



Vision on discoverability of spatial data

Rediscovering Spatial Data Discoverability



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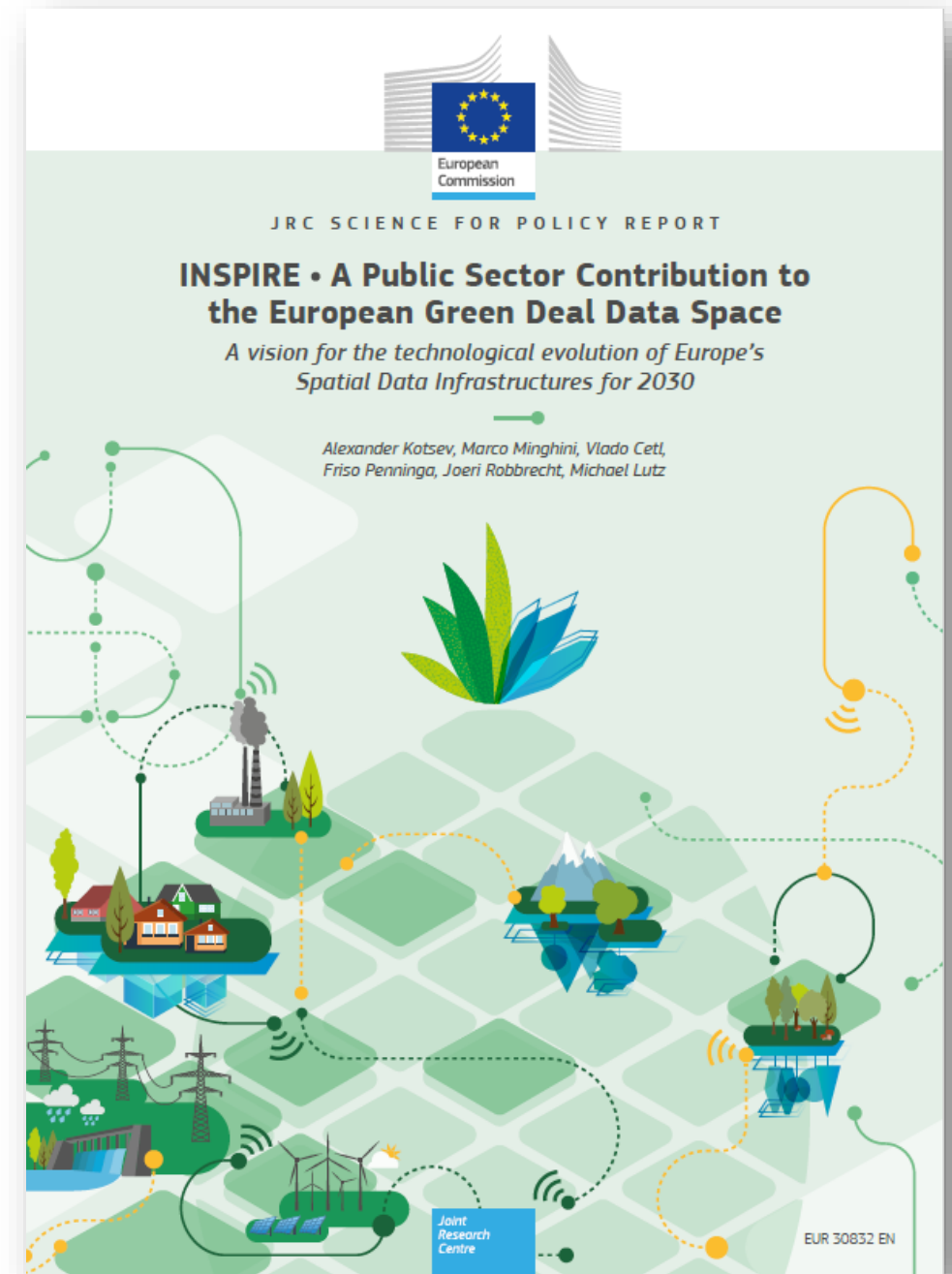
*EuroSDR & EuroGeographics INSPIRE KEN Workshop
on Spatial Data Discoverability, 28th April 2022*

