Openness and environmental data sharing: a JRC perspective

Marco Minghini

2022 Open Innovation for EO Programmes Workshop – November 2-4, 2022

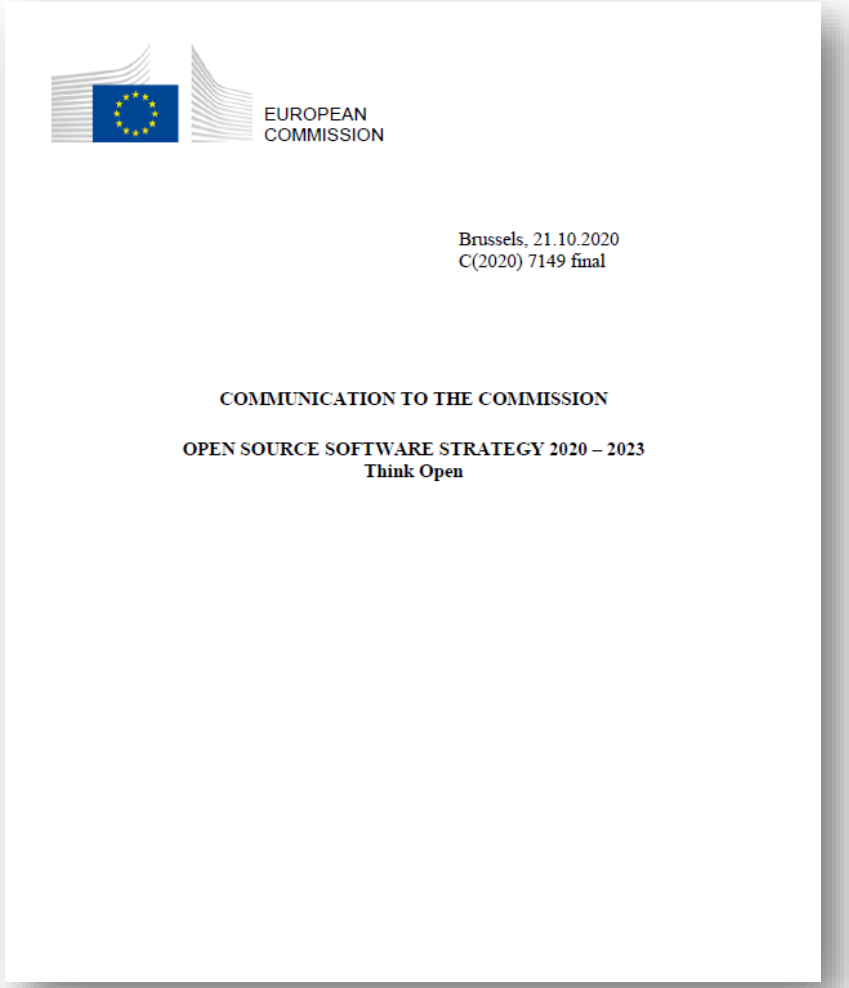
Outline

- Open source at the European Commission
  - strategy & policy
  - tools & actions
- Experiences at JRC – Openness in data sharing
  - INSPIRE
  - JRC contribution to GEO and EuroGEO
- Final recommendations

Open source at the European Commission

Open source at the European Commission

European Commission's open source policy



EUROPEAN
COMMISSION

Brussels, 21.10.2020
C(2020) 7149 final

COMMUNICATION TO THE COMMISSION

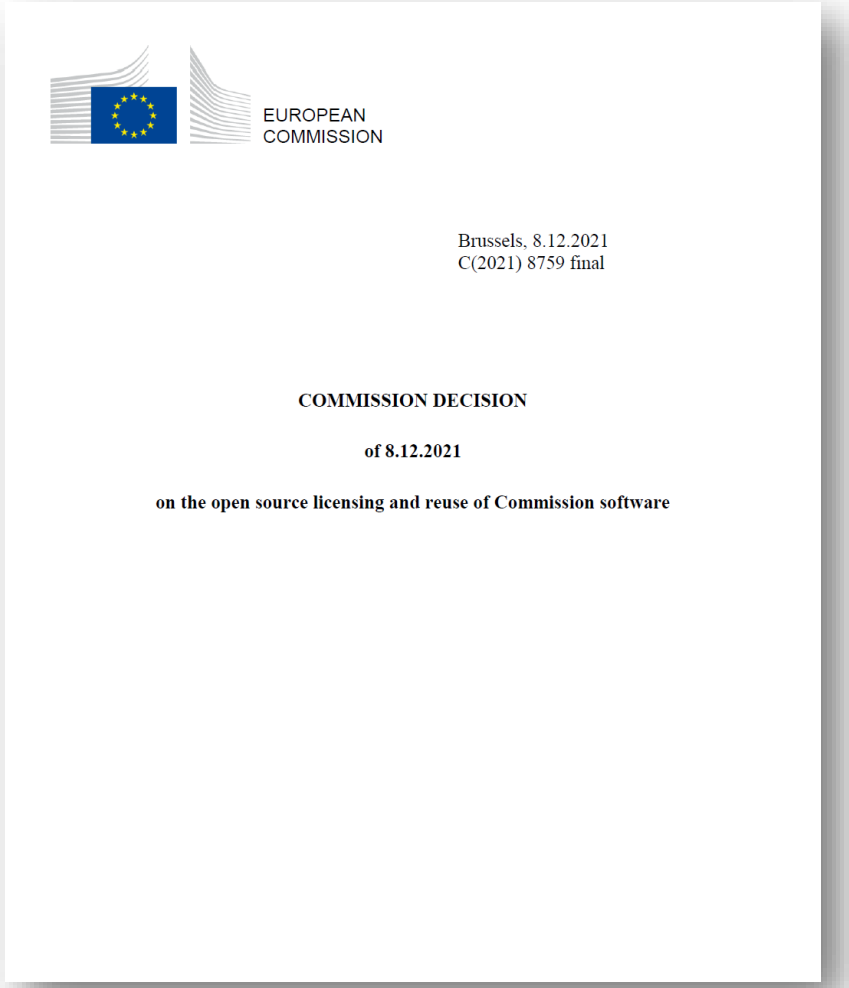
OPEN SOURCE SOFTWARE STRATEGY 2020 – 2023
Think Open

- Open Source Software Strategy 2020-2023 – October 2020
  - impacts the entire organisation
  - links EC policy goals to open source
  - 6 governing principles
    - think open
    - contribute
    - transform
    - secure
    - share
    - stay in control

https://ec.europa.eu/info/departments/informatics/open-source-software-strategy_en

European Commission

European Commission's open source policy



EUROPEAN
COMMISSION

Brussels, 8.12.2021
C(2021) 8759 final

COMMISSION DECISION

of 8.12.2021

on the open source licensing and reuse of Commission software

- Commission Decision on the open source licensing and reuse of Commission software – December 2021
  - simplifies publication of software as open source
    - default license: EUPL
    - alternative open source licenses can be used
  - requires a repository as a single point of access to Commission software
  - allows Commission services to contribute to open source projects
    - including transfer of the ownership of IP rights on the contributed code

https://ec.europa.eu/info/news/commission-adopts-new-rules-open-source-software-distribution-2021-dec-08_en

