INSPIRE ecosystem: geospatial interoperability with open standards and open source software

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The European Commission's science and knowledge service

Joint Research Centre

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FOSS4G-IT 2019

PADOVA 20-24 FEBBRAIO 2019

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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:

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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.

https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32007L0002

INSPIRE Directive – Spatial focus

- INSPIRE addresses 34 spatial data themes for environmental applications:

ANNEX: 1

- Addresses
- Administrative units
- Cadastral parcels
- Coordinate reference systems
- Geographical grid systems
- Geographical names
- Hydrography
- Protected sites
- Transport networks

ANNEX: 2

- Elevation
- Geology
- Land cover
- Orthoimagery

ANNEX: 3

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

 https://inspire.ec.europa.eu/Themes/Data-Specifications/2892

INSPIRE Directive – Requirements

- Implementing Rules (legally binding):
  - Metadata
  - Data Specifications
  - Network Services (Discovery, View & Download)
  - Data and Service Sharing
  - Spatial Data Services
  - Monitoring and Reporting
- Technical Guidelines (non legally binding):
  - specify how legal obligations can be implemented to maximize interoperability
  - make reference to existing geospatial open standards (ISO, OGC)

https://inspire.ec.europa.eu/inspire-implementing-rules/51763

https://inspire.ec.europa.eu/inspire-technical-guidance/57753

INSPIRE Directive – Governance

- INSPIRE Coordination Team (CT):
  - Directorate General Environment (DG ENV), Joint Research Centre (JRC) & European Environmental 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

https://inspire.ec.europa.eu/whos-who-inspire/57734

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INSPIRE Directive – Where are we in 2019?

draft

implement

use

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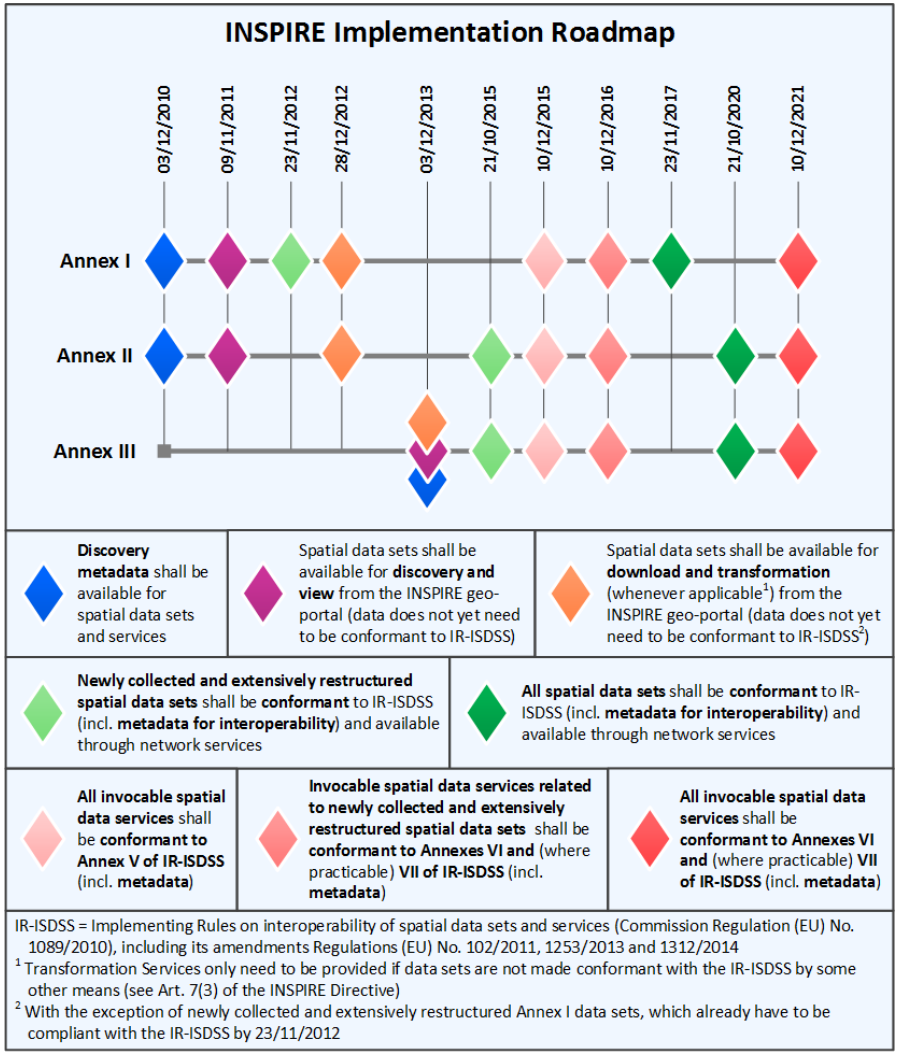
INSPIRE Directive – Roadmap

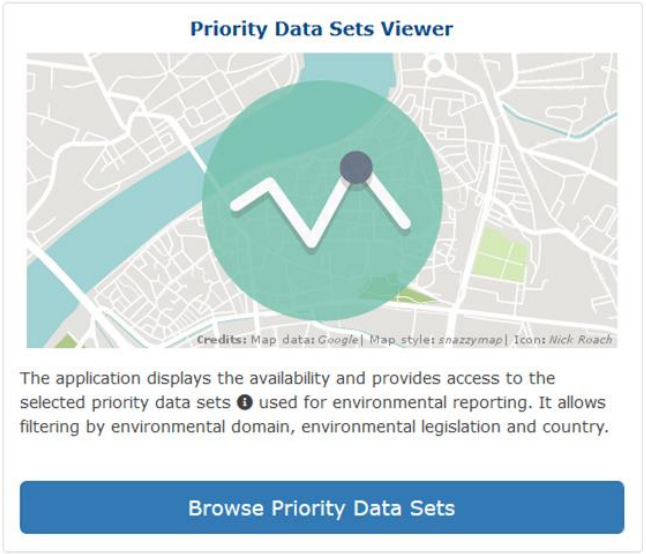
- Implementation in subsequent stages:
  - depending on the Annex
  - depending on the resource type
    - metadata
    - services (Discovery / View / Download)
    - data sets (as-is / compliant)

