



# Open source geospatial ‘Made in Europe’

**FOSS4G 2023 – 29 June 2023**

# European Commission partnering with FOSS4G 2023



European  
Commission

The [European Commission](#) is honoured to join the global community of open source geospatial enthusiasts gathering from 26 June to 2 July at the [FOSS4G 2023](#) conference. We will contribute to the event with a full-day dedicated track titled *Open source geospatial 'Made in Europe'*.

The partnership with the [Open Source Geospatial Foundation \(OSGeo\)](#) is centred around the shared values of openness, transparency, reuse and reproducibility applied to all dimensions, from data to software and standards.

The institution's activities around FOSS4G are naturally flowing from the recent [Open source software strategy 2020-2023](#) entitled 'Think Open', which identifies open source software solutions as key building blocks to deliver better European services, innovate society and increase security, in addition to actively committing to support open source projects and developer communities. This strategy builds on other important initiatives including the [European strategy for data](#), and the upcoming [Interoperable Europe Act](#), whereby open source software helps ensure interoperability and technological sovereignty in key societal areas at the European scale. Supporting the Open source strategy is the recent [Decision](#) on the open source licensing and reuse of Commission software, including the contribution to open source projects.

# A rich & diverse programme

**10:30**  
AM  
30min

Open source geospatial software in support of the common European Green Deal data space

Marco Minghini  
[Open source geospatial 'Made ...](#)

**11:00**  
AM  
30min

EGMS: Validating 10.000 million open geospatial ground motion timeseries at EU scale

Joan Sala Calero  
Open Data

**11:30**  
AM  
30min

Increasing the uptake of Earth Observation services and products through European efforts

Codrina Ilie  
[Open source geospatial 'Made ...](#)

**12:00**  
PM  
30min

EuroGEOSS Prototype Development

Albana KONA  
[Open source geospatial 'Made ...](#)

**2:00**  
PM  
30min

Open Source for Geospatial Software Resources Platform for Geospatial Data Exploitation – OSS4gEO: community led Open Innovation at ESA and beyond

Stefanie Lumnitz, Codrina Ilie  
[Use cases & applications](#)

**2:30**  
PM  
30min

MobiDataLab - Building Bridges on the way for FAIR mobility data sharing

Johannes Lauer, Thierry Chevallier  
[Open source geospatial 'Made ...](#)

**3:00**  
PM  
30min

Runtime environment for the validation of the Copernicus Ground Motion Service

Vasile Craciunescu, Marian Neagul  
[Use cases & applications](#)

**4:00**  
PM  
30min

Low-cost AirQuality stations + open standard (OGC SensorThings) + open data (CC-BY) + open source (FROST + QGIS plugin for sensors)

Piergiorgio Cipriano, Luca Giovannini, Giacomo Magisano  
[Open source geospatial 'Made ...](#)

**4:30**  
PM  
30min

OGC API feature services built with Hakunapi

Teemu Sipilä  
[Open source geospatial 'Made ...](#)



# Open source geospatial software in support of the common European Green Deal data space

Marco Minghini<sup>1</sup>, Alexander Kotsev<sup>1</sup>, Jordi Escriu<sup>1</sup>, Joeri Robbrecht<sup>2</sup>

