

graph.openaire.eu

OpenAIRE Research Graph

Science as a public good

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OpenAIRE Research Graph and related services



Tracking Open Science

Reproducibility and transparency require tracking of all outcomes of science and related "context"



Monitoring Open Science

Monitoring quality, impact, and "open scienceness" of science should be a transparent, reproducible process for all, inclusive of research "context"

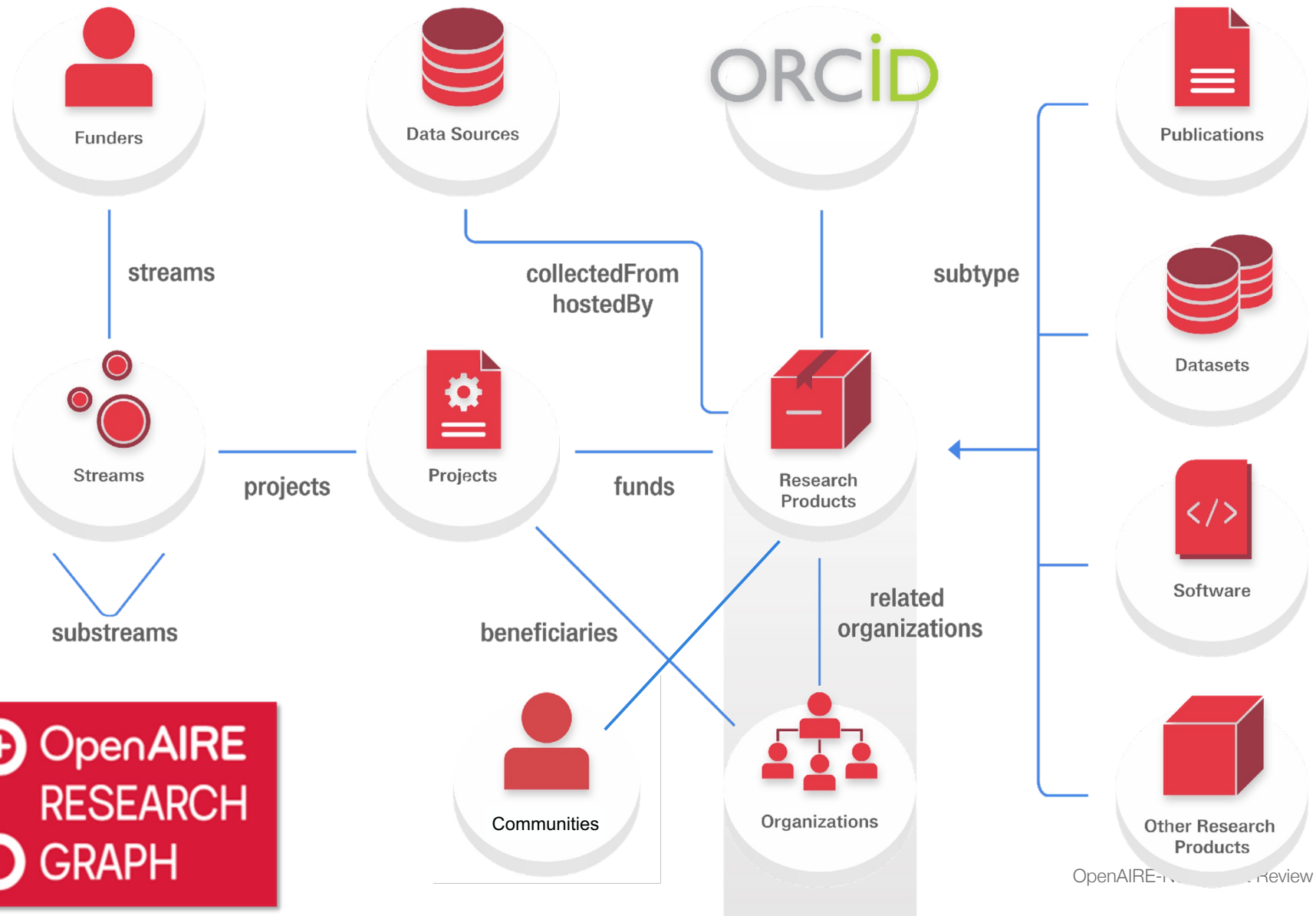


Discovery Open Science

Discovery of reproducible science outcomes must find new ways, driven by "scientific intentions" that go beyond the "find articles related to a research topic".