European Commission

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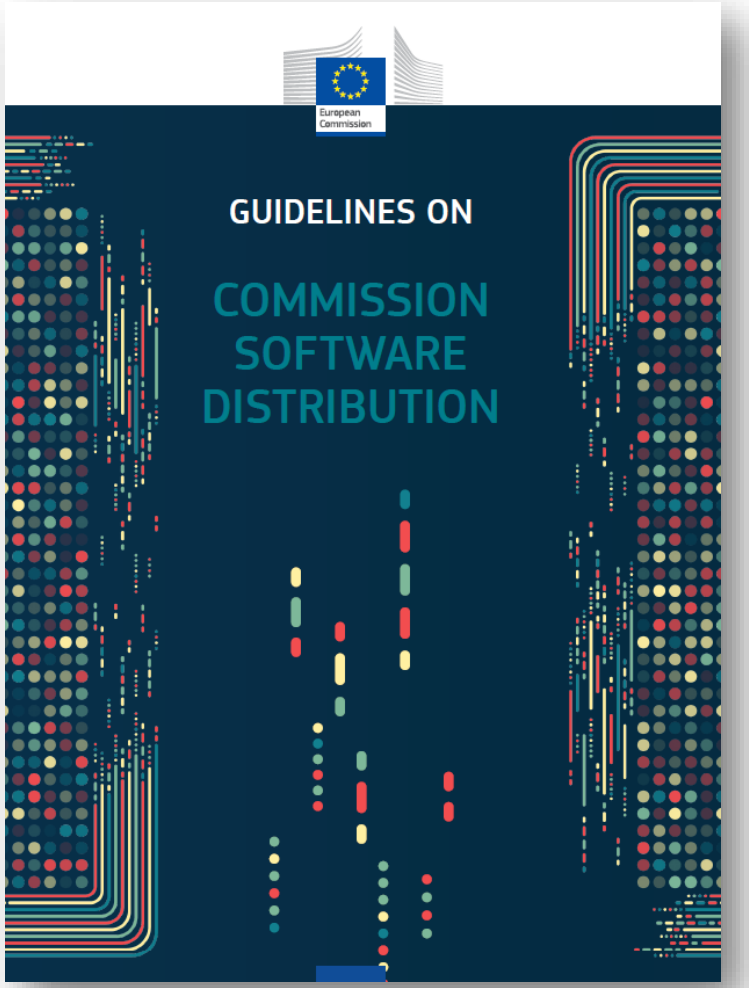

- Guidelines on Commission software distribution – October 2022
  - internal guidelines for open source distribution
    - software identification
    - IP clearance
    - vulnerability assessment

https://code.europa.eu/info/about/-/blob/master/guidelines/code-europa-eu-guidelines.md

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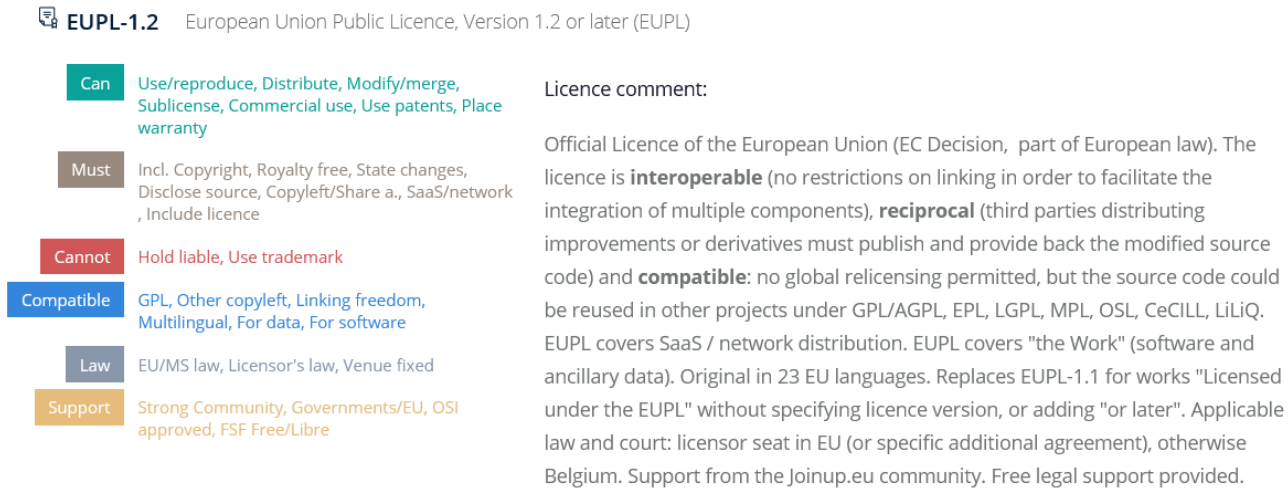
European Union Public License

- Designed by the European Commission to be fully compliant with EU law
  - open source, approved by the OSI, copyleft
  - latest version v.1.2 (2017) available in 23 EU languages
- Highly compatible license
  - GPL v.2 & v.3, LGPL v.2.1 & v.3, AGPL v.3, CeCILL v.2.0, v.2.1, OSL v.2.1 & v.3.0, EPL v.1.0, MPL v.2



https://joinup.ec.europa.eu/collection/eupl/eupl-text-eupl-12
https://joinup.ec.europa.eu/sites/default/files/custom-page/attachment/eupl_v1.2_en.pdf

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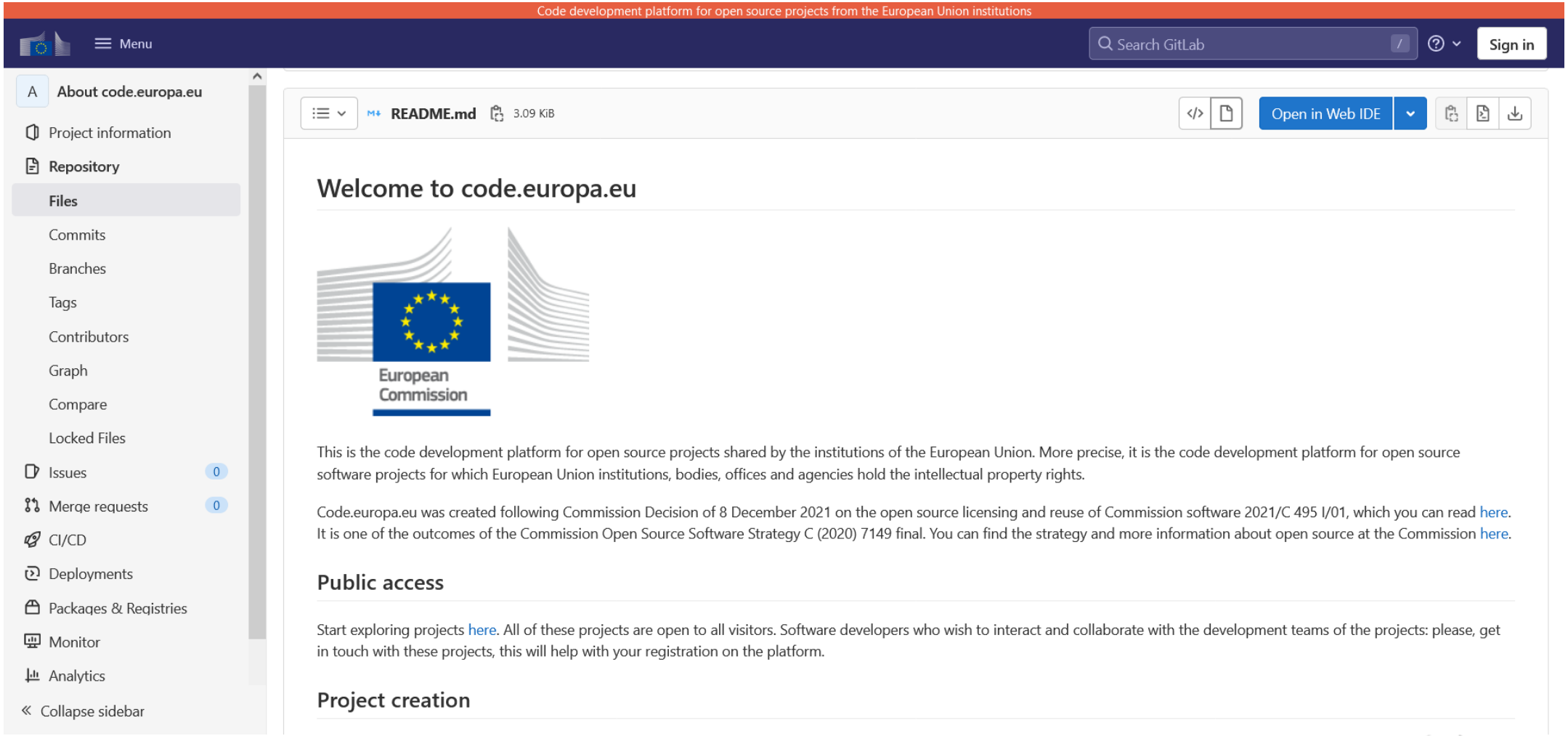
Open source repository



https://code.europa.eu

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Outreach to communities

Bug Bounties

Collabora Online

Dynare

jupyter

WIKI

odoo

CryptPad

LibreOffice

moodle

element

zimbra

Hackathons

Nextcloud

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https://ideas.unite.un.org/sdg11/Page/Overview

