



# Geospatial interoperability in the European Union: the **INSPIRE Directive**

Marco Minghini

**The European Commission's  
science and knowledge service**  
Joint Research Centre

Milan, 11/11/2019



**POLITECNICO  
MILANO 1863**



European  
Commission

# About me

- Environmental Engineer 'grown' at Politecnico di Milano
  - BSc (2008), MSc (2010) & PhD (2014)
  - Postdoc Research Fellow from 2014 to 2018
  - Scientific Project Officer at the European Commission – Joint Research Centre (JRC) since 2018
- Geospatial **expert**, enthusiast of 'open' (software, data, standards, etc.):
  - Researcher (GIS, VGI, SDIs, etc.)
  - Charter Member of the [Open Source Geospatial Foundation](#) (OSGeo)
  - [OpenStreetMap](#) contributor, Member of the [OpenStreetMap Foundation](#) (OSMF), Member of the OSMF State of the Map Working Group
  - Voting Member of the Humanitarian [OpenStreetMap Team](#) (HOT)
  - Secretary of [ISPRS WG IV/4 "Collaborative Crowdsourced Cloud Mapping \(C<sup>3</sup>M\)"](#)
  - Member of the Editorial Board of [Open Geospatial Data, Software and Standards](#)
  - Co-founder of [GISdevio Srl](#) in 2017



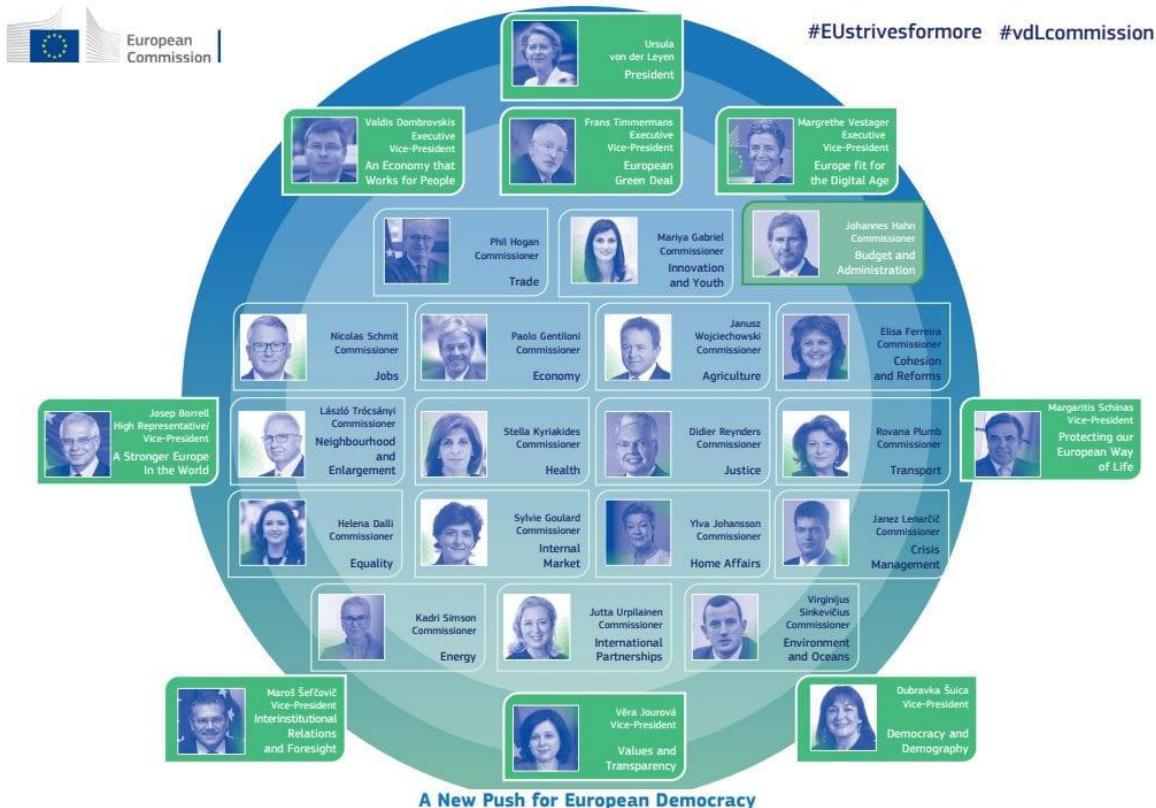
# Outline

- European Commission and the Joint Research Centre
- INSPIRE Directive
- INSPIRE Tools & current Actions
- Practical Exercise

# European Commission & the JRC

# European Commission (EC)

- The executive branch of the European Union:



- Political guidelines for the next European Commission 2019-2024:  
[https://ec.europa.eu/commission/sites/beta-political/files/political-guidelines-next-commission\\_en.pdf](https://ec.europa.eu/commission/sites/beta-political/files/political-guidelines-next-commission_en.pdf)

# EC Directorates-General (DGs)

Agriculture and Rural Development	AGRI	Informatics	DIGIT
Budget	BUDG	Internal Market, Industry, Entrepreneurship and SMEs	GROW
Climate Action	CLIMA	International Cooperation and Development	DEVCO
Communication	COMM	Interpretation	SCIC
Communications Networks, Content and Technology	CNCT	Joint Research Centre	JRC
Competition	COMP	Justice and Consumers	JUST
Economic and Financial Affairs	ECFIN	Maritime Affairs and Fisheries	MARE
Education and Culture	EAC	Migration and Home Affairs	HOME
Employment, Social Affairs and Inclusion	EMPL	Mobility and Transport	MOVE
Energy	ENER	Neighbourhood and Enlargement Negotiations	NEAR
Environment	ENV	Regional and Urban Policy	REGIO
European Civil Protection and Humanitarian Aid Operations	ECHO	Research and Innovation	RTD
Eurostat - European statistics	ESTAT	Taxation and Customs Union	TAXUD
Financial Stability, Financial Services and Capital Markets Union	FISMA	Trade	TRADE
Health and Food Safety	SANTE	Translation	DGT
Human Resources and Security	HR		

# EC DG Joint Research Centre (JRC)

*" As the science and knowledge service  
of the Commission our mission is to support  
EU policies with independent evidence  
throughout the whole policy cycle "*



# EC DG JRC – Sites

- Headquarters in Brussels & research facilities located in 5 Member States:
  - Belgium (Geel)
  - Germany (Karlsruhe)
  - Italy (Ispra)
  - The Netherlands (Petten)
  - Spain (Seville)



# EC DG JRC – Facts & Figures

**€ 386** million Budget annually,  
plus **€ 62** million earned income

**6** locations in 5 Member States: Italy,  
Belgium, Germany, The Netherlands, Spain

**Independent** of private,  
commercial or national interests



**1500** core research staff,  
**3000** total staff

**125** instances of support  
to the EU policy-maker  
annually

More than **100** economic,  
bio-physical and nuclear models

**Policy neutral:** has no policy  
agenda of its own

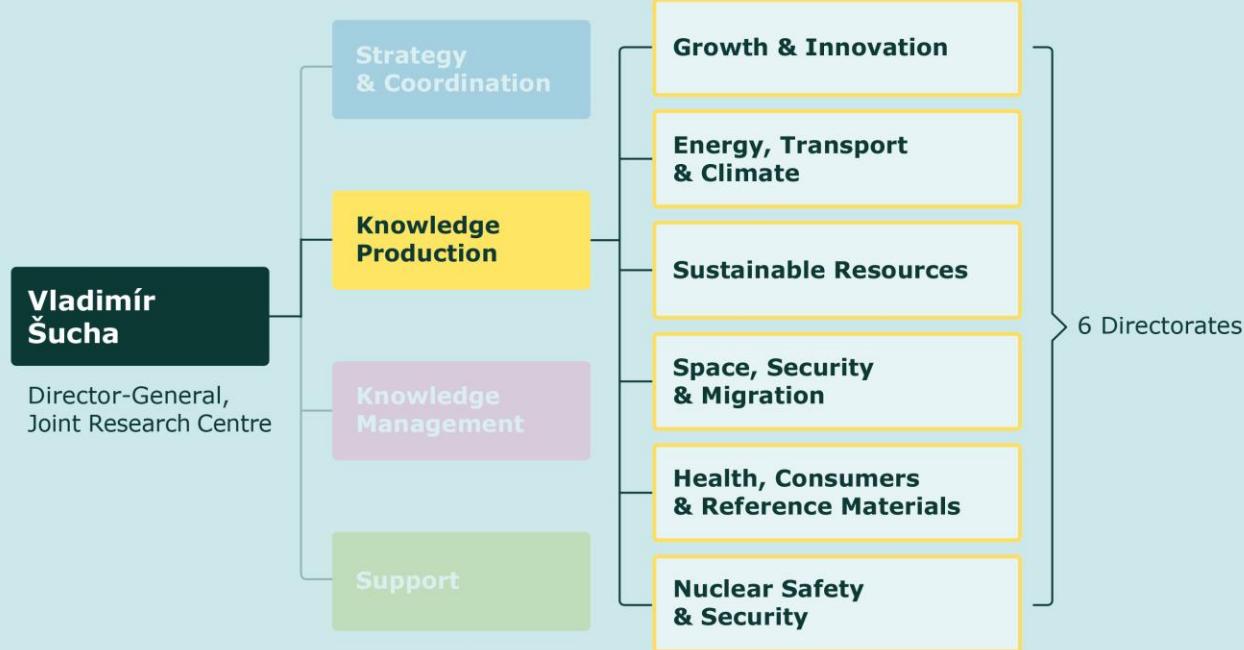


**42** large scale research facilities,  
more than 110 online databases

**83%** of core research staff  
with PhD's

**Over 1,400**  
scientific publications per year

# EC DG JRC – Structure



# EC DG JRC – Unit B.6 Digital Economy

- Focused on how digitalization & ICT are affecting the economy:
  - innovative technology: IoT, AI, Big Data, APIs
  - benefits/opportunities vs. problems/challenges
  - EC Digital Europe programme (to be launched in 2021)
- Policy issues in a number of areas:
  - AI, APIs, Blockchain, Digital government, standardization, data economy, data interoperability, data governance, data ecosystems, Citizen Science
- Multi-disciplinary team:
  - economists experienced on techno-economic impact of digital technologies
  - computer scientists & technologists experienced on digital technologies and digital data governance and interoperability