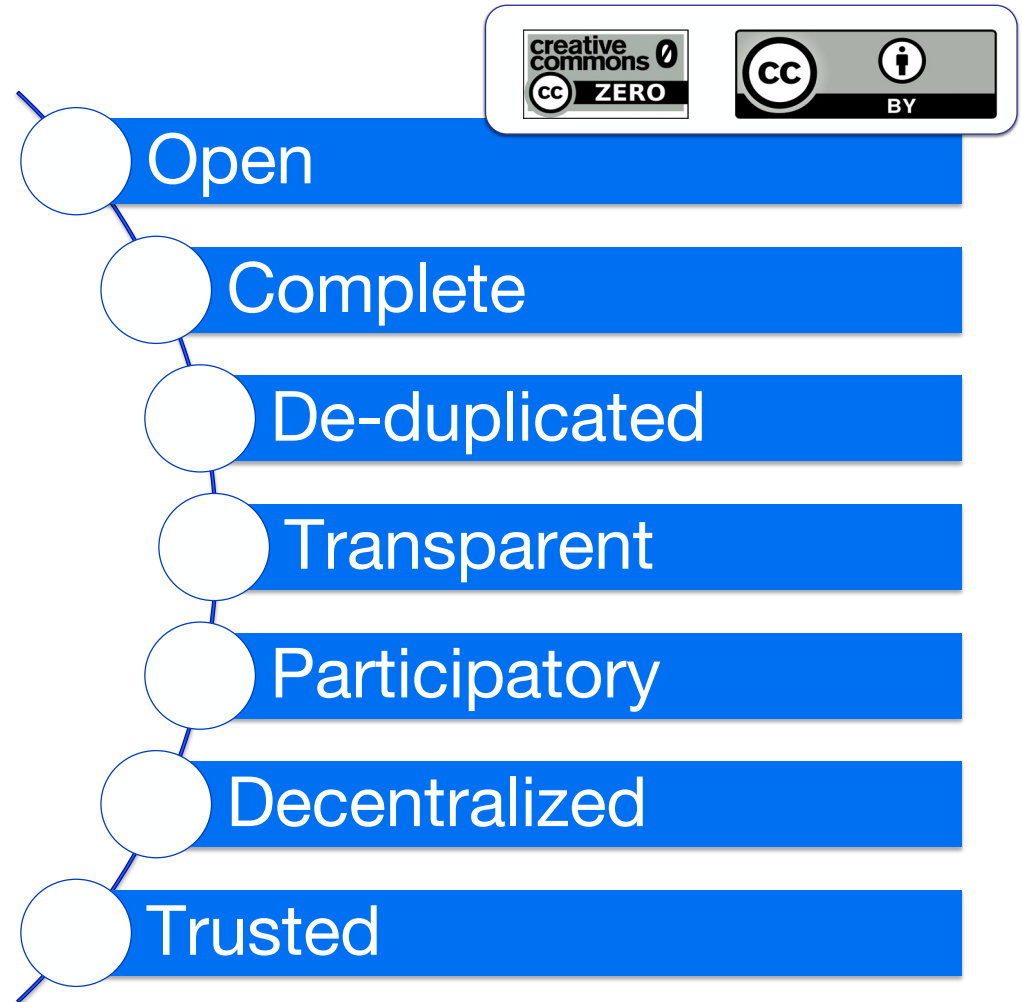


Tracking Open Science





Providing an **open metadata knowledge graph of interlinked scientific products, with Open Access information, linked to funding information and research communities**



Graph Data Sources

GitHub Applications Database
 Supporting

Software Heritage
 PRESERVING TECHNICAL KNOWLEDGE

elixir
 bio.tools

... and more **tools and software sources**

frontiers

PLOS Springer

F1000
 Faculty of 1000

... and more **publishers**

CORDIS
COMMUNITY RESEARCH INFRASTRUCTURE INFORMATION SERVICES

NSF
NATIONAL SCIENCE FOUNDATION

DFG
Deutsche Forschungsgemeinschaft

... and more **European and international funders**

unpaywall

OpenCitations

Microsoft

... and more **research graphs**

OpenAIRE
RESEARCH GRAPH

DataCite

re3data.org
REGISTRY OF RESEARCH DATA REPOSITORIES

ROR

Crossref

OpenDOAR

FAIRsharing.org
standards, databases, policies

ORCID
 ... and more **registries**

LA Referencia
Red de repositorios de acceso abierto a la ciencia

SciELO

DOAJ
DIRECTORY OF OPEN ACCESS JOURNALS

... and more **aggregators**

Cornell University Library

arXiv.org

RePEc

PubMed

HAL
archives-ouvertes.fr

zenodo
Research. Shared.