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Experiences at the JRC – Openness in data sharing

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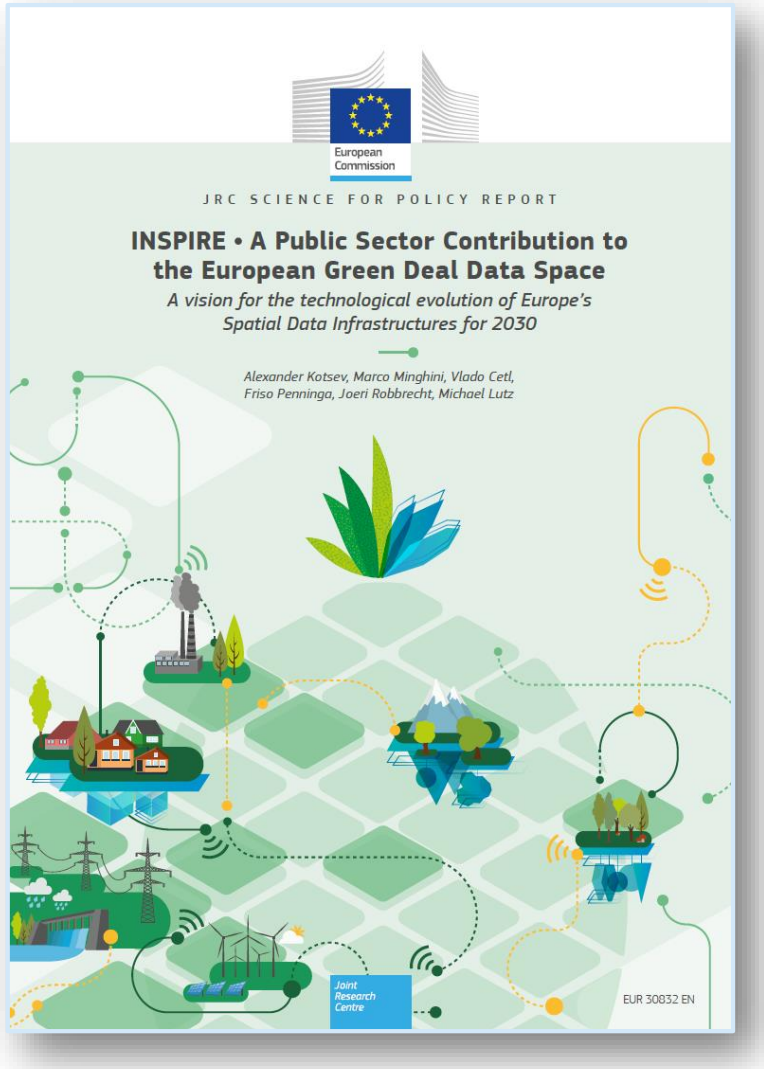
INSPIRE

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)

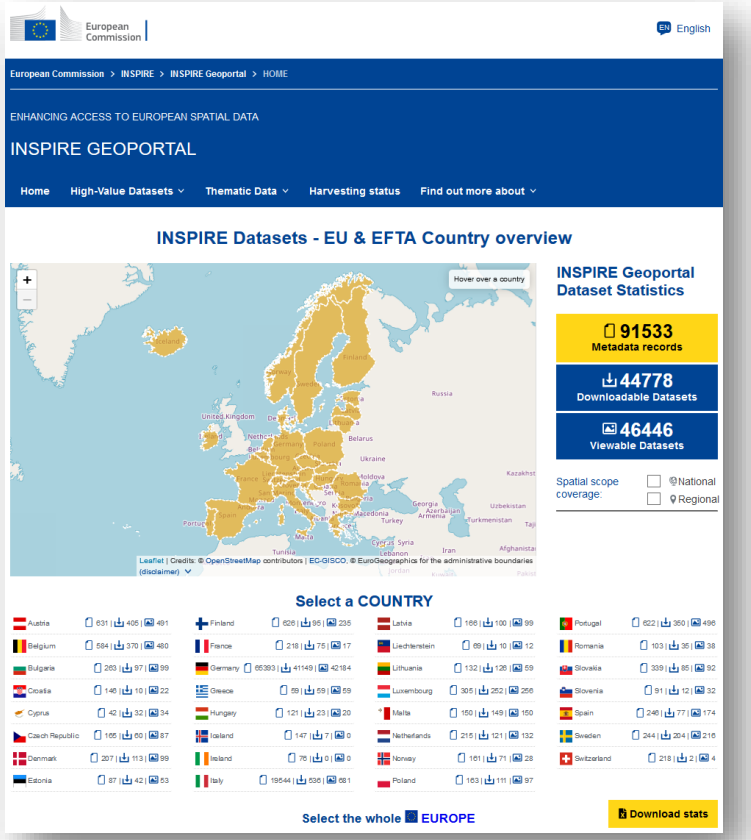
- Directive from 2007 establishing a European Spatial Data Infrastructure for environment policies
  - 7k+ data providers from Member States public sector
  - currently about 90k datasets shared
- JRC is the Technical Coordinator
  - operation, maintenance & evolution of the infrastructure
  - technological and organisational focus



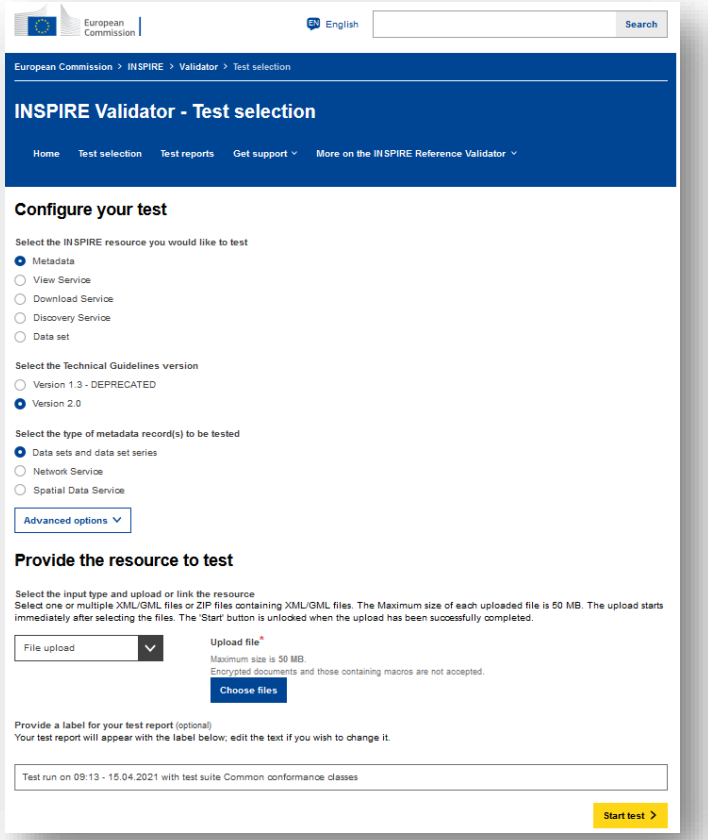
https://inspire.ec.europa.eu
https://publications.jrc.ec.europa.eu/repository/handle/JRC126319