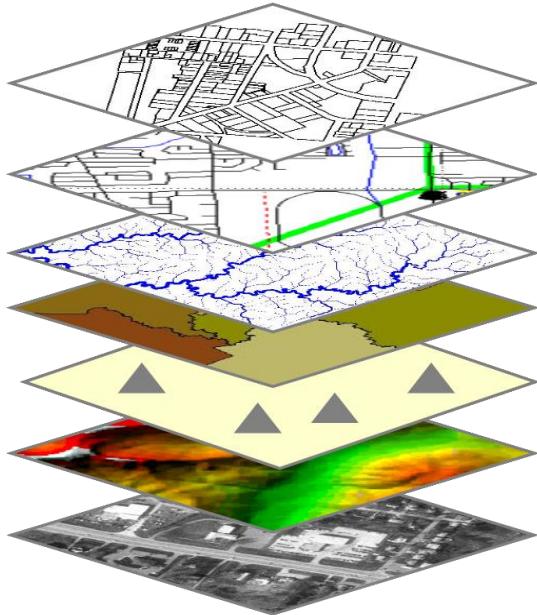
# **INSPIRE**

# **Directive**

# Spatial Data Infrastructure (SDI)

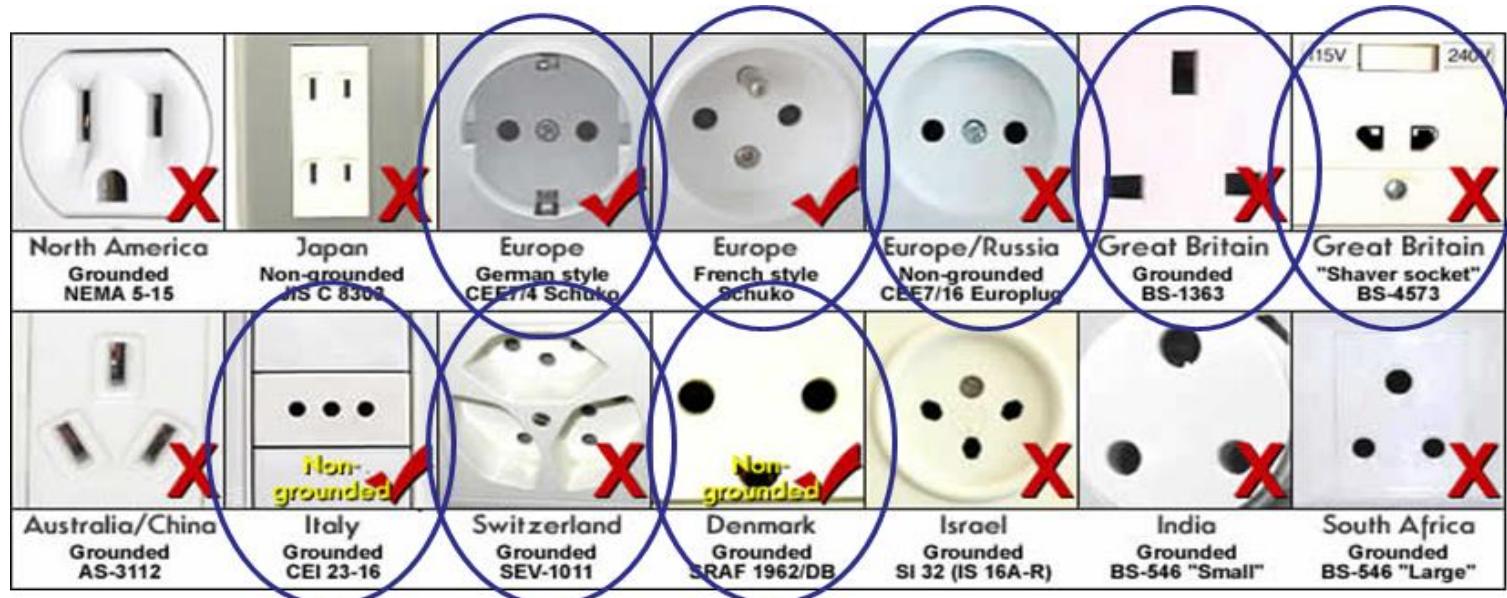
- National Spatial Data Infrastructure (NSDI) means the technology, policies, standards, and human resources necessary to acquire, process, store, distribute, and improve utilization of geospatial data (*Executive Order 12906, 1994*)
- A spatial data infrastructure (SDI) is a data infrastructure implementing a framework of geographic data, metadata, users and tools that are interactively connected in order to use spatial data in an efficient and flexible way (*The White House, Office of Management and Budget, Circular No. A-16 Revised, 2002*)

# SDIs – Legal vs. others



# A European Spatial Data Infrastructure: why?

- Public consultation in the early 2000s identified a number of obstacles preventing the widespread use of geospatial data needed for environmental policy at the EU level:



# INSPIRE Directive



# INSPIRE Directive



DIRECTIVE 2007/2/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 14 March 2007

establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)

- Aims to create a **European SDI** for the purposes of EU environmental policies:
  - environmental spatial data **sharing**, facilitation of **public access** to spatial data, and assisting in cross-boundary **policy-making**
  - based on the SDIs established and operated by the EU Member States
  - came into force on **May 15, 2007**, and will be implemented in various stages, with full implementation required by **2021**.

# INSPIRE Directive – INSPIRE Knowledge Base

Home Learn ▾ Implement ▾ Participate ▾ Use ▾ Toolkit Focus On

INSPIRE Video



The INSPIRE-Directive: a brief description

Latest News

17/10/2019 INSPIRE Conference 2020: Call for abstracts open

13/08/2019 Call for expression of interest to tender: Data ecosystems for geospatial data

02/08/2019 Call for expression of interest to tender: Facilitating access to INSPIRE data through standard-based APIs

All News

Events

12/05/2020 INSPIRE Conference 2020

22/10/2019 Inspire Helsinki 2019

07/05/2019 Webinar: INSPIRE good practices – Alternative Encodings

All Events

Quick Links



INSPIRE LIBRARY



INSPIRE ROADMAP



INSPIRE GEOPORTAL



INSPIRE IN YOUR COUNTRY



INSPIRE COMMUNITY FORUM



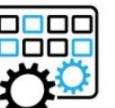
FIND YOUR SCOPE



INSPIRE REGISTRY



INSPIRE LEGISLATION



INSPIRE THEMES



INSPIRE VALIDATOR



INSPIRE TRAINING

Focus On

# INSPIRE

CONFERENCE

# 2020

DUBROVNIK - CROATIA

# INSPIRE Directive – Spatial scope

- INSPIRE addresses 34 spatial data themes for environmental applications:

## ANNEX: 1

	Addresses
	Cadastral parcels
	Geographical grid systems
	Hydrography
	Transport networks

## ANNEX: 2

	Elevation
	Land cover

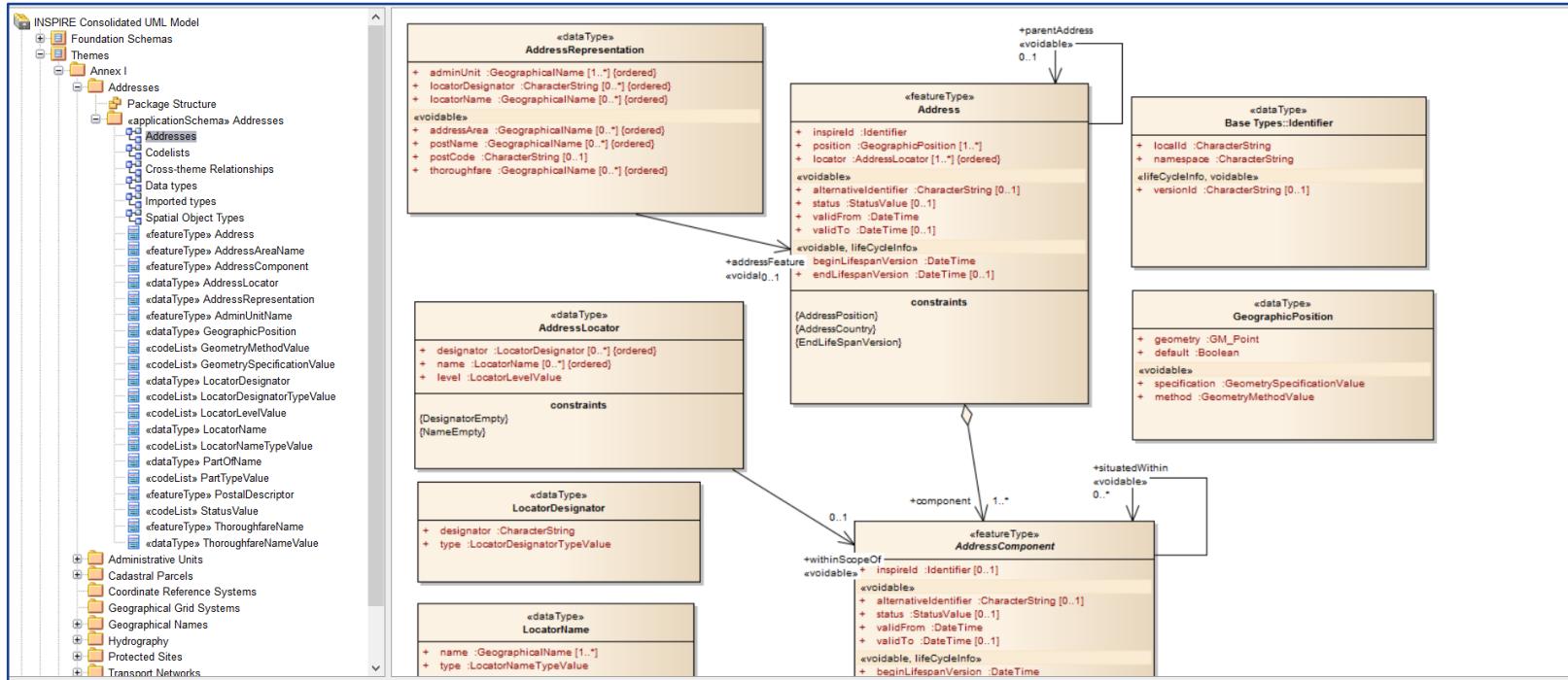
## ANNEX: 3

	Agricultural and aquaculture facilities
	Atmospheric conditions
	Buildings
	Environmental monitoring facilities
	Geographical names
	Protected sites
	Human health and safety
	Meteorological geographical features
	Natural risk zones
	Population distribution and demography
	Sea regions
	Species distribution
	Area management / restriction / regulation zones & reporting units
	Bio-geographical regions
	Energy resources
	Habitats and biotopes
	Land use
	Mineral resources
	Oceanographic geographical features
	Production and industrial facilities
	Soil
	Statistical units
	Utility and governmental services

# **INSPIRE Directive – Data models**



- INSPIRE conceptual data models for each theme are defined in [UML](#):
    - default encoding is the Geography Markup Language ([GML](#))



