%	52%	53%	65%	72%	67%	99%	100%	99%	99%	#N/A
DK	59%	93%	63%	100%	71%	47%	52%	71%	54%	91%	100%	91%	91%	#N/A
EE	97%	96%	56%	80%	58%	58%	74%	77%	76%	91%	100%	90%	91%	#N/A
EL	100%	100%	100%	100%	100%	100%	98%	98%	100%	0%	0%	0%	0%	#N/A
ES	92%	94%	47%	63%	54%	47%	84%	97%	85%	96%	100%	97%	92%	#N/A
FI	97%	100%	25%	25%	23%	39%	34%	55%	47%	53%	100%	57%	52%	#N/A
FR	3%	60%	77%	100%	76%	74%	19%	37%	60%	16%	#N/A	7%	0%	#N/A
HR	98%	99%	59%	58%	58%	59%	56%	73%	62%	80%	100%	65%	97%	#N/A
HU	42%	97%	70%	68%	85%	73%	51%	57%	63%	45%	0%	91%	3%	#N/A
IE	98%	4%	36%	79%	37%	37%	65%	65%	75%	96%	100%	100%	100%	#N/A
IS	87%	77%	50%	54%	51%	51%	50%	78%	55%	0%	#N/A	0%	0%	#N/A
IT	99%	96%	24%	22%	21%	22%	26%	50%	34%	5%	14%	6%	3%	0%
LI	77%	25%	7%	7%	8%	3%	0%	1%	0%	25%	#N/A	100%	0%	#N/A
LT	96%	100%	79%	55%	79%	79%	61%	63%	98%	100%	100%	100%	100%	#N/A
LU	100%	100%	75%	100%	75%	75%	0%	91%	0%	100%	100%	100%	100%	#N/A
LV	0%	0%	77%	83%	55%	81%	56%	60%	58%	0%	#N/A	0%	0%	#N/A
MT	100%	100%	99%	99%	99%	99%	80%	98%	85%	100%	#N/A	100%	100%	#N/A
NL	75%	98%	42%	91%	88%	82%	59%	69%	64%	76%	0%	93%	93%	#N/A
NO	86%	74%	6%	14%	7%	1%	14%	19%	41%	3%	0%	5%	1%	#N/A
PL	97%	91%	81%	76%	93%	79%	60%	65%	65%	97%	100%	96%	99%	#N/A
PT	73%	88%	46%	52%	34%	44%	43%	67%	60%	65%	#N/A	73%	54%	#N/A
RO	57%	95%	45%	100%	33%	100%	38%	38%	39%	91%	100%	98%	93%	#N/A
SE	84%	92%	100%	100%	100%	100%	83%	87%	88%	100%	100%	100%	100%	#N/A
SI	77%	91%	81%	100%	53%	44%	46%	67%	52%	100%	#N/A	100%	100%	#N/A
SK	99%	92%	66%	59%	85%	59%	85%	91%	87%	61%	#N/A	65%	63%	#N/A

Monitoring and Reporting 2023 – Dashboard

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



<https://europa.eu/!Vcdmwv>

Monitoring and Reporting 2023 – 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 2023 indicators

<https://europa.eu/!Vcdmwv>

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](#)

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

Availability		Conformity	
Monitoring of the availability of spatial data and service			
156 DSi1.1 =	258 DSi1.2 =	★★★★★ MDi1.1 =	★★★★☆ MDi1.2 ↓
Monitoring of the conformity of metadata			
★★★★★ DSi2 =			
Monitoring of the conformity of spatial data sets			
★★★★★ DSi2.1 =	★★★★☆ DSi2.2 =	★★★★★ DSi2.3 =	
Monitoring of the accessibility of spatial data sets through view and download services			
★★★★☆ NSi2 =			
★★★★☆ NSi2.1 =	★★★★☆ NSi2.2 =		
Monitoring of the conformity of the network services			
★★★★★ NSi4 =			
★★★★★ NSi4.1 =	★★★★★ NSi4.2 =	★★★★★ NSi4.3 =	Not available NSi4.4 -