INSPIRE open principles – Software

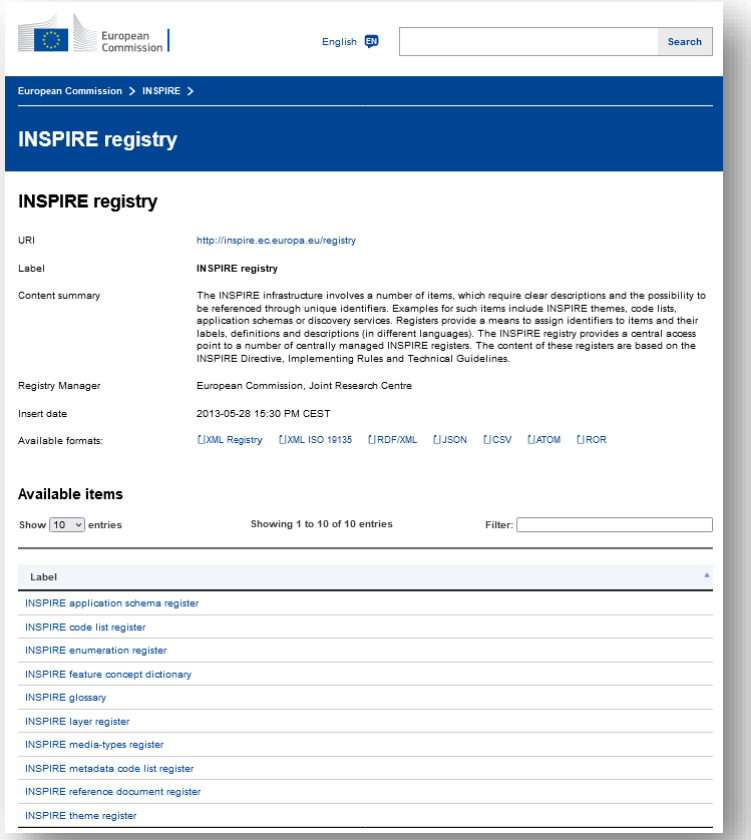
- INSPIRE (legal framework) as a catalyst for technological innovation:
  - central components based on reusable, open source software solutions



INSPIRE Geoportal, based on GeoNetwork opensource



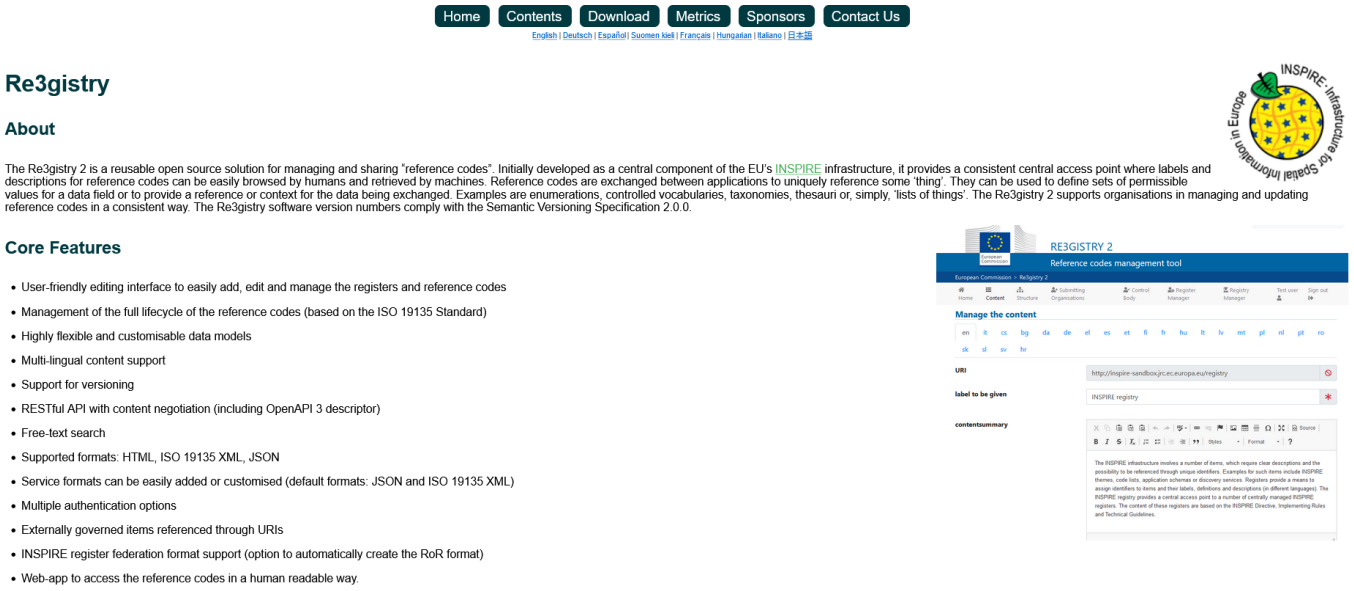
INSPIRE Reference Validator, based on the ETF testing framework

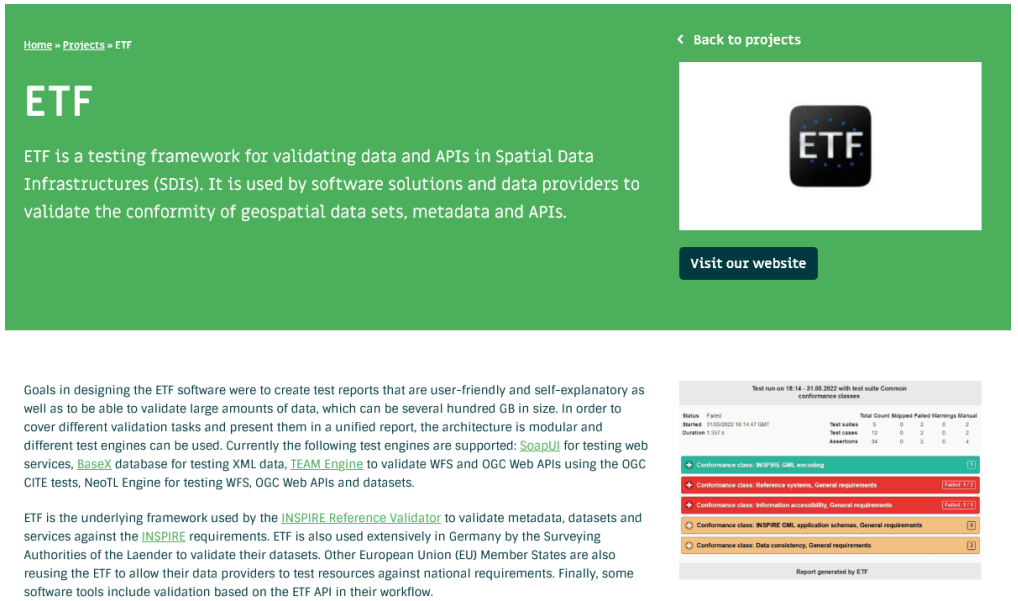


INSPIRE Registry, based on the Re3gistry

INSPIRE open principles – Software

- INSPIRE (legal framework) as a catalyst for technological innovation:
  - central components based on reusable, open source software solutions
  - decentralised governance with multiple (open source) actors OSGeo
    - ETF and Re3gistry included in the OSGeoLive, ETF proposed as OSGeo Community Project





https://live.osgeo.org/en/overview/ETF_overview.html
https://live.osgeo.org/en/overview/re3gistry_overview.html

https://www.osgeo.org/projects/etf

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INSPIRE open principles – Standards

- By nature based on open standards
  - probably the largest uptake of OGC standards worldwide
  - benefits for all: data providers, users & standardisation bodies

INSPIRE open principles – Governance

- Active community
  - conferences, discussion forums, helpdesks
- Community-driven processes
  - inclusive approach since the beginning
  - INSPIRE Good Practices to introduce new approaches (standards, technologies, etc.) in INSPIRE
  - governance process to manage changes/updates to INSPIRE artefacts (Technical Guidelines, schemas and UML models)