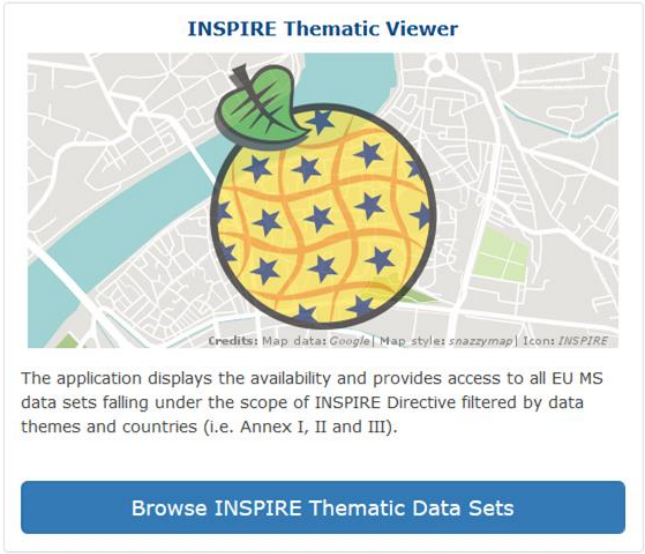


 https://inspire.ec.europa.eu/inspire-roadmap

INSPIRE Geoportal

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





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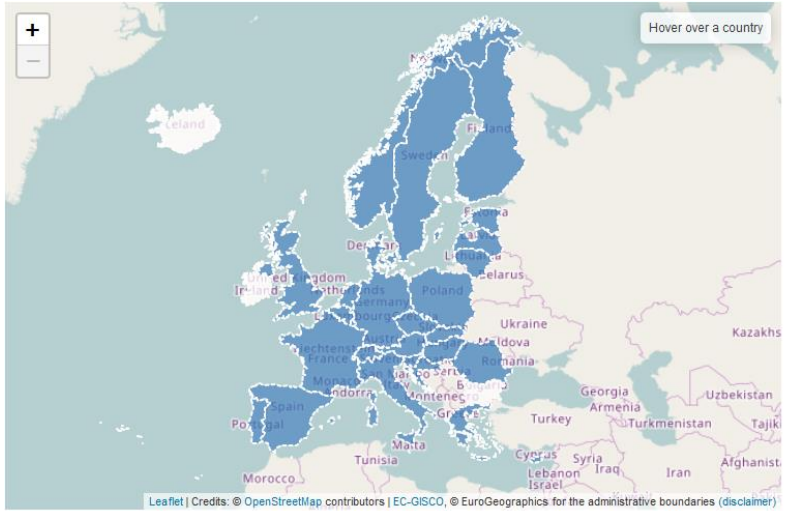
INSPIRE Geoportal – Implementation overview



Show: Downloadable | Viewable

INSPIRE Geoportal Data Set Statistics

156699 Metadata records

26623 Viewable Data Sets

Select a COUNTRY

Austria 547 | 400 | 414	Finland 602 | 51 | 52	Latvia 140 | 3 | 4	Portugal 738 | 131 | 236
Belgium 543 | 170 | 405	France 39055 | 1099 | 13173	Liechtenstein 57 | 9 | 11	Romania 119 | 20 | 14
Bulgaria 29 | 0 | 0	Germany 32101 | 9248 | 10643	Lithuania 48 | 1 | 5	Slovakia 7180 | 4 | 12
Croatia 121 | 3 | 4	Greece 41 | 34 | 34	Luxembourg 224 | 211 | 169	Slovenia 95 | 8 | 8
Cyprus 42 | 28 | 6	Hungary 110 | 0 | 1	Malta 158 | 128 | 151	Spain 219 | 141 | 143
Czech Republic 147 | 14 | 93	Iceland 142 | 7 | 0	Netherlands 210 | 113 | 131	Sweden 285 | 28 | 136
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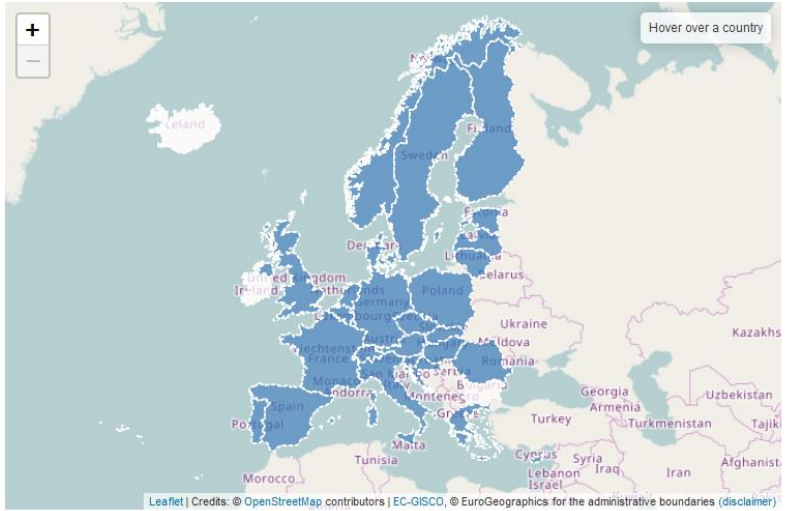

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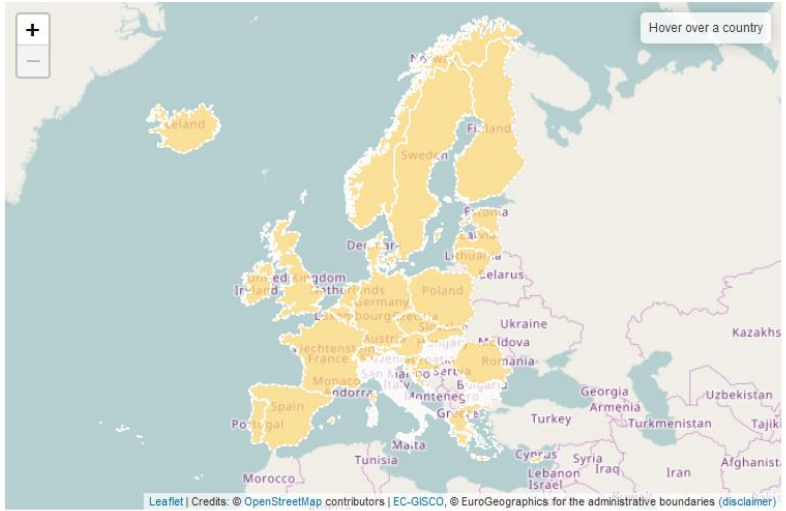

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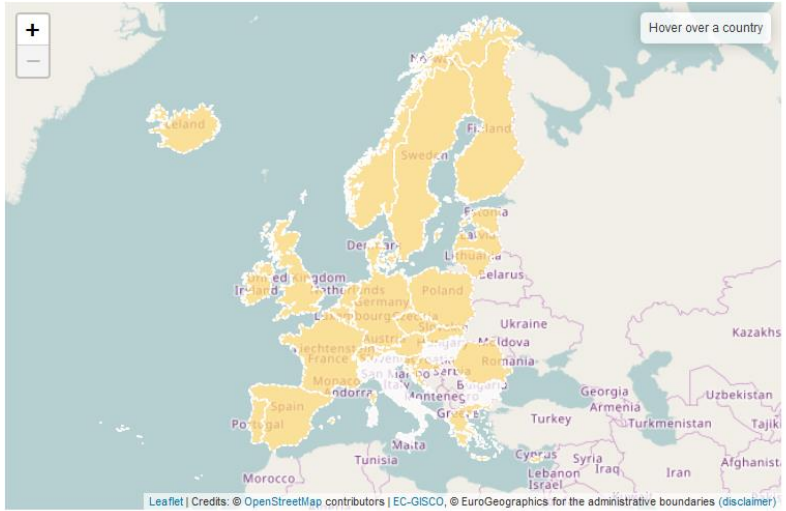