Download the calculated indicators for this country

Monitoring and Reporting 2023 – Dashboard

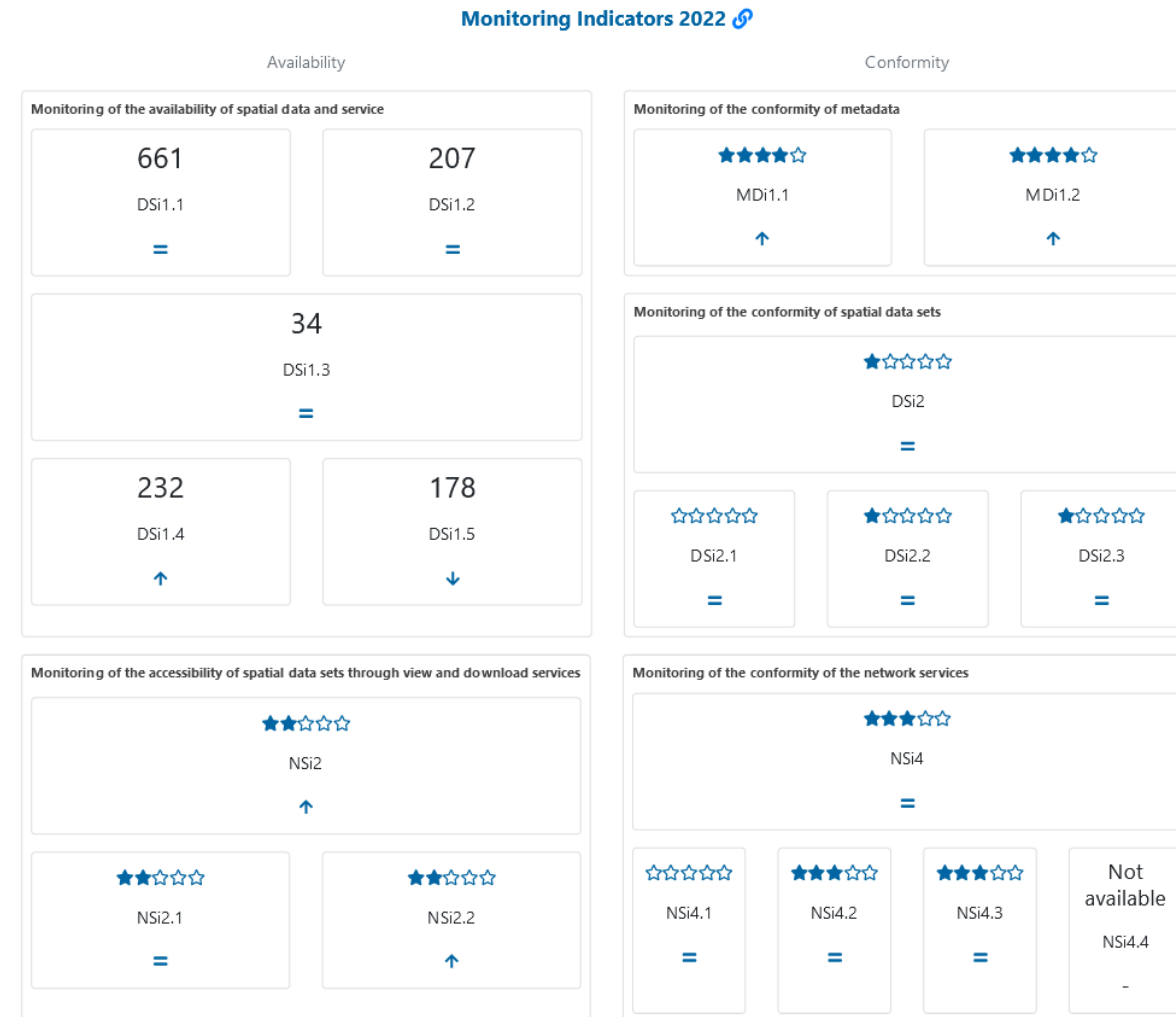
- Visualization of indicators
 - star-based scoring system (for percentage indicators):

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

- comparison against 2022 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 2022 values



Monitoring and Reporting 2023 – 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,
M&R Tools & 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 2023 – General conclusions

- Overall, **slight improvement** of results compared to the **2022** exercise.
- **Significantly improved** accessibility
- **Significant improvement** comparing with previous years M&R baselines, increasing from 2022 to **2020**, 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). Interoperability lacks in XML encoding.
- **Several issues** were identified in the INSPIRE infrastructure during the M&R process, which may turn into opportunities for future improvement.
- **Data-Service Linking Simplification** approach is the way forward!