... and more **thematic and institutional repositories**

DARIAH-EU

elixir

EPOS
EUROPEAN PLATE OBSERVING SYSTEM

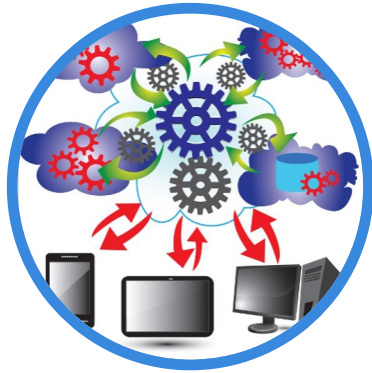
ECRIN
EUROPEAN CLINICAL RESEARCH INFRASTRUCTURE NETWORK

EOSC-Life

esi

... and more **infra and RI sources**

Data wrangling challenges



HETEROGENEITY
Standards, crosswalks,
community and cross-
community view

[GUIDELINES.openaire.eu](https://guidelines.openaire.eu)



QUALITY & ACCURACY
Trust and stability of the
data: researchers and
operators in the loop

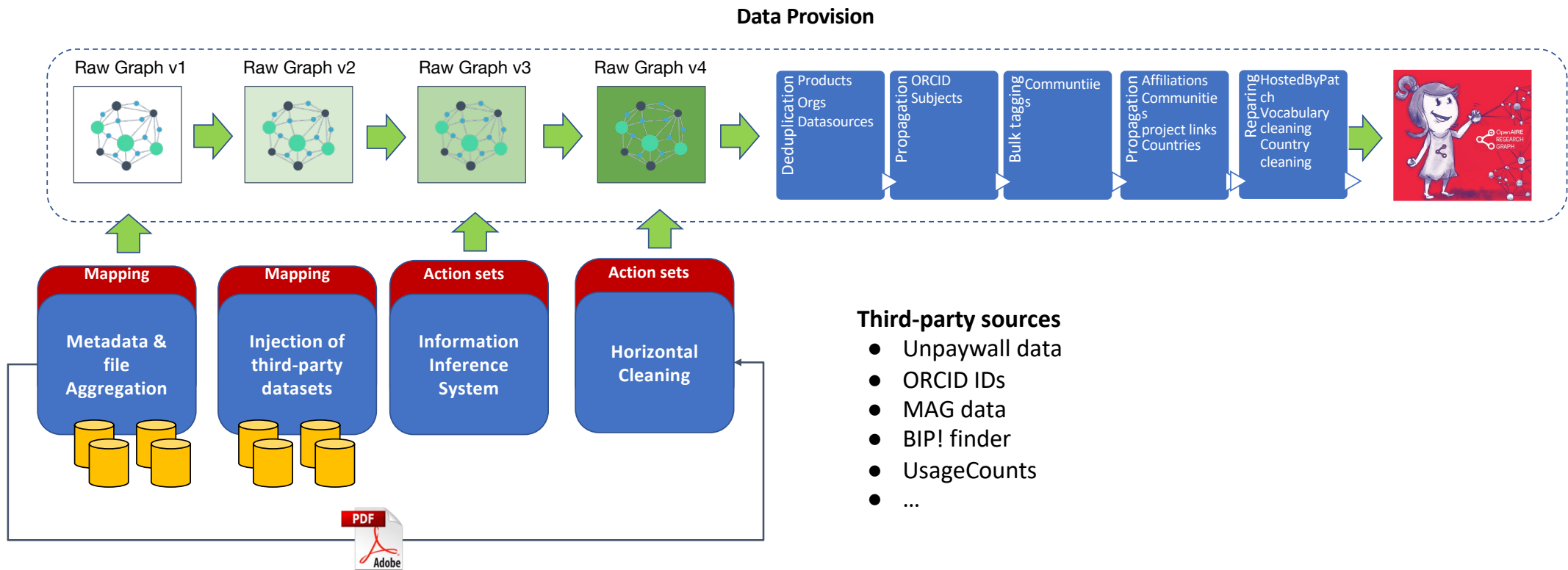
[PROVIDE](#) (validation,
brokering), user feedback,
PIDs



