### **SWIPE RIGHT FOR THE SAKE OF SCIENCE!**

### FIND YOUR PERFECT MATCH IN OUR OPEN SCIENCE CURRICULUM





#### **Open Science Introduction** () 1,5h



Looking for: **Open Science Freshlings** 

#### Interests

Gamification

**Open Peer Review** 

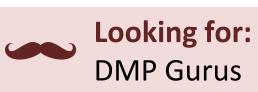
Scivil

**Open Educational Resources** 



Data Manag	ement Pla
•	

() 3,5h



#### Interests

Research Data Life Cycle

Real-life Examples



Project Management
<ul> <li>Looking for:</li> <li>Organisation Maestros</li> </ul>
Interests
Folder Structure File Naming
Tidy Data Version Control

#### More about me

Have already been vibing with Scivil in a consensual workshop to explore citizen science.



#### More about me

Cozying up with the learning styles of Kolb to teach about data management (plans).

DMP Bingo

#### More about me

Foreign affair with eScience Center (DCC Spring training day on 03/06/2021)





#### **Documentation and Metadata** (**b** 6h



Looking for: **Information FAIRies** 

Interests
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README

Metadata Standards

Data Repositories

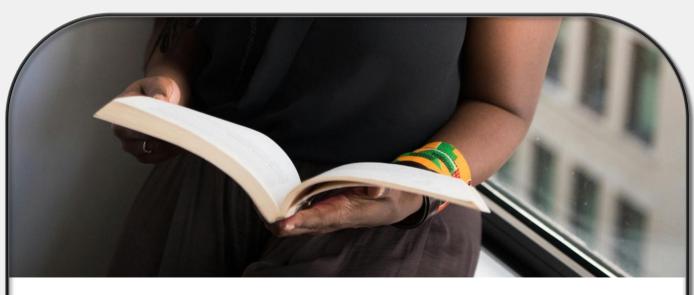


#### Linked Open Data (**\**) 4h



#### Interests

**Resource Description Framework** Wikidata SPARQL



#### **Open Access** (**\**) 7h **Looking for:** Scholarly Romeo's

Gold	Green	

Sherpa Romeo

**Creative Commons** 

#### More about me

A match made in heaven with the electronic lab notebooks training by Hanne Vlietinck (UHasselt).

FAIR

#### More about me

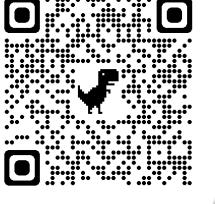
Let's get tangled up in a semantic web that mirrors the depth of our love.

More about me

Interests

No double dipping for me, I am only interested in the fair players.

#### Open Educational **Resources (NL)**



Guest lecturer of the Open Science curriculum: Jolien Berckmans (EhB/UHasselt) Head of the postgraduate Information management: Kevin Linsingh (EhB)



erasmus

HOGESCHOOL BRUSSEL

### Enabling FAIR Data through Peer-to-Peer support: The Brussels-Wallonia Federation Data Ambassadors Network



Biernaux, Judith (ULiège) jbiernaux@uliege.be Hoyas, Sébastien (UMONS) <u>sebastien.hoyas@umons.ac.be</u> Desterbecq, Joëlle (UCLouvain) joelle.desterbecq@uclouvain.be

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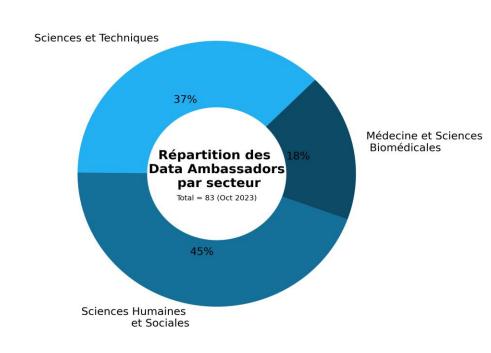
UNIVERSITE DE NAMUR



UCLouvain

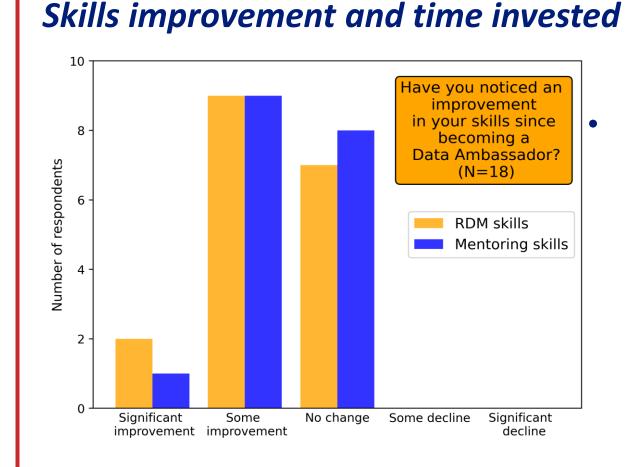
#### Introduction

- **Open Access Evolution and Response**: Since the Open Access Decree in 2018, FWB research organizations have embraced open access and are now extending it to open and FAIR datasets. Inspired by Cambridge and TUDelft, Research Data Officers (RDOs) in Wallonia-Brussels Federation (FWB) Universities built a **network of** *Data Ambassadors* (DAs) in a bottom-up fashion to promote FAIR data principles and data management with disciplinespecific expertise.
- **Community Growth**: Starting with 51 in 2021, the network **expanded to 83 members by 2024**, across all sectors. Initially with a mostly local impact, the network has broadened its scope with remote events, reaching beyond FWB to the international research community.



 Consolidation and Expansion: To sustain the network's rapid growth, RDOs of all FWB universities work to

#### Results



Jniversité de Mons

11 (N=18) respondents have reported an **improvement** in their self-evaluated RDM skills, for a **time investment** of less than a day to a few days per month.

### What skills are perceived as improved through their role of Data Ambassadors?

They can be grouped into 6 categories: **learning new contents** (legal aspects, qualitative data management, ...), **deepening or updating one's knowledge**, **broadening one's point of view** (approaching practices beyond one's laboratory), **structuring knowledge** that had sometimes remained informal, **identifying tools** in research data management, **identifying experts** and resource persons.

continuously ensure the satisfaction and effectiveness of the DAs, and specifically, the match between their experience and expectations.

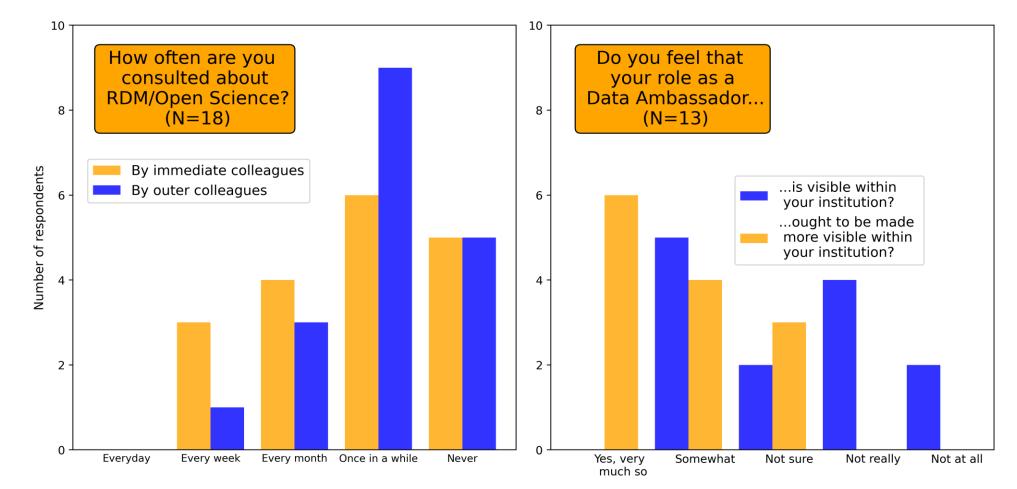
#### Method

- **Objective**: Understand and evaluate the DAs' experience and satisfaction after the first two years of operation, identify their needs and expectations in order to define priorities for the future of the network.
- Method: A comprehensive online survey was submitted to all DA's during the last two weeks of March 2024. The survey includes 26 questions covering both facts (activities, day-to-day tasks, ...) and perceptions (self-definition of their role, feeling of recognition, self-evaluation of skills, ...). The answers to the questions are examined from a quantitative and qualitative point of view.
- Sample: 18 members from the network provided data through the survey (N=18), with 6 questions for which only 13 answers were collected (N=13). The small number of respondents means that the results cannot be generalised from a statistical point of view, but it does meet the objective of understanding and evaluating the experience of Data Ambassadors.

#### Conclusions

- The community of FWB Data Ambassadors has grown to include a wide range of members with different profiles and statuses.
- Even though they are not regularly consulted and report a time investment of less than a day/a few days per month, several DAs have already put initiatives in place (mainly on-demand support and seminars).
- Certain DAs sometimes face practical obstacles, but also resistance to the very philosophy of open data within their work environment.
- The upskilling objective seems to be mostly achieved on an individual level.

#### Day-to-day role and visibility



- 13 (N=18) respondents are
   consulted at least once in a while as Data Ambassadors by their immediate and « outer » colleagues, with a majority of irregular consultations.
- Only 7 (N=18) respondents have reported feeling valued in their role, and only 5 (N=13) feel visible to their community as a DA. 10 (N=13) indicate feeling the need to be made more visible.

#### How is the role of a Data Ambassador perceived?

When we ask Data Ambassadors how they would summarize their role, we find several recurring perceptions. These representations can be grouped into 7 lexical fields: mediation or connection (relay, facilitator), transmission of knowledge (producing guidance, train, passing knowledge), support or guidance (advice, support, help), persuasion (promote, convince, raise awareness), exchange or sharing (share knowledge or good practices), affect ("*lower anxiety*") and "strategic" action (establish policy).

- The next step is to support DAs empowerment to scale it up to a collective level.
- To that end, DAs report the **need to be made more visible** and provided with **tools for their autonomous work**, such as training material.

**Caveat**: Because of the low proportion of respondents, who may be the most motivated in the larger sample, the results may be skewed towards a higher need for visibility and empowerment. Regardless, RDOs believe that a strong core of visible ambassadors will help transitioning into new data management practices collectively.

#### What's next ?

After its first couple of years, the network is **moving from its learning phase to its action-oriented phase**. For 2024-2025 it aims at :

- Reinforcing communication about the DAs individually and about the network
- Setting up a more visible web page and advertise DAs in their roles within their institution
- Creating a visual identity (logo, profiles, etc.)
- Provide DAs with tools that they can reuse autonomously in their communities, such as template training material

It should also be noted that the mission of the Data Ambassadors **sometimes comes up against certain obstacles**, such as resistance to change. Thus, the obstacles identified are both **practical** (limitation of time, diversity of data, reaching beginners) and sometimes **"epistemological"** (linked to the very philosophy of Open Data). One respondent said they had the impression of "*preaching in the desert*".

#### References

Grard, A., Biernaux, J., & Zahreddine, S. (2022). Joining forces: building a community of data ambassadors across universities in Brussels-Wallonia federation (Belgium) [Poster presentation]. 51st LIBER Annual Conference. Available at <a href="https://orbi.uliege.be/handle/2268/293219">https://orbi.uliege.be/handle/2268/293219</a>
Higman, R., Teperek, M. and Kingsley, D. (2018). Creating a Community of Data Champions, *IJDC VOL 12 NO 2 (2017)*, <a href="https://doi.org/10.2218/ijdc.v12i2.562">https://doi.org/10.2218/ijdc.v12i2.562</a>
Teperek, M., Cruz, M. J. Verbakel, E., Böhmer, J, and Dunning, A. (2018). Data Stewardship Addressing Disciplinary Data Management Needs, *IJDC Vol 13 No 1 (2018)*, <a href="https://doi.org/10.2218/ijdc.v13i1.604">https://doi.org/10.2218/ijdc.v13i1.604</a>
Connie Clare. (2021). 4TU.ResearchData: Building a community for FAIR data. <a href="https://doi.org/10.5281/zenodo.5666998">https://doi.org/10.5281/zenodo.5666998</a>

### **KULEUVEN**

KU Leuven RDM Competence Center Dieuwertje Bloemen, Ingrid Barcena Roig, Johan Philips, Kim Sterckx, Veerle Van den Eynden

### **From ManGO to RDR: interoperable RDM tools at KU Leuven**



Storage

In the data centers of

#### Automation

- Two copies are stored in different data

Event triggers

- Define processes that
- run upon a trigger
- Create automated

- ManGO (MANagement van Gegevens voor Onderzoek) is an active data management platform
- Based on the open-source software iRODS
- To store and manage research data during the active phase of research projects
- Different available clients:
  - a command-line interface
  - a Python API
  - a web interface.

#### centers

KU Leuven.

#### **Metadata**

- Can be added on file
  - or folder level
    - Added manually or via automation
      - Metadata schema's can be used

workflows

#### **Collaborate securely**

- System of permissions
- Manage on file and
- folder level
- Collaborate securely outside KU Leuven with Globus

#### **Findability**

- Each dataset gets its own DOI
  - The metadata is harvestable and openly available

#### Accessibility

- Download infrastructure is openly
- accessible
- Guidance on preferred file formats

#### Reusability

- 0,.0
- Multiple licensing options
- Versioning system
- Creation of DTA's for restricted data





- Detailed metadata
- In multiple metadata schema's/standards
- ReadMe file is mandatory

- RDR (Research Data Repository) is KU Leuven's institutional research data repository
- Based on the open-source Dataverse.org software
- To publish and archive 'finished' research data, typically at the end of a research project
- UI & API interface
- A data publication platform with a curation phase
- Connected to other KU Leuven RDM tools such as: ManGO, GitLab, OSF, SharePoint...