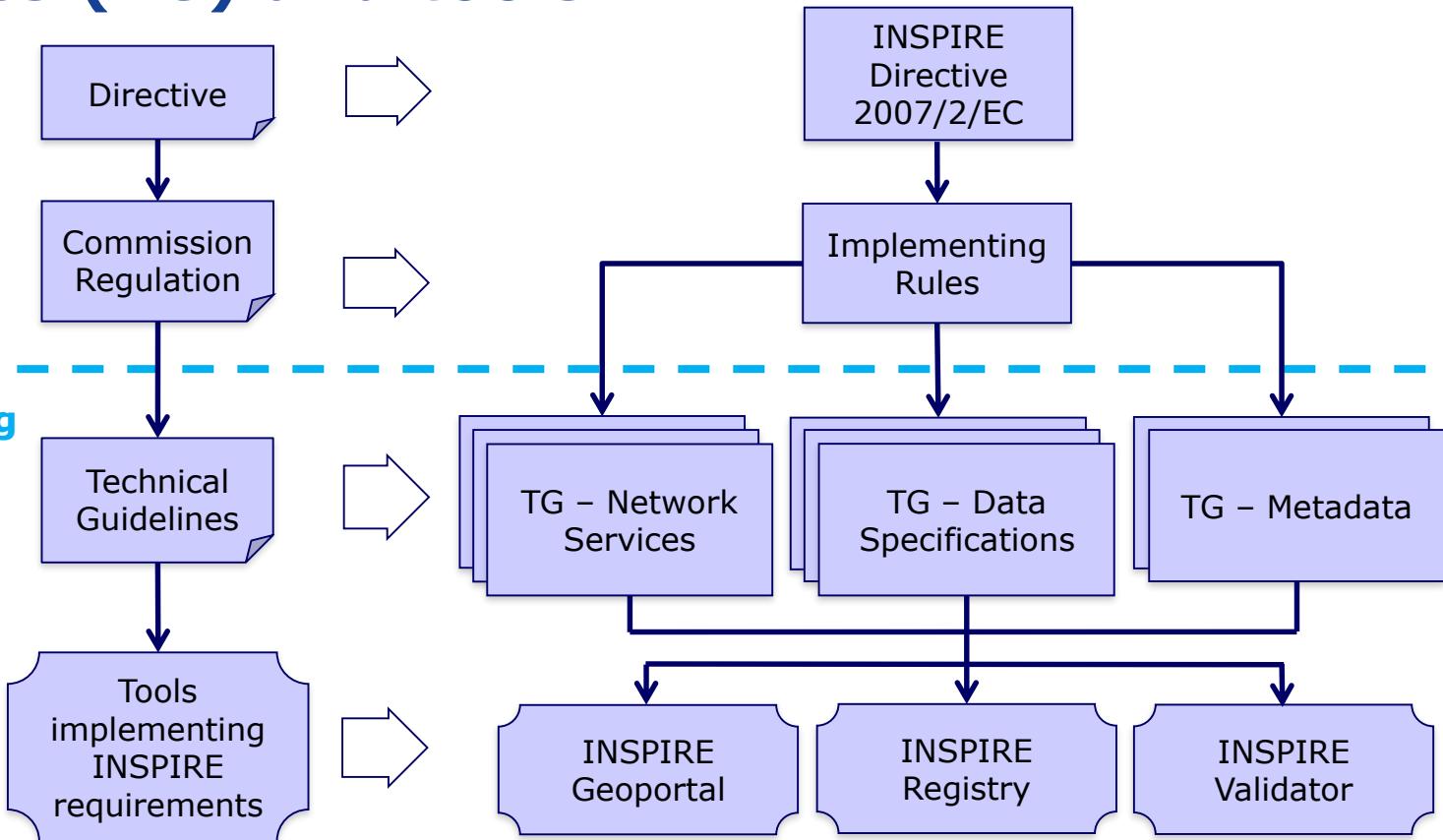
# Implementing Rules (IR), Technical Guidelines (TG) and tools

“What Member States must implement”  
 (abstract specification)

**legally binding**

**not legally binding**

“How Member States might implement it”  
 (implementation specification)



# INSPIRE Directive – Governance

- INSPIRE Coordination Team (CT):
  - Directorate General Environment (DG ENV), Joint Research Centre (JRC) & European Environment Agency (EEA)
- INSPIRE Committee (IC):
  - Member States representatives
- Member States National Contact Points (NCPs)
- INSPIRE Maintenance and Implementation Group (MIG):
  - representatives of the NCPs
  - MIG-P (Political) & MIG-T (Technical)
  - Maintenance and Implementation Work Programme ([MIWP](#))
- INSPIRE stakeholders

# INSPIRE Directive – Where are we in 2019?

1



draft

2



implement

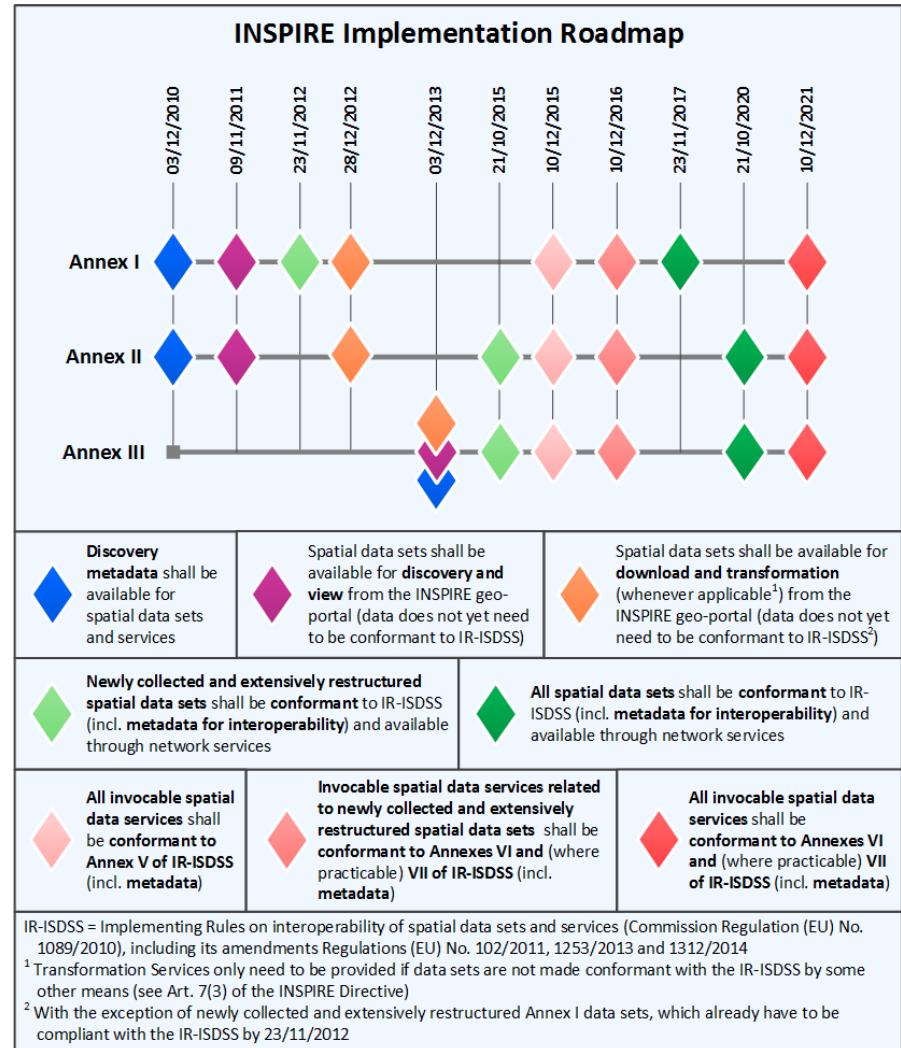
3



use

# INSPIRE Directive – Roadmap

- Implementation in subsequent **stages**:
  - depending on the **Annex**
  - depending on the **resource type**
    - metadata
    - services (Discovery / View / Download)
    - data sets (as-is / compliant)

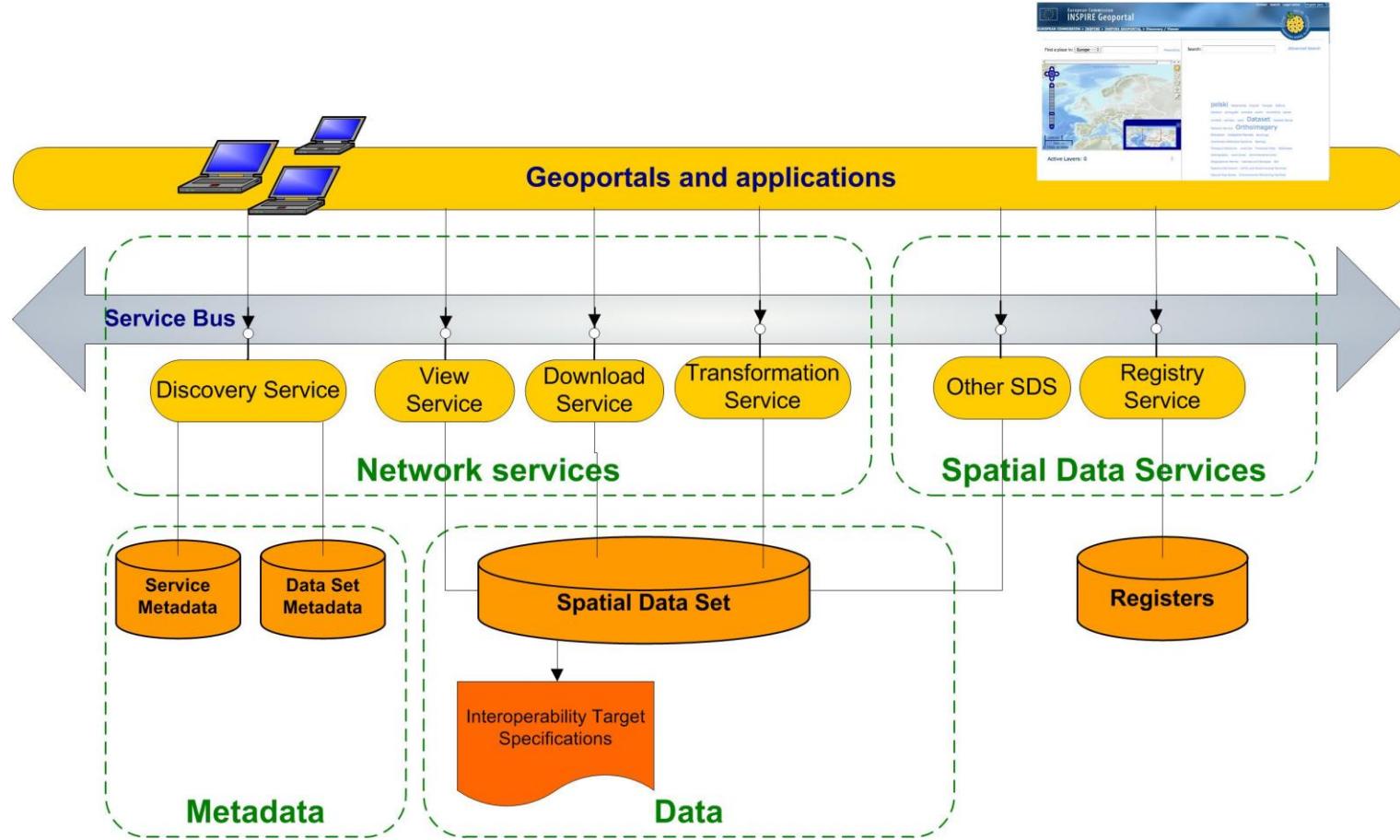


# **INSPIRE**

# **Tools & current**

# **Actions**

# INSPIRE Architecture



# INSPIRE – Tools for implementers

- A very rich INSPIRE-compliant ecosystem:
  - data **serving** (WMS/WMTS, WFS, WCS, SOS)



- data/metadata **catalogs** (CSW)



- **ETL** (Extract-Transform-Load) tools



# INSPIRE Tools – Geoportal

- Allows to search, view & download data sets using 2 viewers:
  - Priority Data Sets Viewer
  - INSPIRE Thematic Viewer

**Priority Data Sets Viewer**



Credits: Map data: Google | Map style: snazzymap | Icon: Nick Roach

The application displays the availability and provides access to the selected priority data sets used for environmental reporting. It allows filtering by environmental domain, environmental legislation and country.