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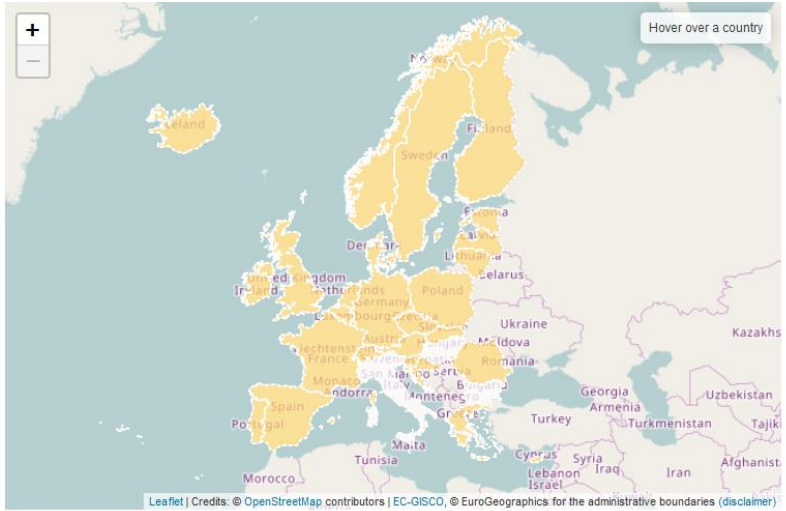

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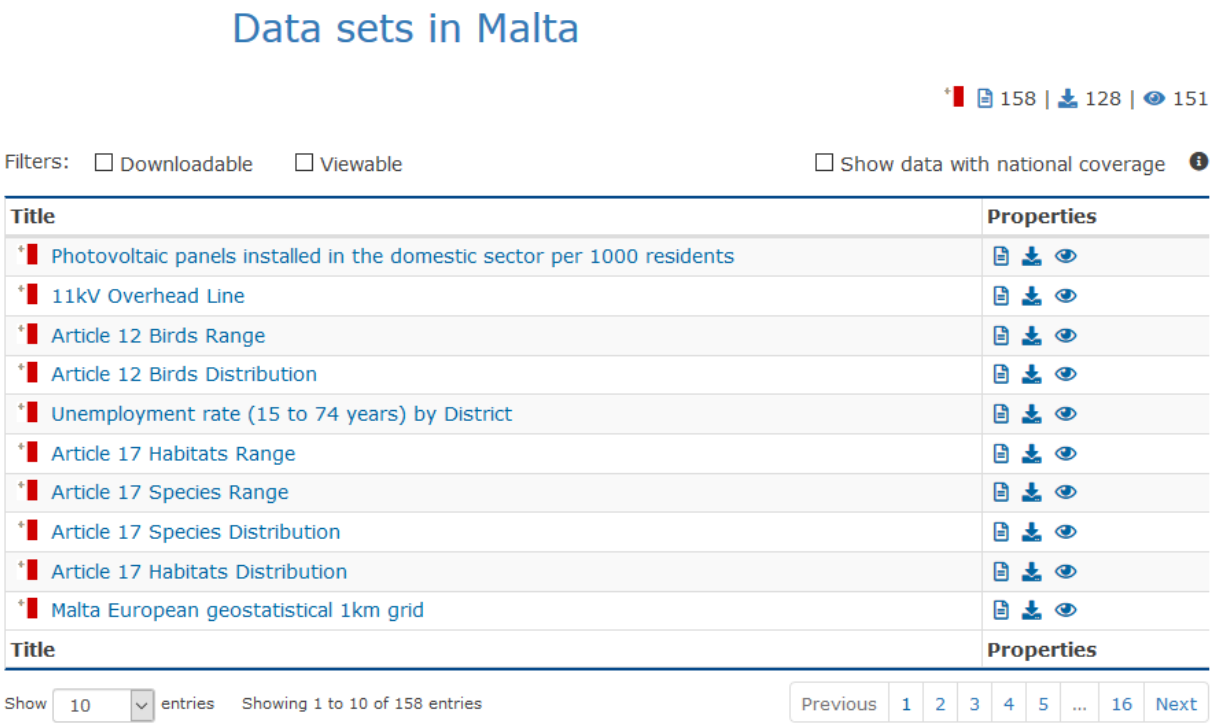
INSPIRE Geoportal – Data access

- Data set and service availability:



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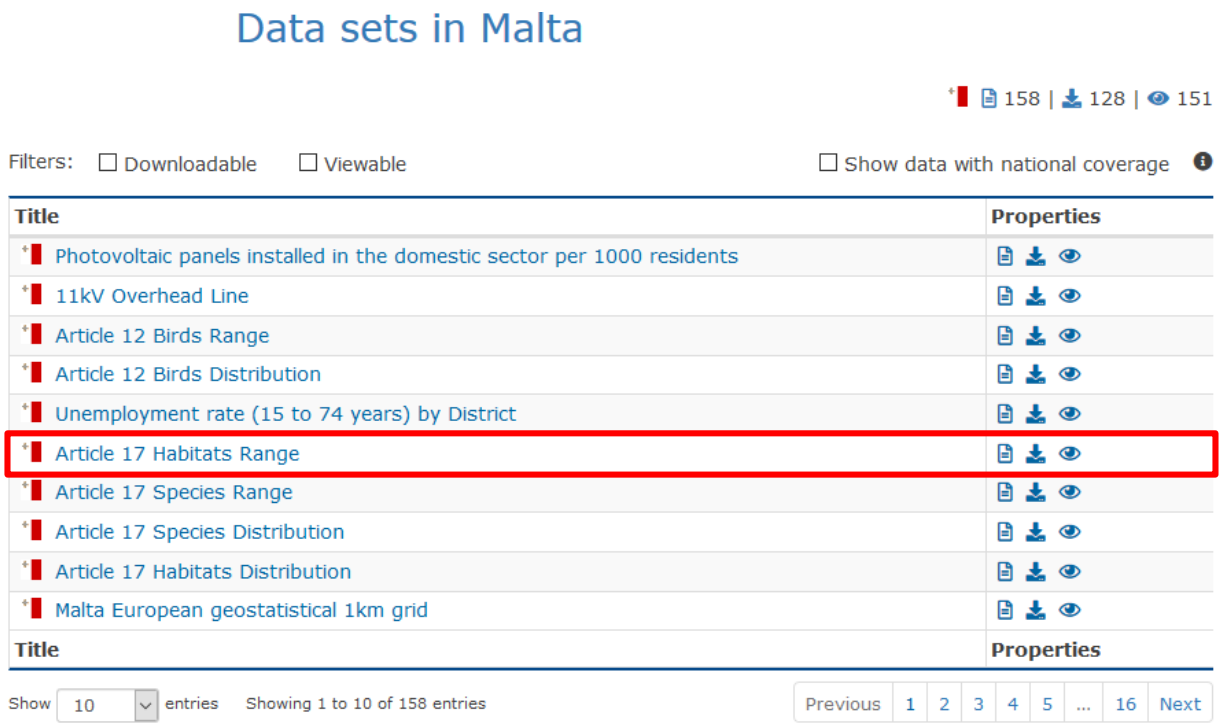