#### **RDR integration dashboard: connecting RDM tools**

RDR Integration МапGQ OneDrive dashboard pulls data from existing RDM tools, such as **RDR** ManGO GitLab s > SharePoint It compares the data source with what's already in the dataset GitHub Only transfers what has been changed

#### **Open Science to Open Source**

Goal: 1) Use open-source software whenever possible. 2) Make KU Leuven RDM work available and reusable for others whenever possible

- ManGO portal: available in open-source at: https://github.com/kuleuven/mango-portal
- Integration dashboard: available in open-source at: https://github.com/libis/rdm-integration
- ManGO is based on iRODS, available in open-source at: https://github.com/irods/irods
- RDR is based on the Dataverse project, available in open-source at: https://github.com/IQSS/dataverse/



### **OPEN SCIENCE IN SOLID EARTH SCIENCES** - THE CONTRIBUTION OF EPOS -



www.epos-eu.org @EPOSeu

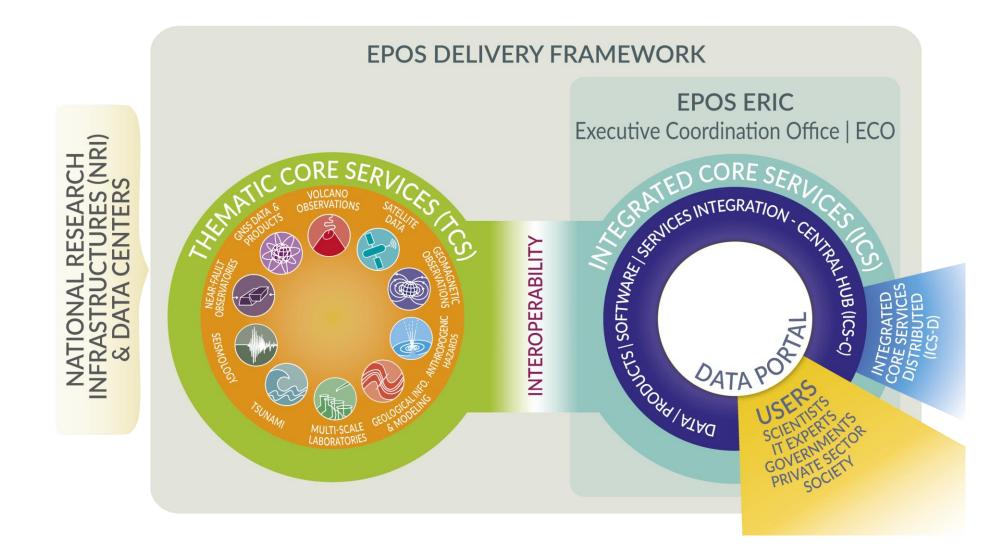


Carine Bruyninx J. Legrand, F. Bamahry A. Fabian, K. Van Noten VLIZB. VanhoorneFLANDERS MARINEF. HernandezINSTITUTES. Vermaere



F. Tanlongo V. Avramo

The European Plate Observing System (EPOS) is a distributed multidisciplinary infrastructure dedicated to the integration of data, services and resources of the solid Earth science research communities in Europe



#### AN INFRASTRUCTURE TO OPENLY SHARE SOLID EARTH SCIENCE DATA

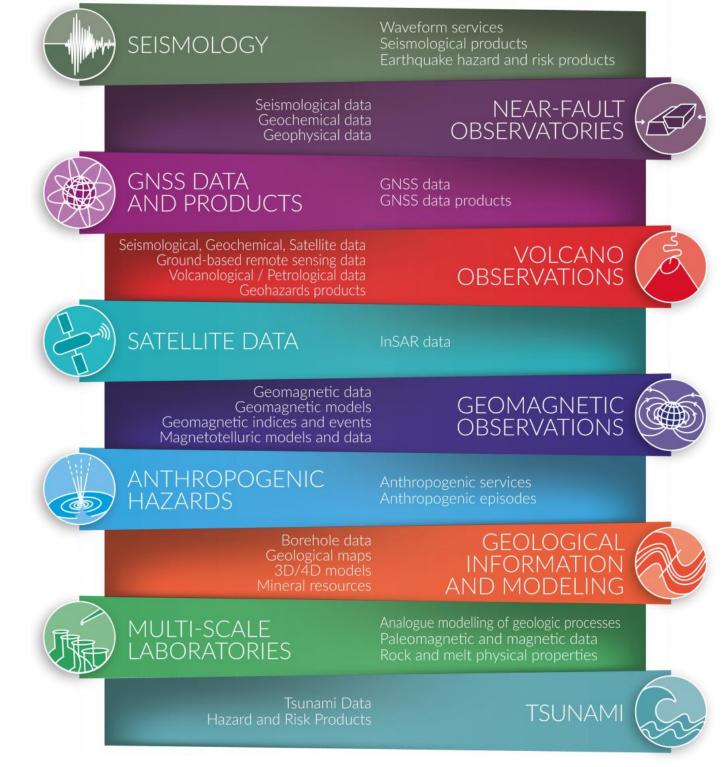
Understanding how the Earth works as a system is critically important to modern society. Volcanic eruptions, earthquakes, floods, landslides, tsunamis, weather, and global climate change are all Earth phenomena affecting society. EPOS aims to ensure a **sustainable and universal use and reuse of Earth science data and products** with the goal to facilitate the understanding of the dynamic processes of the Earth System.

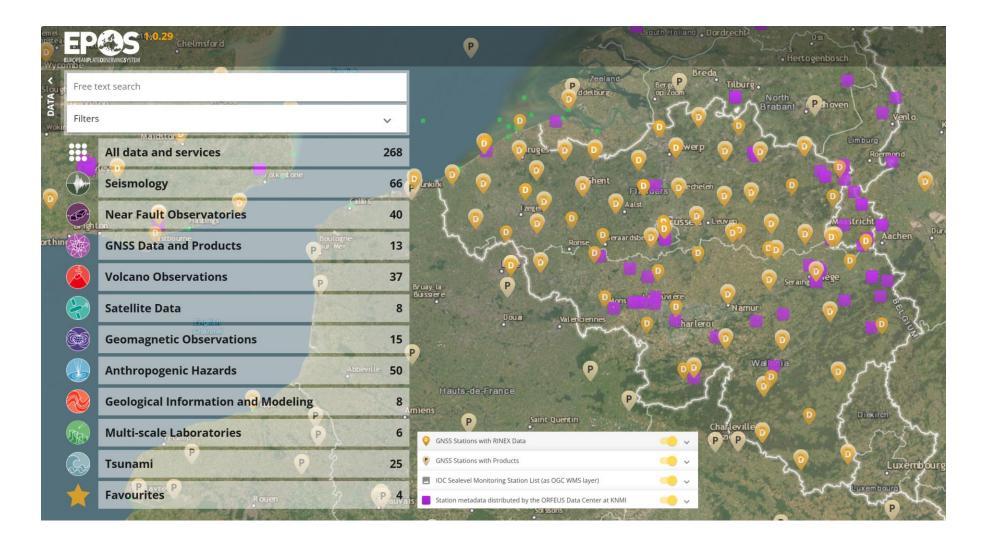
#### **THEMATIC CORE SERVICES**

The backbone of EPOS are Thematic Core Services (TCS), which cover **10 domains of the solid Earth science** (seismology, GNSS, geology, tsunami, satellite data, volcanos, multi-scale laboratories, anthropogenic hazards, near-fault observatories, geomagnetism). The TCS ensure EPOS scientific relevance as well as its adherence to the **real needs of the scientific communities** in terms of scientific data, services, and products.

#### **EPOS-BE**

Through the TCS, **Belgian research institutes and governments provide data and services to EPOS**. The Royal Observatory of Belgium provides GNSS and seismic data, and essential technical information on the measuring stations. The Flanders Marine Institute contributes by supplying metadata and real-time sea level data from the IOC-UNESCO Sea Level Station Monitoring Facility (SLSMF). All those data are then openly made available through the EPOS data portal.





#### THE EPOS OPEN DATA PORTAL: FAIR IN PRACTICE

The EPOS data portal is a user-oriented platform (https://www.epos-eu.org/dataportal) that facilitates data integration, access, use, and re-use. It puts FAIR principles into practice thanks to the adoption of a **co-development approach** and a constant **harmonization** involving scientists, developers and data providers.

Currently, the EPOS data portal contains contributions from 256 research organizations across Europe.





### **Fostering Open Science in the Arts and Humanities:** the CLARIAH-VL Open Humanities Service Infrastructure

#### What are DARIAH and CLARIN?

**DARIAH** is a pan-European infrastructure that enables excellent research in the Arts and Humanities by exchanging and sustaining tools, services, data and knowledge from its member countries and facilitating the wide uptake of digital methods.



**Digital Research Infrastructure** for the Arts and Humanities



https://www.dariah.eu

https://www.clarin.eu

**CLARIN**, a European Research Infrastructure

for Language Resources and Technology,

makes digital language resources available to

from

especially in the Humanities and Social

students

all

and

disciplines,

scholars, researchers,

CLARIN

Common Language Resources and

Technology Infrastructure

citizen-scientists

Sciences.

#### **Ghent Centre for Digital Humanities**

#### Activities:

- advice and guidance throughout the research project lifecycle where digital tools, methods or collections are used
  - with a specific focus on:
  - collaborative databases



#### What is CLARIAH-VL?

Aim: to embed high-quality, user-friendly tools and resources into the workflows of humanities researchers and pave the way for Flemish participation in the European Open Science Cloud

Funded by the Flemish Research Foundation (FWO) under the International Research Infrastructures (IRI) programme





#### **CLARIAH and Open Science?**

**CLARIAH-VL** is dedicated to preparing arts and humanities scholars in Flanders for active participation in the European Open Science Cloud (EOSC). It does so by:

- Active participation in the Flemish Research Data Network (FRDN)
- Close collaboration with the **Flemish Supercomputer Centre (VSC)**



Vlaanderen



#### University of Antwerp's Platform for Digital Humanities

#### Activities:

- Introductory BA course
- MA Track in Digital Text Analysis
- Summer School in Digital Humanities
- platform{DH} Lecture Series



- digital text analysis
- geospatial analysis
- research data management and training

#### Research groups:

- Inter-faculty Research Centre
- Hosted by the Faculty of Arts and Philosophy
- Faculty of Arts and Philosophy Library
- Ghent University's HPC Infrastructure



http://www.ghentcdh.ugent.be

#### Instituut voor de **Nederlandse Taal**

#### **Activities:**

- Language Technology Services
- Depositing service for textual material
- Disclosure of linguistic resources (mainly for Dutch)

Dutch Language Institute:

- Bi-national institute funded by Flemish and Dutch governments
- CLARIN-B technical centre
  - for Flanders
  - for the Netherlands

#### http://www.ivdnt.org/



/instituut voor de Nederlandse taal/

• Antwerp Time Machine

#### **Research Groups:**

- ACDC (Antwerp Centre for Digital humanities and literary Criticism)
- **CLiPS** (Computational Linguistics and Psycholinguistics)
- **CSG** (Centre for Urban History)
- University Library

http://uahost.uantwerpen.be/platformdh/

#### **VUB Platform for Digital Humanities (DIGI)**

#### Activities:

- **Support** digitally-enabled research across the Arts and Humanities
- focus on
  - digital collections
  - historical sociolinguistics
  - socio-economic history

**Research Groups:** 

- History
- Linguistics
- Literature
- **DINF** (University Library Artificial Intelligence Lab)

https://digi.research.vub.be/home/



### **Leuven Digital Humanities**

#### **Researchers**

#### Activities:

- sharing of knowledge and digital tools
- co-organising DH workshops, lectures, summers schools and conferences
- long-term preservation strategy for research data from DH projects at and beyond the university
- Advanced Master in Digital Humanities

#### **Research Groups:**

L1

- Ancient History & Archaeology
- Centre for Computational Linguistics
- Artes Library (DH Commons initiative)

#### https://www.arts.kuleuven.be/digitalhum anities





BRUSSELS PLATFORM

- Philosophy





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Birkholz, J., Chambers, S., Vandeghinste, V., Verbruggen, C., Daelemans, W., Lefever, E., Van Hulle, D., Soens, T., Jongepier, I., Hermenault, L., Hacıgüzeller, P., Lemmens, J., Bekius, L., Asadi, N.S., Neyt, V., Depauw, M., Van de Cruys, T., Pietowski, F., Fantoli, M., Gheldof, T., De Potter, P-J., Lamsens, F., Verbeke, D., Ducatteeuw, V., Debrulle, R, Singh, P., Van Hee, C., Danniau, F., Foket, L., Huskens, G., Thirukokaranam Chandrasekar, K.K., Ryckbosch, W. and Van Der Eycken, J. (2024) Fostering Open Science in the Arts and Humanities: the CLARIAH-VL Open Humanities Service Infrastructure, EOSC Tripartite Event | Belgium, Palais des Académies / Paleis der Academiën, Brussels, Belgium, 16th April 2024.



Strengthening the Digital Arts and Humanities in Flanders and beyond https://clariahvl.hypotheses.org/ 💥 @ClariahVl

### Towards a Belgian Federal Open Science Cloud (FedOSC)

#### The Belgian Federal Open Science Cloud (FedOSC)

**FedOSC**'s aim is to facilitate the integration of research data and publications from the Belgian Federal Scientific Institutions (FSIs) into the **European Open Science Cloud** (EOSC).

**FedOSC** will provide domain-specific data management expertise to support the thematic clusters of the FSIs.





https://www.belspo.be/belspo/fsi/index\_en.stm

#### A collaborative initiative

Collaboration between:

- Belgian Science Policy Office (BELSPO)
- Belgian National Research Network (Belnet)
- Belgian Federal Scientific Institutions (FSIs)







#### **FedOSC** activities

- Best practices in :
  - Research Data Management (RDM)
  - **FAIR+** (FAIR+ includes long-term storage and preservation of research data)
  - CARE



- Topics:
  - Long-term storage
  - Preservation
  - Ethical and legal considerations
  - Unique identification of data and publications (Persistent Identifiers)
  - $\circ~$  Inter-linking of data, publications and other research outputs will also be considered

#### The role of the Data Stewards

A team of **4-5 Data Stewards** led by the **FedOSC Project Manager** (Belnet) will provide domain-specific data management expertise to support the four thematic clusters of the

FSIs:

3.