INSPIRE Evaluation & Future JRC Science for Policy Report

- **INSPIRE - A Public Sector Contribution to the European Green Deal Data Space**

<https://publications.jrc.ec.europa.eu/repository/handle/JRC126319>

- Prepared by JRC, Geonovum and DG ENV.
- Sneak peek:
 - Overview of the status
 - Policy and technological context
 - Lessons learned
 - **Vision for the technological evolution**
 - Actions and roadmap
 - Prototype reference framework



INSPIRE Evaluation & Future Vision

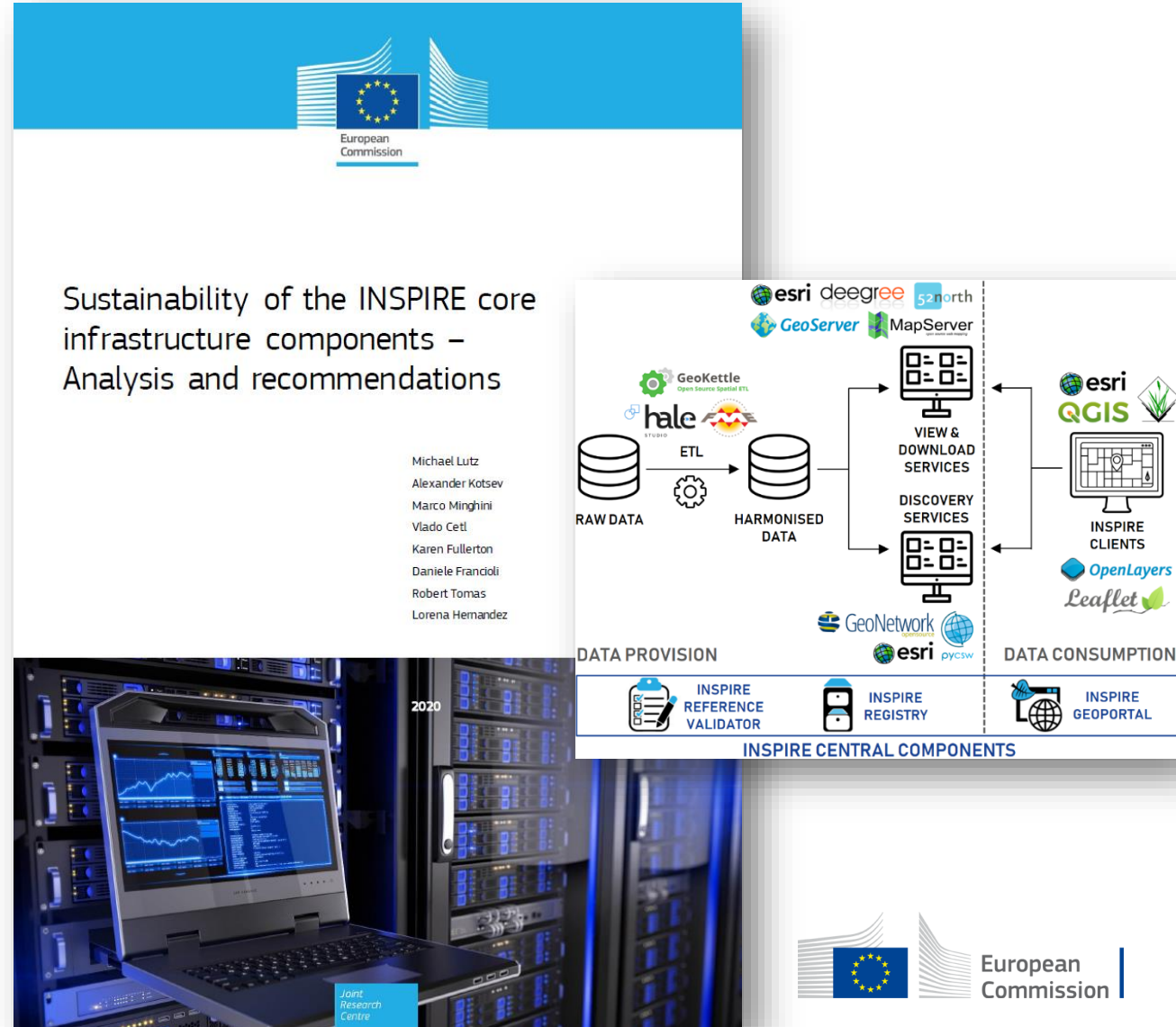


- Evolution to a data ecosystem.
- Broadening the scope:
 - New sectors: public, private/businesses, academia.
 - New communities: developers, users.
- Widening the range of applications and use cases.
- **Making the INSPIRE framework more simple, flexible and agile.**
- Lowering the knowledge entry-level for implementing and/or using data.
- Reusing well-adopted and working standards and technologies.