**Browse Priority Data Sets**

**INSPIRE Thematic Viewer**

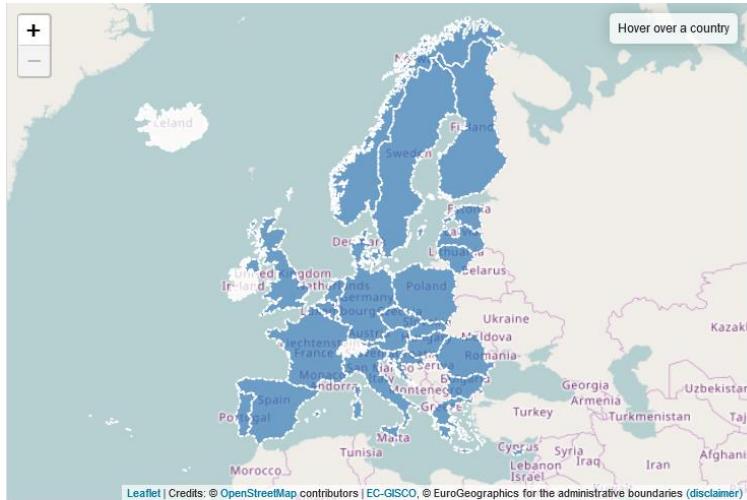


Credits: Map data: Google | Map style: snazzymap | Icon: INSPIRE

The application displays the availability and provides access to all EU MS data sets falling under the scope of INSPIRE Directive filtered by data themes and countries (i.e. Annex I, II and III).

**Browse INSPIRE Thematic Data Sets**

# INSPIRE Geoportal – Implementation overview



Show:

Downloadable Viewable

## INSPIRE Geoportal Data Set Statistics

153290  
Metadata records

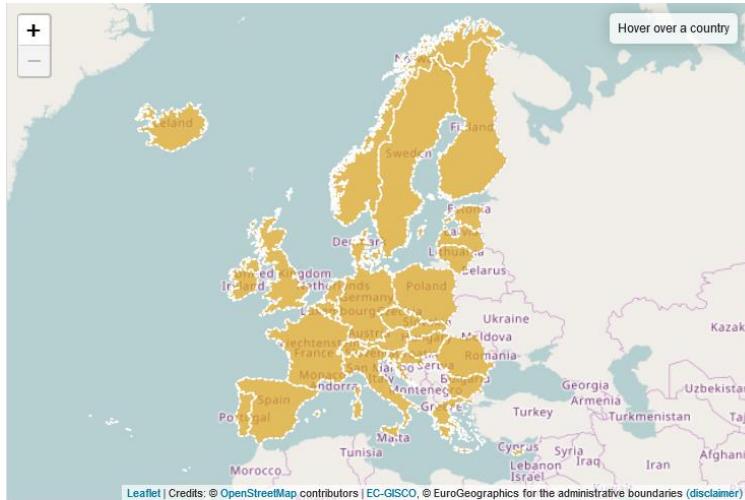
31972  
Viewable Data Sets

[Leaflet](#) | Credits: © OpenStreetMap contributors | EC-GISCO, © EuroGeographics for the administrative boundaries ([disclaimer](#))<sup>(i)</sup>

### Select a COUNTRY

Austria	550	418	463
Belgium	614	241	478
Bulgaria	169	4	3
Croatia	109	4	12
Cyprus	42	3	3
Czech Republic	151	6	77
Denmark	219	17	34
Estonia	75	14	23
Finland	553	34	178
France	40027	12588	14736
Germany	30625	10054	10169
Greece	57	2	57
Hungary	121	23	20
Iceland	147	7	0
Ireland	51	0	0
Italy	20523	7	209
Latvia	145	11	27
Liechtenstein	60	10	12
Lithuania	111	73	14
Luxembourg	217	192	163
Malta	157	136	152
Netherlands	210	87	117
Norway	168	56	17
Poland	34929	27	4132

# INSPIRE Geoportal – Implementation overview



Show:

Downloadable Viewable

## INSPIRE Geoportal Data Set Statistics

153290  
Metadata records

24415  
Downloadable Data Sets

## Select a COUNTRY

Austria	550	418	463
Belgium	614	241	478
Bulgaria	169	4	3
Croatia	109	4	12
Cyprus	42	3	3
Czech Republic	151	6	77
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# INSPIRE Tools – Registry

- Tool to manage and share reference codes (i.e. unique identifiers)
- INSPIRE customization of the Re3gistry software ([open source](#) under the EUPL)

Registry manager: European Commission, Joint Research Centre

Other formats:

 XML Re3gistry     XML ISO 19135     RDF/XML     JSON     Atom     CSV

**Registers**

Label	Actions
INSPIRE application schema register	
INSPIRE code list register	
INSPIRE enumeration register	
INSPIRE feature concept dictionary	
INSPIRE glossary	
INSPIRE layer register	
INSPIRE media-types register	
INSPIRE metadata code list register	
INSPIRE reference document register	
INSPIRE theme register	

Items per page  Showing 1 to 10 of 10 entries

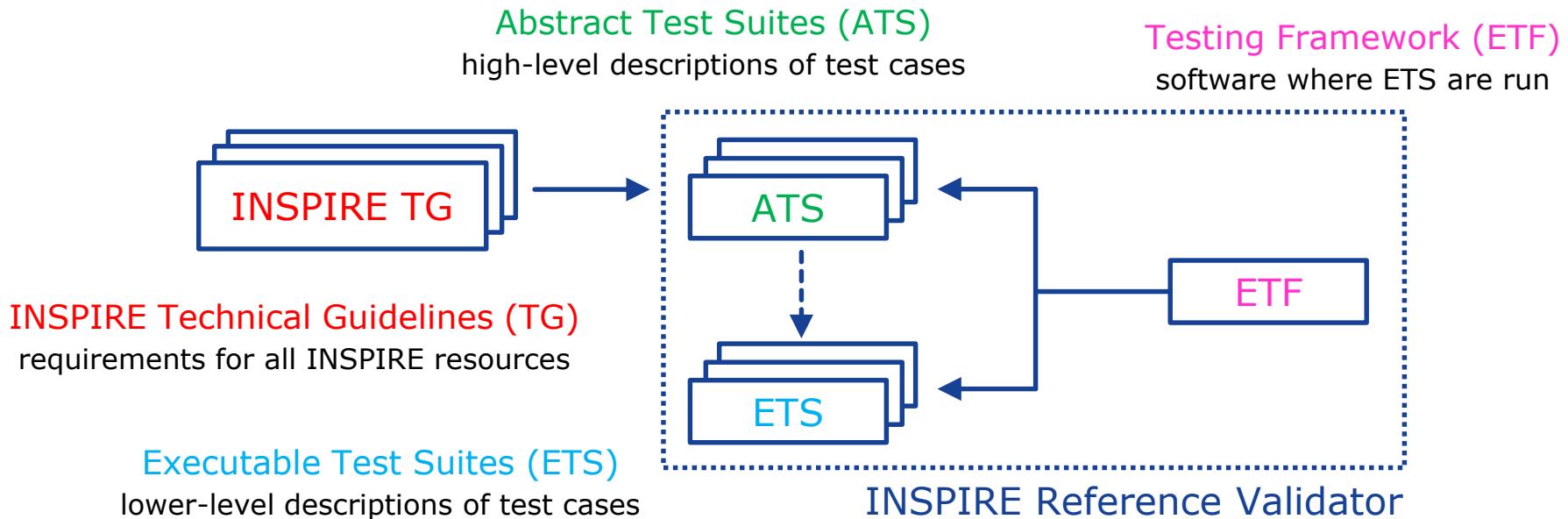
First Previous **1** Next Last

<http://inspire.ec.europa.eu/registry>

31 <https://joinup.ec.europa.eu/solution/re3gistry>

# INSPIRE Tools – Reference Validator

- Allows data providers to validate metadata, data sets & services:
  - it translates the TG requirements into Abstract & Executable Test Suites



# INSPIRE Tools – Reference Validator

- Allows data providers to validate metadata, data sets & services:
  - open source under the EUPL
  - available as a webapp & a REST API, Docker container available

## Executable Test Suites

To start a Test Run, select one or multiple Test Suites with a click on the flip switches on the right-hand side ("use") and press the "Start" button that appears once at least one Test Suite is selected. Please note that the Test Suites are only applicable to certain Test Object types and therefore not all Test Suites are combinable for a Test Run. Additional information about a Test Suite will be shown with a click on the plus button.

The screenshot shows a user interface for selecting executable test suites. At the top, there is a search bar labeled "Filter items...". Below it, a section header reads "View Services - WMS and WMTS (TG version 3.11) - BETA". The list contains two items, each with a plus sign icon, a description, and a "use" checkbox:

- Conformance Class: View Service - WMS
- Conformance Class: View Service - WMTS

Below this section, another header reads "Download Services - WFS and ATOM (TG version 3.1)". It also contains two items:

- Conformance Class: Download Service - Direct WFS
- Conformance Class: Download Service - Pre-defined Atom

At the bottom, another header reads "Conformance Class: Download Service - Pre-defined WFS", which has one item listed:

- Conformance Class: Download Service - Pre-defined WFS

# INSPIRE Actions – MIWP 2017.2

- “Alternative encodings for INSPIRE data”
  - **purpose**: develop concrete proposals for alternative/additional encodings of INSPIRE to improve usability in GIS desktop/web clients & define a template/procedure for proposing additional encoding rules
  - **result**: development of a generic UML-to-GeoJSON encoding rule + a set of model transformation rules specifically developed for AD and EF themes & a template for alternative encodings for INSPIRE data

README.md

2017.2

---

This is the Repository for action 2017.2 on alternative encodings.