Good Practice Library

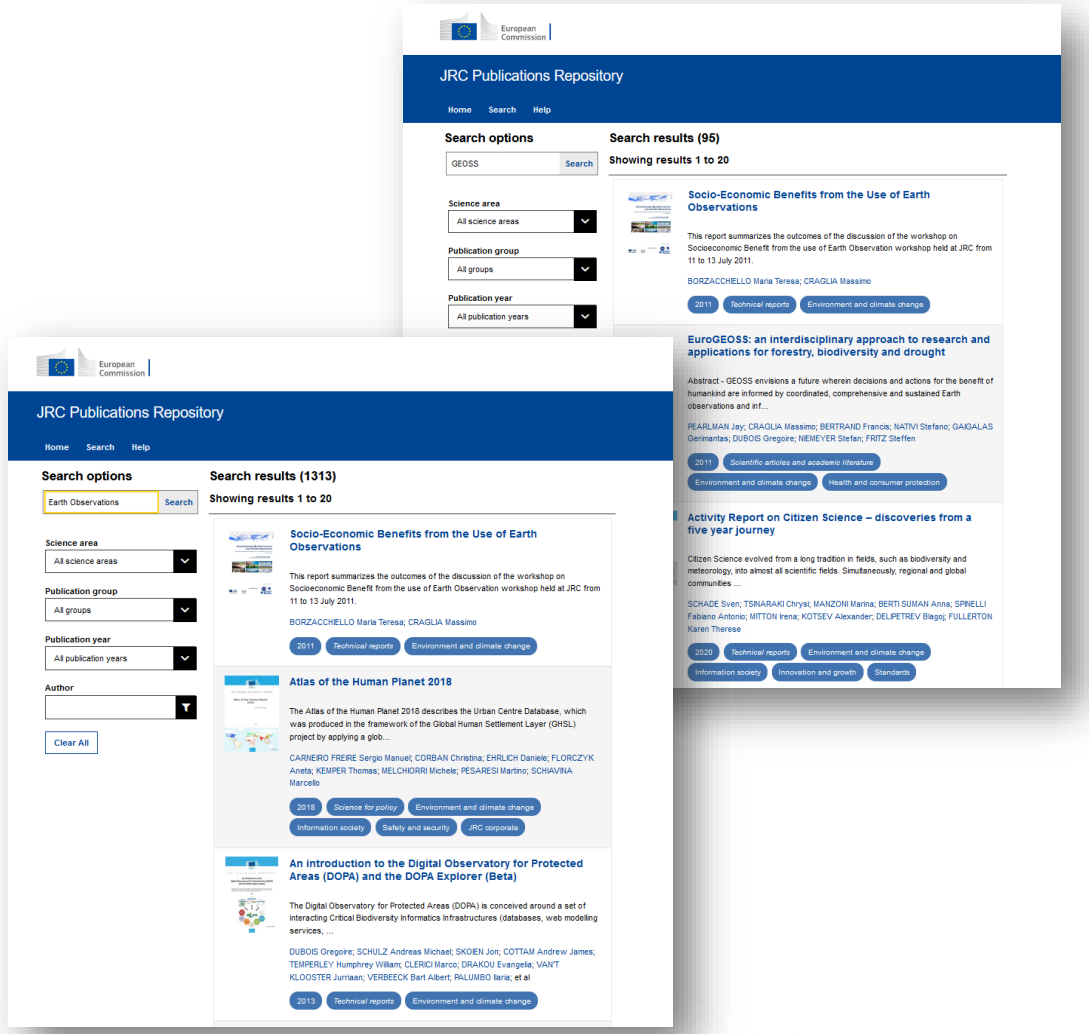
Good Practice documents

Candidate	Endorsed
GeoPackage encoding of INSPIRE datasets	GeoDCAT-AP
Data-Service Linking Simplification	SDMX for Human Health and Population Distribution
	OGC API – Features as an INSPIRE download service
	OGC SensorThings API as an INSPIRE download service
	Building one access point to dispersed data sources
	Making spatial data downloadable via WMS services
	OGC compliant INSPIRE Coverage data and service implementation

https://inspire.ec.europa.eu/portfolio/good-practice-library
https://github.com/INSPIRE-MIF

JRC contribution to GEO & GEOSS

- Long-term contribution to GEO
  - defined in the Horizon Europe WP
  - EAG, Programme Board, WGs
- in close collaboration with other EC services (RTD, DEFIS, CNECT, ENV, etc.) and the GEO community
- multiple research outputs with a science for policy emphasis
  - datasets
  - services
  - analyses tailored to the needs of the GEO community



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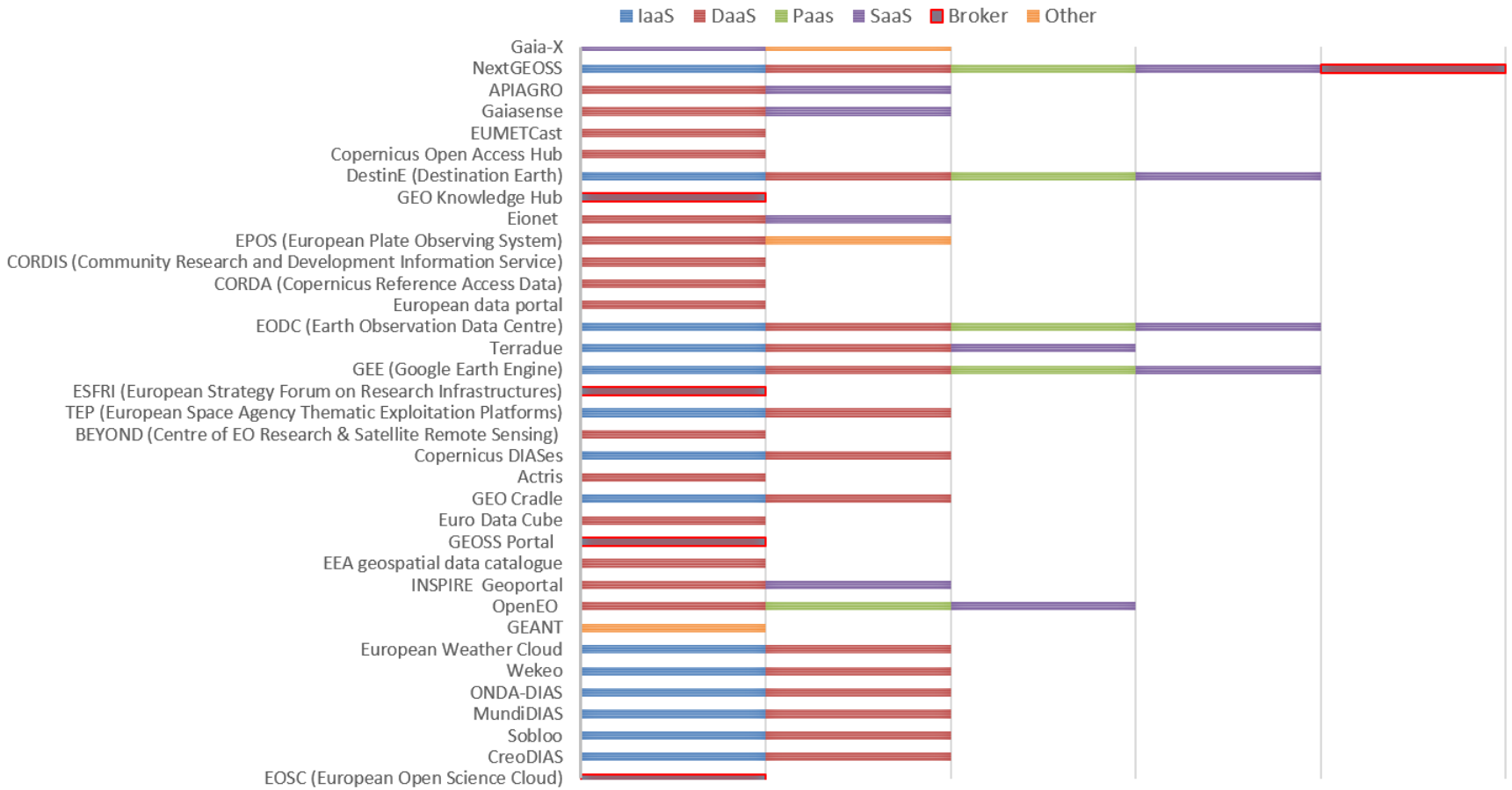
JRC contribution to EuroGEO

- European regional GEO initiative
  - umbrella framework to showcase and scale-up European user-driven products/services: Copernicus DIAS, INSPIRE, ESA TEPs, in-situ data sources, citizen observatories, etc.
  - EuroGEOSS virtual digital infrastructure as European contribution to GEOSS to address environmental use cases

- Identification of approaches for modernising data sharing in EuroGEO
  - alignment with the European policy context around data spaces
  - tackling fragmentation of open EO infrastructures
  - streamlining end-to-end process from raw data to insights for decision makers
  - user-driven and demand-driven
  - changing context – hyperscalers