Conformity of datasets and services

Self-declared conformity

- Many countries (some being the same as in 2022) 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%	89%	88%	87%	87%	44%	52%	91%	96%	100%	99%	97%	#N/A
BE	92%	81%	75%	68%	77%	74%	72%	78%	88%	93%	83%	94%	93%	#N/A
BG	28%	46%	95%	98%	92%	97%	27%	33%	27%	0%	0%	0%	0%	#N/A
CH	0%	0%	3%	6%	2%	4%	0%	60%	2%	3%	#N/A	100%	0%	#N/A
CY	0%	0%	2%	0%	25%	0%	98%	98%	100%	0%	#N/A	0%	0%	#N/A
CZ	90%	98%	47%	57%	53%	47%	92%	96%	96%	97%	100%	97%	97%	100%
DE	74%	79%	61%	53%	52%	53%	65%	72%	67%	99%	100%	99%	99%	#N/A
DK	59%	93%	63%	100%	71%	47%	52%	71%	54%	91%	100%	91%	91%	#N/A
EE	97%	96%	56%	80%	58%	58%	74%	77%	76%	91%	100%	90%	91%	#N/A
EL	100%	100%	100%	100%	100%	100%	98%	98%	100%	0%	0%	0%	0%	#N/A
ES	92%	94%	47%	63%	54%	47%	84%	97%	85%	96%	100%	97%	92%	#N/A
FI	97%	100%	25%	25%	23%	39%	34%	55%	47%	53%	100%	57%	52%	#N/A
FR	3%	60%	77%	100%	76%	74%	19%	37%	60%	16%	#N/A	7%	0%	#N/A
HR	98%	99%	59%	58%	58%	59%	56%	73%	62%	80%	100%	65%	97%	#N/A
HU	42%	97%	70%	68%	85%	73%	51%	57%	63%	45%	0%	91%	3%	#N/A
IE	98%	4%	36%	79%	37%	37%	65%	65%	75%	96%	100%	100%	100%	#N/A
IS	87%	77%	50%	54%	51%	51%	50%	78%	55%	0%	#N/A	0%	0%	#N/A
IT	99%	96%	24%	22%	21%	22%	26%	50%	34%	5%	14%	6%	3%	0%
LI	77%	25%	7%	7%	8%	3%	0%	1%	0%	25%	#N/A	100%	0%	#N/A
LT	96%	100%	79%	55%	79%	79%	61%	63%	98%	100%	100%	100%	100%	#N/A
LU	100%	100%	75%	100%	75%	75%	0%	91%	0%	100%	100%	100%	100%	#N/A
LV	0%	0%	77%	83%	55%	81%	56%	60%	58%	0%	#N/A	0%	0%	#N/A
MT	100%	100%	99%	99%	99%	99%	80%	98%	85%	100%	#N/A	100%	100%	#N/A
NL	75%	98%	42%	91%	88%	82%	59%	69%	64%	76%	0%	93%	93%	#N/A
NO	86%	74%	6%	14%	7%	1%	14%	19%	41%	3%	0%	5%	1%	#N/A
PL	97%	91%	81%	76%	93%	79%	60%	65%	65%	97%	100%	96%	99%	#N/A
PT	73%	88%	46%	52%	34%	44%	43%	67%	60%	65%	#N/A	73%	54%	#N/A
RO	57%	95%	45%	100%	33%	100%	38%	38%	39%	91%	100%	98%	93%	#N/A
SE	84%	92%	100%	100%	100%	100%	83%	87%	88%	100%	100%	100%	100%	#N/A
SI	77%	91%	81%	100%	53%	44%	46%	67%	52%	100%	#N/A	100%	100%	#N/A
SK	99%	92%	66%	59%	85%	59%	85%	91%	87%	61%	#N/A	65%	63%	#N/A

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:
 - between 10% and 20%!
 - 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.

Opportunities for improvement

Metadata records from national catalogues with indexing errors or warnings

- Metadata records with XML (ISO 19139) encoding errors, not properly indexed by GeoNetwork.

The screenshot displays the 'INSPIRE Geoportal - Internal' status page. On the left, a sidebar contains navigation options: Status, Record links analysis, Information, Versioning, and Last user feedbacks. The main content area is divided into two sections: 'Critical System Checks' and 'Non-critical System Checks'. Under 'Critical System Checks', 'CSW GetCapabilities operation', 'Database Connection', and 'Remote index' are all marked as 'OK'. Under 'Non-critical System Checks', 'Dashboard application' is marked as 'ERROR', while 'Dead locked threads', 'Sufficient free file handles', 'Available connections in database', 'No harvesting errors', 'Index is in readonly mode', and 'Metadata index errors' are marked as 'OK'. At the bottom of this section, a red box highlights 'Records in index/db = 318339/318341' with an 'ERROR' status. To the right, a 'Metadata with indexing errors' panel is visible, featuring a filter and a list of error types: 'Errors (31)', 'Warning (12940)', and 'Harvested (12970)'. The 'Indexing errors' section is circled in red and lists two error types: 'IndexingErrorMsg-GNIDX-XSL|A sequence of more than one item is not allowed as the first...' (30) and 'ElasticsearchException[Elasticsearch exception [type=mapper_parsing_exception, reason=f...]' (1). The 'Indexing warnings' section lists various warnings related to missing keywords and field values, such as 'Warning / Field resourceTemporalDateRange / Lower and upper bounds empty or not v...' (2776) and 'Warning / Keyword inspire not found in https://register.geonorge.no/subregister/metadat...' (385).