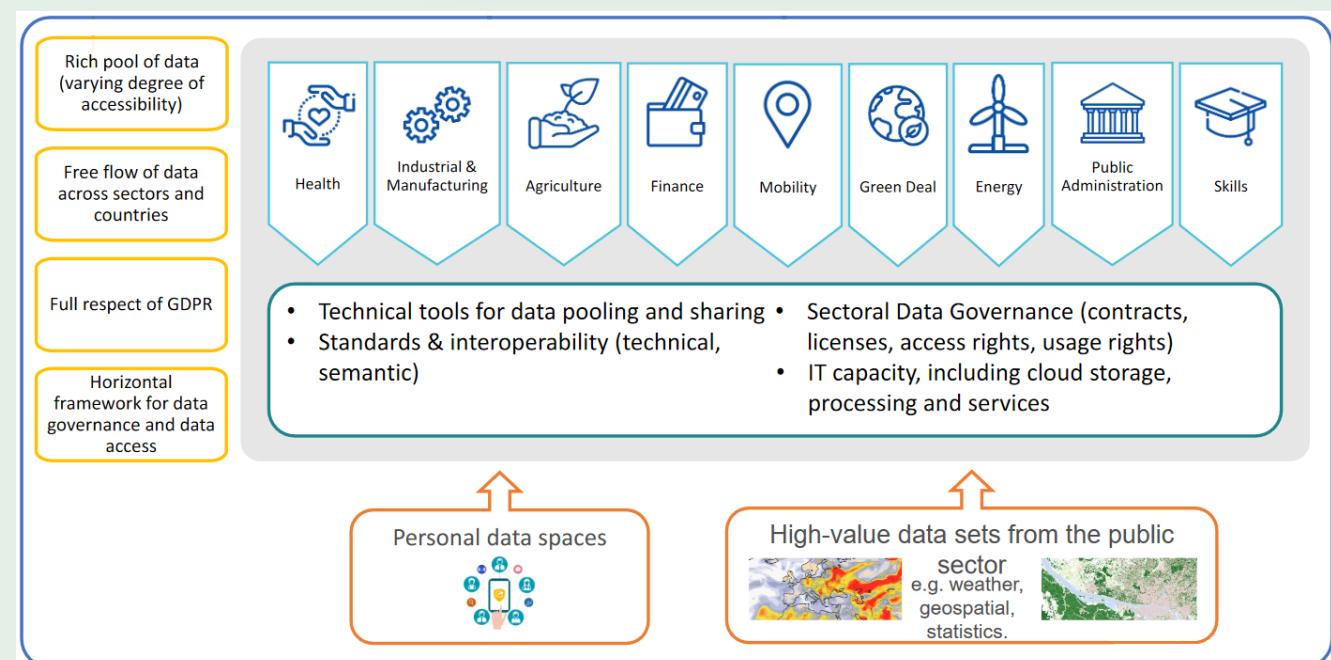
<sup>1</sup> European Commission, Joint Research Centre (JRC)