- . Art
- . Nature
- Space

#### https://www.belspo.be/belspo/index\_en.stm https://belnet.be/fr

Interrelationships:

- ESFRI Research Infrastructures and Science Clusters
- European Strategy for Data
- European Open Science Cloud (EOSC)
- Common Data Space Initiatives
- Flemish Open Science Board (FOSB)
- Flemish Research Data Network (FRDN)
- Open Science in Wallonia

#### Phase 1: Inventory of Datasets and Needs Analysis

#### Goals:

- Identify the needed support to make the data FAIR and compatible with the EOSC interoperability Framework
- Focus on key challenges and shared needs across the FSIs

#### Activities:

- Inventory of data sources managed by FSIs (which are:)
  - KMKG-MRAH
  - KMSKB-MRBAB
  - KIK-IRPA
  - KBIN-IRSNB
  - KMMA-MRAC
  - BIRA-IASB
  - KMI-IRM
  - KSB-ORB and Planetarium
  - RA-AE

- 4. Documentation
- 5. Integration of other FSIs or Belgian Institutes

This domain-specific expertise is essential to ensure a high-quality Federal Open Science Cloud (FedOSC).

#### Phase 2: FedOSC Implementation

#### Goals:

Implement **a plan** to support onboarding of a selected number of federal data sources into EOSC

#### Activities:

- Developing services and infrastructures (Belnet) according to the needs of the FSIs
- Include common services
  - Orfeo
  - SODHA
  - $\circ~$  Domain-specific services



https://orfeo.belnet.be/ orfeo



#### Phase 3: Sustaining Federal Open Science and Open Data activities

#### Goals:

Develop a long-term strategy to sustain Open Science and Open Data activities at the FSIs

#### Activities:

The long-term strategy will take into account:

- Role of the FSIs in delivering data sources from the EOSC
- EOSC EU Node and the future shape of the EOSC Federation
- Belgian strategy towards EOSC, including EOSC Nodes as part of the EOSC Federation
- Role of domain-specific expertise in EOSC, see Science Clusters: Position Statement on operational commitment to EOSC and Open Research

(https://doi.org/10.5281/zenodo.10732049)





• Selection of potential datasets for onboarding to EOSC





Chambers, S., Fremout, W., Bruyninx, C., Kauranne, S., Vanholsbeeck, M., Claessen, E., Bercegeay, M.-S., Monteny, F., Osstyn, D., Haex, D., Deriemaecker, N., Strobbe, F., Miglio, A., (2024) *Towards a Belgian Federal Open Science Cloud (FedOSC)* - a poster for *The European Open Science Cloud (EOSC) and national/regional Open Science Policies,* Brussels, 16 April 2024.



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 Towards a Belgian Federal Open Science Cloud (FedOSC)

 Mttps://www.belspo.be/belspo/index\_en.stm
 https://www.belspo.be/belspo/index\_en.stm

 @belspo
 @belnet\_be
 @KBRbe
 @nat\_sciences\_be
 @kikirpabe
 @ORB\_KSB

### **ELIXIR** European Research Infrastructure for data in life sciences

https://www.elixir-belgium.org https://elixir-europe.org

ELIXIR is an intergovernmental organisation that brings together life science resources such as

- databases
- software tools 7-7
- training resources

- interoperability resources
- compute resources
- data management support

to coordinate bioinformatics resources across Europe to form an interconnected infrastructure

#### **Research Data Management**

The toolkit for research data management in life sciences: Best practices and guidelines to help you make your data FAIR

#### **Sensitive Data Infrastructure**

The GDI project is enabling access to genomic and related phenotypic and clinical data European across Europe, by establishing **Genomic Data** a federated, sustainable and Infrastructure secure infrastructure.

BELGIUM

#### https://rdmkit.elixir-europe.org

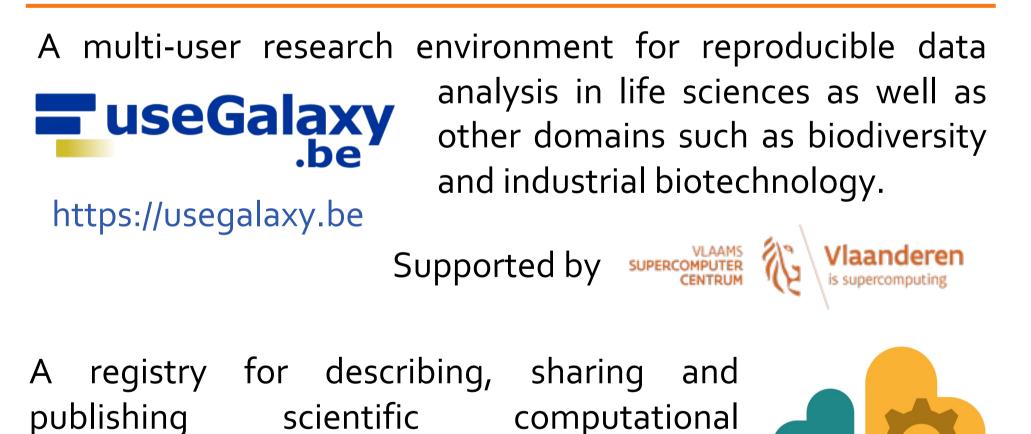


A platform to enable FAIR-by-design: make FAIR data practises part of the daily research process, and submit high quality annotated data to community repositories

https://datahub.elixir-belgium.org

RO-Crate FAIR Digital Object is а implementation based on linked data formats, which allows for packaging data with rich metadata to make it actionable and improve **RO-Crate** interoperability. https://researchobjectorg/ro-crate/

#### **Reproducible Data Analysis**





https://gdi.onemilliongenomes.eu

We build on the outputs of the Beyond 1 Million Genomes (B1MG) project to realise the ambition of the 1+Million Genomes (1+MG) initiative, and contribute to the establishment of the European Health Data Space (EHDS).

In Belgium, we are building an extended network of trust including health researchers, a framework "Federated Learning for Everyone" (FL4E) and a toolkit to enable its adoption by researchers and infrastructures.

**WiNGS** 

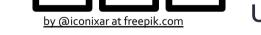
https://wings.esat.kuleuven.be

#### Training

By using active learning, training is invested in upskilling researchers and all scientific staff in data management, data science, reproducible analysis and handling of sensitive data while encouraging the adoption of Open and FAIR Science practices. We also focus on the effective

integrated with GitHub and workflows, Workflow Management Systems.





use of the ELIXIR Belgium Node services.

https://workflowhub.eu

https://www.elixir-belgium.org/training https://www.elixir-belgium.org/services

#### ELIXIR Belgium is hosted by VIB, as part of VIB Data Core, and has as partners:





#### THE JOURNEY OF RESEARCH DATA MANAGEMENT AND OPEN SCIENCE AT HASSELT UNIVERSITY

#### DIRECTORATE RESEARCH, LIBRARY AND INTERNATIONALISATION



KNOWLEDGE IN ACTION

#### **CIVIC UNIVERSITY**

"Connected to a strong region"

Learning

Inclusive

International

Sustainable



#### FRAMEWORK

The principles of Open Science, Open Innovation, and Openness to the World are put into practice through our institutional **Research Data Management Policy** and **Open Access Policy**.



#### NETWORK

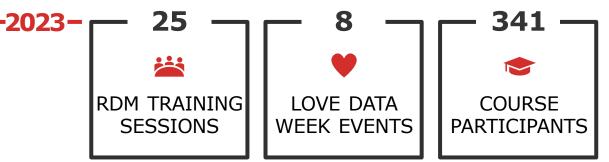
Facilitating knowledge exchange across regional, national, and international levels through communities of best

practices, such as the Flemish Research Data Network (FRDN), Flemish Interuniversity Council (VLIR), European Open Science Cloud and VLIR-UOS.



#### **SUPPORT**

A dedicated team of data stewards and legal and IT support is available throughout the research data management (RDM) lifecycle. Complemented by **open educational resources** and targeted training to elevate our researchers' Open Science practices.



#### TOOLS

Institutionally supported tools to optimize the RDM lifecycle encompass DMPonline for writing a data management plan (DMP); **electronic lab notebooks** such as Signals, eLabFTW, and Castor EDC to promote open methods; and the **UHasselt Metadata Repository** (UH MDR) to monitor research output such as publications and datasets.



#### **ROAD AHEAD**

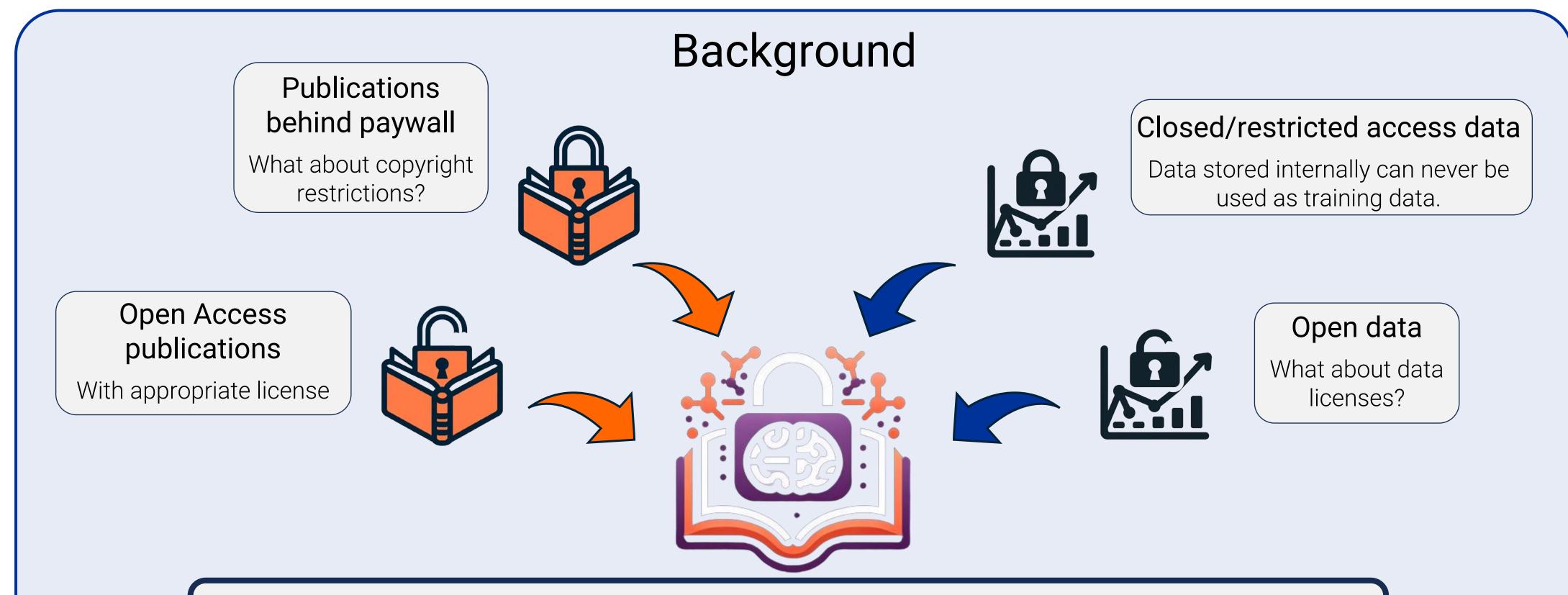
More Open Science initiatives drive UHasselt forward!



uhasselt.be/rdm

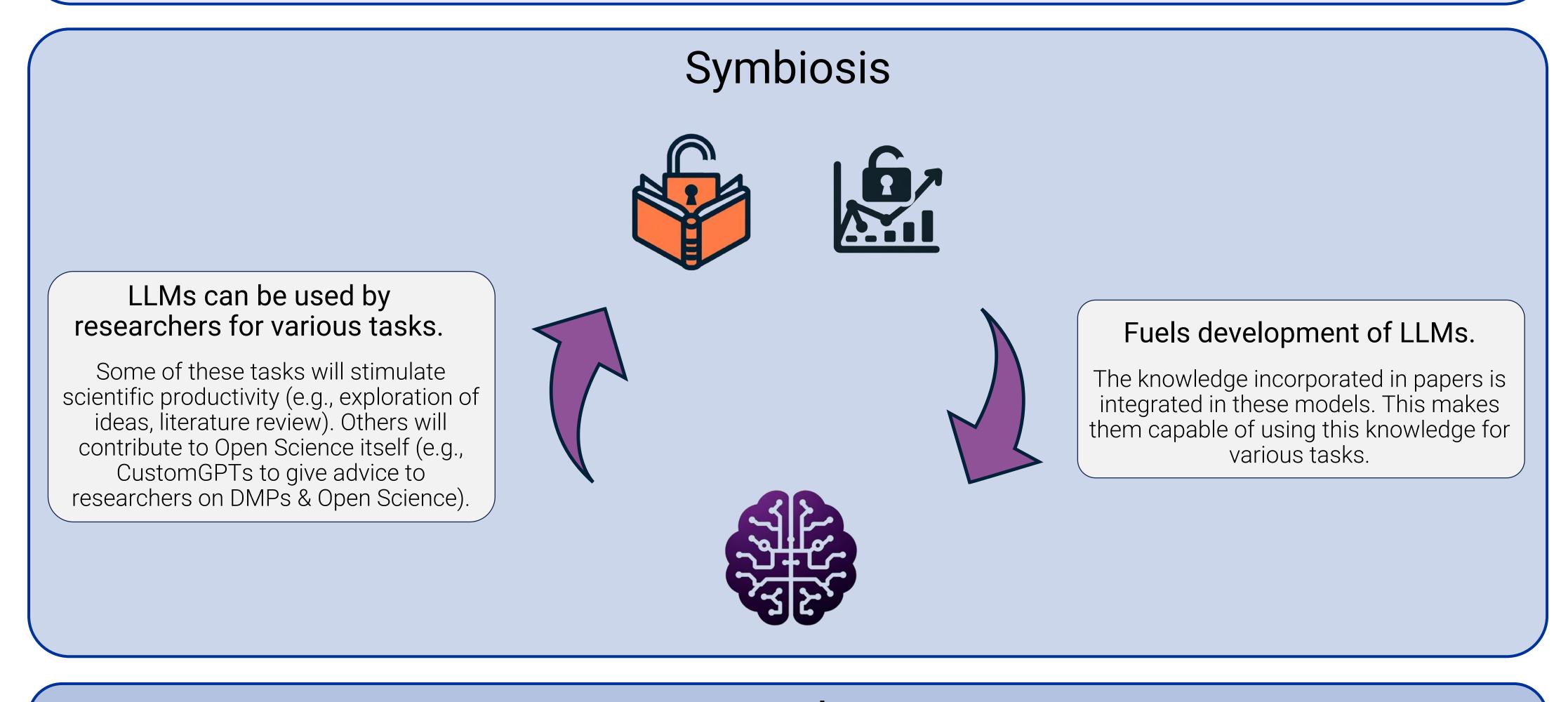
### Bridging AI and Open Science: The Synergy of Generative AI and Open Science for Scientific Discovery