COMPLETENESS
Practices, sharing of
technology and data
(Knowledge Graphs)

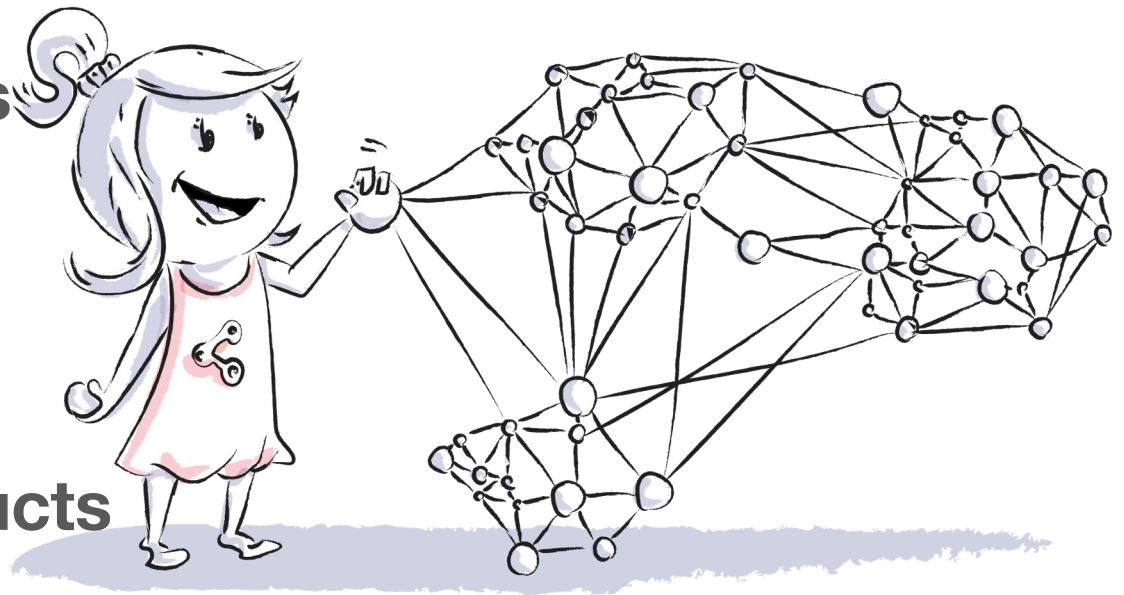
[Open Science publishing](#)
workflows, RDA OSG
interoperability

OpenAIRE Research Graph: the supply chain



OpenAIRE Research Graph in numbers

- **25** funders
- **111k** data sources/journals
- **2.9Mi** projects
- **145Mi** publications
- **311k** software
- **18Mi** research data
- **6.8Mi** other research products
- **4.5Bi** semantic links