<sup>2</sup> European Commission, Directorate General for Environment

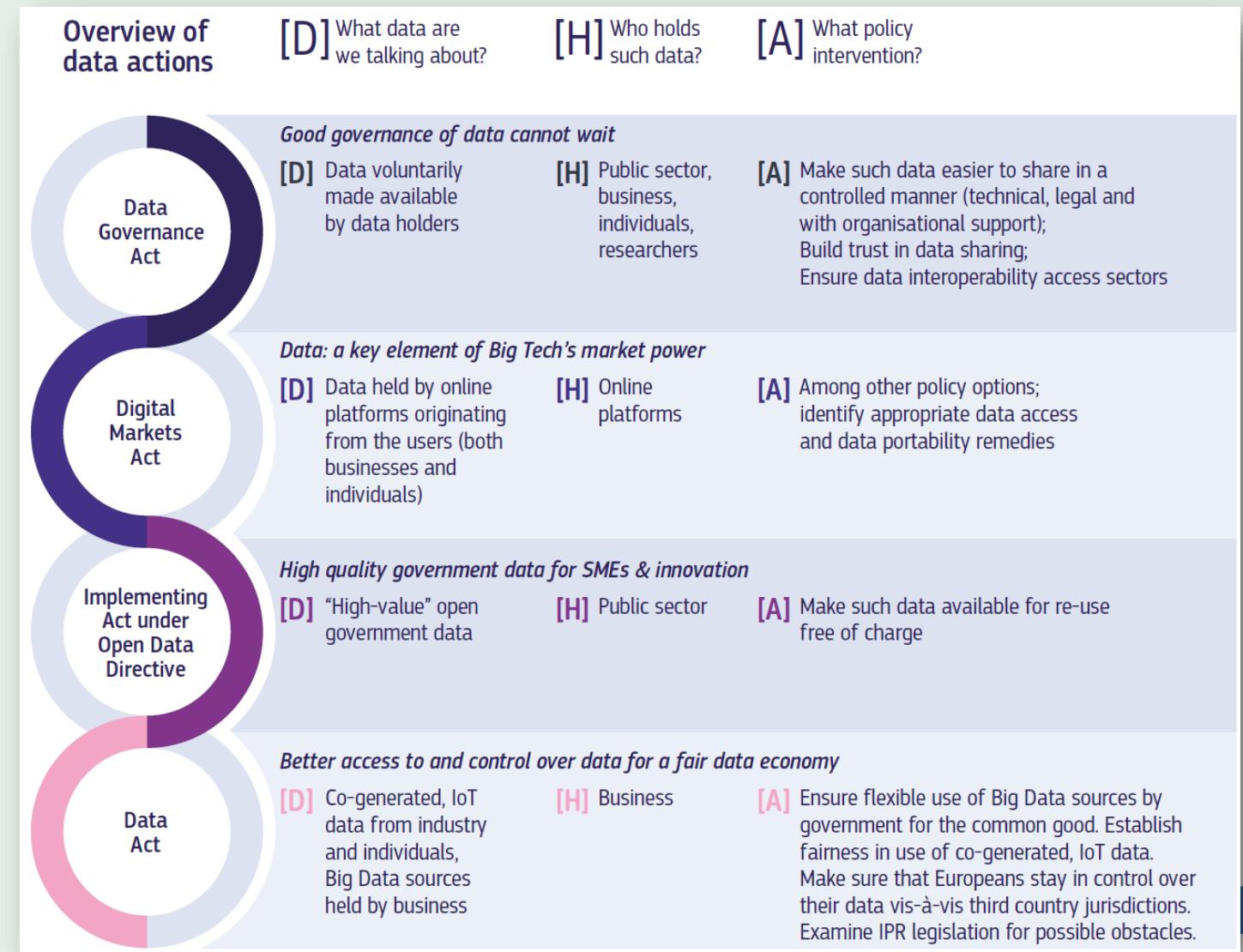
# European strategy for data



- Aims to create a European single market for data
- Highlights the problems to address
  - data availability, interoperability, quality
  - governance & infrastructures
  - skills & data literacy
  - cybersecurity
- Envisages the establishment of
  - a common European data space
  - sectoral data spaces