Central INSPIRE Components

Sustainability approach

- Sustainability of the INSPIRE core infrastructure components
 - **Support by tools is the default.**
 - **Build strategic partnerships with communities.**
 - Focus on the INSPIRE-specificity and not on mainstream tool development.
 - Harmonise the approaches for helpdesk.
 - Decouple tools from infrastructure.
 - Extensive use of the cloud.




Flexibility in INSPIRE Implementation

INSPIRE Good Practices

- Good Practice library available.
- Procedure for proposing Good Practices and subsequent potential endorsement:
 - *Step 1. Initiation.*
 - *Step 2. Submission as candidate (MIG-T).*
 - *Step 3. Outreach.*
 - *Step 4. Submission (MIG).*
 - *Step 5. Legal scrutiny.*
 - *Step 6. Feedback.*

<https://inspire.ec.europa.eu/portfolio/good-practice-library>



The screenshot displays the INSPIRE Knowledge Base website. At the top, there is a navigation bar with the European Commission logo, the text 'INSPIRE KNOWLEDGE BASE', and a search bar. Below this is a blue header with the text 'Infrastructure for spatial information in Europe' and a breadcrumb trail: 'European Commission > INSPIRE > Toolkit > Good Practice Library'. The main content area is divided into two columns. The left column features a 'Quick search' menu with a list of categories: Data and Service Sharing, Data Specifications, Implement, INSPIRE, INSPIRE in your Country, Learn, Maintenance and Implementation, Metadata, MIG Work Programme, Monitoring and Reporting, Network Services, Participate, Spatial Data Services, and Use. The right column is titled 'Good Practice Library' and contains a section for 'Good Practice documents'. This section is divided into two columns: 'Candidate' and 'Endorsed'. Under 'Candidate', there are three links: 'Building one access point to dispersed data sources', 'Making spatial data downloadable via WMS services', and 'OGC compliant INSPIRE Coverage data and service implementation'. Under 'Endorsed', there are three links: 'GeoDCAT-AP', 'SDMX for Human Health and Population Distribution', and 'OGC API - Features as an INSPIRE download service'. Below the 'Good Practice documents' section is a 'Good Practice Template' section with a 'Download Template' button. The 'Context' section follows, providing a detailed explanation of the INSPIRE implementation process and the role of good practices. It mentions that the development of INSPIRE foresaw the creation of an initial set of legally-binding Implementing Rules (IRs) and Technical Guidelines (TGs). As technology evolved, the need for new TGs emerged, alongside a range of related tools that can maximise the benefits of the implementation process. These were developed in 2015 and 2016 under dedicated actions under the Maintenance and Implementation Work Programme. It also notes that in the Thematic Clusters discussion forums, good practices for specific implementation issues (e.g. how to create persistent identifiers), opportunities offered by emerging technologies and standards (e.g. Vector Tiles, OGC SensorThings API) or extensions/profiles for specific application domains are being shared and discussed. Also, work in Member States, by solution providers or in research projects often yield interesting results that implementers in other Member States could benefit from. Finally, it states that at least three types of good practice can already be observed: 1. Good practice related to INSPIRE implementation, where practitioners are extending and evolving the key elements of INSPIRE to support their communities' needs, such as extended data models.

Spatial data discoverability trends

INSPIRE Conference 2021 dedicated session



<https://inspire.ec.europa.eu/conference2021/livestream/2>

Time reference: 13:29:26

- The field of metadata catalogues is evolving in a very fast and dynamic way.
- Member States are developing cataloguing solutions that encompass both INSPIRE/geospatial as well as Open Data domains.
- The OGC is finalizing the new OGC - API Records standard, which will highly simplify the discovery, access and management of metadata on the web.
- The new developments are pushing the evolution of software components, in particular open source. In particular, making metadata available in multiple national and European infrastructures through different standards and rules.