Pieter De Bruyn, Thijs Devriendt and Elisa Maes

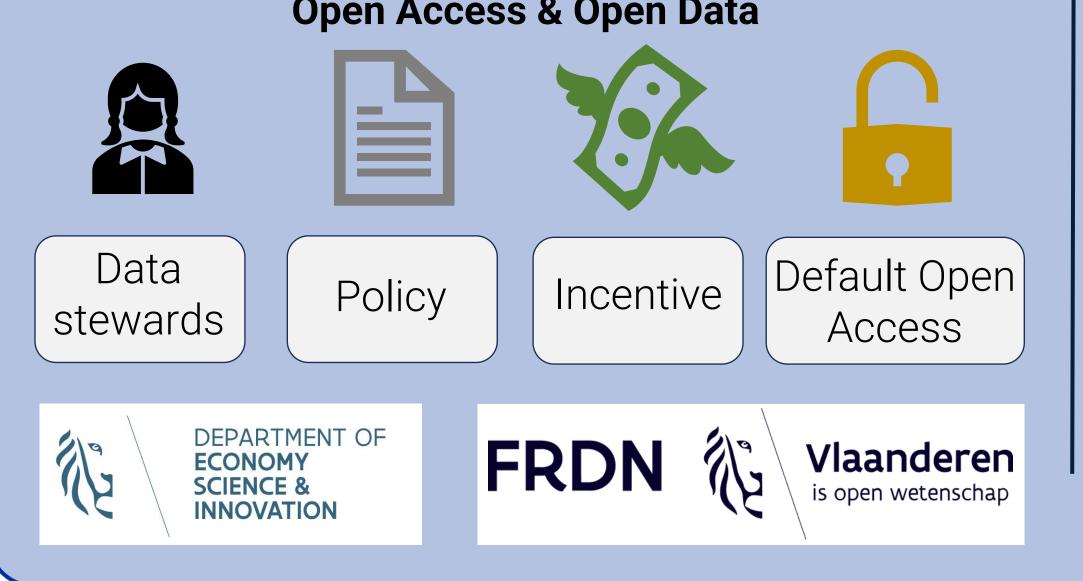


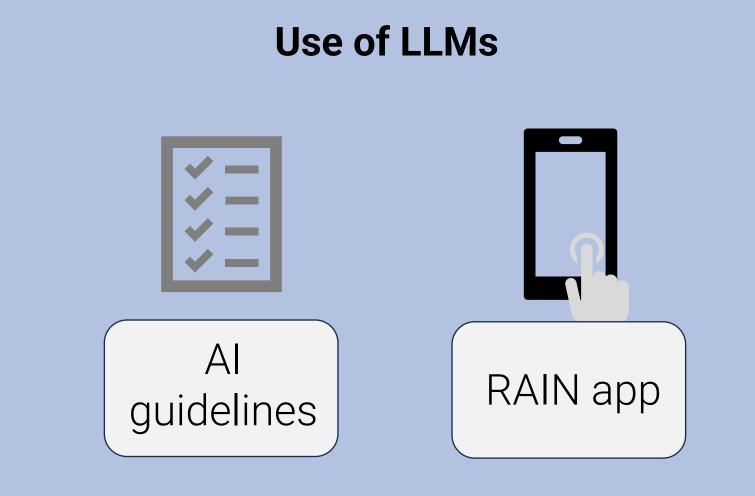
All available data, including publications, are made part of the training data of Large

Language Models (LLMs). They individually contribute to the capabilities of these LLMs.



#### Stimulus





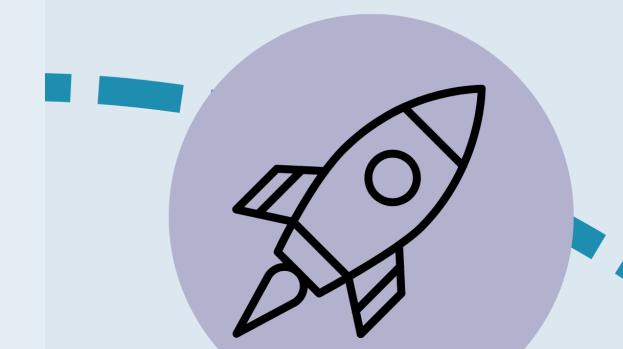




Strengthening collaboration with society and stimulating citizen science as a research method: A unique citizen science call and project at KU Leuven

Authors: dr. Katrijn De Brucker, dr. Sara Decoster, Jozefien De Marrée, Kristof Haex, dr. Marlies Lambrecht, prof. dr. em. Joos Vandewalle

### Launch call: Oct 22



From academic citizen science call to a project with societal impact

Criteria

- At least 3 applicants affiliated with **3 different groups** and at least **2** different campuses and/or partners of Association
- Co-creation with a **societal partner** is encouraged
- Intended **societal impact** of the research
- Open for **multidisciplinary** research
- Citizens should be actively involved and have a clear added value
- Project should aim to inform and engage citizens and students
- Project leads to increased visibility of KU Leuven in context of topic



### **Peer review: May-Sept 23**

• Declaration of Intent: 26 January 2023 • Full Application: 11 May 2023

Selection criteria for full proposals: 1) Criteria related to **science** itself, including a methodological component (citizen science) 2) Citizen engagement & societal impact 3) **Organisation of the project** in relation to the postulated societal challenge 4) Quality of the proposed **budget** plan

### Goals

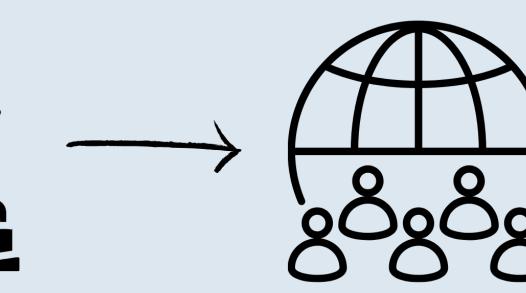
- Valuable research
- Enhancing visibility of citizen science as method within academic community
- Societal impact



### **Public online voting: Nov 23**



The three highest evaluated project applications were presented at the KU Leuven website through videos and summaries, open to vote for during 2 weeks.



### Start elected project - Jan 24

'From Bystander to Hero'

• Consortium: researchers with expertise in

emergency medicine, interpreting studies, mass communication and statistics and risk

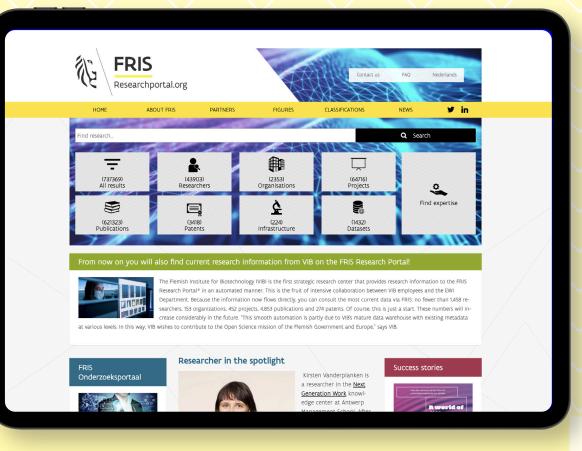
- Aim: engaging citizens together with city services, to improve survival rates after out-ofhospital cardiac arrests
- Budget: €750.000/3years

First project results will be presented during festivities of the 600th anniversary of KU Leuven to promote citizen science and the societal relevance of science at KU Leuven.

#### OPEN SCIENCE MONITORING IN FLANDERS USING FRIS, THE REGIONAL CRIS



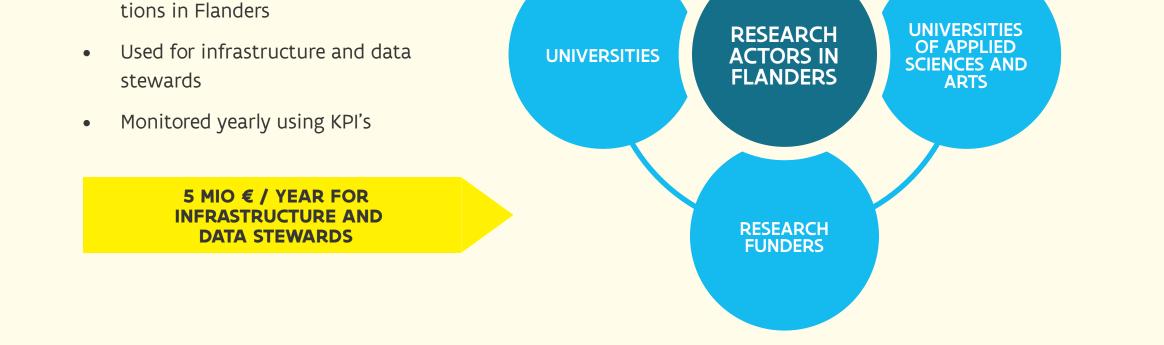
#### **Flanders** State of the Art



#### FRIS (Flanders Research Information Space)

is a regional Current Research Information System (CRIS) and portal that collects research information of publicly funded research performed in Flanders. The portal offers a unique window increasing the visibility of research in Flanders to researchers and the wider public. At the same time, it is a rich information source for reports, analysis and statistics for better policy making.

# COECC METADATA OF DATASETS ADVITOR KPI'S Initiative of Flemish government (2019) Governed by the Flemish Open science Board (FOSB) S mio € / year Granted to all knowledge institu-



#### researchportal.be/en

#### **SETTING UP OPEN SCIENCE MONITORING**

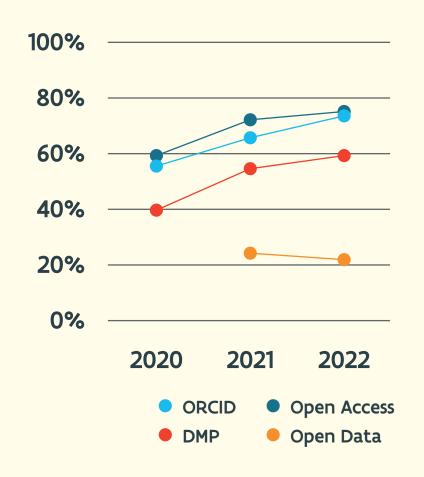
DEFINITION OF KPI'S AND SETTING GOALS	<ul> <li>In FOSB Working Group RDM and Open Science involving all research actors.</li> <li>Collaborative effort and consensus.</li> <li>5 KPI's: ORCID, Data Management Plan, Open Access of publications, FAIR Data, Open Data.</li> <li>Goals were set in 3 tracks with varying degree of ambition.</li> </ul>
EXTENSION OF THE RESEARCH INFORMATION MODEL	<ul> <li>In FOSB Working Group Metadata &amp; Standardization involving all research actors.</li> <li>Creation of a common metadata model for datasets.</li> <li>Adoption of this model by all research actors and implementation in their CRIS's.</li> </ul>
EXPLICITING THE METRIC METHODOLOGY BASED ON THE INFORMATION IN FRIS	<ul> <li>Translation of definitions into detailed technical specifications for measurement using FRIS data.</li> <li>Advantages:         <ul> <li>transparency</li> <li>consistency and comparability</li> <li>less administrative burden when using FRIS data</li> </ul> </li> </ul>

#### • Measured since 2020 (ORCID, DMP, Open Access) and

#### **OPEN SCIENCE KPI'S**

- **ORCID KPI:** Researchers that receive public funding should have an ORCID
- **DMP KPI:** Projects that receive public funding should have a Data Management Plan (DMP)
- **Open Access KPI:** Peer-reviewed journal articles resulting from publicly funded research should become available in Open Access
- **FAIR KPI:** Research data underlying journal articles resulting from publicly funded research should become as FAIR as possible
- **Open Data KPI:** Research data underlying journal articles resulting from publicly funded research should become as open as possible