→ Consequences:

- a) Metadata records not available in the INSPIRE Geoportal (not processed by Elastic Search).
- b) Decrease in indicators.

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.

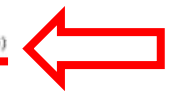
The screenshot shows a metadata record with the following details:

- Title:** Geoscience Australia's Open Day Photographs 26th August 2007 (highlighted with a red box)
- Description:** During National Science Week on Sunday 26th August 2007, Geoscience Australia opened its doors to the community to showcase a diverse range of work activities. Members of the public had the opportunity to discover how earthquakes are detected, pan for gold, tour the building, view Australia in 3D, become a seafloor detective and talk to the people who work for Australia's national geoscience research organisation. The photographs of that open day have been converted into thumbnail images and are available on the GA web site.
- Access and use constraints:** The images are only available in thumbnail size for privacy reasons.
- Technical information:** Revision 25-08-2007 23:00, Language English

Type of resources ▼



• Dataset (170)
• Service (41)
• collectionSession (3)



Type of resources ▼

Dataset (173)
 Service (41)
 Collection session (3)

→ Consequences:

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

Opportunities for improvement

Conformity of datasets and/or 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;&#x3BD;
&#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:PT_FreeText>
              <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;&#x3BD;
&#x3B1;&#x3C6;&#x3BF;&#x3C1;&#x3AC; &#x3C4;&#x3B9;&#x3C2; &#x3B4;&#x3B9;&#x3BA;&#x3C4;&#x3C5;&#x3B1;&#x3BA;&#x3AD;&#x3C2;</gmd:LocalisedCharacterString>
            </gmd:textGroup>
          </gmd:PT_FreeText>
        </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.

Opportunities for improvement

Declaration of GEMET INSPIRE Theme keywords

- Not following, apart from Requirements on this concern, the whole set of Recommendations.
- Example (best use):

```
/gmd:MD_Metadata/gmd:identificationInfo/*/gmd:descriptiveKeywords/gmd:MD_Keywords:
<gmd:MD_Keywords>
  <gmd:keyword>
    <gmx:Anchor xlink:href="http://inspire.ec.europa.eu/theme/ac">
      Atmospheric conditions
    </gmx:Anchor>
  </gmd:keyword>
  <gmd:keyword>
    <gmx:Anchor xlink:href="http://inspire.ec.europa.eu/theme/mf">Meteorological geographical features</gmx:Anchor>
  </gmd:keyword>
  <gmd:thesaurusName>
    <gmd:CI_Citation>
      <gmd:title>
        <gmx:Anchor xlink:href="http://www.eionet.europa.eu/gemet/inspire_themes">GEMET - INSPIRE themes, version 1.0</gmx:Anchor>
      </gmd:title>
      <gmd:date>
        <gmd:CI_Date>
          <gmd:date>
            <gco:date>2008-06-01</gco:date>
          </gmd:date>
          <gmd:dateType>
            <gmd:CI_DateTypeCode codeList="http://standards.iso.org/iso/19139/resources/gmxCodeLists.xml#CI_DateTypeCode">
            </gmd:CI_DateTypeCode>
          </gmd:dateType>
        </gmd:CI_Date>
      </gmd:date>
    </gmd:CI_Citation>
  </gmd:thesaurusName>
</gmd:MD_Keywords>
```

→ Consequences: Difficulties to filter dataset metadata records by theme / INSPIRE Annex.
Non-representativeness of dataset conformity indicator.

Opportunities for improvement

Problems preventing dataset accessibility through network services

Examples:

- Service timeouts. Requirements on Quality of Service (QoS) not assured.

```
HTTPSConnectionPool(host='...', port=443): Read timed out. (read timeout=5)
```

- Misconfiguration of services. SSL certificate errors.

```
(Caused by SSLError(SSLCertVerificationError(1, '[SSL: CERTIFICATE_VERIFY_FAILED] certificate verify failed: self-signed certificate in certificate chain (_ssl.c:1006)')))
```

→ Consequences: Decreased indicators on accessibility through view / download services.