The first encoding that the group specified is the [GeoJSON Encoding](#). GeoJSON may serve as an alternative or additional encoding for simple data sets for the Addresses and the Environmental Monitoring Facilities.

The template for alternative or additional encodings can be found [here](#).

The glossary of terms can be found [here](#).

# INSPIRE Actions – MIWP 2017.3

- “Improved client support for INSPIRE data”
  - **purpose:** assess the support for INSPIRE data in the mainstream desktop & web clients for both the GML and GeoJSON encodings (through a “Can I use” support table) & improve the support through collaboration with software vendors

## Welcome to CanIUse INSPIRE

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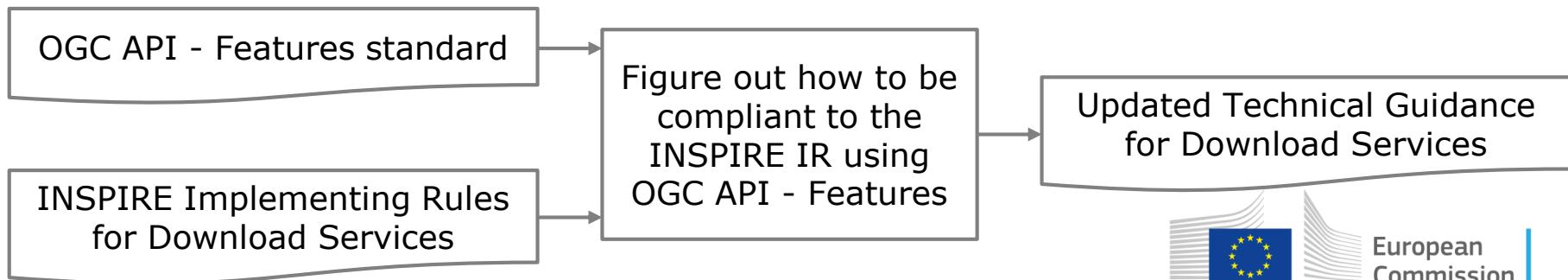
In this repository we document which features of INSPIRE GML and any alternative encodings (such as the GeoJSON encoding currently under development) can be used in which software product. The repository is created as part of the MIG 2017.3 action work to improve the usability of INSPIRE Data.

We have tested several client applications, including:

- QGIS 2.18 and QGIS 3.4
- Esri ArcMap 10.5
- Esri ArcGIS Online
- OpenLayers 3
- Leaflet 1.4
- OGR
- Safe Software FME
- wetransform hale studio

# INSPIRE Actions – OGC API - Features [tbd]

- OGC is developing the new OGC API family of standards:
  - modernization of the existing web service standards (W\*S)
  - consistent with the OGC/W3C Spatial Data on the Web Best Practices
  - first standard (OGC API - Features – Part 1 Core) published last week
    - API building blocks to create, modify, and query features on the Web
- Development of a Good Practice document for INSPIRE Download Services based on the new OGC API - Features standard.
- Testing with real implementations: pygeoapi, Idproxy, GeoServer, etc.



# **INSPIRE**

# **Exercise**

# INSPIRE Exercise

- INSPIRE Geoportal overview
- Data access: metadata, View Service and Download Service
- Service/data access from the QGIS client
- Links to the [INSPIRE Registry](#)
- Validator of a metadata resource using the [INSPIRE Validator](#)

# INSPIRE Geoportal – Overview

- Allows to search, view & download data sets using 2 viewers:
  - Priority Data Sets Viewer
  - INSPIRE Thematic Viewer

**Priority Data Sets Viewer**



Credits: Map data: Google | Map style: snazzymap | Icon: Nick Roach

The application displays the availability and provides access to the selected priority data sets used for environmental reporting. It allows filtering by environmental domain, environmental legislation and country.

**Browse Priority Data Sets**

**INSPIRE Thematic Viewer**



Credits: Map data: Google | Map style: snazzymap | Icon: INSPIRE

The application displays the availability and provides access to all EU MS data sets falling under the scope of INSPIRE Directive filtered by data themes and countries (i.e. Annex I, II and III).

**Browse INSPIRE Thematic Data Sets**

# INSPIRE Geoportal – Priority Data Sets Viewer

- Allows to access priority data sets, classified according to:
  - country, environmental domain & environmental legislation

## Priority Data Sets Viewer

Explores the data sets identified by EU Member States and EFTA countries as priority data sets for environmental reporting. You can filter by environmental domain, environmental legislation and country.

The list of priority data sets has been defined and is being further developed in the framework of INSPIRE Maintenance and Implementation Work Plan 2016-2020 (MIWP).

The Priority Data Sets Viewer provides statistical overviews of the availability of priority data set as well as simplified access to view or download selected data sets.

### Browse Priority Data Sets:



#### Country overview

Priority Data Sets grouped by individual EU & EFTA countries



#### Environmental Domains

Priority Data Sets grouped by 6 environmental domains



#### Environmental Legislation

Priority Data Sets grouped by relevant environmental reporting legislation

# INSPIRE Geoportal – INSPIRE Thematic Viewer

- Allows to access all INSPIRE data sets, classified according to:
  - country & data theme

## INSPIRE Thematic Viewer

Explores INSPIRE data sets provided by EU Member States and EFTA countries. You can filter by [spatial data theme](#) (from Annex I, II and III) and country.

The Thematic Viewer provides statistical overviews of data set availability as well as simplified access to view or download selected data sets.

### Browse INSPIRE Data Sets:

#### Country overview



Availability of INSPIRE data sets grouped by individual EU & EFTA countries

#### INSPIRE Data Themes



Availability of INSPIRE data sets grouped by INSPIRE data themes

# INSPIRE Geoportal – Data access

- Data set and service availability:

Data sets in Malta

Filter dataset by: Show dataset titles in: Show only:  
 Downloadable  Viewable original MD language  dataset with National coverage i

Title	Properties
* <a href="#">MALTA Classification at Local Administrative Unit (LAU), Level 1</a>	
* <a href="#">Photovoltaic panels installed in the domestic sector per 1000 residents</a>	
* <a href="#">11kV Overhead Line</a>	
* <a href="#">Article 12 Birds Range</a>	
* <a href="#">Article 12 Birds Distribution</a>	
* <a href="#">Unemployment rate (15 to 74 years) by District</a>	
* <a href="#">Article 17 Habitats Range</a>	
* <a href="#">Article 17 Species Distribution</a>	
* <a href="#">Article 17 Species Range</a>	
* <a href="#">Article 17 Habitats Distribution</a>	
Title	Properties

Show  entries

# INSPIRE Geoportal – Data access

- Data set and service availability:

Data sets in Malta

\* 157 | 136 | 152

Filter dataset by: Show dataset titles in: Show only:  
 Downloadable  Viewable original MD language  dataset with National coverage i

Title	Properties
* MALTA Classification at Local Administrative Unit (LAU), Level 1	  
* Photovoltaic panels installed in the domestic sector per 1000 residents	  
* 11kV Overhead Line	  
* Article 12 Birds Range	  
* Article 12 Birds Distribution	  
* Unemployment rate (15 to 74 years) by District	  
* Article 17 Habitats Range	  
* Article 17 Species Distribution	  
* Article 17 Species Range	  
* Article 17 Habitats Distribution	  
Title	Properties

Show 10 entries

43 <https://inspire-geoportal.ec.europa.eu/results.html?country=mt>

# INSPIRE Geoportal – Data access

- Metadata access:

Article 17 Habitats Range

Choose metadata language:  
original MD language ▾

Download Options ▾

View Options ▾

Data set Metadata ▾

**Resource Title**  
Article 17 Habitats Range

**Resource Abstract**  
Article 17 of the Habitats Directive requires Member States to report every six years about the progress made with the implementation of the Habitats Directive. As the main focus of the directive is on maintaining and/or restoring a favourable conservation status for habitat types & species of community interest, monitoring & reporting under the directive is focusing on that. Monitoring of conservation status is not restricted to Natura 2000 sites and data need to be collected both and outside the Natura 2000 network to achieve a full appreciation of conservation status. Some data on sensitive species is restricted from public access, as the disclosure of such might adversely affect the conservation of the species in question; this is in line with the provisions of Article 4 2(h) of Directive 2003/4/EC.

**Lineage**  
Habitats Directive - Article 17 Report - Malta - 2013 submitted on 11 Dec 2013; Habitats Directive - Article 17 Report - Malta - 2007 submitted on 07 Mar 2008.

**Unique Resource Identifier**  
Code: Art17\_MT\_hb\_range Namespace: <https://era.org.mt/>

**Spatial Data Theme**  
Habitats and biotopes

**Topic Category**  
biota  
environment

**Reporting Tags**

**Conditions Applying To Access And Use**  
No conditions apply

**Limitations On Public Access**  
Some data on sensitive species is restricted from public access, as the disclosure of such might adversely affect the conservation of the species in question; this is in line with the provisions of Article 4 2(h) of Directive 2003/4/EC.

**Geographic Bounding Box**

Leaflet | Credits: © OpenStreetMap contributors | EC-QISCO, © EuroGeographics for the administrative boundaries ([disclaimer](#))

**Responsible Party**  
Organisation name Environment and Resources Authority  
E-mail [info@era.org.mt](mailto:info@era.org.mt)

**Metadata Point Of Contact**  
Organisation name Environment and Resources Authority  
E-mail [info@era.org.mt](mailto:info@era.org.mt)

**Metadata Language**  
eng

**Metadata Date**  
2018-04-06T12:55:50

**fileIdentifier**  
3a8bde72-9204-4631-82d0-6e6338e731d

**Download metadata**  
application/vnd.iso.19139+xml

access to the XML file of the data set metadata

# INSPIRE Geoportal – Data access

- View Service:

Choose metadata language:  
original MD language ▾

Article 17 Habitats Range

Download Options ▾

View Options ▾

Search..

Simple Viewer	Layer title	Layer name	CRS	Desktop Tool ⓘ	Service metadata
<a href="#">Preview Data Set</a> ⚠️ ↻	Habitat Range	HB.HabitatRange	EPSG:4258	<a href="#">Google Earth</a>	🔗
<a href="#">Preview Data Set</a> ⚠️ ↻	Habitat Range	HB.Habitat.Range	EPSG:4258	<a href="#">Google Earth</a>	🔗

Data set Metadata ▾

# INSPIRE Geoportal – Data access

- View Service:

Choose metadata language:  
original MD language ▾

Article 17 Habitats Range

Download Options ▾

View Options ▾

Search..