Mapping the existing landscape

- Fragmentation of services offered by existing European EO digital platforms



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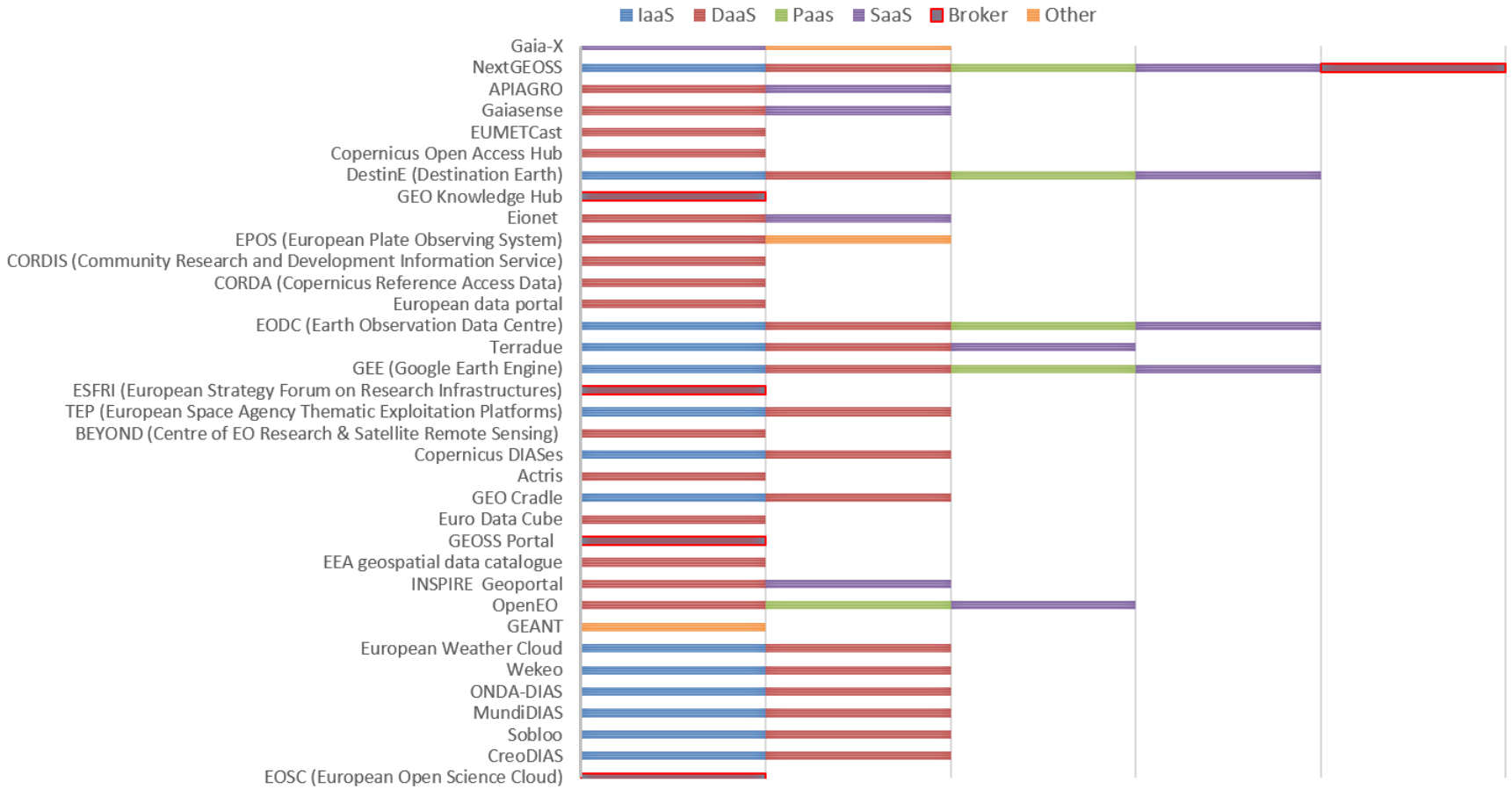
Mapping the existing landscape

- Fragmentation of services offered by existing European EO digital platforms
  - elicitation of requirements for EuroGEOSS



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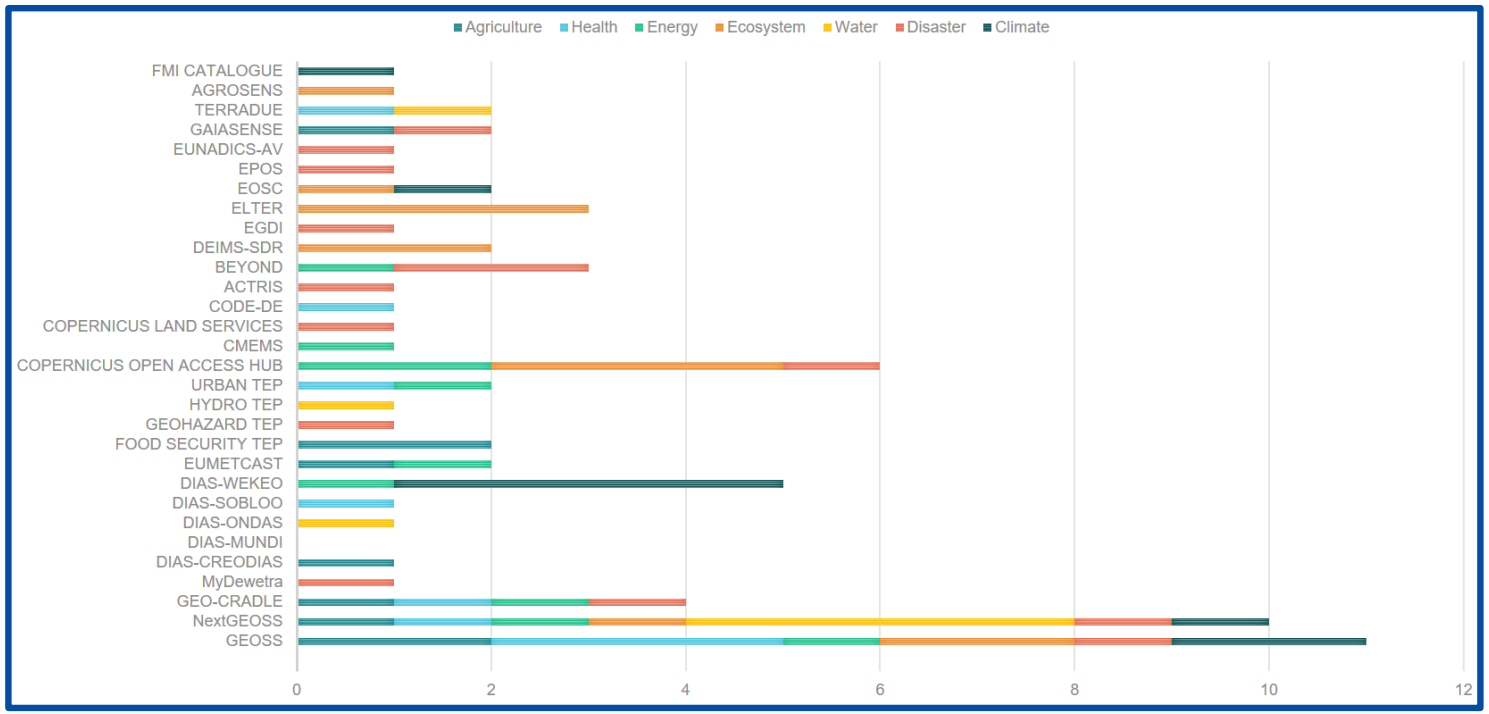
Mapping the existing landscape