#### OPEN SCIENCE KPI'S FLANDERS



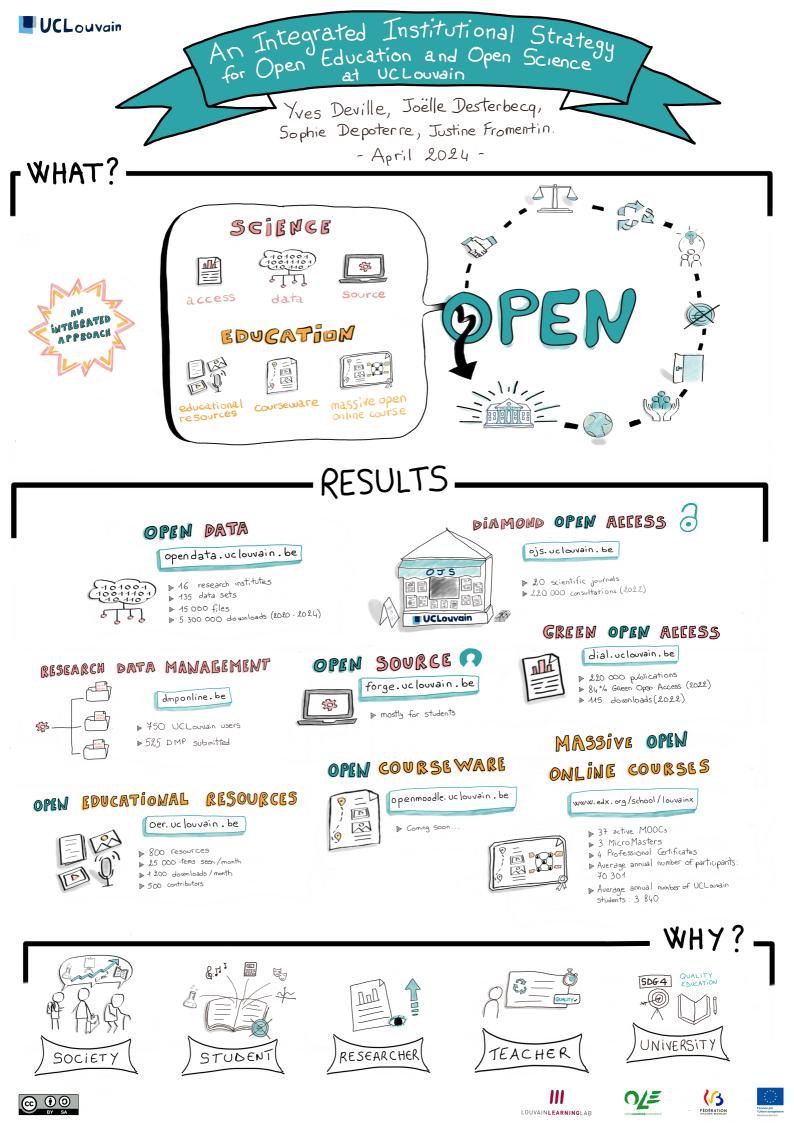
MEASUREMENT OF THE KPI'S	<ul><li>2021 (Open Data). The FAIR KPI is put on hold until international metrics are developed.</li><li>Monitoring of progress (see figure).</li></ul>
EVALUATION OF THE METRICS	<ul> <li>Yearly review by FOSB Working Group RDM and Open Science.</li> <li>Evaluation of the Open Science Initiative in 2024, including KPI metrics.</li> </ul>

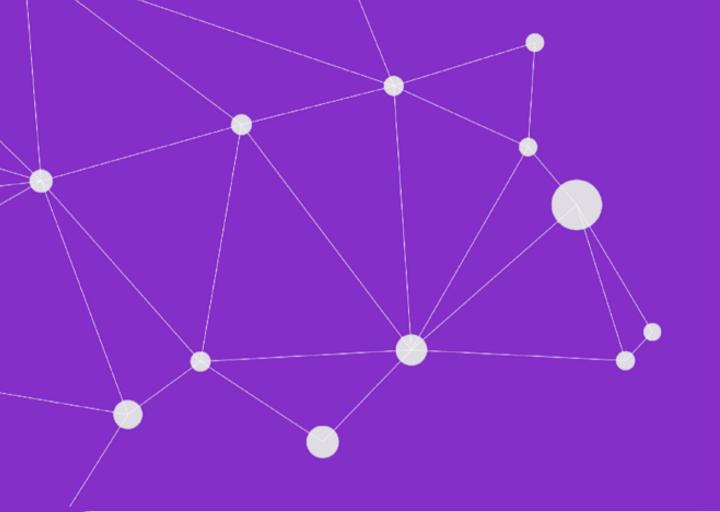
#### CONCLUSION

- Open Science policy: moving all research actors in Flanders towards Open Science
- Intensive collaboration with all research actors (change management)
- Monitoring using 5 KPI's: transparant, consistent and comparable, less burden when using FRIS data
- Evaluation of Open Science initiative and KPI's in 2024



DEPARTMENT OF ECONOMY SCIENCE & INNOVATION





### Enriching Metadata in the Flemish Research Landscape



Dhollander, Evelien 1, a, b, c; Kevin Leonard, 1, c, d; Neyens, Evy 2; Bloemen, Dieuwertje 3; Wuyts, Tom 4; Dengis, Pascale 4; Portier, Marc 5, c 1 Ghent University; 2 ECOOM; 3 KU Leuven; 4 FRIS; 5 VLIZ

a conceptualization; b Writing (first draft); c Writing (review and editing); d visualization (data presentation)



### Objectives

- Reduce cost for all partners
- Improve quality of research data metadata
- Improve discoverability of research data metadata

### **Principles**

- Enter once, reuse often
- As simple as possible (but no simpler)
- Future proof so growth is possible

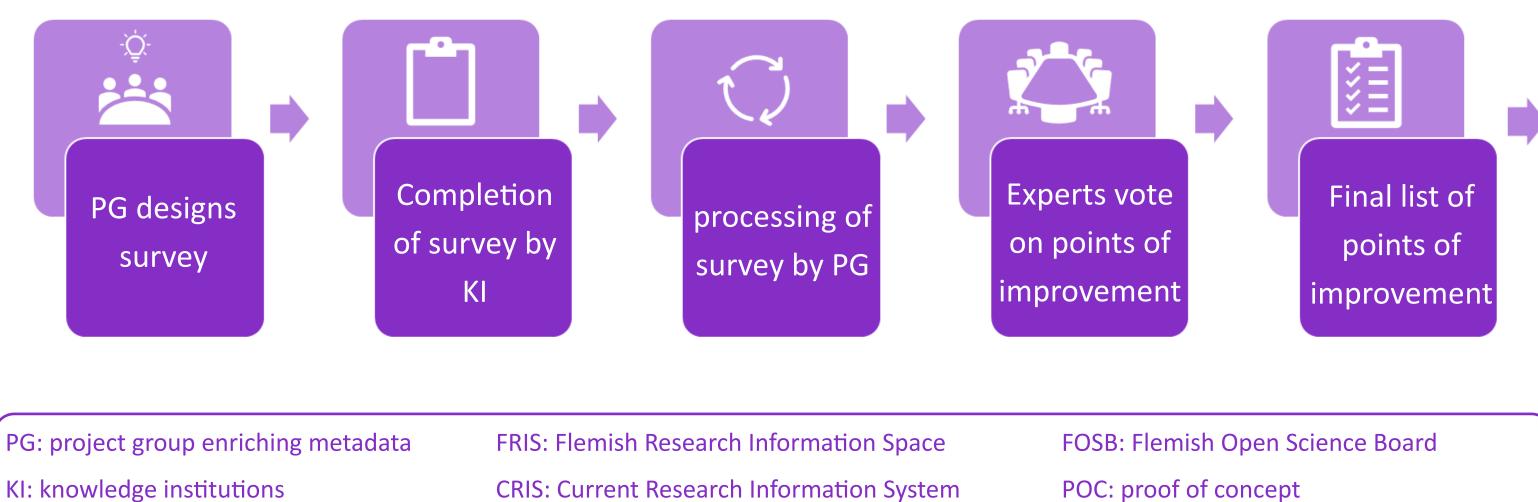


A list of prioritized and externally validated points of improvement within the current ecosystem.

### Key deliverable 2

Proof of concept or solution for collecting metadata:

- Define business needs
- Identify limitations of available technologies



WG: working group architecture

Assess ease of

use of

metadata

source

**CRIS: Current Research Information System ORCID:** Open Researcher and Contributor Identifier

POC: proof of concept

- 1. Deduplication of effort/Use **FRIS for harvesting**
- 2. Integrate with external repositories
- 3. ORCID integration by KI's
- 4. Change some FOSB metadata fields from mandatory to recommended or optional

#### Assessment of metadata sources

Assess	
metadata	
quality of	
metadata	
source	

**Assess completeness of metadata source** 

Comparison of different metadata sources

conclusion: DOI aggregator (DataCite) does not return all DOI's of KI's

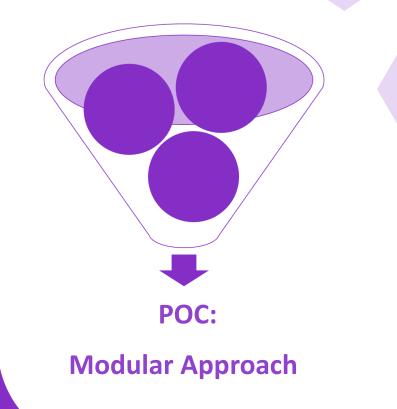
### POC: Modular Approach, simplified flow

**FRIS or KI selects source to** harvest

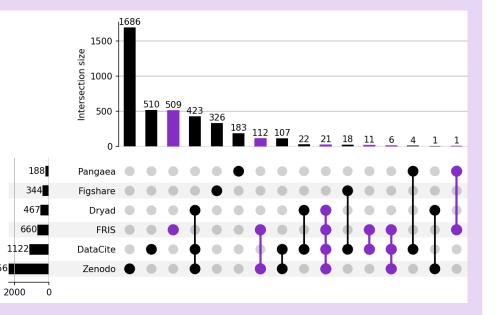
Integration built for repository or aggregator?

**Consult institution** al dataset finder









- Yes —> download code
- No —> create code and share on GitHub

Run code to get csv of persistent identifiers (and metadata)

Integrate found datasets in **CRIS or FRIS** 

**Develop query set for** 

repository or aggregator

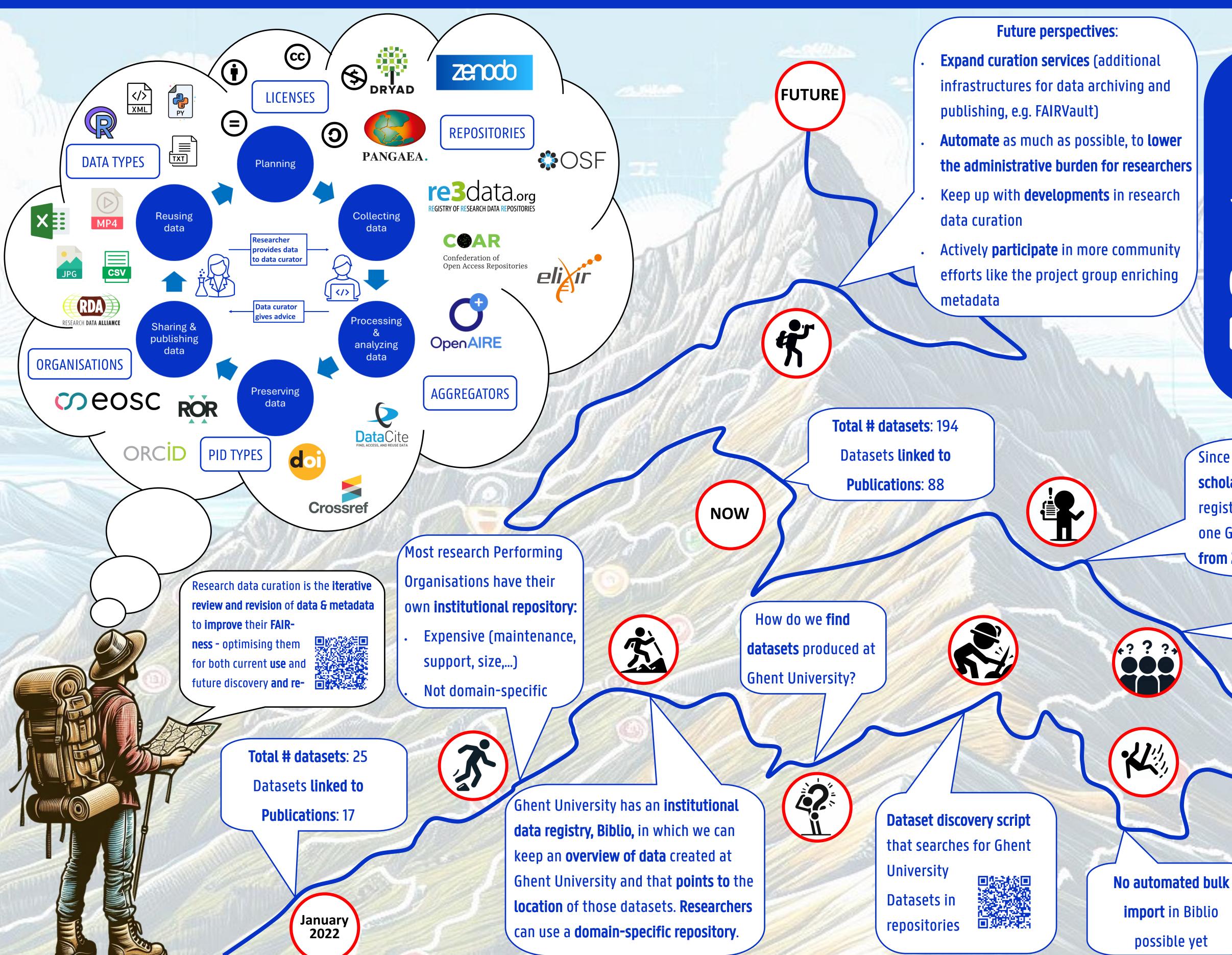
**Deduplicate based on per**sistent identifier eliminate false positives





### From idealism to pragmatism: our journey in research data curation

Dhollander, Evelien 1, a, b, c; Leonard, Kevin 1, c; Mertens, Myriam 1, c



1 Open Science Team, Ghent University Library, Ghent, Belgium a Conceptualization; b Writing (first draft); c Writing (review and editing)

> Do you want to know more? Contact us, follow us or visit our website



boekentoren.gent/UGent\_OS

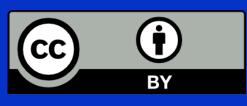
rdm.support@ugent.be

@UGent\_OS



@UGent\_OS





https://creativecommons.org/ licenses/by/4.0/

Since 2023, Ghent University has a new **policy on scholarly publishing**. Registration in our institutional register (Biblio) of published **datasets** with at least one Ghent University creator, supporting **publications from 2023 or later** is mandatory

> The 2016 RDM policy **only encourages researchers to share data** (as open as possible, as closed as necessary), no monitoring was done.