Simple Viewer	Layer title	Layer name	CRS	Desktop Tool ⓘ	Service metadata
<a href="#">Preview Data Set</a> ⚠️ ↻	Habitat Range	HB.HabitatRange	EPSG:4258	<a href="#">Google Earth</a>	 <a href="#">access to the XML file of the service metadata</a>
<a href="#">Preview Data Set</a> ⚠️ ↻	Habitat Range	HB.Habitat.Range	EPSG:4258	<a href="#">Google Earth</a>	

Data set Metadata ▾

# INSPIRE Geoportal – Data access

- View Service:
  - service metadata

## MSDI Harmonised Datasets WMS X

<b>Resource Title</b>	<b>Conditions Applying To Access And Use</b>	
MSDI Harmonised Datasets WMS	NONE	
<b>Resource Abstract</b>	<b>Limitations On Public Access</b>	
MSDI Harmonised INSPIRE WMS View service	None	
<b>Resource Locator</b>	 <a href="https://msdi.data.gov.mt/deegree/services/wms?request=GetCapabilities&amp;service=WMS&amp;version=1.3.0">https://msdi.data.gov.mt/deegree/services /wms?request=GetCapabilities&amp;service=WMS&amp; version=1.3.0</a>	
<b>Responsible Party</b>	 <b>Organisation name</b> Malta Information Technology Agency <b>E-mail</b> inspire.mita@gov.mt	
<b>Metadata Point Of Contact</b>	 <b>Organisation name</b> MITA <b>E-mail</b> inspire.mita@gov.mt	
<b>Metadata Language</b>	<b>Metadata Date</b>	
eng	2016-09-01	
<b>fileIdentifier</b>	<b>Download metadata</b>	
37569840-7c18-49da-bac5-f730491591e4	<a href="#">application/vnd.iso.19139+xml</a>	

# INSPIRE Geoportal – Data access

- View Service:
  - data set preview

\* Article 17 Habitats Range

Choose metadata language:  
original MD language ▾

Download Options ▾

View Options ▾

Search..

Simple Viewer	Layer title	Layer name	CRS	Desktop Tool ⓘ	Service metadata
<a href="#">Preview Data Set</a> ⚡ ⓘ	Habitat Range	HB.HabitatRange	EPSG:4258	<a href="#">Google Earth</a>	<a href="#">🔗</a>
<a href="#">Preview Data Set</a> ⚡ ⓘ	Habitat Range	HB.Habitat.Range	EPSG:4258	<a href="#">Google Earth</a>	<a href="#">🔗</a>

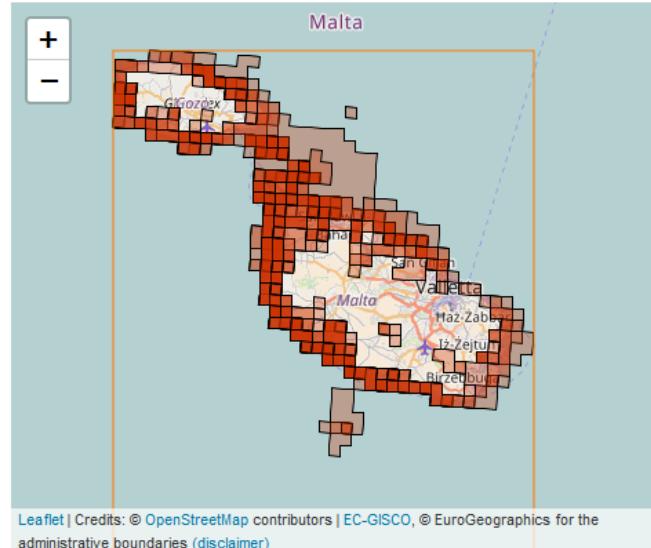
Data set Metadata ▾

# INSPIRE Geoportal – Data access

- View Service:
  - data set preview in a Leaflet Web map

Habitat Range (HB.HabitatRange)

you might need to zoom-in to see the information



Legend

Article 17 Habitats Range

# INSPIRE Geoportal – Data access

- Download Service:

Download Options ▾

Download link	Data Format	CRS	Service Metadata
<a href="#">Get Data Set</a> ⚠		undefined	<a href="#"></a>
<a href="#">Get Data Set</a> ⚠		<a href="http://www.opengis.net/def/crs/EPSG/0/3045">http://www.opengis.net/def/crs/EPSG/0/3045</a>	<a href="#"></a>
<a href="#">Get Data Set</a> ⚠		undefined	<a href="#"></a>

View Options ▾

Data set Metadata ▾

# INSPIRE Geoportal – Data access

- Download Service:
  - service metadata

## Harmonised WFS Article 17 Habitats Range X

### Resource Title

Harmonised WFS Article 17 Habitats Range

### Resource Abstract

Harmonised WFS download service for Article 17 of the Habitats Directive requires Member States to report every six years about the progress made with the implementation of the Habitats Directive. As the main focus of the directive is on maintaining and/or restoring a favourable conservation status for habitat types & species of community interest, monitoring & reporting under the directive is focusing on that. Monitoring of conservation status is not restricted to Natura 2000 sites and data need to be collected both in and outside the Natura 2000 network to achieve a full appreciation of conservation status. Some data on sensitive species is restricted from public access, as the disclosure of such might adversely affect the conservation of the species in question; this is in line with the provisions of Article 4 2(h) of Directive 2003/4/EC.

### Conditions Applying To Access And Use

No conditions apply

### Limitations On Public Access

no limitation

### Resource Locator

[https://msdi.data.gov.mt/deegree/services/hb\\_HabitatRange?request=GetCapabilities&service=WFS&AcceptVersions=2.0.0](https://msdi.data.gov.mt/deegree/services/hb_HabitatRange?request=GetCapabilities&service=WFS&AcceptVersions=2.0.0)

### Responsible Party

Organisation name Malta Information Technology  
Agency (MITA)  
E-mail euaffairs.mita@gov.mt

### Metadata Point Of Contact

Organisation name Malta Information Technology  
Agency  
E-mail euaffairs.mita@gov.mt

### Metadata Language

eng

### Metadata Date

2016-12-09T15:04:01

### fileIdentifier

8db4960e-  
1f84-4806-9b5b-  
961d1d95e0af

### Download metadata

<application/vnd.iso.19139+xml>

# INSPIRE Geoportal – Data access

- Download Service:
  - download of a GML extract of the data set

Download Options ▾

Download link	Data Format	CRS	Service Metadata
<a href="#">Get Data Set</a> 		undefined	
<a href="#">Get Data Set</a> 		<a href="http://www.opengis.net/def/crs/EPSG/0/3045">http://www.opengis.net/def/crs/EPSG/0/3045</a>	
<a href="#">Get Data Set</a> 		undefined	

View Options ▾

Data set Metadata ▾

# INSPIRE Geoportal – Data access

- Download Service:
  - download of a GML extract of the data set

Download Options ▾

Search..

Download link	Data Format	CRS	Service Metadata
<a href="#">Get Data Set</a> ⚠		undefined	<a href="#">View</a>
<a href="#">Get Data Set</a> ⚠		<a href="http://www.opengis.net/def/crs/EPSG/0/3045">http://www.opengis.net/def/crs/EPSG/0/3045</a>	<a href="#">View</a>
<a href="#">Get Data Set</a> ⚠			<a href="#">View</a>

View Options ▾

Data set Metadata ▾

Warning

The link will only return a small subset of the Spatial Objects present in the Data Set.

Please use a proper client software (e.g. QGIS) to access the whole Data Set.

Cancel [Download](#)

# QGIS service/data access – View Service

- From the QGIS menu select Layer → Add Layer → Add WMS/WMTS Layer
- Create a new WMS connection using as URL the service endpoint available in the View Service metadata on the INSPIRE Geoportal
- From the list of Layers, select the one corresponding to the data set of interest (use the copy layer URL to the clipboard button in the INSPIRE Geoportal)

The image shows two windows from the QGIS application:

**Create a New WMS/WMTS Connection (Left Window):**

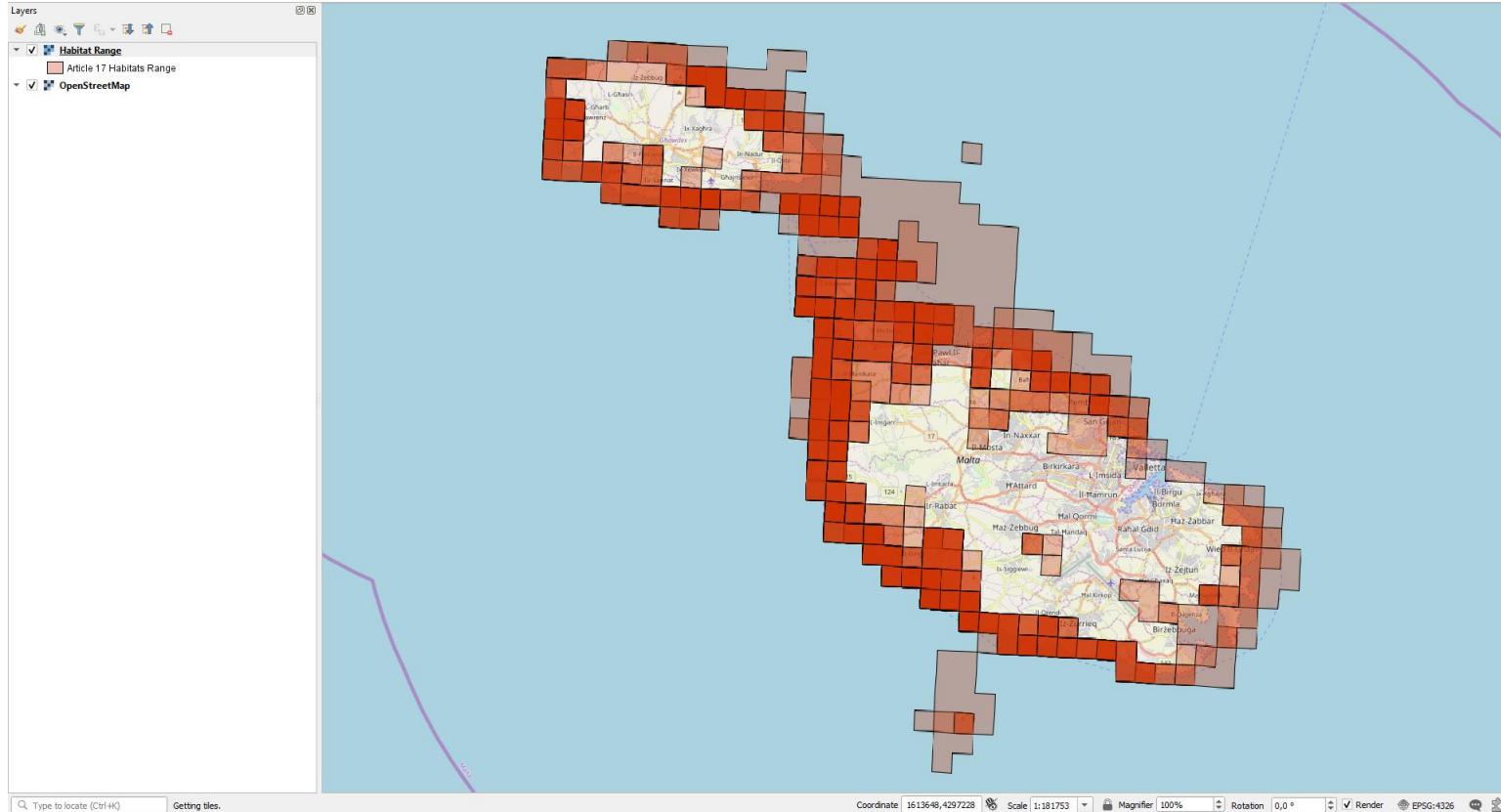
- Connection Details:** Name: Malta, URL: <https://msdi.data.gov.mt/deegree/services/wms?request=GetCapabilities>.
- Authentication:** Basic authentication selected.
- WMS/WMTS Options:** Referer: [empty], DPI-Mode: all, checkboxes for Ignore GetMap/GetTile URI reported in capabilities, Ignore GetFeatureInfo URI reported in capabilities, Ignore axis orientation (WMS 1.3/WMTS), Invert axis orientation, Smooth pixmap transform.