Spatial data discoverability trends

Good practices identified

Practices

- Data-service linking simplification (MIWP Action 2.3.2).

Standards

- OGC - API Records.
- SpatioTemporal Asset Catalogues (STAC).
- GeoDCAT-AP.

Tools

- GeoNetwork.

Bridge between geospatial and open data catalogues

- ISO Metadata – GeoDCAT-AP.

Spatial data discoverability trends

Standards

OGC API - Records



Open
Geospatial
Consortium

OGC - API Records - <https://ogcapi.ogc.org/records>

- Simplification of the discovery, access and management of metadata (creation, modification and sharing) on the web.
- Data automatically discoverable through search engines.
- **Status:**
 - OGC API - Records - Part 1: Core - Draft specification, near to be adopted.
 - Covering read-only access to records and simple query capabilities.
 - Additional parts: covering additional capabilities addressing specific needs.
- **Endorsed as INSPIRE Good Practice candidate (discovery services):**
 - 69th MIG-T Meeting:

<https://wikis.ec.europa.eu/display/InspireMIG/69th+MIG-T+meeting+2022-04-01>

Spatial data discoverability trends

Standards



SpatioTemporal Asset Catalogues (STAC) - <https://stacspec.org>

- SpatioTemporal Asset: any file that represents information about the earth captured in a certain space and time.
- STAC: Common language to describe a range of geospatial information.
- It allows data providers to expose their data as SpatioTemporal Asset Catalogs (STAC), so that new code does not need to be written whenever a new data set or API is released.
- Making it being more easily indexed and discovered.
- MIG-T community showed increasing interest on STAC.

Future of spatial data discoverability

Sectoral European data spaces / Green Deal

Rich pool of data
(varying degree of
accessibility)

Free flow of data
across sectors and
countries

Full respect of GDPR

Horizontal
framework for data
governance and data
access



Health



Industrial
&
Productive



Agriculture



Finance



Mobility



Environment
Green Deal



Energy



Public
Administration



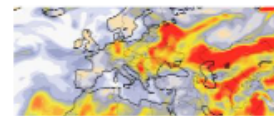
Skills

- Technical tools for data pooling and sharing
- Standards & interoperability (technical, semantic)
- Sectoral Data Governance (contracts, licenses, access rights, usage rights)
- IT capacity, including cloud storage, processing and services

Personal Data Spaces



High Value Data sets



Public
Sector



Vision on future spatial data discoverability

Personal reflections

- **Metadata models**
 - Storing metadata information in a standard-agnostic way.
 - Maintaining all metadata elements which allows serving metadata in all the standards required in your domain.
- **Metadata Catalogues & Tools**
 - Easy-to-use editor, with automatic aids.
 - Ability to transform metadata on-the-fly and serve the information in a wide range of standards.
 - Bridging the gap across different domains (e.g. Geospatial vs. Open data).
 - Metadata exposed through the use of geospatial discovery APIs.
 - Automatically discoverable through Web search engines.
 - Discovery service (backend) on the cloud.
- **UI (frontend) - What a user would expect?**
 - Simple, understandable communication, NLP search, data filtering, levelled exploration of results.
 - Metadata results automatically translated to user's language, adapted to user's knowledge.
 - Frontend not necessarily coupled to the SDI geoportal / catalogue.