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INSPIRE Geoportal – Data access

- Metadata access:

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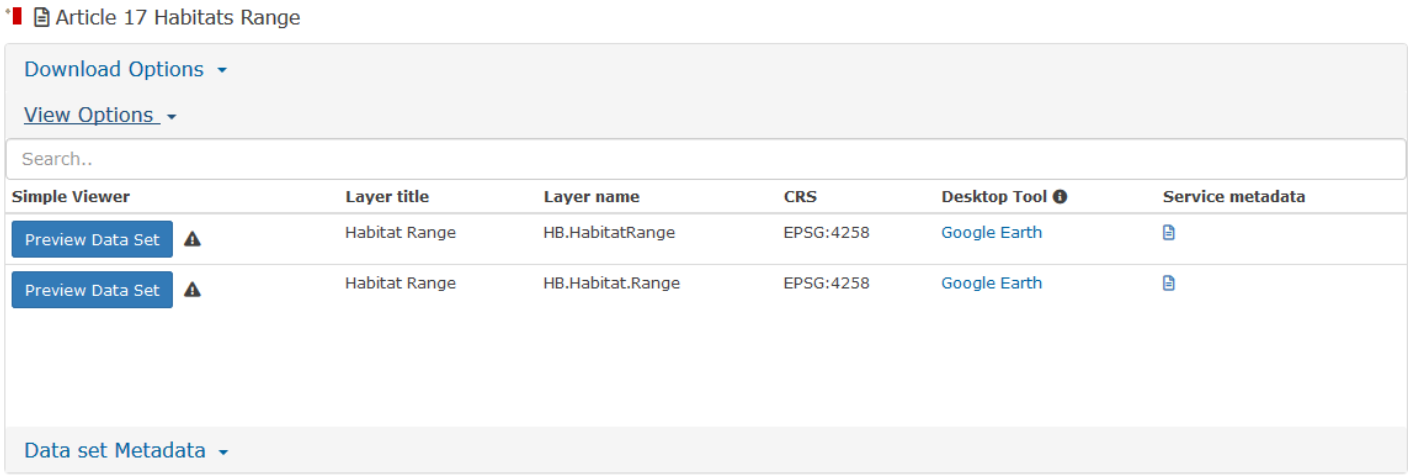
INSPIRE Geoportal – Data access

- View Service:



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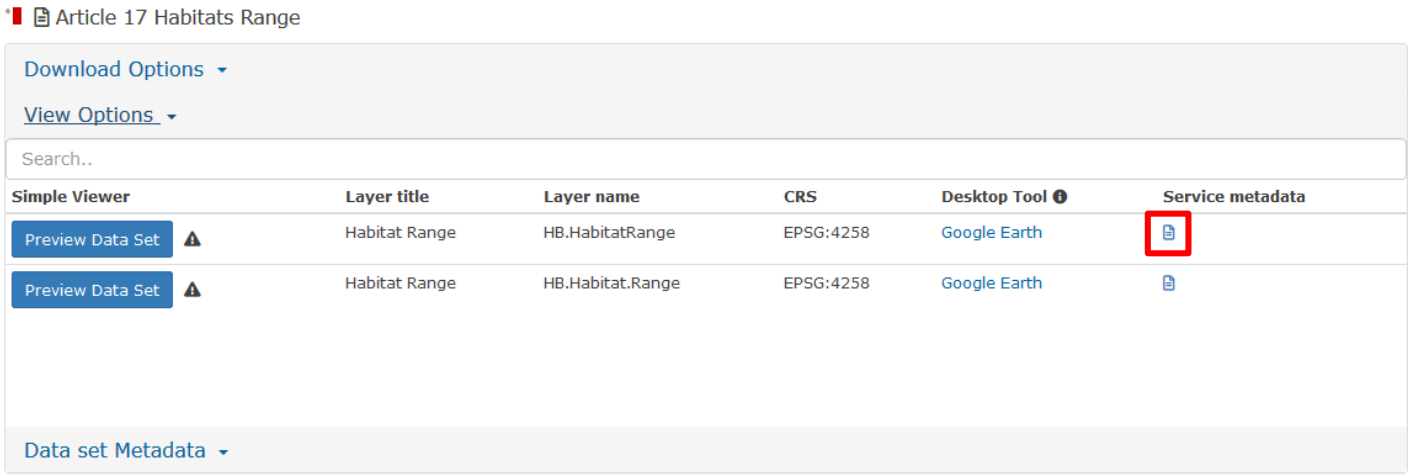

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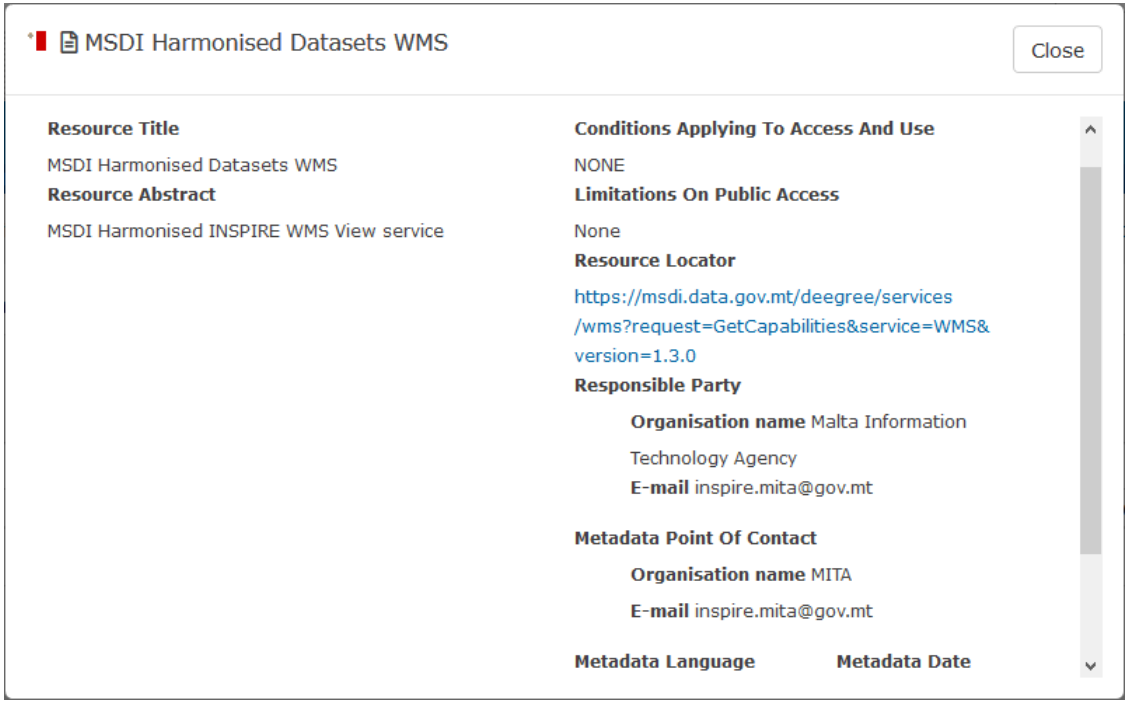
INSPIRE Geoportal – Data access