PIDs in OpenAIRE

Authors

ORCID



Organizations

GRID

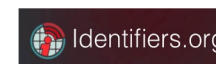
ROR



Products



arXiv.org



Funders/Projects



FCT Fundação para a Ciência e a Tecnologia



and other funders



Data sources

re3data.org
REGISTRY OF RESEARCH DATA REPOSITORIES

OpenDOAR

+ journal lists from publishers

DOAJ
DIRECTORY OF OPEN ACCESS JOURNALS



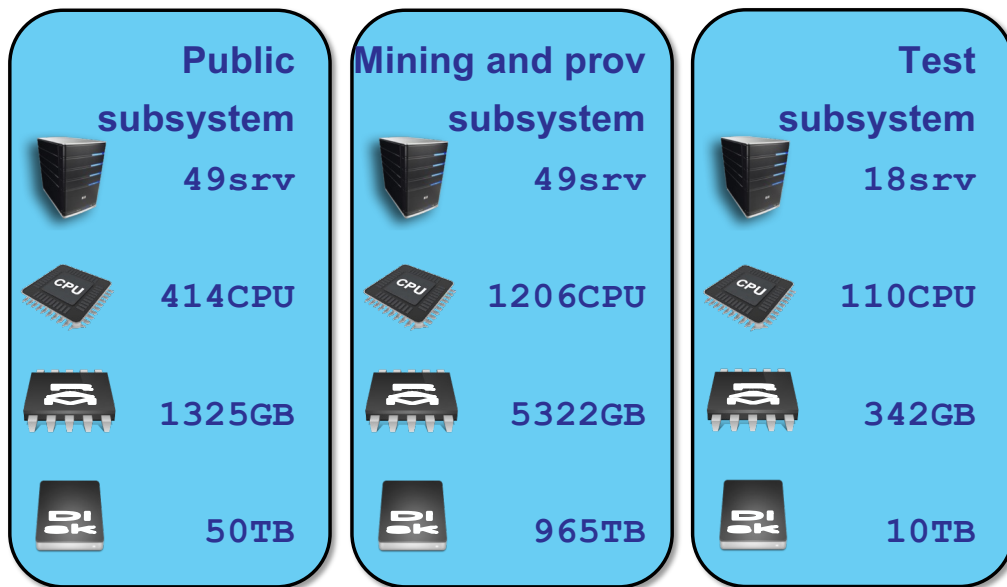
Services (fortcoming...)