- Identification of policy use cases from *e-shape* pilots



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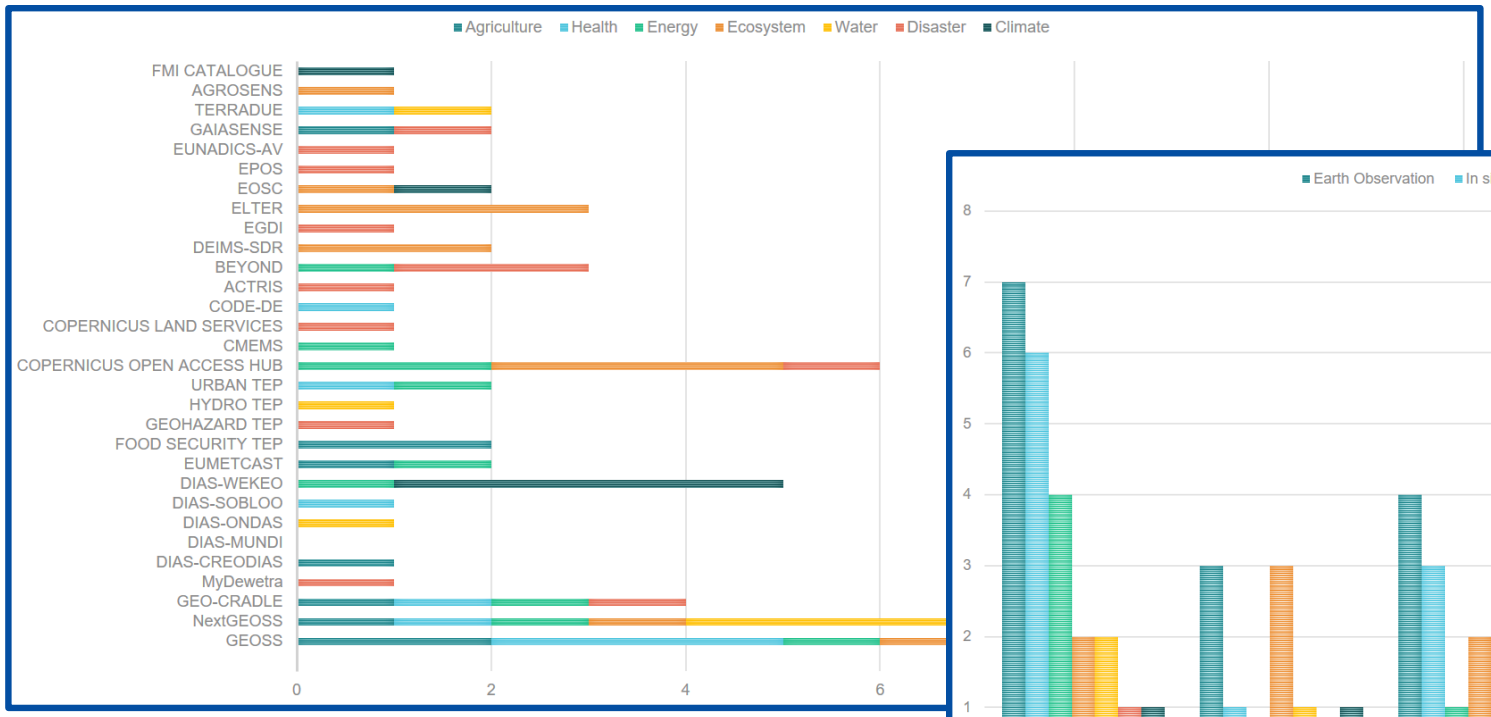