> > Establish Ghent University Research Data Community on Zenodo. Making data curation possible with a built-in messaging system between data curators and researchers, and datasets appear higher in searches.

### PeriscOApe: Monitoring the Open Acess dynamics of an institution

Christophe Dony, University of Liège - ULiège Library

#### **Objectives and context**

- Develop a pilot method for institutions of the Wallonia-Brussels Federation (FWB) to monitor, per discipline, and over time:
  - rates of closed vs. Open Access;
  - diversity in terms of:

BIC f B

- OA dynamics (access types, APCs, models);
- publisher concentration;
- disciplines.
- Project financed by the FWB university library consortium Bibliothèque Interuniversitaire de la Communauté française de Belgique (Bicfb) and developed by the University of Liège Library

#### Methods and scope

- Data sample: journal articles published between 2018 and 2020 for which at least one (co-)author is affiliated with the University of Liège; n=11,114
- Data collection and enrichment with open data and tools to ensure reproduciblity
- Adoption of a 'types of access' typology to evaluate efficiency of open repositories and OA mandates
- Distinction made between APC-led OA (hybrid and full OA) vs. no-fees OA articles
  - Additional layer of information whether APC paid by insitution (OpenAPC)



#### **Some results** (ULiège journal articles 2018-2020)

#### **Evolution of Closed vs. Open Access rates**

Little variation in the evolution of closed vs. open access rates over time.

Closed access Open access 2018 2019 26% 2020 25% 30% 35% 40% 45% 50% 55% 65% 75% 20% 60% 70% 80%

#### Distribution of types of access per discipline

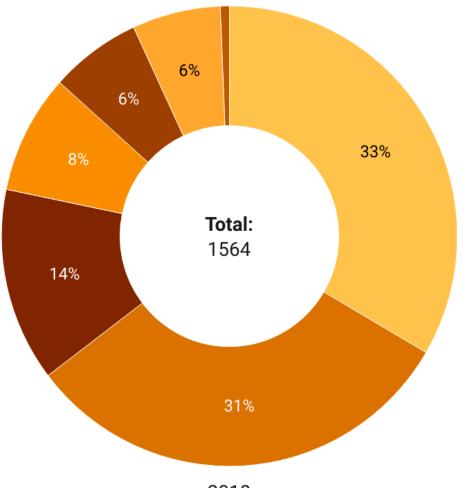
Little variation across disciplines. Distribution shows the important role of open repositories.

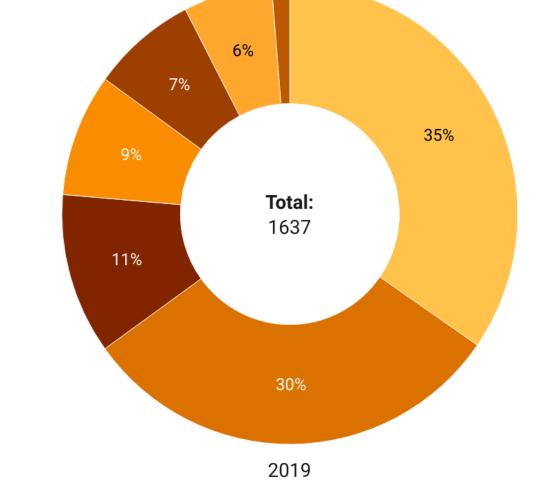
🗾 Open access on publisher's website 🔄 Open access on publisher's website and in an open repository 📃 Open access in an open repository 📃 Closed access

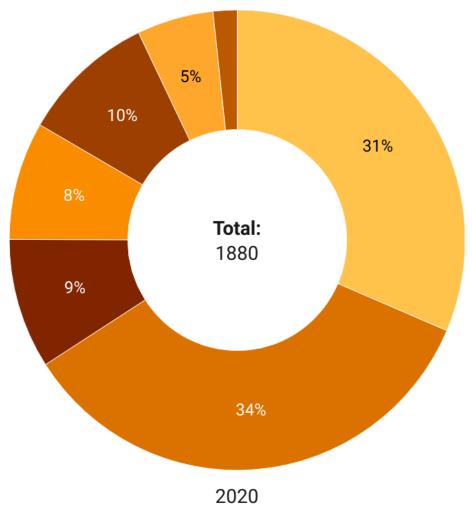
All disciplines	17% (1841)	29%	(3240)				29%	% (3221)		25% (2812)	11114
Arts & humanities	12% (93)	25% (200)					33% (260)			31% (243)	796
Business & economic sciences	13% (31	)					49% (119)			34% (82)	243
Engineering, computing & technology	10% (94)	21% (198)					38% (358)			30% (285)	935
Human health sciences	25% (802)		31% (98	39)				21% (675)		23% (741)	3207
Law, criminology & political science	8% (43)					46% (257)				43% (244)	561
Life sciences	18% (474)	34	% (891)					25% (649)		24% (625)	2639
Physical, chemical, mathematical & earth Sciences	13% (248)	33% (618)						33% (626)		21% (385)	1877
Social & behavioral sciences, psychology	<b>12%</b> (102)	32% (270)						32% (277)		24% (207)	856
C	)% 1	0 2	0 3	30 Z	10 5	50	60	70 8	80 90	1(	00

#### Breakdown of OA types for articles available on publisher's website

Provides insights into article-level OA dynamics. Overall, APC-led OA articles account for over 70% of content. Proportionally, the University pays APCs for approximately 15% of its article production every year.







#### **Conclusions and perspectives**

- Fully reproducible method with open or free data offers possibilities to audit data and processes and expand or modify indicators.
- Adoption of 'types of access' typology:
  - shows added-value of OA repositories in overall OA rates;
  - provides insights into the efficiency of OA-related mandates and policies.
- Discipline classification allows detailed insights into OA dynamics per broad subject and can help finetune OA awareness or training programmes at the institutional level.
- Significant numbers of articles pubished in hybrid or APC-led OA journals raise questions of equity and can help set up new training modules at the insitutional level.
- □ Further investigation should be carried out to explore why:
  - particular disciplines heavily rely on APC-led OA;
  - approximately 15% of articles are OA only on publishers' website;
  - significant numbers of OA articles produced by the **institution as publisher** do not have clearly identifiable licences (i.e. free access/bronze OA).

#### Full report and data



Dony, Christophe. « PeriscOApe : Enjeux et méthodologie pour la réalisation d'un jeu de données de monitoring de l'Open Access (Rapport Technique) », 11 décembre 2023. https://orbi.uliege.be/handle/2268/30972



Dataset

Dony, Christophe. « PeriscOApe ULiège 2018-2020 Data1 ». ULiège Open Data Repository, 12 décembre 2023. https://doi.org/10.58119/ULG/AJAGVF





# DigiL4Arch - Digital law for archiving (FED-tWIN Project)



Q

#### Archives = data spaces

### **Digital archiving = increasing the available data**

**<u>Challenge</u>**: Unlocking the (personal) data amplified by digital archiving in a legally compliant manner respecting the public interest mission of archives

#### = EU and national Data law



**<u>Challenge:</u>** Applying the multi-layered framework that is based on an often uncertain distinction between personal and non-personal data in a digital archiving context

DATA LAW

Data are regulated in at least five areas of law at both EU and national level:

- (1) <u>Human rights law</u> (personal data protection, privacy, freedom of expression, freedom of information)
- (2) Data protection law (for example General Data Protection Regulation)
- (3) Data law stricto sensu (for example Data Governance Act, Data

New Technologies such as Artificial Intelligence are required to fully realize the potential of digital archiving.

**Challenge:** Compliance of the use of new technologies with data law



Act, Health Data Space Regulation)

- (4) <u>Digital Rulebook</u> (for example AI Act, Digital Services Act, Digital Markets Act, eIDAS II)
- (5) <u>Copyright law</u> (for example the Digital Copyright Directive)

**LEGAL RESEARCH: doctrinal &** empirical

Expected outcomes

#### (1) <u>Comprehensive overview of the legal requirements of relevance for digital</u>

archiving in Belgium:

- (1) Developing guidance based on legal research for archivists engaged in digital archiving
- (2) Knowledge centre on data law and digital archiving

(2) Identification of legal friction points and regulatory gaps

(1) Legal friction points = different legal frameworks are misaligned

(2) Regulatory gaps = over- or under-regulation of the use of data

(3) <u>Recommendations for a digital law for archiving in Belgium</u>

(1) Recommendations for interpreting the existing frameworks aligned with the

objectives of digital archiving

(2) Recommendations for changes to legal frameworks/new frameworks

### Contact

Prof. dr. Laura Drechsler State Archives of Belgium/ Centre for IT & IP Law (KU Leuven) laura.drechsler@arch.be laura.drechsler@kuleuven.be

TECHNOLOGY



**Citip** 

Save the date! 12/9/2024 Citizen Science Networking Day Mechelen www.scivil.be

### Building Bridges for Better Citizen Science

Scivil's Role in Fostering Open Citizen Science

# Scivil

### knowledge center on citizen science

**Citizen Science is scientific research** conducted, in whole or in part, by **nonprofessional scientists** (citizens).

Citizen science is often (but not always) conducted **in collaboration with** professional scientists.

#### Citizens can contribute to any part of the research cycle



### Citizen science as part of open science

#### **Citizen Science**

- Can help to **open up the process** of doing science.
- Supports open engagement of societal actors.
- Provides opportunities for open,
   inclusive and participatory
   knowledge creation.
- Is an essential part of realising open science.

#### Who is involved?



#### Scivil...

#### **promotes** citizen science

so that contributing to solutions for scientific and societal issues is accessible to everyone.

#### connects initiators and partners

so that together they can realize impactful citizen science projects.

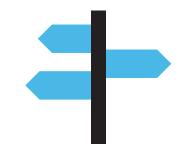
#### supports initiators and partners

to make citizen science diverse, qualitative, impactful and internationally prominent.

#### maps and innovates citizen science

so that the research method remains attuned to the latest scientific and societal evolutions.

#### Scivil helps you with...



- **Workshops and lectures** on citizen science tailored to your organization;
- Personalized advice on future and ongoing citizen science projects;
- Networking events to connect citizen science actors;
- **Guides and manuals**on partial aspects of citizen science;
- An innovative citizen science approach as a partner in your project.



Annelies Duerinckx, Charlotte Hens, Sven Speybrouck, Sanne Strouven, Jef Van Laer, Isaak Vandermaessen, Karen Verstraelen

#### Get in touch!

- info@scivil.be
- +32 16 28 38 00
- Kapeldreef 75, Leuven

#### www.scivil.be

### Project Academic Open Book Edition (AcOBE)

**What** ? Demonstrate the feasibility of a software suite for publishing university digital books based on Open Science principles.

For Who? The Universities and Higher Schools of the Wallonia-Brussels Federation of Belgium (FWB).

### AcOBE's project in four steps

**1. State of the art** of publishing practices in universities of FWB

2. Research, installation, analyse and **testing twentythree open-source technologies** 

### AcOBE's guidelines

**1.** The **software suite** (*Pressbooks* + *paged.js*) allows open academic books publishing

2. Minimum editorial team made up of three professions : editor, IT specialist and webdesigner

**3.** Publication of three academic monographs with the software suite *Pressbooks* + *paged.js* and based on a single-source publishing solution

**4.** AcOBE's guidelines for an open academic publishing in the **final report** (code QR below)

3. Editorial infrastructure with sufficient resources : avoid the redirection of intrauniversity authors to private publishing

4. Creation of an interuniversity entity for FWB university presses

### Digital format (html)

Préface – Le droit publ								
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Acobe			Accueil	Lire Se conn	ecter F	Recherche	er dans le	<b>Q</b>
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TABLE DES MATIÈRES	•	LE DROIT PUBLIC APRÈS LES BOMB	ES					
		Préface						
		ANNE-EMMANUELLE BOURGAUX ET JULIEN PIERET						

À l'heure où les bombes pleuvent sur Kiev et Marioupol, elles semblent s'être tues sur Alep et Mossoul. Mais un autre danger guette la Syrie : celui du silence. Moins spectaculaire mais tout aussi fracassant. Cela fait maintenant plusieurs mois, voire plusieurs années, que la Syrie n'occupe plus les titres des journaux télévisés, que les rapports qui continuent de documenter les atrocités subies par la population civile circulent avec moins de vigueur sur les réseaux sociaux, que les prises de position de l'opposition en exil ne sont plus relayées et soutenues par les chancelleries occidentales. Où en est la Syrie aujourd'hui ? Où en sera-t-elle demain ? Où en était-elle hier ? Autant de questions auxquelles il devient difficile de répondre. Aujourd'hui, même les causes du déclenchement du conflit en 2011 se brouillent, son déroulement devient flou, ses protagonistes ont retrouvé l'ombre, son issue devient incertaine : en 2022, a-t-il seulement pris fin ? Dans le même temps, le régime syrien entend faire revenir les *tour operators* et les touristes... Comme si de rien n'était. Comme si tout cela était fini et pouvait être oublié.