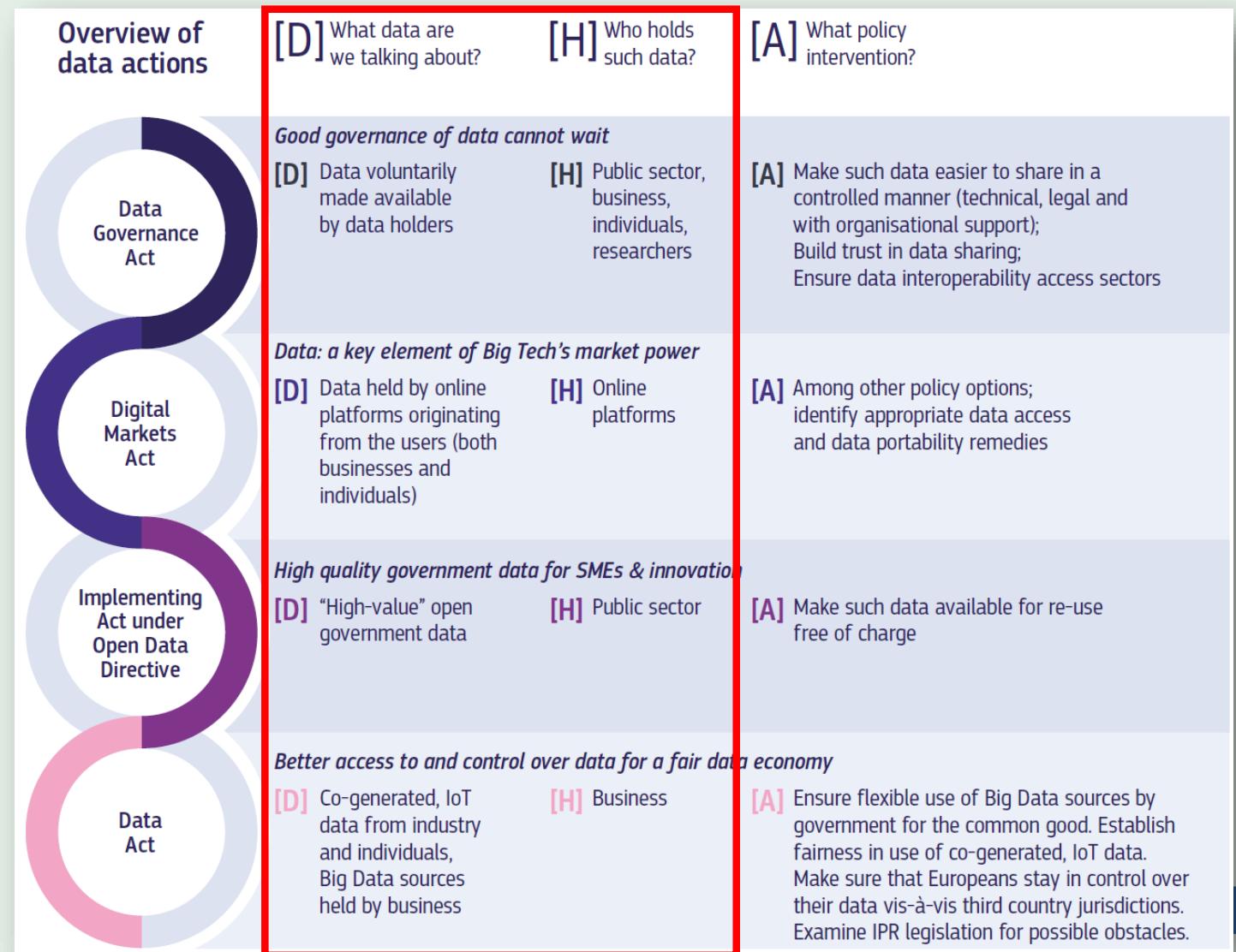


# Horizontal data sharing legislation



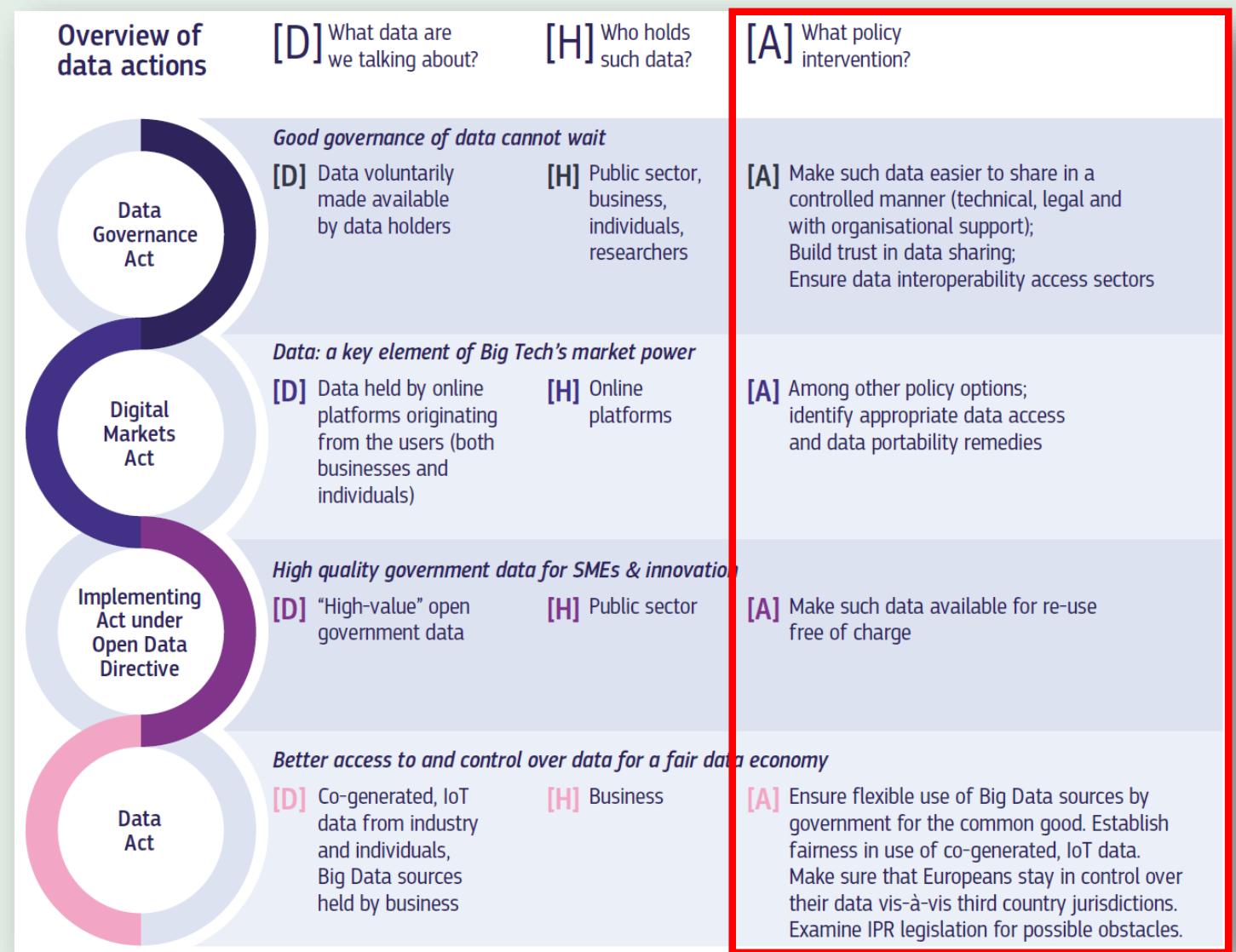
# Horizontal data sharing legislation

- Data in scope
  - from public sector, businesses, researchers and individuals



# Horizontal data sharing legislation

- Data in scope
  - from public sector, businesses, researchers and individuals
- Data sharing flows
  - G2B, B2G, C2G, etc.



# Implementing Act on high-value datasets

- The Open Data Directive defines high-value datasets
  - datasets the **re-use** of which is associated with important **socio-economic benefits**
- To be made available
  - for **free**, under **open access** licenses
  - in **machine-readable formats**, via **APIs** and (when relevant) as a bulk download
- Thematic **categories** of high-value datasets

*Geospatial*

*Earth observation  
and environment*

*Meteorological*

*Statistics*

*Companies and  
company  
ownership*

*Mobility*

- The Implementing Act defines
  - the **list of high-value datasets** for each thematic category
  - the **requirements** for their provision:

- license (CC BY 4.0, CC0 or any equivalent or less restrictive license)
- key attributes, formats, metadata, granularity, etc.

# List of (geospatial) high-value datasets

## *Geospatial*

### INSPIRE data themes

- Administrative units
- Geographical names
- Addresses
- Buildings
- Cadastral parcels

### Reference & Agricultural parcels (IACS)

## *Earth observation and environment*

### INSPIRE data themes

- Hydrography
- Protected sites
- Elevation
- Geology
- Land cover
- Orthoimagery
- Area management / restriction / regulation zones & reporting units
- Bio-geographical regions
- Energy resources
- Environmental monitoring facilities
- Habitats and biotopes
- Land use
- Mineral resources
- Natural risk zones
- Oceanographic geographical features
- Production and industrial facilities
- Sea regions
- Soil
- Species distribution

## *Meteorological*

- Observations data measured by weather stations
- Climate data: validated observations
- Weather alerts
- Radar data
- Numerical weather prediction model data

## *Statistics*

### INSPIRE data themes

- Transport networks

## *Companies and company ownership*

## *Mobility*

# Data space actors

- Data Spaces Support Centre (DSSC)
  - coordination of all relevant actions on sectoral data spaces in Europe
  - blueprint, best practices, common standards, support activities and knowledge transfer
- Coordination and Support Actions (CSAs)
  - one for each sectoral data space
  - community of practice, priority datasets, stakeholder engagement, governance/business models, roadmap
- European Data Innovation Board (EDIB)
  - consultative and advisory body established in the Data Governance Act
    - to be setup in September, deadline for applications: 30 June – <https://europa.eu/Yrc6bX>
  - identification of guidelines for interoperability of common European data spaces