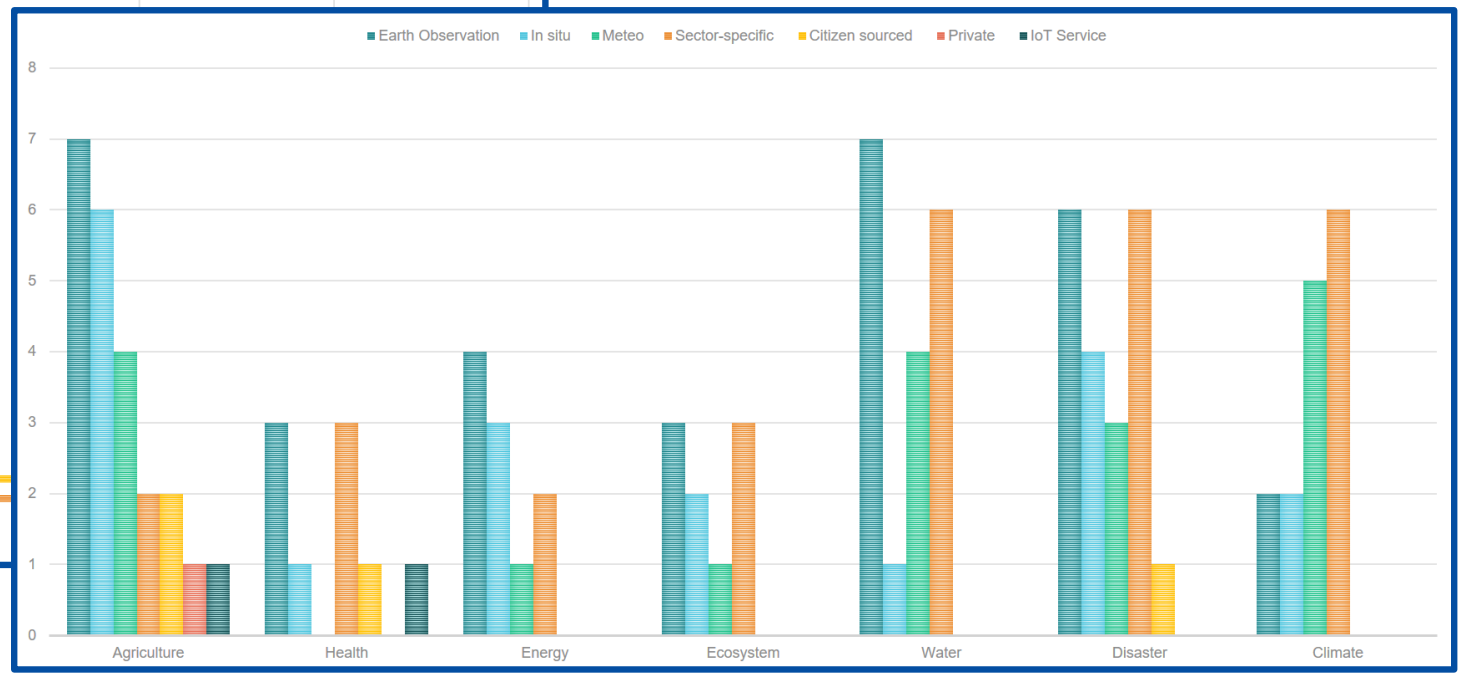

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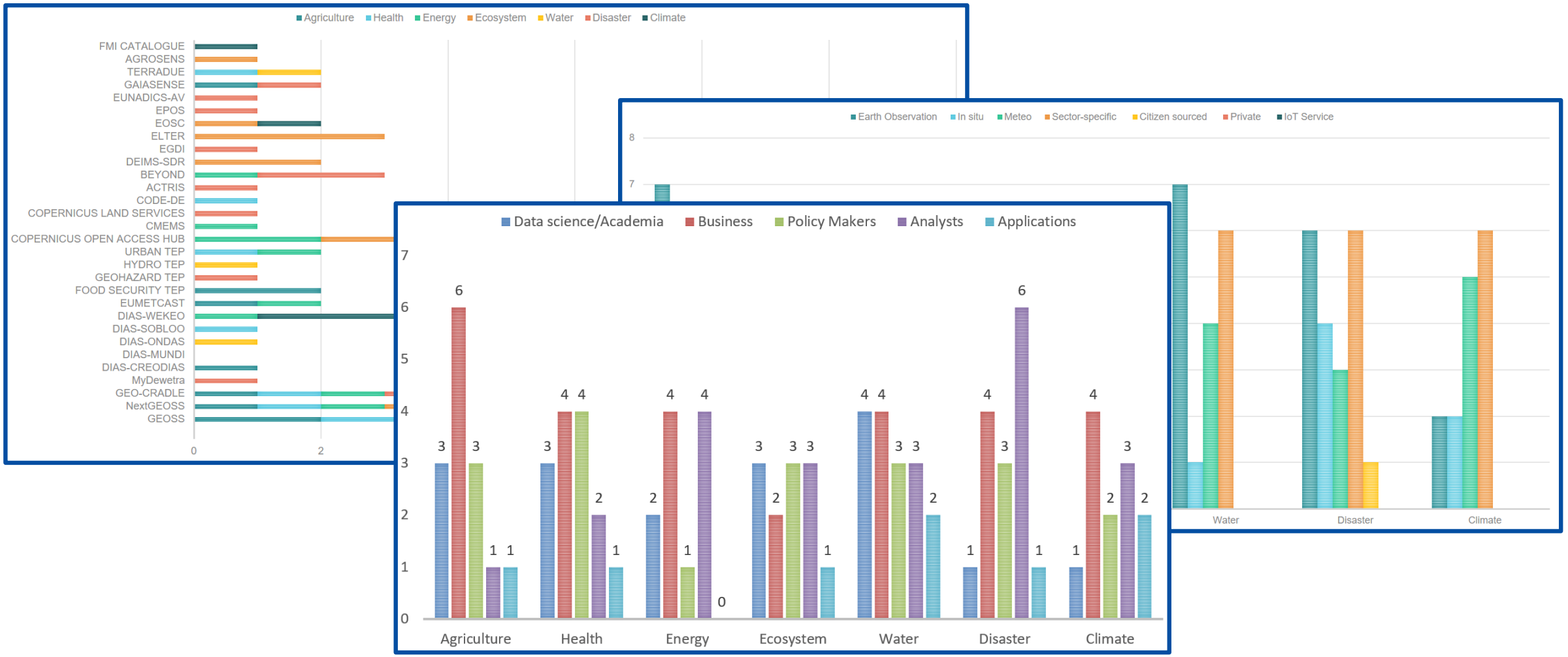
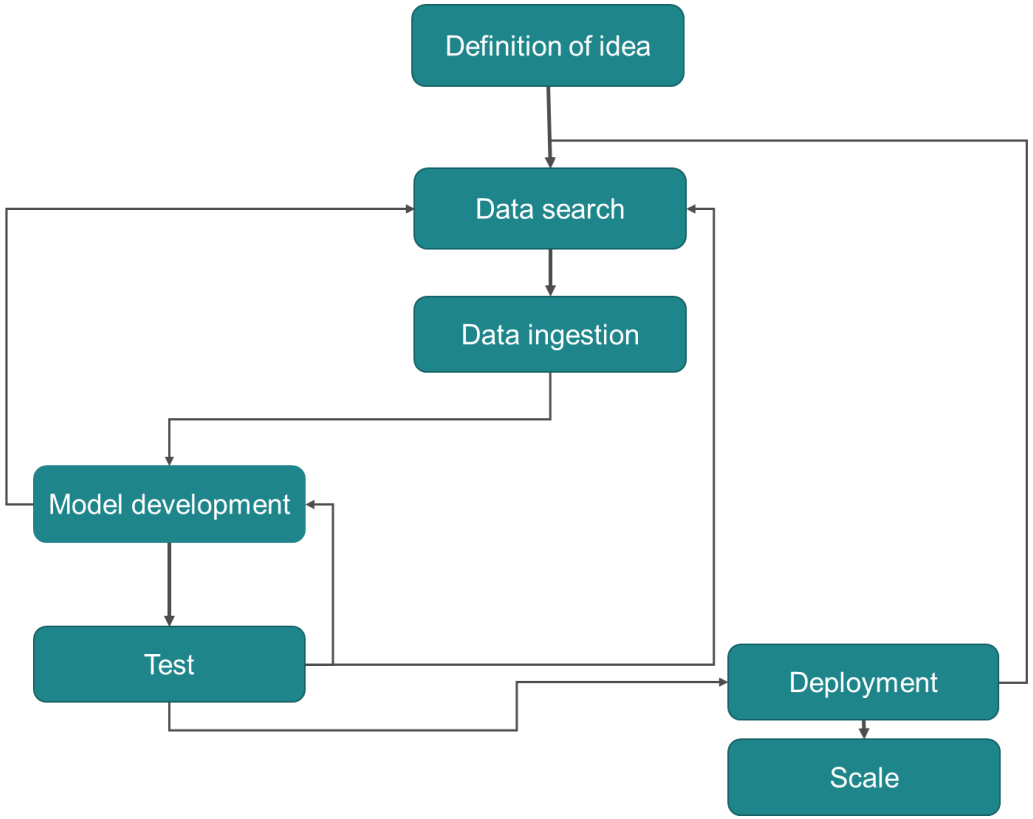


Development life cycle & available options

- Definition of a developer journey
  - considering emerging technologies & trends
  - based on some principles:

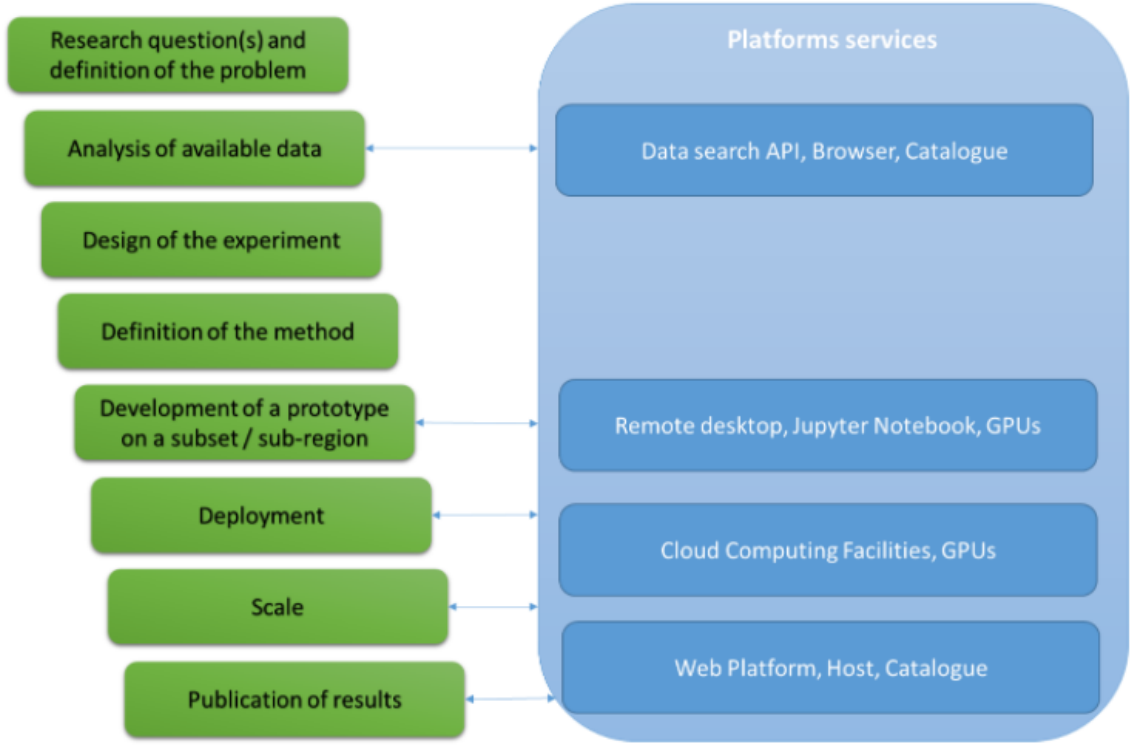


- prefer open source software
- avoid vendor/technology lock-in
- avoid approval processes for user projects as much as possible
- limit data movement as much as possible
- reuse existing tools/modules
- combine data from different infrastructures/services
- adhere to FAIR principles

Use-case driven requirement analysis

- Setup of prototypical data-driven EO applications
  - based on the knowledge from existing European pilots & the development life cycle
  - using European infrastructure
  - 2 use cases from different domains, addressed in an independent way

- Target
  - identify inefficiencies and bottlenecks
  - identify potential areas of improvement
  - document the utility, maturity and reusability of the technical stack
  - distill recommendations for GEO and EuroGEO



Final recommendations

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- When starting/developing an open source project
  - when possible, reuse the existing rather than developing new tools
  - choose an established license maximising compatibility and reuse (no custom licenses)
  - design with a user-driven & demand-driven approach
  - validate that user needs are satisfied
  - establish a governance and a community around the project to ensure sustainability

Final recommendations

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  - validate that user needs are satisfied
  - establish a governance and a community around the project to ensure sustainability

- Openness as a working culture
  - not only open source software, but open data, open standards, FAIR principles, etc.
  - partner with existing projects & communities (outreach, sponsor, etc.)
  - consider taking a role in the governance of software projects, open source communities, standardisation bodies, EO initiatives, etc.

Thank you!

and thanks to: Alexander Kotsev, Josep Soler Garrido, Jordi Escriu, Margherita Di Leo, Nicholas Spadaro, Gijs Hillenius

 marco.minghini@ec.europa.eu

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