EUROPEAN OPEN SCIENCE CLOUD

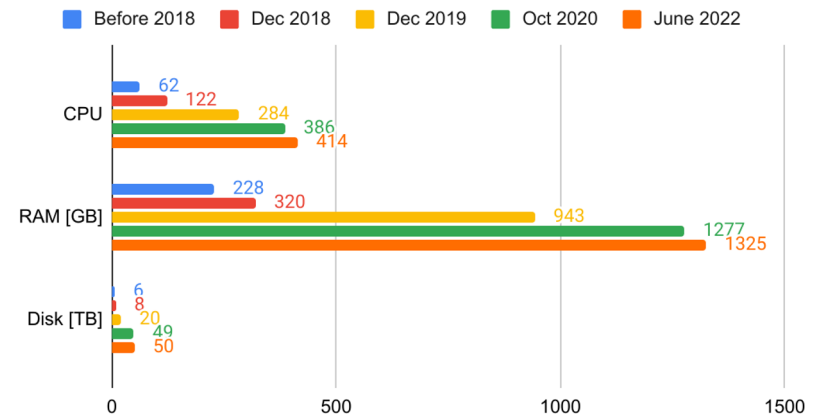
...Clusters and RIs service catalogues

System infrastructure

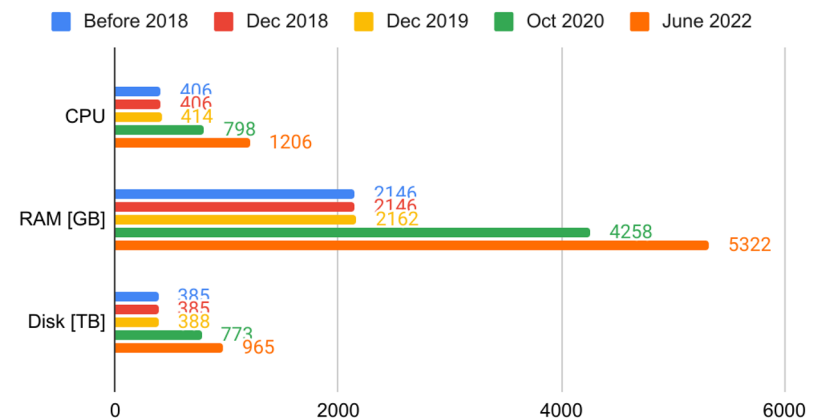


June 2022

Public subsystem resources



Data mining and provision subsystem resources



OpenAIRE | PROVIDE : data source managers



VALIDATE

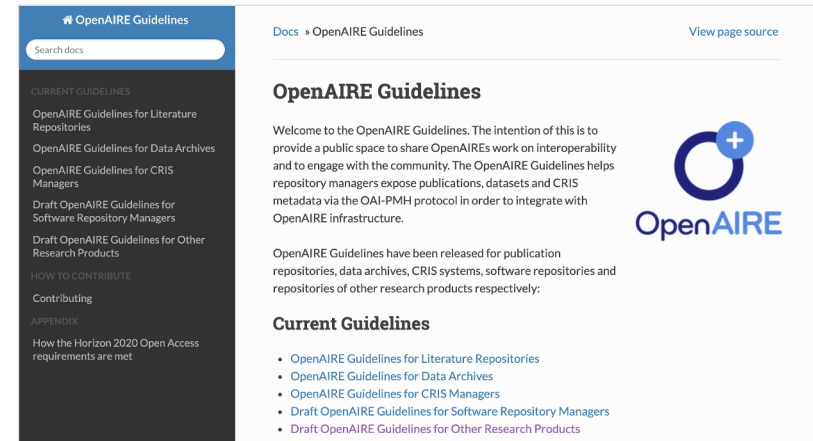
- **Registration of data sources**

- Repositories
- Data archives
- Software repositories
- CRIS systems



REGISTER

- **Validation against OpenAIRE/EOSC Guidelines**



OpenAIRE Guidelines

Search docs

Docs » OpenAIRE Guidelines [View page source](#)

OpenAIRE Guidelines

Welcome to the OpenAIRE Guidelines. The intention of this is to provide a public space to share OpenAIREs work on interoperability and to engage with the community. The OpenAIRE Guidelines helps repository managers expose publications, datasets and CRIS metadata via the OAI-PMH protocol in order to integrate with OpenAIRE infrastructure.

OpenAIRE Guidelines have been released for publication repositories, data archives, CRIS systems, software repositories and repositories of other research products respectively:

Current Guidelines

- OpenAIRE Guidelines for Literature Repositories
- OpenAIRE Guidelines for Data Archives
- OpenAIRE Guidelines for CRIS Managers
- Draft OpenAIRE Guidelines for Software Repository Managers
- Draft OpenAIRE Guidelines for Other Research Products

CURRENT GUIDELINES

- OpenAIRE Guidelines for Literature Repositories
- OpenAIRE Guidelines for Data Archives
- OpenAIRE Guidelines for CRIS Managers
- Draft OpenAIRE Guidelines for Software Repository Managers
- Draft OpenAIRE Guidelines for Other Research Products

HOW TO CONTRIBUTE

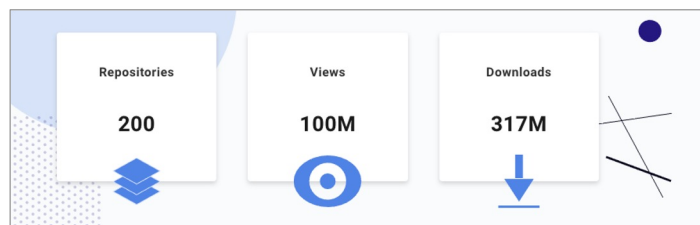
- Contributing

APPENDIX

- How the Horizon 2020 Open Access requirements are met

OpenAIRE **PROVIDE** : added value functions

Usage statistics for Institutional Repositories



Brokering of metadata



Improve your metadata. Get more connections

OA Broker service offers a wealth of information on scholarly communication data. Find out what interests you and subscribe to enrich your records.



ENRICH

Enrich Your Content - Browse Events	
More	Missing
ADDITIONAL METADATA INFORMATION THAT MAY ENRICH OR SUPPLEMENT UNIVERSIDADE DO MINHO: REPOSITORY CONTENT # OF EVENTS	MISSING METADATA INFORMATION THAT MAY ENRICH OR COMPLETE UNIVERSIDADE DO MINHO: REPOSITORY CONTENT # OF EVENTS





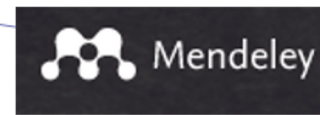
Usage

DEVELOP

Consumers



The Graph as EOSC Resource Catalogue



EBSCO



No.	Type	Title	authors	Title of the Journal/Book	Date of Publication	DOI	Project link	action
1	Book/Ch	Open Science Training Handbook	Sergio Brigos, April Chyl		06/04/2018	10.5201/2018-12124		X
2	Other	Project FOSTER Plus	Drinkers, Helene		01/09/2017	10.5201/2018-48124		X

No.	Type	Title	authors	Title of the Journal/Book	Number, date on top of the Journal/Book	DOI	Project link	action
1	Publist	Project FOSTER Plus	Drinkers, Helene				MendeleyLinkers35-08	X