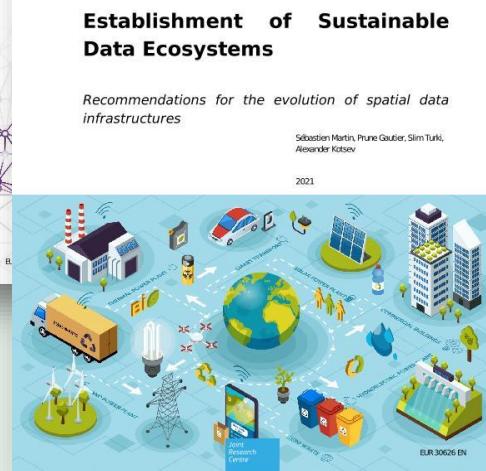
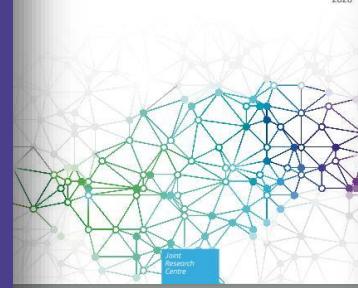
# JRC knowledge base on data spaces

- Several findings around (geospatial) data sharing



Vaccari L., Posada M., Boyd M.,  
Gottwinkel D., Mavridis D., Smith R.S.,  
Santoro M., Nativ S., Meljoua M., Reusa I.,  
Switzer S., and Friis-Christensen A.

2020



Ulrich P., Dutch Brown N., Kiselev A., Minghini M., Hirmandi Qureshi L., Boguslavskiy R., Piganiello F.



Grajeda M. (Ed.), de Nigris S., Gómez-Bonilla E., Gómez E., Martínez B., Gómez M., Vespe M., Schaefer S., Michel M., Kiselev A., Mittoni A., Verdin-Alujer L., Piganiello F., Haderer J., Nativ S., Sanchez I., Hanon R., J. Jiménez H.

2020

EUR 30 306 EN

# New JRC Science for Policy Report

- Title: European Data Spaces – Scientific insights into data sharing and utilisation at scale
- Authors from 3 JRC Units
- <https://publications.jrc.ec.europa.eu/repository/handle/JRC129900>
- A knowledge base on data spaces:
  - requirements for data spaces
  - data spaces how-tos (technical & organisational)
  - wiki on data spaces: <https://europa.eu/!7jpHXH>
  - dashboard on JRC data sharing-related publications: <https://europa.eu/!JVBynp>



# JRC partnerships



Open  
Geospatial  
Consortium



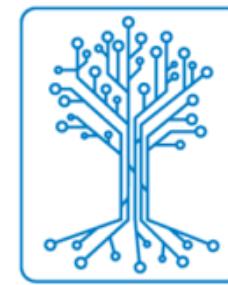
UN-GGIM  
UNITED NATIONS INITIATIVE ON  
GLOBAL GEOSPATIAL  
INFORMATION MANAGEMENT



International Society for  
Digital Earth



INSPIRE - Infrastructure  
for Spatial Information  
in Europe

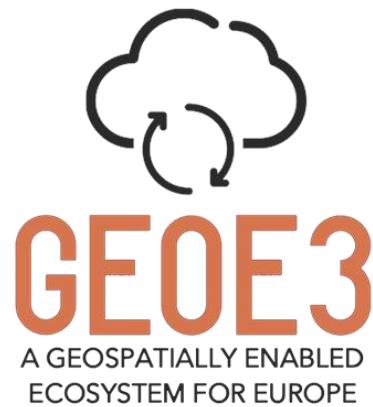


GAIA-X

INTERNATIONAL DATA  
SPACES ASSOCIATION



# JRC partnerships – Green Deal data space



# Our main contribution – 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)

- In force since 2007, aims to create a European SDI to support EU environmental policies
- Provides a comprehensive framework for interoperability of spatial data:
  - data discovery ([metadata](#))
  - data sharing ([network services](#))
  - data interoperability ([data models](#))
- JRC is the [technical coordinator](#)



FOSS4G  
Prizren, 2023

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



European  
Commission

# Modernisation of INSPIRE infrastructure



- Inclusion of new standards and technologies as **INSPIRE** good practices
  - modern encodings (**GeoJSON**, **GeoPackage**)
  - modern data sharing standards (**OGC APIs**)
- Introduction of inclusive and **agile** governance approaches
- Migration to a fully **open source** software stack
- Establishment of a mature **community**
- Main lessons learnt & future vision
  - <https://europa.eu/!8qH67V>