Data spaces Cookbook

Future spatial data discoverability - Conclusions

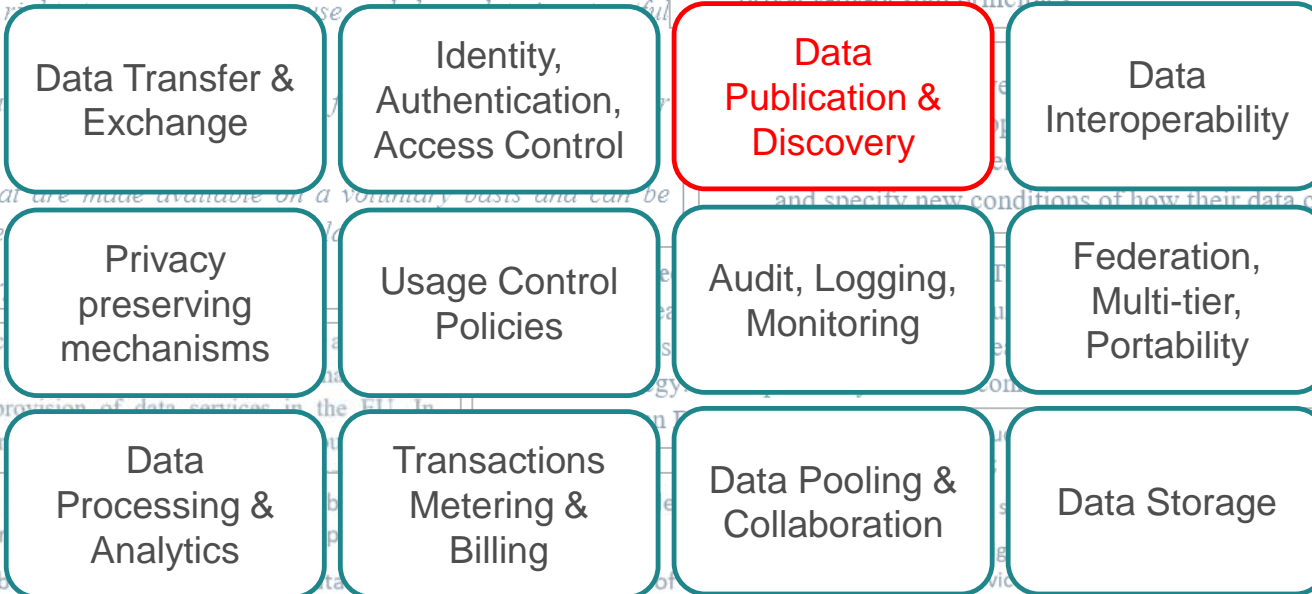
Key features of a data space

- A secure and privacy-preserving IT infrastructure to pool, access, process, use and share data.
- A data governance mechanism, comprising a set of rules of legislative, administrative and contractual nature that determine the rights and obligations of participants in a secure and transparent manner.
- Data holders are in control of who can access their data and under which conditions it can be used.
- Presence of vast amounts of data that are made available on a voluntary basis and can be reused against remuneration or for free.
- Participation by an open number of organisations.

Respect of EU rules and values: data spaces

- EU legal framework on data protection and portability and other rules relevant for provision of data services in the EU. In particular, reasonable technical, legal and organisational measures should be taken to ensure compliance with the EU legal framework.
- Provide a full cloud stack with built-in identification and security, including data masking services; and on crosscutting, low power, and energy efficient data storage services;
- Provide a technical baseline to be used by implementation effort and overlaps and to ensure a proper alignment of the various implementation approaches;
- Allow state-of-the art data management between cloud and edge, enabling seamless ultra-fast data workload balancing between them, and intelligent data porting between centralised and decentralised data infrastructures;
- Ensure performance and quality of service in the execution of applications across multiple cloud and edge providers;

- **Technical data infrastructure:** participants in the creation of common European data spaces will be encouraged to use the common technical infrastructure and building blocks which will allow to efficiently build data spaces in a coordinated manner. The common technical infrastructure should integrate the cybersecurity-by-design and privacy-by-design principles.



- common European data spaces should allow participants to pool, access, use and share all types of data. Data holders should be able to give their consent and to change access rights and specify new conditions of how their data can be accessed and reused.

- integration costs and interoperability in the European data spaces ecosystem by the adoption of common standards and best practices.

- built-in identification and security, including data masking services; and on crosscutting, low power, and energy efficient data storage services;

- Integrate an environmental tracking performance system to ensure services operate in a low power mode;
- Provide secure resource efficient data storage services;
- Be tested in use cases in areas of public interest including the areas of trust services and electronic identity, modernisation of public administration, mobility, as well as industrial data spaces.

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[EU Spotify](https://open.spotify.com/playlist/37i9dQZF1DX0XUx1u8Ijv9)

Thank you!



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