**Data Source Manager | WMS/WMTS (Right Window):**

- Layers Tab:** Shows a list of layers under the 'Malta' connection. One layer is selected: '13 HB.HabitatRange' with Title 'Habitat Range' and Abstract 'Article 17 of the...'.
- Image Encoding:** PNG selected.
- Coordinate Reference System:** 3 available, ETRS89 selected.
- Layer Selection:** Layer name: Habitat Range, 1 Layer(s) selected.

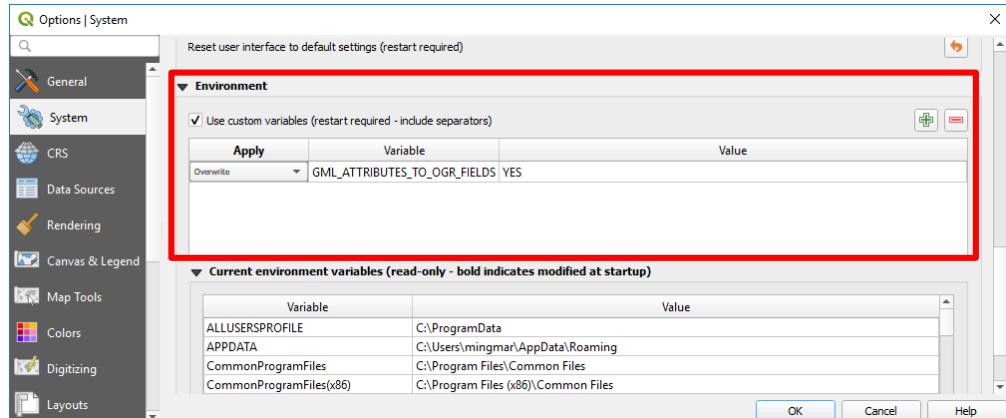
# **QGIS service/data access – View Service**

- Visualize the data set in the QGIS map window (e.g. on top of a basemap)



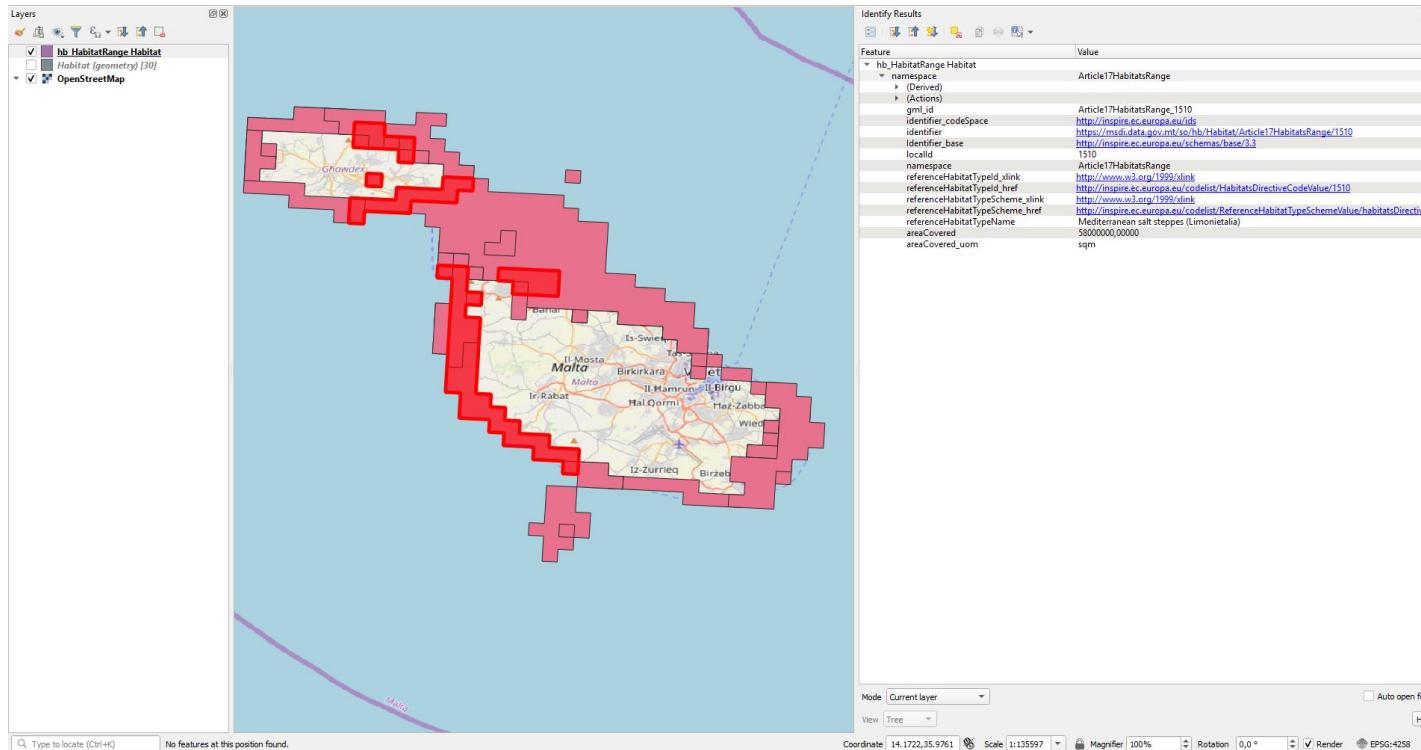
# QGIS service/data access – Download Service

- By default, the GML driver of QGIS cannot read XML attributes:
- This can be enabled by setting the configuration option `GML_ATTRIBUTES_TO_OGR_FIELDS` to `YES` as an environmental variable
- From the QGIS menu `Settings → Options`, select `System`:
  - under `Environment`, check `Use custom variables` and add the option with `GML_ATTRIBUTES_TO_OGR_FIELDS` and set it to `YES`
  - restart QGIS



# QGIS service/data access – Download Service

- Visualize the GML extract in the QGIS map window (e.g. on top of a basemap)
- GML attributes (including links to the Registry) are correctly read.



# QGIS service/data access – Download Service

- To connect to WFS 2 services from QGIS, you need the [GML Application Schema toolbox](#) plugin, that you can download from the [Plugins QGIS](#) menu.

## Geography Markup Language (gml)

This section describes the tests being performed to assess usability of INSPIRE data in GML encoding.

### gml\_file\_load

QGIS	ArcGIS Online	ArcGIS Pro	ArcMap Desktop	hale studio	FME Desktop	OpenLayers	Leaflet	GRASS GIS
3.4.4-Madeira	December 2018 release	2.3	10.7	3.4.1	2018.1	5.3.0	1.4.0	7.7.svn

### gml\_file\_display

QGIS	ArcGIS Online	ArcGIS Pro	ArcMap Desktop	hale studio	FME Desktop	OpenLayers	Leaflet	GRASS GIS
3.4.4-Madeira	December 2018 release	2.3	10.7	3.4.1	2018.1	5.3.0	1.4.0	7.7.svn

### gml\_WFS2\_load

QGIS	ArcGIS Online	ArcGIS Pro	ArcMap Desktop	hale studio	FME Desktop	OpenLayers	Leaflet	GRASS GIS
3.4.4-Madeira	December 2018 release	2.3	10.7	3.4.1	2018.1	5.3.0	1.4.0	7.7.svn

Result: Supported

Date of test: 2019-07-15

Used data: <https://wfspoc.brgm-rec.fr:443/geoserver/wfs?service=WFS&version=2.0.0&request=GetFeature&typename=ef%3AEnvironmentalMonitoringFacility&count=100>

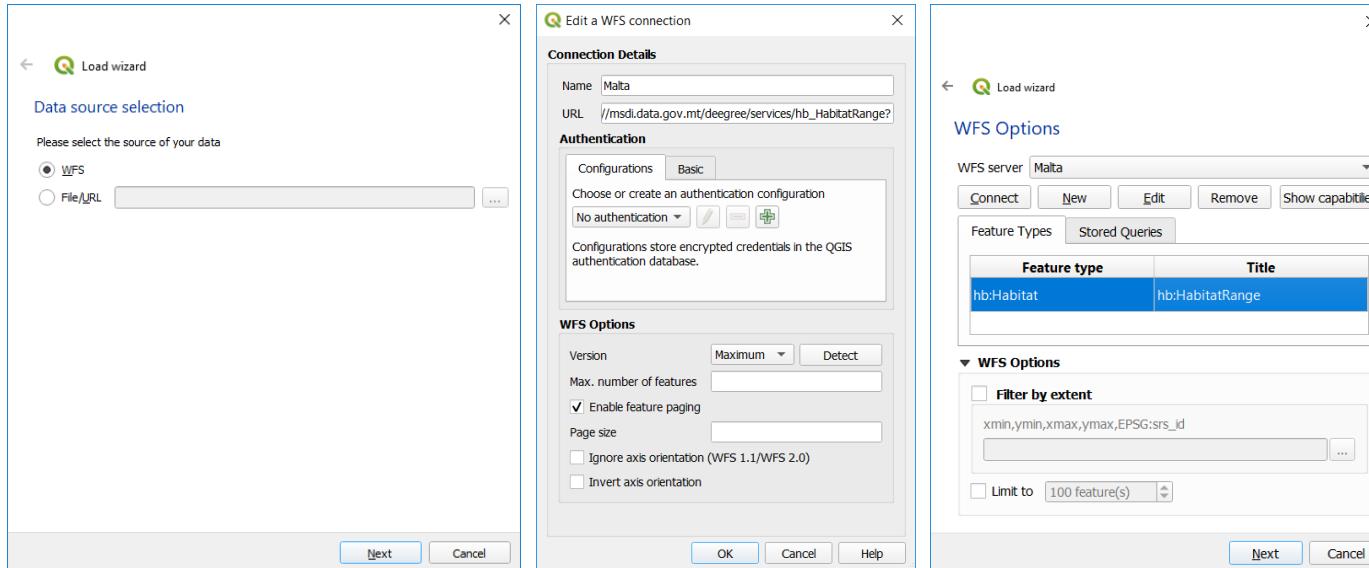
Notes: need the 'GML Application Schema toolbox' plugin. When the 'Filter by extent' option is selected, no data is loaded and the following error is returned <'Crs' object has no attribute 'split' >