# Technological stack

- INSPIRE (legal framework) as a catalyst for technological innovation:
  - central components based on reusable, open source software solutions

The screenshot shows the INSPIRE Geoportal homepage. At the top, there's a navigation bar with the European Commission logo, a search bar, and language selection (EN English). Below the header, a banner reads "ENHANCING ACCESS TO EUROPEAN SPATIAL DATA". The main content area features a large map of Europe with country names. To the right of the map, there are three boxes: "INSPIRE Geoportal Dataset Statistics" (91533 Metadata records, 44778 Downloadable Datasets, 46446 Viewable Datasets), "Spatial scope coverage" (checkboxes for National and Regional), and "Select a COUNTRY" (a grid of flags and download links for various countries). At the bottom, there's a "Select the whole EUROPE" button and a "Download stats" button.

INSPIRE Geoportal

The screenshot shows the INSPIRE Reference Validator - Test selection page. The header includes the European Commission logo, a search bar, and language selection (EN English). The main content area has a title "INSPIRE Validator - Test selection" and a sub-section "Configure your test". It contains several configuration options: "Select the INSPIRE resource you would like to test" (radio buttons for Metadata, View Service, Download Service, Discovery Service, Data set), "Select the Technical Guidelines version" (radio buttons for Version 1.3 - DEPRECATED and Version 2.0), "Select the type of metadata record(s) to be tested" (radio buttons for Data sets and data series, Network Service, Spatial Data Service), and "Advanced options". Below this, there's a section "Provide the resource to test" with a "File upload" input field, a "Choose files" button, and a note about file size and accepted formats. At the bottom, there's a "Start test >" button.

INSPIRE Reference Validator

The screenshot shows the INSPIRE registry page. The header includes the European Commission logo, a search bar, and language selection (EN English). The main content area has a title "INSPIRE registry" and a sub-section "INSPIRE registry". It displays a table of available items with columns for URI, Label, Content summary, Registry Manager, Insert date, and Available formats. A note explains the purpose of the registry. Below this, there's a section "Available items" showing a list of 10 entries, with a "Show 10 entries" dropdown and a "Filter" input field. At the bottom, there's a table of labels with corresponding descriptions.

INSPIRE Registry

# Technological stack

- INSPIRE (legal framework) as a catalyst for technological innovation:
  - central components based on reusable, open source software solutions

INSPIRE Geoportal

INSPIRE Reference Validator

INSPIRE Registry

# Technological stack

- INSPIRE (legal framework) as a catalyst for technological innovation:
  - central components based on reusable, open source software solutions

INSPIRE Datasets - EU & EFTA Country overview

INSPIRE Geoportal Dataset Statistics

94533 records  
78 Datasets  
46 Datasets  
@National  
Regional

Select a COUNTRY

Country	Records	Datasets
Austria	631	405
Belgium	584	370
Bulgaria	283	97
Croatia	146	10
Cyprus	42	32
Czech Republic	105	90
Denmark	207	113
Estonia	87	42
Finland	626	95
France	218	75
Greece	59	59
Hungary	121	23
Iceland	147	17
Ireland	78	0
Italy	19544	636
Lithuania	132	128
Malta	146	140
Netherlands	216	121
Poland	163	111
Portugal	165	100
Romania	103	36
Slovakia	338	85
Slovenia	91	12
Spain	240	77
Sweden	244	204
Turkey	218	2

Select the whole EUROPE

Download stats

EN English

European Commission > INSPIRE > INSPIRE Geoportal > HOME

ENHANCING ACCESS TO EUROPEAN SPATIAL DATA

INSPIRE GEOPORTAL

Home High-Value Datasets Thematic Data Harvesting status Find out more about

INSPIRE Geoportal

INSPIRE Validator - Test selection

Configure your test

Select the INSPIRE resource you would like to test

Metadata

View Service

Download Service

Discovery Service

Data set

Select the Technical Guidelines version

Version 1.3 - DEPRECATED

Version 2.0

Select the type of metadata record(s) to be tested

Data sets and data set series

Network Service

Spatial Data Service

Advanced options

Provide the resource

Select the input type and upload one or multiple XML/GML files immediately after selecting the test suite.