- View Service:
  - service metadata



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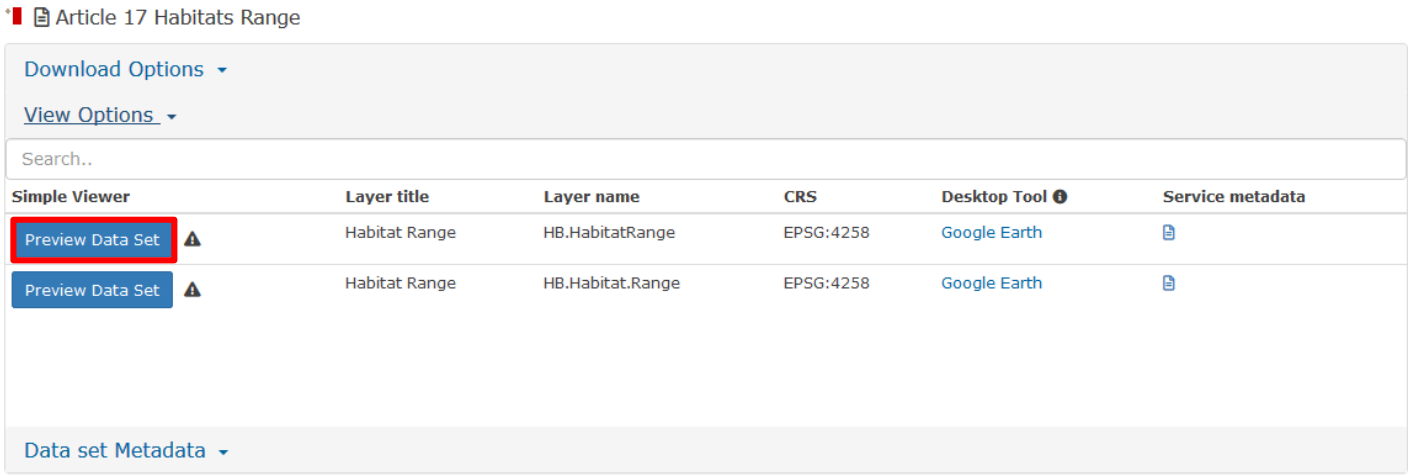
INSPIRE Geoportal – Data access

- View Service:
  - data set preview



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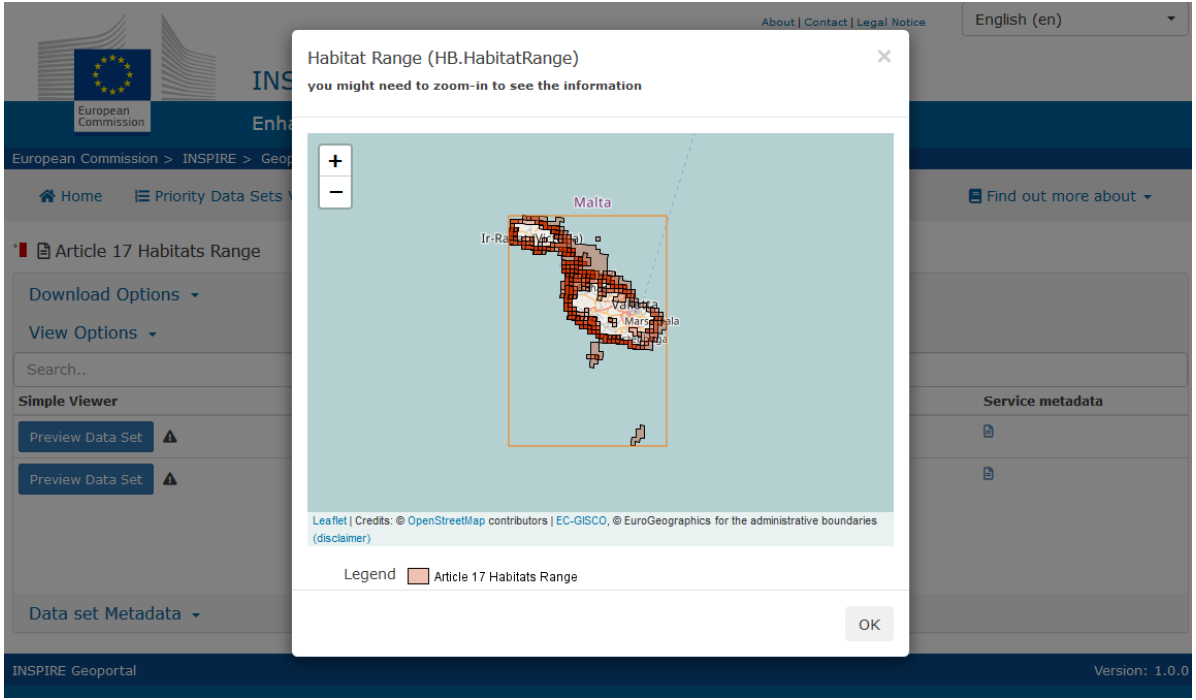
INSPIRE Geoportal – Data access

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



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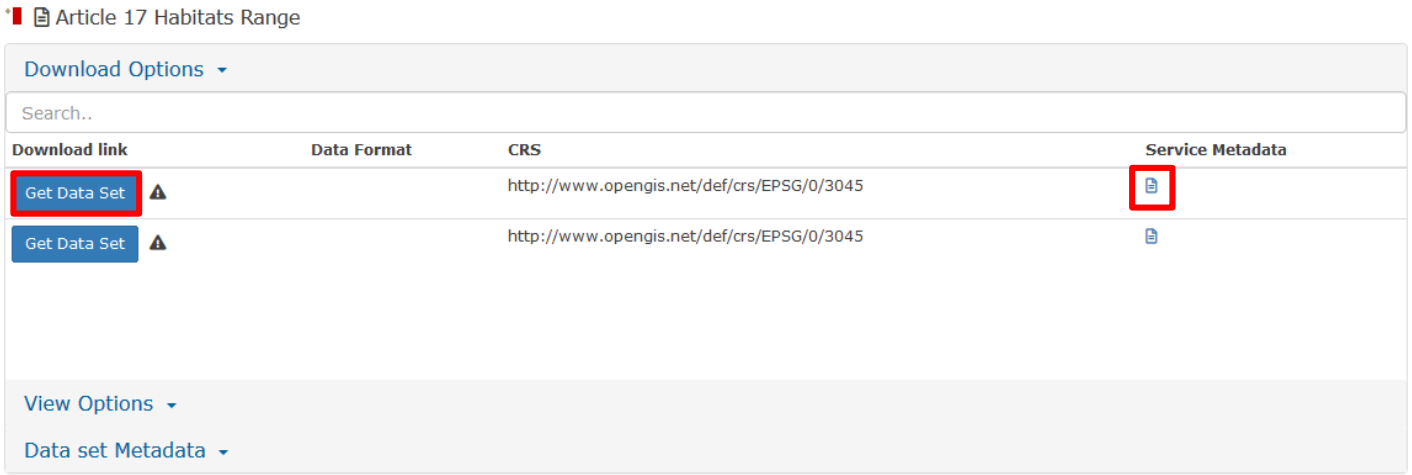
INSPIRE Geoportal – Data access