### gml\_WFS2\_display

QGIS	ArcGIS Online	ArcGIS Pro	ArcMap Desktop	hale studio	FME Desktop	OpenLayers	Leaflet	GRASS GIS
3.4.4-Madeira	December 2018 release	2.3	10.7	3.4.1	2018.1	5.3.0	1.4.0	7.7.svn

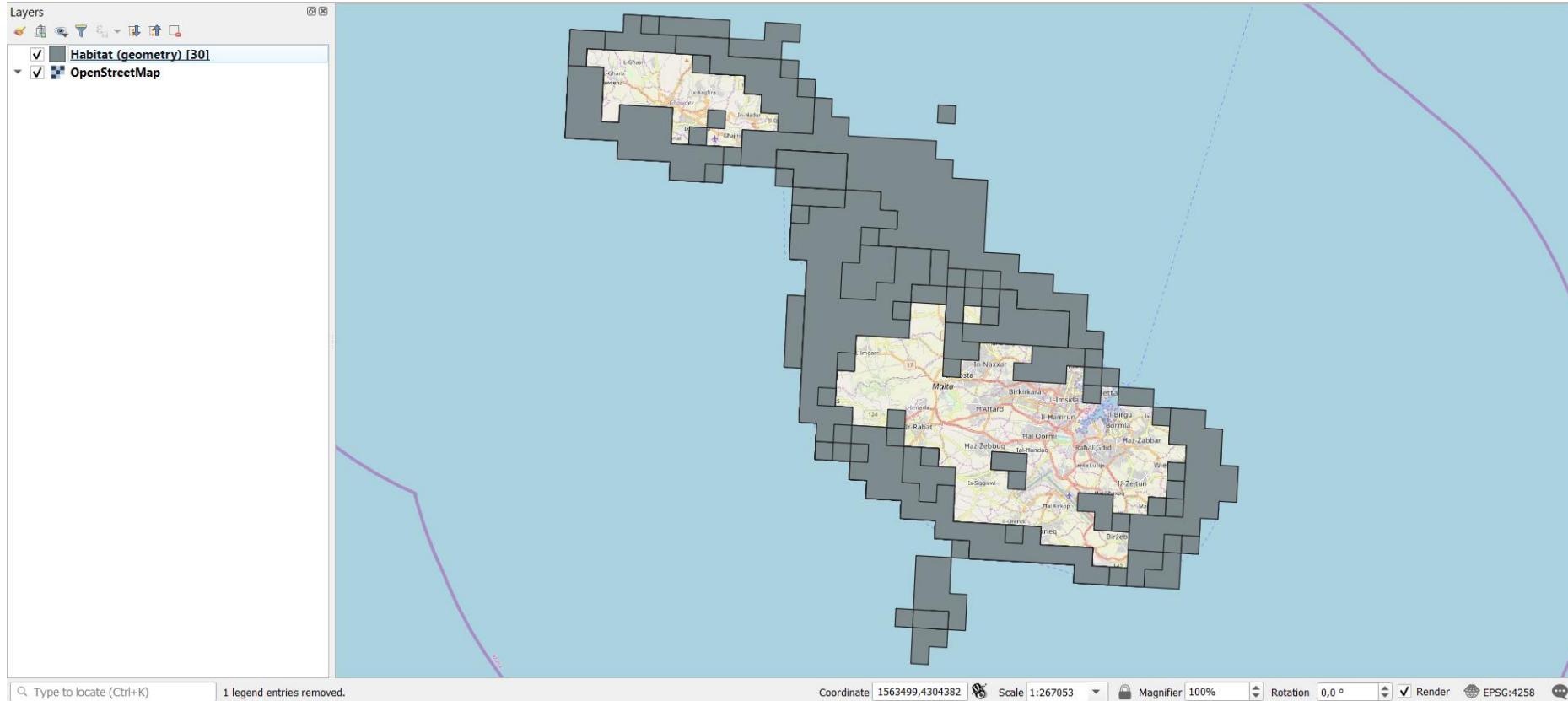
# QGIS service/data access – Download Service

- To connect to WFS 2 services from QGIS, you need the [GML Application Schema toolbox](#) plugin, that you can download from the [Plugins](#) QGIS menu.
- From the menu [Plugins](#) → [GML Application Schema toolbox](#) → [Load \(wizard\)](#), select [WFS](#) and enter the WFS service endpoint as from the INSPIRE Geoportal.
- Select the [hb:HabitatRange](#) data set and add it to the map.



# QGIS service/data access – Download Service

- Visualize the data set in the QGIS map window (e.g. on top of a basemap)



# Validation of INSPIRE resources – Metadata

- Access the INSPIRE Validator at <http://inspire.ec.europa.eu/validator>
- Select the 3 Conformance Classes for metadata TG 2.0 for data set.
- Press **Start**.

The screenshot shows the user interface of the INSPIRE Validator. At the top, there is a navigation bar with links for 'Start test', 'Status', 'Test reports', 'Help', and 'About'. Below the navigation bar, there are two sections: 'Metadata (TG version 1.3)' and 'Metadata (TG version 2.0) - BETA'. The 'Metadata (TG version 2.0) - BETA' section is highlighted with a red border. It contains a list of conformance classes, each with a 'use' checkbox. The checkboxes for 'Conformance Class 1', 'Conformance Class 2', and 'Conformance Class 3' are checked, while the others are unchecked. A large blue 'Start' button is located in the top right corner of the main content area.

Conformance Class	use
Common Requirements for ISO/TC 19139:2007 based INSPIRE metadata records.	(unchecked)
Conformance Class 1: INSPIRE data sets and data set series baseline metadata.	(checked)
Conformance Class 2: INSPIRE data sets and data set series interoperability metadata.	(checked)
Conformance Class 3: INSPIRE Spatial Data Service baseline metadata.	(unchecked)
Conformance Class 4: INSPIRE Network Services metadata.	(unchecked)
Conformance Class 5: INSPIRE Invocable Spatial Data Services metadata.	(unchecked)
Conformance Class 6: INSPIRE Interoperable Spatial Data Services metadata.	(unchecked)
Conformance Class 7: INSPIRE Harmonised Spatial Data Services metadata.	(unchecked)

# Validation of INSPIRE resources – Metadata

- In the following dialogue, upload the metadata file to test and press Start.

Configure Test Run

Label: Test run on 16:17 - 08.11.2019 with test suite Common Requirements for ISO/TC 1

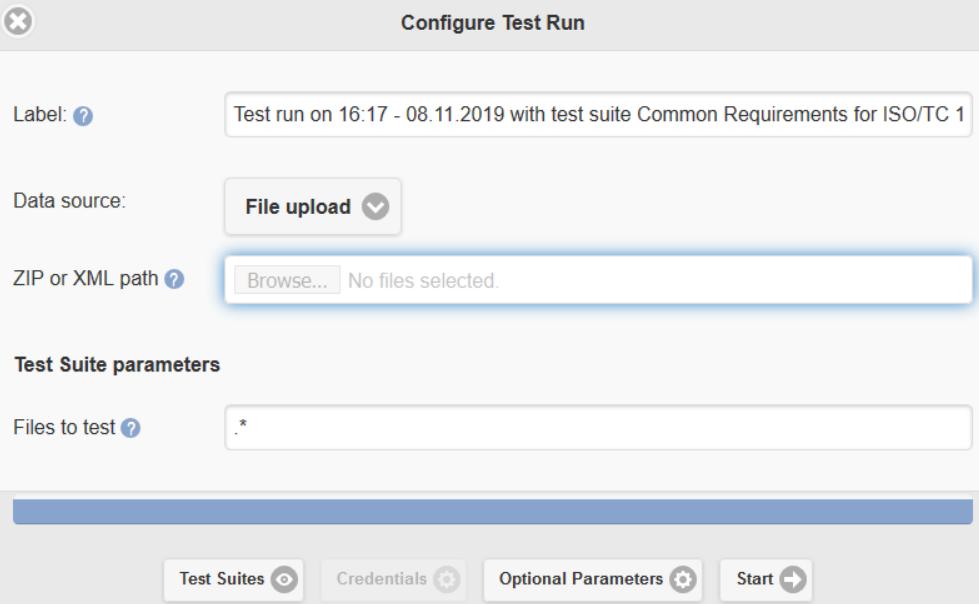
Data source: File upload

ZIP or XML path Browse... No files selected.

Test Suite parameters

Files to test \*

Test Suites Credentials Optional Parameters Start



# Validation of INSPIRE resources – Metadata

- The test (i.e. the corresponding ETS) is run on the metadata resource provided.
- The [test report](#) provides a summary of the validation.
- Validation errors appear in red and can be expanded to get more information.
- After fixing each error, the validation can be run again until all the tests are passed.

The screenshot shows a validation report interface with two main sections: "General requirements" and "Identification".

**General requirements:**

- Status: Failed
- Duration: 42 s
- Test md common req C.1: XML Schema (Failed)
- Test md common req C.2: Root Element (Passed)
- Test md common req C.5: Language Code (Passed)
- Test md common req C.6: Metadata Point of Contact (Passed)
- Test md common req C.7: Metadata Date (Passed)

**Identification:**

- Status: Failed
- Duration: 0.002 s
- Test md common req C.8: Resource Title (Passed)
- Test md common req C.9: Resource Abstract (Failed)

**Messages:**

The metadata record set has 1 record(s) with errors for this assertion.  
XML document 'metadata\_2\_0\_dataset.xml', record '123e4567-e89b-12d0-a456-426655440000': Every metadata record must have an abstract, but this record does not have an 'abstract' property.

# Thank you!

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@MarcoMinghini



# Stay in touch



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