File upload

Provide a label for your test. Your test report will appear with this label.

Start test >

EN English

European Commission > INSPIRE > Validator > Test selection

INSPIRE Validator - Test selection

Home Test selection Test reports Get support More on the INSPIRE Reference Validator

INSPIRE registry

Re3gistry

OSGeoLive

OSGeo Community

Test run on 09:13 - 15.04.2021 with test suite Common conformance classes

Start test >

INSPIRE registry

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

Label: INSPIRE registry

Content summary: The INSPIRE infrastructure involves a number of items, which require clear descriptions and the possibility to be referenced through unique identifiers. Examples for such items include INSPIRE themes, code lists, application schemas or discovery services. Registers provide a means to assign identifiers to items and their descriptions, and to publish them to enable access based on the identifier.

Registry Manager

Insert date

Available for:

Available

Show 10 entries

Label: OSGeoLive

INSPIRE application schema

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

EN English

European Commission > INSPIRE > Registry

INSPIRE registry

Re3gistry

OSGeoLive

Start test >

INSPIRE Geoportal

INSPIRE Reference Validator

INSPIRE Registry

# What about the future?

- Evaluation of the INSPIRE Directive (2022): <https://europa.eu/kPYHWK>
    - improvements in data availability and access
    - issues still present
    - need for a revision
  - Revision of the legal framework for the European Green Deal data space
    - impact assessment, policy options under development
      - data scope – beyond geospatial, beyond public sector?
      - alignment with recent horizontal legislation / governance
      - legacy of INSPIRE infrastructure
    - JRC ex-ante Policy Brief: <https://europa.eu/Hyf3mf>
  - Revised legal framework expected in 2025



SCIENCE FOR POLICY BRIEF

## Beyond INSPIRE. Perspectives on the legal foundation of the European Green Deal Data Space



**HIGHLIGHTS**

- This brief provides an initial reflection of the Joint Research Centre of the European Commission on the possible legal interventions that can facilitate the establishment of the European Green Deal Data Space and more sustainable environmental data sharing practices in the EU beyond the implementation of the INSPIRE Directive.
- It is intended to feed into the debate around the possible future(s) of environmental data sharing that is inclusive and well aligned with the ambitions set out in the *Strategic Plan for Europe's Green Deal* and *A European Green Deal 2019–2024 European Commission prioritisation*.
- The views expressed here represent the perspective of the authors and are not to be considered as an official position of the European Commission.

### What is the problem?

Data about the environment are **needed** in support of a broad spectrum of use cases and applications, ultimately benefiting citizens, business and environmental policymaking. Multiple **obstacles** shall be overcome to effectively leverage available data, which are currently undressed due to a complex set of intertwined reasons as described in [1]. Those include:

- Outdated provider-centric legal framework with a strong focus on the public sector as the main user and provider of the data;
- Complex technical requirements that are enforced without an easily and objectively quantifiable benefit;
- Different rules and infrastructures being used on the different levels in the EU, which is not in place for complying to the requirements on the EU level;
- Novel technological developments and inclusion of new actors in the data economy (such as data intermediaries) that are not fully utilised.

At the same time, **rapidly emerging technologies** [2] and **new legal instruments** that will have a strong impact on data sharing, in particular the *Data Act*, *Data Governance Act*

(DGA), Implementing Act on high-value datasets, all defined under the *European Strategy for Data*, as well as the *Interoperable Europe Act*, are being developed or already entered into force. Organised in a horizontal legal framework, those instruments provide multiple opportunities for the better utilisation of existing data. Those however would need to be tailored to the specificities of environmental data and the associated use cases.

With the objective to contribute to the debate around the possible future(s) of environmental data sharing in the EU, this policy brief prepared by the Joint Research Centre (JRC) of the European Commission provides an overview of several different **policy development pathways** characterised by a different level of ambition. Three overarching principles have guided the authors in conceptualising the different pathways:

- First, focus is put on the reuse of data that can bring societal, economic and environmental benefits and go beyond the current scope of the *INSPIRE* and the *Public Access to Environmental Information* Directives, which are both subject to a possible revision within the context of EC's *GreenData4All initiative*.

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# Thank you!



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