Access to the OpenAIRE Graph and Scholexplorer

Graph: api.openaire.eu

The screenshot shows the OpenAIRE DEVELOP website. At the top left is the OpenAIRE logo with a plus sign and the word 'DEVELOP'. To the right are navigation links: OVERVIEW, AUTHENTICATION, BULK ACCESS, and SELECTIVE ACCESS. Below the navigation is a paragraph: 'The OpenAIRE APIs allow developers to access the metadata information space of OpenAIRE programmatically. If you have any question, please open a ticket to the [OpenAIRE Helpdesk](#).' Below this are three main service categories: 'Broker' (with a 'New!' tag and links to 'Documentation' and 'Swagger'), 'Bulk access' (with links to 'OpenAIRE Research', 'Graph Dumps', 'OAI-PMH', and 'Bulk access to projects'), and 'Selective access' (with links to 'Publications', 'Research data', 'Software', 'Other Research Products', and 'Projects').

Scholexplorer:
<http://api.scholexplorer.openaire.eu/v2/ui/>

The screenshot shows the Scholexplorer API 2.0 interface. At the top, it says 'Scholexplorer API 2.0' with '2.0.0' and 'OAS3' labels. Below this is a list of API endpoints with their methods and descriptions:

- LinkProvider : Operation related to the Link Provider**
 - GET /v2/LinkProvider Get All Link Providers
- LinkPublisher : Operation related to the Link Publisher**
 - GET /v2/LinkPublisher/inSource Get All Publishers that provide source object
 - GET /v2/LinkPublisher/inTarget Get All Publishers that provide target object
- Links : Operation related to the Scholix Links**
 - GET /v2/Links Get Scholix Links

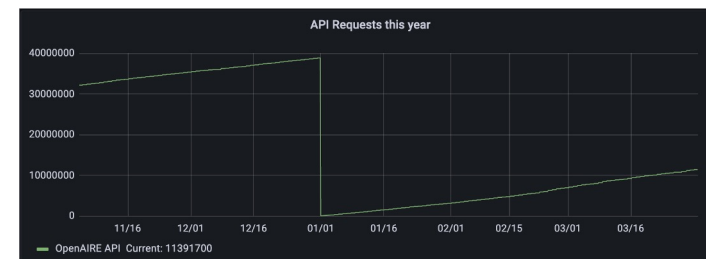
At the bottom, there is a 'Schemas' section with a dropdown menu for 'IdentifierType'.



Key Performance Indicators

API hits by 2021-12-31: 38Mi

Api hits in 2022 (May) : 11Mi



Dump title	views	downloads
<i>OpenAIRE Research Graph Dump</i>	5,589	4,539
<i>OpenAIRE Research Graph: Json schemas of the dump</i>	930	605
<i>OpenAIRE Research Graph: Dumps for research communities and initiatives</i>	840	391
<i>OpenAIRE Research Graph: Dump of funded products</i>	897	45,632
<i>OpenAIRE Research Graph: Json schema of the dumps for funded research products, research communities and initiatives</i>	657	138
<i>OpenAIRE ScholeXplorer Service: Scholix JSON Dump</i>	3,525	1,168
<i>The Scholix Metadata JSON Schema</i>	81	40
<i>OpenAIRE Covid-19 publications, datasets, software and projects metadata</i>	8,232	673
<i>OpenAIRE Research Graph: Dump for Transport Research community</i>	163	9
<i>DOIBoost Dataset Dump</i>	2,925	3,627
totals	23,839	56,822