- Download Service:



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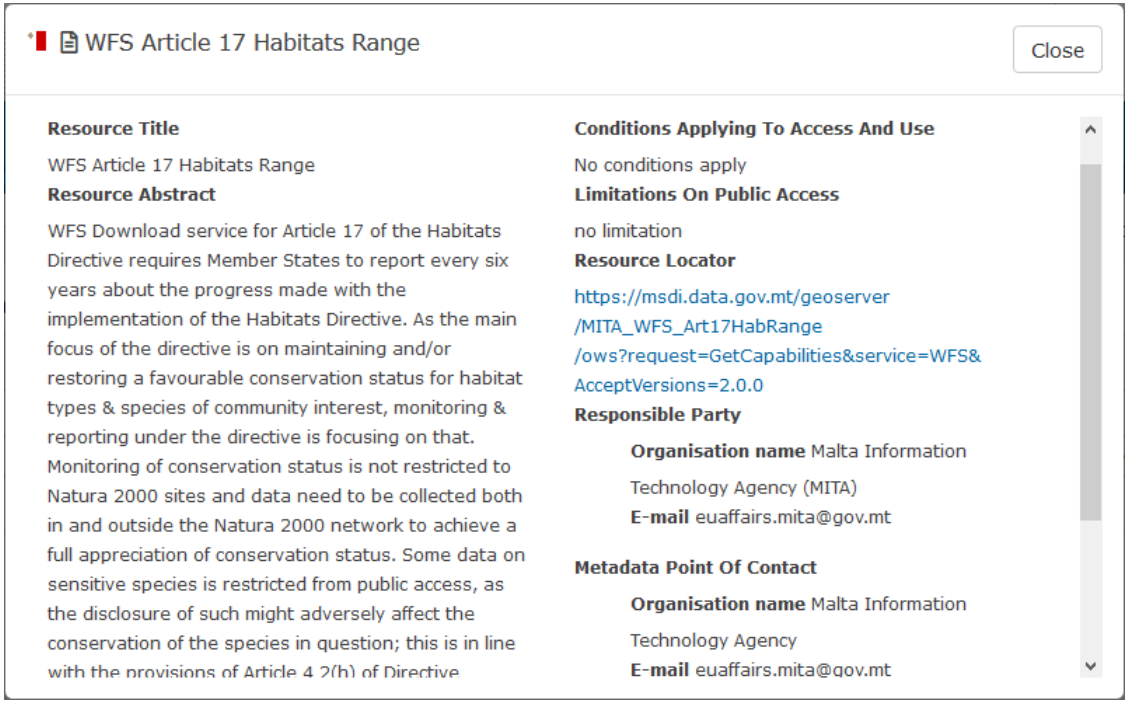

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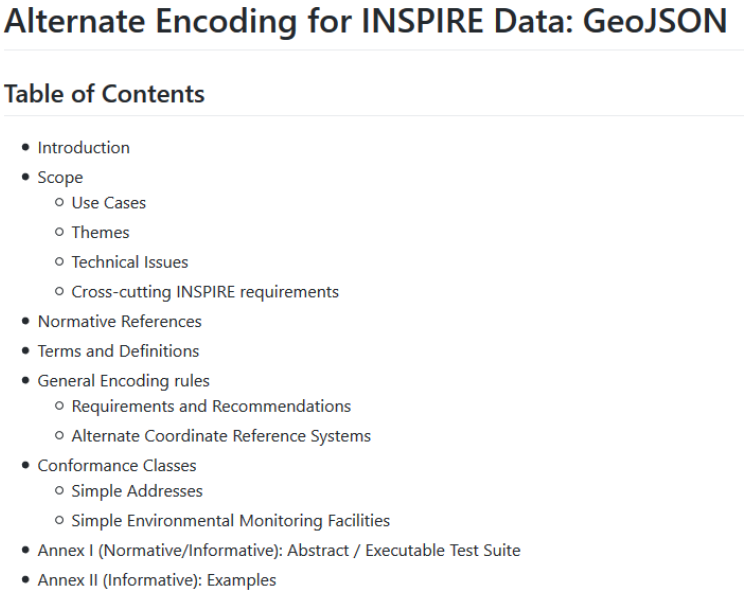
INSPIRE – Data usability

- Increasing attention from data availability (providers) to data usability (users):
  - MIWP 2017.2 *Alternative encodings for INSPIRE data*
  - MIWP 2017.3 *Better client software/ tool support for INSPIRE data*



Alternate Encoding for INSPIRE Data: GeoJSON

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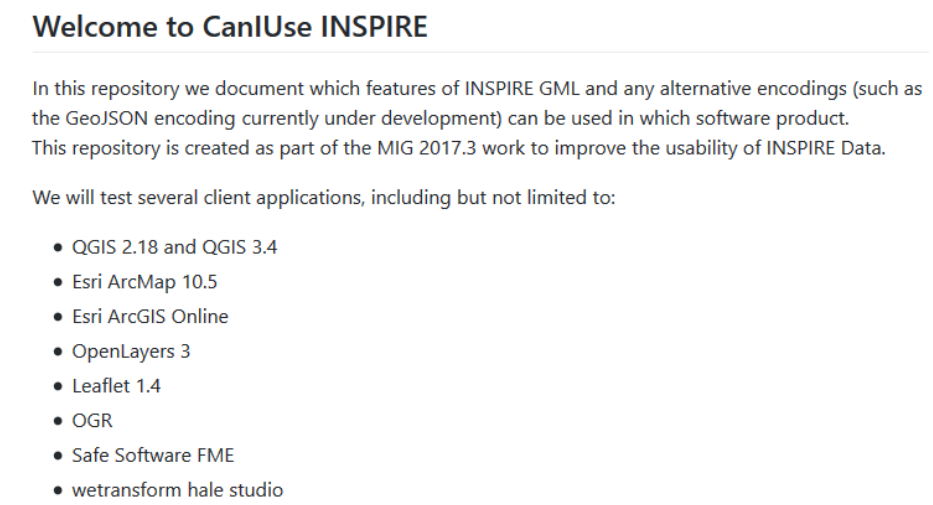
  - Alternate Coordinate Reference Systems
- Conformance Classes
  - Simple Addresses
  - Simple Environmental Monitoring Facilities
- Annex I (Normative/Informative): Abstract / Executable Test Suite
- Annex II (Informative): Examples



Welcome to CanIUse INSPIRE

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.
This repository is created as part of the MIG 2017.3 work to improve the usability of INSPIRE Data.