Good practices identified

Greece (EL), Luxembourg (LU), Malta (MT)

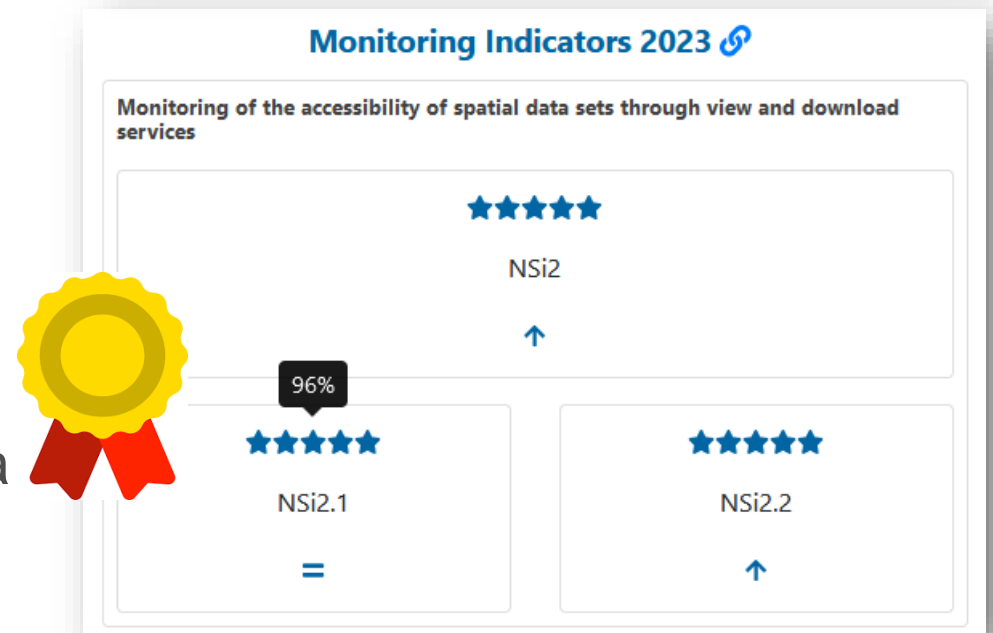
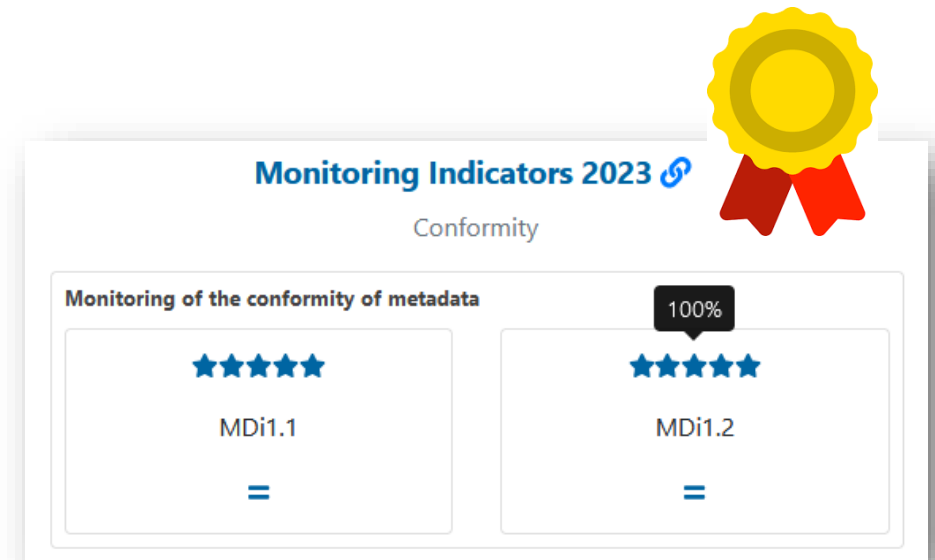
- 100% Conformity of INSPIRE metadata.

Other countries effectively using the INSPIRE Reference Validator (datasets)

- Some countries with dataset metadata conformity near to 100%: AT, EE, FI, HR, IT, LT, PL, SK.

Overall improvement of M&R indicators (2023 vs. 2022)

- Belgium (BE), Germany (DE), Estonia (EE), Croatia (HR), Lithuania (LT), Malta (MT), Poland (PL), Sweden (SE), Slovakia (SK).



Good practices identified

Slovakia (SK)

- Exercise performed with national data providers to assure accessibility of URLs:
 - Specific Link-Checker project: <https://gitlab.com/mzpsr/geocloud/applications/sdi-linkage-checker>
 - Positive impact on accessibility indicators.
 - Active and continuous feedback to JRC Team for enhancing the INSPIRE Geoportal.
- Proactive attitude and continuous feedback to the INSPIRE Geoportal team (e.g. issues detected, potential solutions, active participation in GitHub helpdesks).

Thank you!



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