Key Performance Indicators

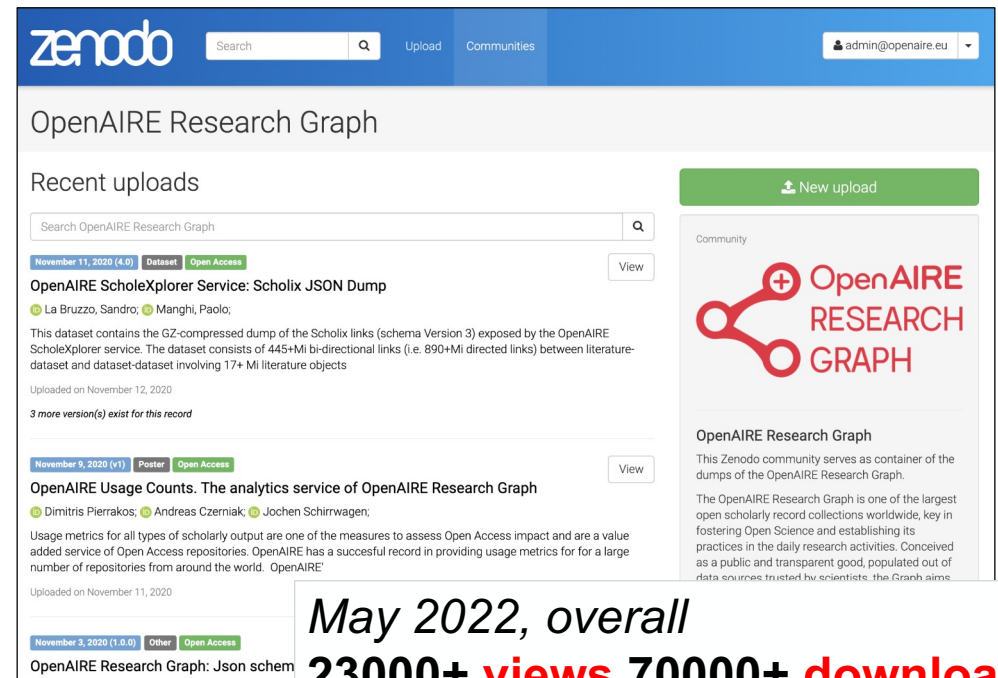


ScholExplorer

Service	VA KPI name	Point of reference (Basis)	Success Target	Success Target value (M30)	M12 value	Perc. of units provided
ScholExplorer	#APIrequests	555,000,000	160%	888,000,000	510,300,371	57%

OpenAIRE Research Graph: Dumps

- **OpenAIRE Research Graph**
- **OpenAIRE Funded products**
- **OpenAIRE COVID-19**
- **OpenAIRE communities**
- **DOIBoost**
- **OpenAIRE ScholeXplorer**
- **EOSC Graph**



The screenshot shows the Zenodo interface for the OpenAIRE Research Graph community. The page title is "OpenAIRE Research Graph". Under "Recent uploads", there are three items:

- November 11, 2020 (4.0) Dataset Open Access**
OpenAIRE ScholeXplorer Service: Scholix JSON Dump
La Bruzzo, Sandro; Manghi, Paolo;
This dataset contains the GZ-compressed dump of the Scholix links (schema Version 3) exposed by the OpenAIRE ScholeXplorer service. The dataset consists of 445+Mi bi-directional links (i.e. 890+Mi directed links) between literature-dataset and dataset-dataset involving 17+ Mi literature objects.
Uploaded on November 12, 2020
3 more version(s) exist for this record
- November 9, 2020 (v1) Poster Open Access**
OpenAIRE Usage Counts. The analytics service of OpenAIRE Research Graph
Dimitris Pierrakos; Andreas Czerniak; Jochen Schirrwagen;
Usage metrics for all types of scholarly output are one of the measures to assess Open Access impact and are a value added service of Open Access repositories. OpenAIRE has a successful record in providing usage metrics for a large number of repositories from around the world. OpenAIRE
Uploaded on November 11, 2020
- November 3, 2020 (1.0.0) Other Open Access**
OpenAIRE Research Graph: Json schem

On the right side, there is a "New upload" button and a community logo for "OpenAIRE RESEARCH GRAPH". Below the logo, it says "OpenAIRE Research Graph" and "This Zenodo community serves as container of the dumps of the OpenAIRE Research Graph." It also includes a paragraph about the OpenAIRE Research Graph being one of the largest open scholarly record collections worldwide.

May 2022, overall
23000+ views 70000+ downloads

zenodo.org/communities/openaire-research-graph





Call for collaboration

Improving quality and completeness the Graph

Data and infrastructure sharing
OpenAIRE support to access to Graph data (metadata and full-text) and access to full-text mining infrastructure

Embedding improvements as part of the data provision workflow of the Graph

Devising new Open Science services for the community

Improving service provision



Mining and collaborations

Collaboration with companies and research organizations

- Springer, Elsevier, ACM, SIRIS academics
- French Monitor, European Commission, RISIS infrastructure, VU Amsterdam Library,

How to open our mining infrastructure?

Open Full-text data for Download

On request access to mining resources

graph.openaire.eu

Thank you!

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