**Print format** 

CHAPITRE 2. LA SCÈNE PSYCHIATRIQUE

IMAGES ASILAIRES



FIGURE 18 - Miloš Forman, Vol au-dessus d'un nid de coucou, 1975



IGURE 19 - Miloš Forman, Vol au-dessus d'un nid de coucou, 1975





FIGURE 21 - Miloš Forman, Vol au-dessus d'un nid de coucou, 1975



FIGURE 22 - Miloš Forman, Vol au-dessus d'un nid de coucou, 1975

#### 3. Jeu de dupes

En ce qui concerne *Titicut Follies*, nul besoin de s'appesantir aussi longuement pour saisir le caractère strié de son image. Elle l'est en réalité à plusieurs niveaux, à commencer par sa texture. Bien que les pellicules couleur n'étaient pas encore très répandues dans la pratique documentaire à l'époque du tournage (1966), Wiseman laisse supposer dans une interview<sup>113</sup> que le choix du noir et blanc est toujours délibéré dans ses réalisations. Un choix qui consonne d'ailleurs avec les canons alors en vigueur puisque, comme le rappelle Dalle Vacche et Price, la couleur était alors associée à la fiction

Il faut rappeler qu'avant la poudre, c'est le pollen du Printemps arabe qui a saturé l'air syrien. Il faut rappeler que le conflit syrien a débuté en 2011 lorsque les habitants de Deraa se sont opposés à l'arrestation, l'emprisonnement et la torture d'une vingtaine d'adolescents. L'un d'entre eux, âgé de quatorze ans avait tagué le

Précédent : Remerciements

FIGURE 20 - Miloš Forman, Vol au-dessus d'un nid de coucou, 1975

113. Cf. ARNAULT (Y.), « Entretien avec Frederick Wiseman », *Cancer(s) et psy(s)*, vol. 1, n°1 (2014), p. 156-168.

A. Kodmani & S. Sendiane, Le droit public après les bombes. Projets de réformes constitutionnelles et législatives
 L. Gilson, Images asilaires. Essai sur les rapports
 pour une Syrie démocratique, Éditions de l'Université de Bruxelles, coll. « Droit & Criminologie », 2023
 L. Gilson, Images asilaires. Essai sur les rapports
 Saint-Louis Bruxelles, coll. « Générale » (n°164), 2

Suivant : Quelle justice transitionnelle pour la Syrie contemporaine ? ightarrow

L. Gilson, Images asilaires. Essai sur les rapports entre l'asile psychiatrique et le cinéma, Presses Universitaires Saint-Louis Bruxelles, coll. « Générale » (n°164), 2024

58

57

OriginSubsidizing organizationExecuting organizationCREF<br/>CONSEIL DES RECTRICES<br/>ET RECTEURS FRANCOPHONESImage: Constitution of the security of the securit

Partner organization





#### Authors

Jason Dufrasne

Bernard Pochet



### **2 BE or not 2 BE Reproducible:** The Belgian Reproducibility Network as part of the European Network of Reproducibility Networks



Julia Eberlen<sup>1</sup>, Rrita Bajraktari<sup>1</sup>, Patrick Onghena<sup>2</sup>, Christophe Phillips<sup>3</sup>, Roosmarijn Vandenbroucke<sup>4,5</sup>

<sup>1</sup>Université libre de Bruxelles, <sup>2</sup>KU Leuven, <sup>3</sup>Université de Liège, <sup>4</sup>Universiteit Gent, <sup>5</sup>Vlaams Instituut voor Biotechnologie

#### What is a Reproducibility Network?

A strategic community effort to promote transparent and trustworthy research practices in the academic research system:

 Recognizes the need to constantly evaluate and improve research practices with the aim to conduct research of the highest quality and embedded within a collaborative and transparent research culture

#### **Creating Connections**

#### International contact

The BE-RN is part of the international movement of Reproducibility Networks, actively working together and learning from each other.

Some networks, such as the UK-RN, are already fully formed and funded, with high interdisciplinarity between its members.

- Recognizes the need for flexibility; different disciplines, institutions and countries will face different challenges and have different needs
- Reproducibility Networks are all structured along broadly similar lines to facilitate this coordination function, whilst allowing national and local flexibility
- The term reproducibility is used as an umbrella term that includes open science practices, computational reproducibility, replicability, transparency, and accessibility of scientific work.

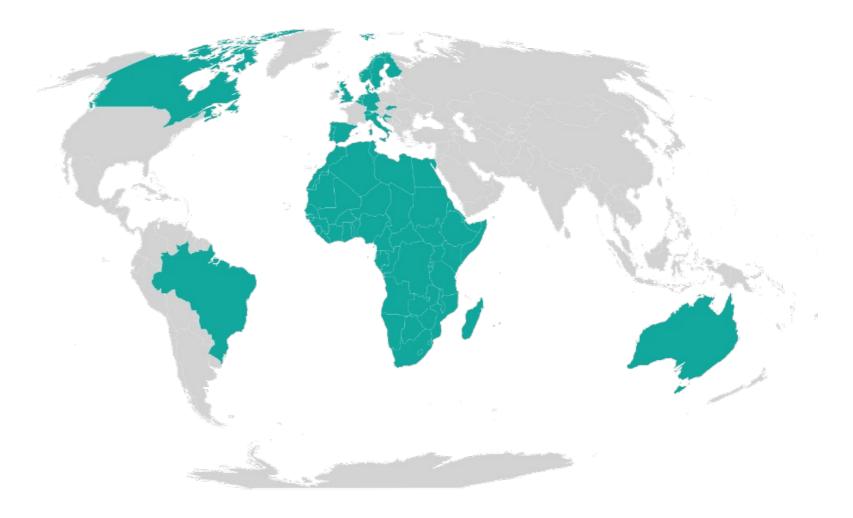
#### The Belgian Reproducibility Network

The Belgian Reproducibility Network **BE-RN** was launched in November 2022, with the mission to support reproducibility in all academic disciplines in the Belgian research landscape.

It is modelled after existing reproducibility networks such as the UK-RN, the Swiss RN, and the German RN.

The BE-RN consists of a national steering group and an international advisory board but is based on the grassroots activities of local nodes increasingly active within different Belgian universities.

Regular meetings allow for exchange on best practices, but also to identify and apply to funding opportunities



#### National contact

We aim to facilitate connextions between existing initiatives such as the Data Ambassadors and the ReproducibiliTea journal clubs, but also between researchers interested in reproducibility across institutions.

#### Institutional connections

The BE-RN lives because of its local nodes spread across Belgium. Our current local nodes are active at KU Leuven, ULiège, UCLouvain, ULB, and UGent.

All members and contributors of the BE-RN are involved as volunteers:

#### The aims:

- Support researchers striving to improve their own scientific practices
- Unite already existing initiatives
- Become a voice in support of reproducibility in contact with universities, funding bodies, academies, and other scientific organisations.

#### The Student BE-RN

A particular initiative just getting started at the ULB is the student BE-RN. Involving students will allow us to better understand how we can support the next generation of researchers and contribute to improved scientific understanding in the professional population.

- This is our strength: it allows for independence and flexibility from institutional regulations
- It is also a difficulty: we have to prioritize our day-to-day work over our involvement in the BE-RN.

#### Participating in the BE-RN

#### Do you want to find out more about the BE-RN? Visit:



or contact us via info@reproducibilitynetwork.be

### Signature Cloud 2026

### Advancing ocean research through cloud-based data integration and Open Science



Scan the QR Code to visit our website blue-cloud.org

Blue-Cloud 2026 is building a marine thematic EOSC, supported by several leading marine Research Infrastructures, stimulating and supporting open science. It is a federated ecosystem for FAIR and open data in marine research, which accelerates gaining more scientific knowledge and establishing analytical workflows, through data interoperability.

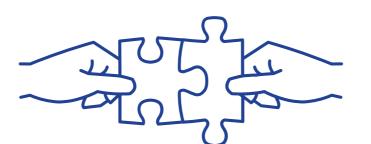
The Blue-Cloud technical framework is extensible and open by design, constantly evolving according to the needs of the community, facilitating collaborative research and the uptake of Open Science principles, through a distinguished set of

### **Blue-Cloud Open Science Platform**



#### **Data Discovery &** Access Service (DD&AS)

An easy and FAIR service for discovering and retrieving multi-disciplinary data sets and data products managed and provided by leading Blue Data Infrastructures. The federation facilitates sharing of datasets as input for analytical and visualisation services and applications, that are hosted and further developed in the Blue-Cloud Virtual Research Environment (VRE).

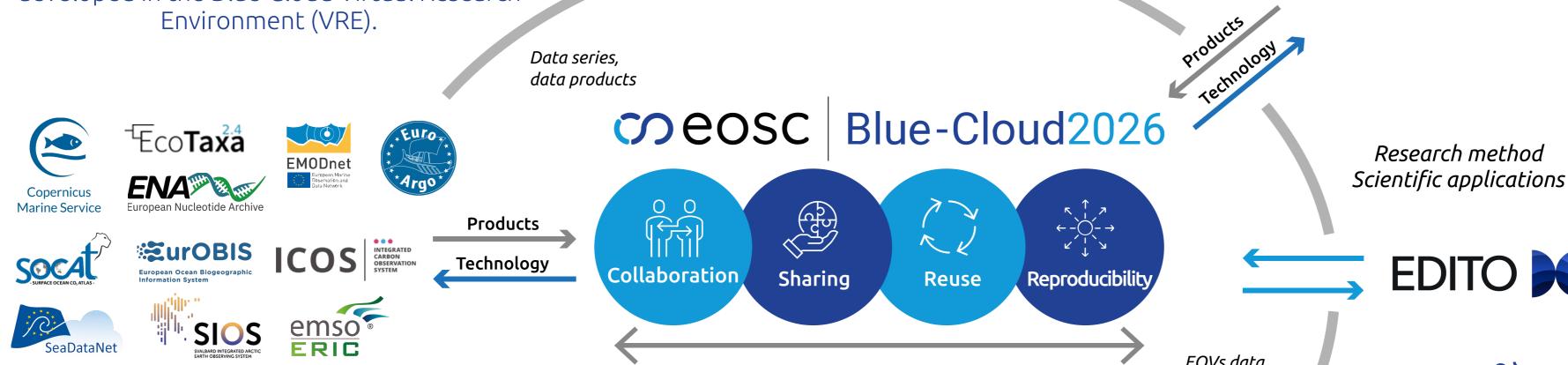


**Collaborative Research** data preparation, dana analysis and publication.



#### Virtual Laboratories

Researchers work closely together with the Blue-Cloud 2026 technical team to describe Virtual Lab workflows and technical requirements, in order to implement them in the Blue-Cloud VRE and further test its capabilities on specific topics.



**EMBRC** EUROPEAN MARINE BIOLOGICAL RESOURCE

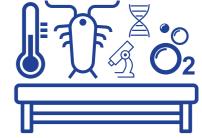


#### **VRE Blue-Cloud Core Services EOSC Core Services**

EOVs data collections

Products

Technology



**European Digital** 

Twin Ocean

#### Data Workbenches

An Open Science platform for collaborative marine research, using a wide variety of datasets and analytical tools, complemented by generic services such as sub-setting, pre-processing, harmonising, publishing and visualisation. The VRE hosts different Virtual Labs and is going to include thematic Workbenches, which users can access with existing credentials in EOSC. All methods and services in the Catalogue are exchanged with the EOSC Portal Catalogue & Marketplace.

Data intensive workbenches that facilitate the generation of validated and harmonised data collections for selected Essential Ocean Variables for physics, chemistry and ecosystems.







Your One-Stop Platform for Information on Marine Natural Products, Their Gene Clusters and Producing Organisms

Cedric Hermans<sup>\*</sup>, Maarten L. De Mol, Marieke Mispelaere, Anne-Sofie De Rop, Jeltien Rombaut, Tesneem Nusayr, Rebecca Creamer, Sofie L. De Maeseneire, Wim K. Soetaert and Paco Hulpiau

\* Presenter, Bioinformatics Knowledge Center (BiKC), Campus Brugge Station, Howest University of Applied Sciences, Belgium

#### Abstract

Marine environments harbor a vast diversity of microorganisms that produce a variety of natural products with diverse chemical structures and biological activities. These natural products are valuable resources for Belgium and Europe, as they have potential applications in biotechnology, medicine, agriculture and other fields. However, identifying and characterizing these compounds and their gene clusters (BGCs) is a challenging task that requires advanced bioinformatic

from **public databases** such as NCBI, MIBiG and PubChem, as well as relevant publications for each species, cluster and molecule. MariClus allows users to easily search, filter and visualize the data on the **web portal**, as well as to perform metaanalyses on the taxonomic distribution, cluster types and molecule diversity of the marine prokaryotes in the database. Furthermore, MariClus enables several case studies related to **microbiology**, **gene cluster identification and natural product discovery**, such as finding marine bacteria that degrade oil in cold environments, comparing gene clusters of abyssomicin and related compounds, and linking predicted molecules to their bioactivities and patents. MariClus is **freely available** at **https://www.mariclus.eu** and aims to provide a user-friendly and comprehensive resource for marine natural product research.

🔘 MariClus

#### tools and skills.

To address this challenge, we developed **MariClus**, an online platform that integrates the results of **antiSMASH 7**, the most widely used open-source tool for BGC prediction and analysis, for over 500 manually curated high-quality genome assemblies of marine prokaryotes. MariClus also provides additional information

### Methods and results

#### Data collection:

Over 500 marine prokaryote genome assemblies were collected and curated from NCBI Genome datasets and information on their taxonomy, isolation source, publications and culture collection number were extracted from various sources.

#### Genome mining:

The genome assemblies were analyzed using antiSMASH 7 to identify biosynthetic gene clusters and predict their products. Additional features from the antiSMASH results, such as cluster type, contig, length, number of genes and cumulative BLAST score, were also extracted.