We will test several client applications, including but not limited to:

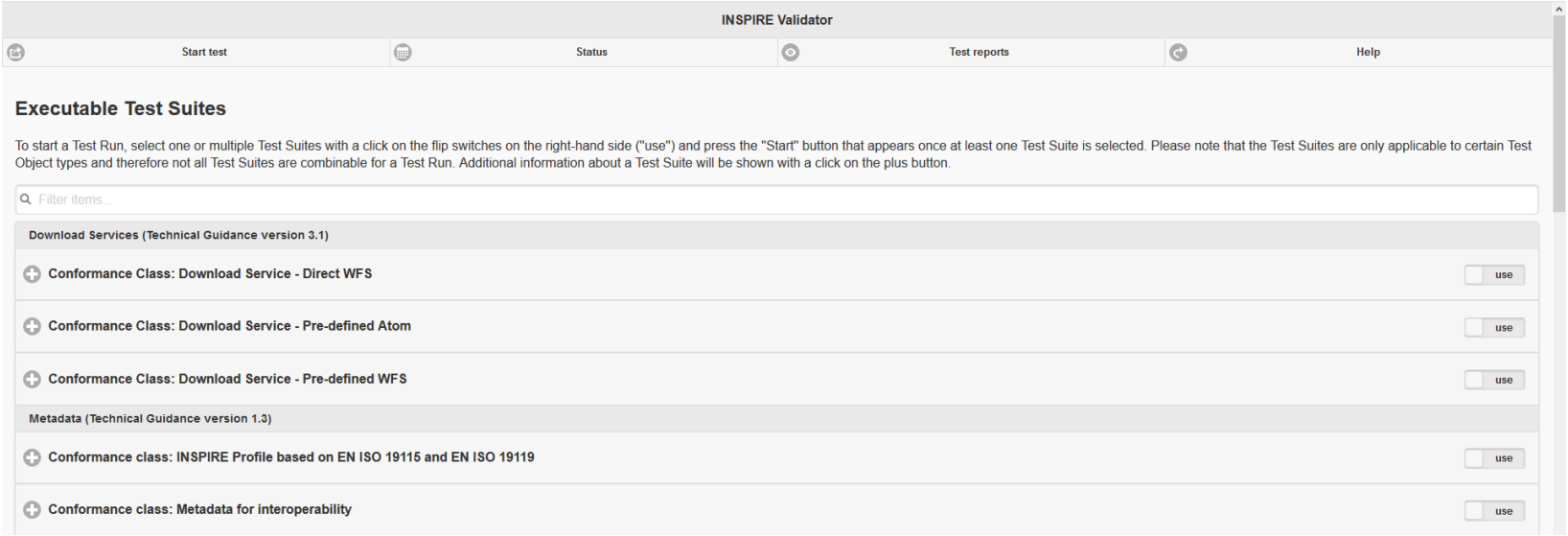
- QGIS 2.18 and QGIS 3.4
- Esri ArcMap 10.5
- Esri ArcGIS Online
- OpenLayers 3
- Leaflet 1.4
- OGR
- Safe Software FME
- wetransform hale studio

https://github.com/INSPIRE-MIF/2017.2

https://github.com/INSPIRE-MIF/caniuse

INSPIRE – Other JRC open source tools

- INSPIRE Reference Validator:
  - web application to validate metadata, data sets & services
  - open source under the European Union Public License (EUPL)



http://inspire-sandbox.jrc.ec.europa.eu/etf-webapp

https://github.com/etf-validator

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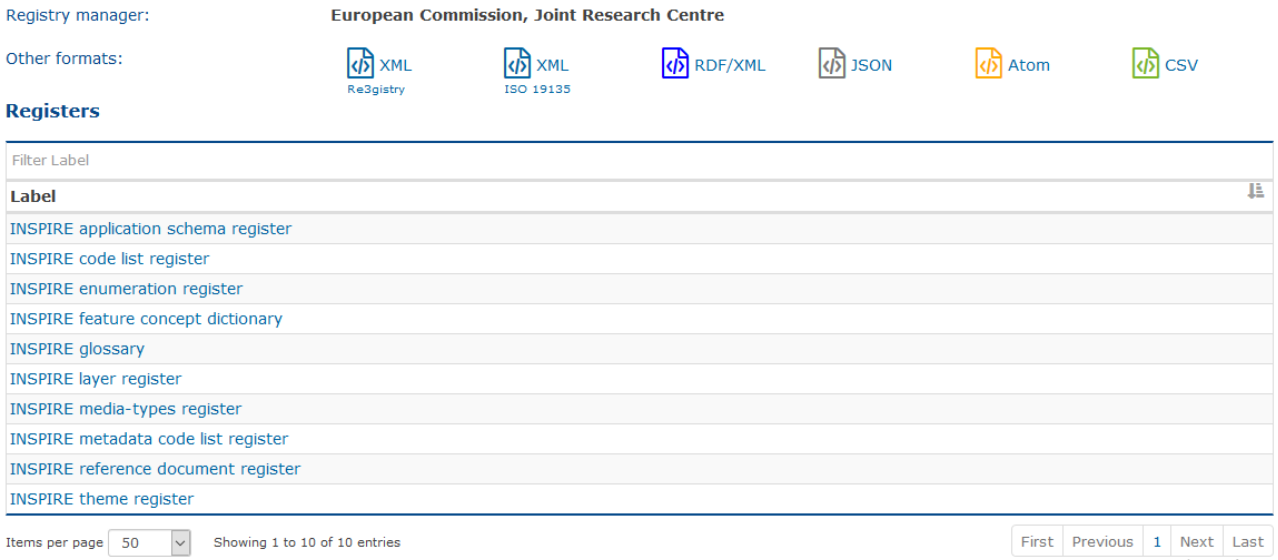
INSPIRE – Other JRC open source tools

- INSPIRE Registry:
  - tool to manage and share reference codes (i.e. unique identifiers)
  - open source under the European Union Public License (EUPL)



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

https://joinup.ec.europa.eu/solution/re3gistry

INSPIRE – Open source tools for implementers

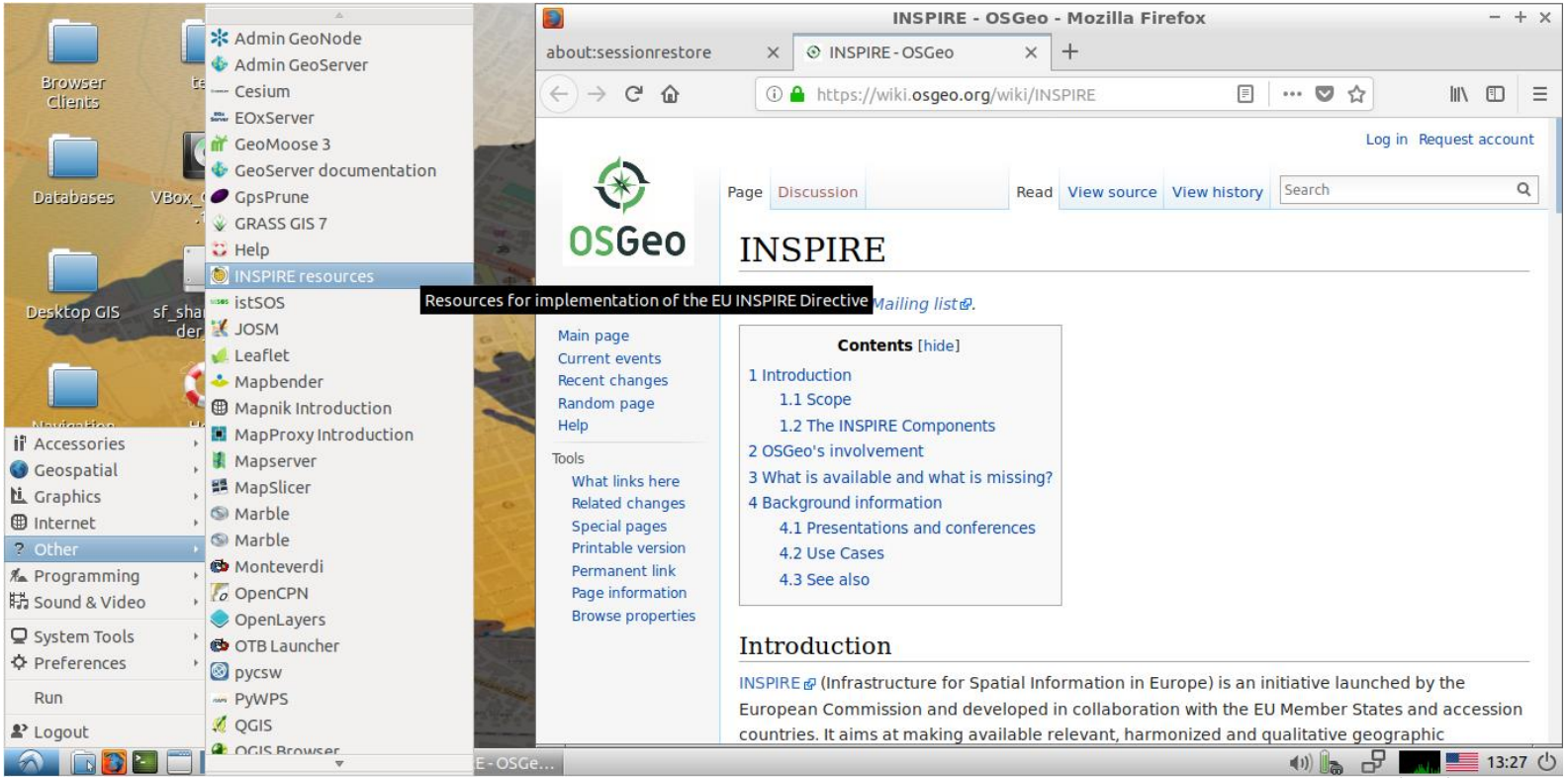
- A very rich INSPIRE-compliant ecosystem:
  - data serving (WMS/WMTS, WFS, WCS, SOS)

  - data/metadata catalogs (CSW)

  - data consumption

  - ETL (Extract-Transform-Load) tools

INSPIRE on the OSGeoLive



The future of INSPIRE

- Do we still need an SDI?

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The future of INSPIRE

- Do we still need an SDI? YES!
  - the exponential growth and heterogeneity of data raises the importance of an integrated (a.k.a. SDI) approach towards data management

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The future of INSPIRE

- Do we still need an SDI? YES!
- How will it look like in the future?

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The future of INSPIRE

- Do we still need an SDI? YES!
- How will it look like in the future?
  - we don’t know, but for sure they will follow some trends

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The future of INSPIRE

- Do we still need an SDI? YES!
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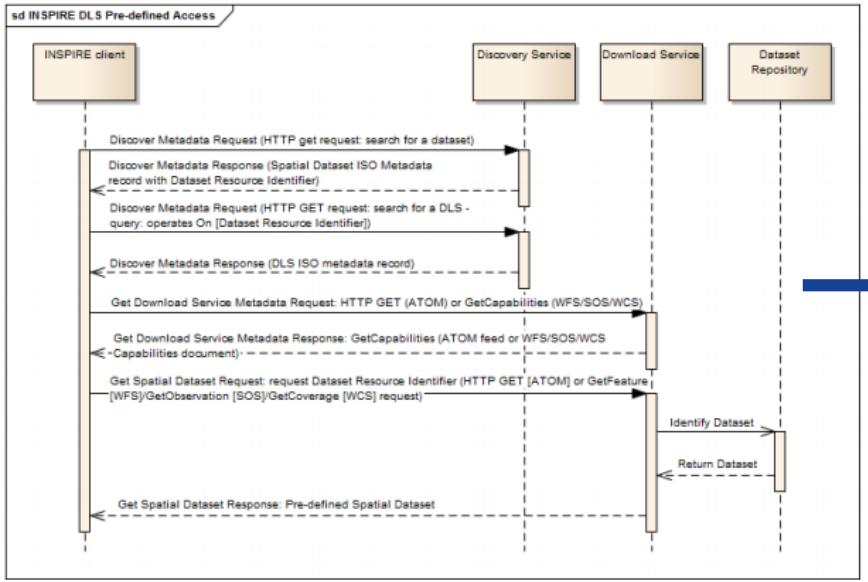
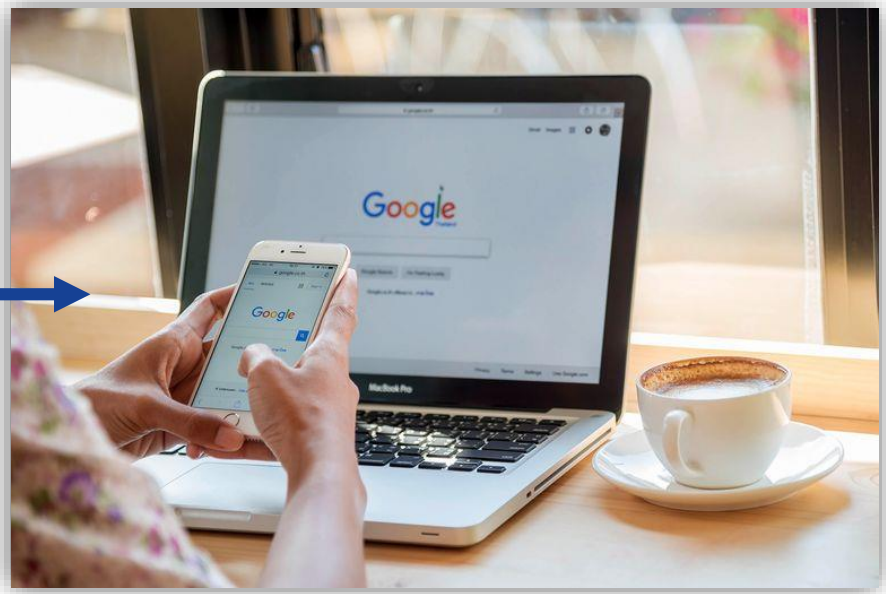
    - mainstream ICT





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    - standardization 2.0 (hackathons, Git, etc.)

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    - SDI as a platform (coupling data & algorithms)
    - new data sources from citizens & companies
    - licensing & legislative framework
  - FOSS4G is a pillar!

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Thank you!

Questions?

marco.minghini@ec.europa.eu
@MarcoMinghini

Stay in touch

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