#### Database integration:

All the data were integrated into a MariaDB database and a web interface was developed to display and query the data on marine species, gene clusters and molecules. Links to external resources, such as NCBI, PubMed,

### Examples

Examples of the search 📱 Dashboard results for salinosporamide Species - Clusters Salinosporamide A (Marizomib) Molecules potent proteasome IS а 💮 Contact inhibitor being studied as a 🤿 Tutorial potential anticancer agent. The 🔒 Article MariClus platform returns information about species, gene clusters, molecules and the titles of possible relevant articles. It links directly to NCBI and PubMed references. Each result also contains a link to the details page for the linked containing species more information

alinosporamide			Sea
Search			
<b>▼</b> Specie	es		
Species	Description	Accession number	Pubmed ID
Salinispora tropica	This species produces the chemicals <mark>salinosporamide</mark> A and B which may be useful for cancer treatment.	GCF_000016425.1	17563368 , 19590008

#### **▼**Gene clusters and molecules

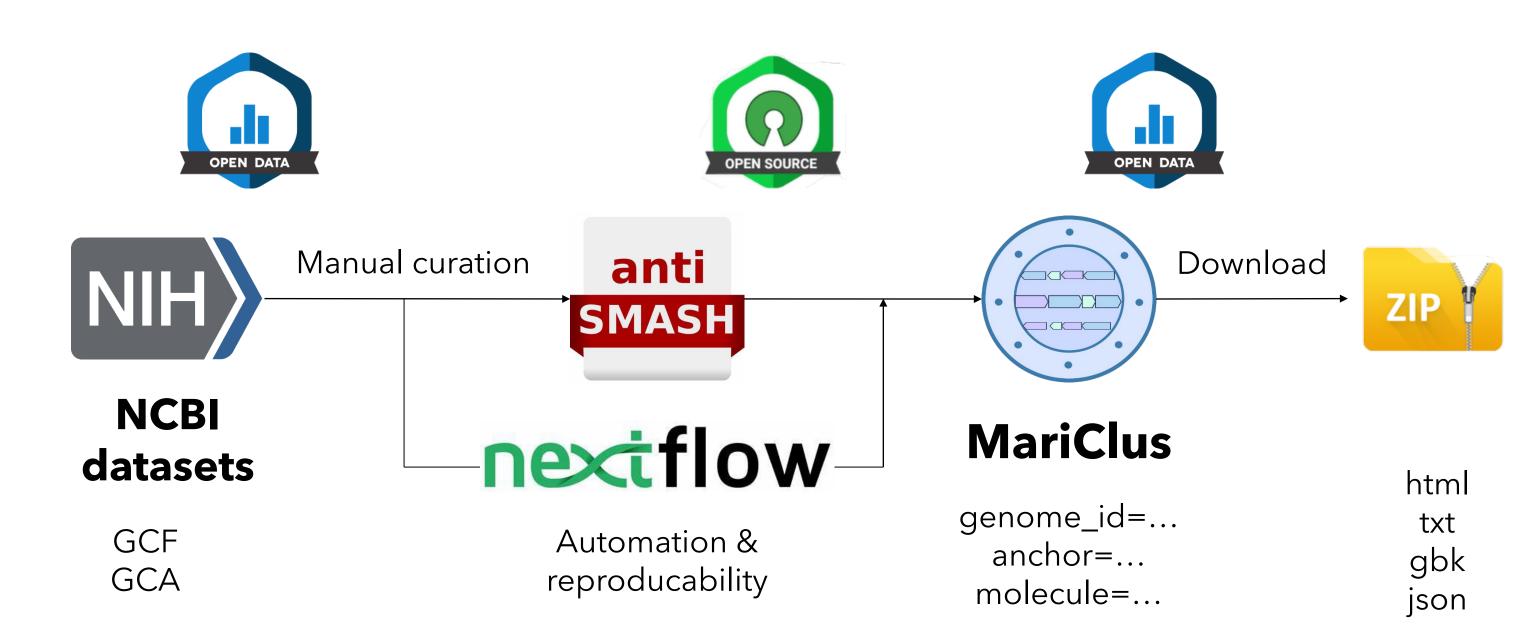
Species 💧 🗍	Contig ID	Туре 🔶	Predicted product
🔍 Salinispora fenicalii	NZ_AZWQ01000016.1	transAT-PKS- like	<mark>salinosporamide</mark> A
Salinispora pacifica	NZ_KB905359.1	NRPS-like	<mark>salinosporamide</mark> A
🔍 Salinispora tropica	NC_009380.1	transAT-PKS- like	<mark>salinosporamide</mark> A

#### Articles

#### PubChem, MIBiG and antiSMASH, were also provided.

#### Open science and FAIR:

MariClus uses open-source tools and public databases. Our platform allows for easy downloading of the antiSMASH results and sharing of specific clusters through unique URLs.



Species 🔶	PMID 🍦	Title 🔶
🔍 Salinispora tropica	19590008	Biosynthesis of the <mark>salinosporamide</mark> A polyketide synthase substrate chloroethylmalonyl-coenzyme A from S-adenosyl- L-methionine

#### Examples of the antiSMASH results

KnownClusterBlast results showing the overlap between detected clusters and known clusters from the MIBiG database

abyssomicin C/atrop-abyssomicin C	
Download graphic	
heronamide A/heronamide B/herona	mide C/heronamide D/heronamide E/heronamide F 🗸 Download graphic
Query sequence	
BGC0001349: heronamide A/hero	onamide B/heronamide C/heronamide D/heronamide E/heronamide F (100% of genes
quartromicin A1	
BGC0001349: heronamide A/hero	

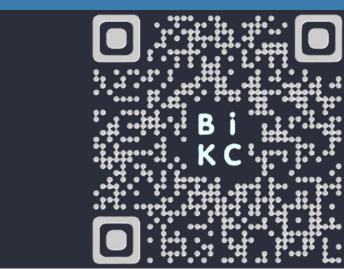
Summary



MariClus is a novel and user-friendly resource that facilitates marine natural product discovery by integrating genome mining results from antiSMASH 7 with data from public databases and publications for over 500 marine prokaryote species. MariClus provides comprehensive and transparent information on the genome assemblies, gene clusters, predicted molecules and relevant publications for each species. Users can easily explore and

compare the data on the web portal, as well as access the antiSMASH pages for each cluster and molecule. MariClus also enables meta-analyses and case studies on the marine biodiversity, microbial ecology, biosynthetic pathways, enzyme characterization, metabolic engineering and drug development. MariClus is a valuable tool for researchers interested in marine natural products and their source organisms and gene clusters.

**Funding:** This research was funded by the Research Foundation Flanders (FWO), grant number S001422N, and by a PWO grant with acronym MetaTec, provided by Howest University College and the Flemish Government.





### KU LEUVEN



EOSC Tripartite Event 16 April 2024

### Open Science to Increase Reproducibility in Science (OSIRIS) Magdalena Kozula, Veerle Van den Eynden, & Patrick Onghena

Faculty of Psychology and Educational Sciences, Research Coordination Office & RDM Competence Centre

Creating Trust in Open Science & Reproducibility through Accessibility and Transparency

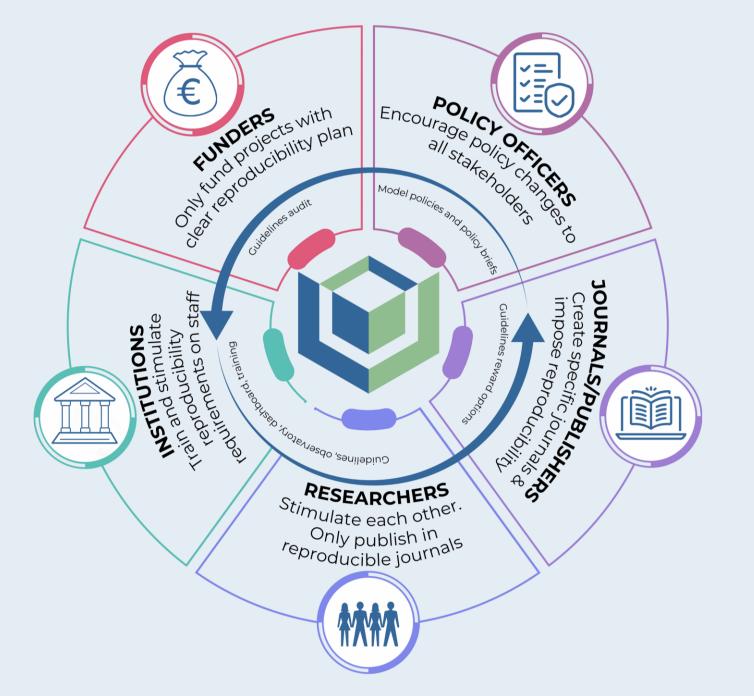
Ambition: facilitate paradigm and culture shift to reform the R&I system both from the top down - and the bottom up to guarantee the trustworthiness of science

#### OUR AIMS

- Gather knowledge on the drivers of reproducibility issues
- Test evidence-based solutions
- Identify incentives for reproducibility among stakeholders
- Embed reproducibility in research design

Crucial role: Open Science practices foster a culture of openness and accountability

#### IMPACT, TOOLS & MATERIALS



#### **OUR RESEARCH ACTIVITIES**

Drivers,	Interventions	Interventions	Training and guidance
barriers and	to improve	to improve	
facilitators for	reproducibility	reproducibility	
reproducibility	for researchers	for funders and	
of research	and institutes	journals	
<ul> <li>Scoping review &amp; evidence maps</li> <li>Interviews</li> <li>Focus groups</li> <li>Audit policies</li> <li>Audit OSIRIS</li> <li>Case studies</li> </ul>	<ul> <li>Computational reproducibility checks</li> <li>Methods reproducibility checks</li> <li>Observatory dashboard</li> <li>Testing interventions</li> </ul>	<ul> <li>Observatory dashboard</li> <li>Observational study</li> <li>Interventions journals</li> <li>Interventions funders</li> </ul>	<ul> <li>Round table</li> <li>Training resources</li> <li>Testing workshop</li> <li>Run training workshop</li> </ul>



- OA publications: review, interviews, FGs, RCTs
- Webinars: to introduce the methodologies, share good practices & project results and activities
- MOOC: to disseminate our established training program
- Training materials for researchers: on increasing reproducibility
- If successful, the OSIRIS networks and observatories will be kept online: foundation for aligning practices, continued EU-wide



The OSIRIS project is funded by the European Union's Horizon Europe research and innovation programme under grant agreement No. 101094725. Views and opinions expressed are, however, those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (ERA). Neither the European Union nor the ERA can be held responsible for them. All Rights Reserved.

#### **INVOLVEMENT OPPORTUNITIES**

- Researchers: Interviews, Reproducibility Networks, RCTs (paper submission and follow-up RCT), Roundtable on key insights and findings of our research, co-creation & testing of training materials
- Journals: RCT to test automated machine systems and manual checks
- Funders: RCT to test guidance for reviewers of grant proposals
- Other stakeholders: Focus Groups







Al in marine sciences: An openaccess integrated environment for automated classification of phytoplankton images

Rune Lagaisse (VLIZ), Wout Decrop (VLIZ), Klaas Deneudt (VLIZ), Ilaria Fava (EGI Foundation)

### What is phytoplankton?

**Phytoplankton** is the single-cell algae at the basis of marine food webs and an essential indicator of ecosystem health

### FlowCam use case

**Objective:** monitor phytoplankton under the LifeWatch RI using automated image techniques. **Challenge:** Speed up taxonomists' job of manually labelling ~350,000 images/year

#### **Solution**

- 1. Use of automated imaging and machine learning to build a set of over 2.2 million annotated FlowCam images
- 2. Taxonomists fine-tuned the trained classifiers correcting wrong model predictions
- 3. Publish the open-access dataset and the trained classifiers for the benefit of marine monitoring
- 4. Build a user-friendly module allowing users to predict FlowCam images using pre-trained models and train classifiers on their own image input
- 5. Leverage the iMagine platform to host the FlowCam module, offering an integrated environment with all source code and a graphical user interface. This module provides tools for post hoc analysis of model performance and code for image transformation and augmentation

#### What's next

- 1. Facilitate many marine researchers in the application of automated classification of phytoplankton imaging data.
- Researchers and monitoring programs are encouraged to make use of the FlowCam service and the iMagine AI platform to contribute to more efficient biomonitoring.



### **Discover the**

Use Case and the

iMagine Al Platform

**START:** 01/09/2022 – **END:** 31/08/2025 **CONSORTIUM:** 24 partners from Belgium, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Slovakia, Spain, Turkey 12 connected RIs



iMagine is funded by the European Union. Grant Agreement No. 101058625

#### How

#### Belnet

#### advances open science?

#### AAI

Authentication and Authorization Infrastructure

> **PIDs** Persistant identifiers

Other services DMP Online Orfeo FileSender



Visit our website www.belnet.be



National Research and Education Network (NREN)

Connecting Belgian research communities

Co-creation & Co-innovation



#### **Do you want to know more?** We're happy to help!

Belgian Mandated Organisation within EOSC-A.





Disseminate your scientific article through the certified federal Open Access repository!



https://orfeo.belnet.be







#### Features:

- DSpace-based platform (market leader in Open Access repository systems in Europe)
- Custom tailored to partner requirements (metadata nomenclatures, personalized home page)
- Partnership not limited to federal institutions
- User friendly interface
- Readymade researcher and institutional bibliographies
- Compatibility for harvesting with other Open Access repositories (like the European OpenAIRE repository)
- Hosted by Belnet, the Belgian national research network, which boasts the technical know-how for professional platform maintenance

#### Advantages:

- Increased visibility
- Wider dissemination
- More citations (Green OA has a higher citation rate than Gold OA)
- Durable scientific heritage conservation
- Fast (the ability to publish post prints online long before the publisher version is made available)
- More than just articles (Grey literature)
- Availability of research output statistics and indicators
- Create competition for costly APC-based OA journals
- Provides leverage when negotiating with major publishers

#### Facts & Figures:

- Launched in 2015
- A total of 11022 items deposited
  - 6.349 full texts
  - 4.673 references
- Deposit rate averages 1.200 items / year
- Total searches: 1.259.617
- Most popular search category: Earth and related Environmental sciences: 31.568
- Most views : Comprendre et expliquer le rôle des nouveaux médias sociaux dans la formation de l'extrémisme violent. Une recherche qualitative et quantitative (RADIMED) : résumé : 705

### **EDITO-Infra: Empowering Open Science & Digital Twins in the Marine Domain**



European Digital Twin Ocean

**EDITO-Infra:** The main aim of the "EU Public Infrastructure for the European Digital Twin Ocean (**EDITO-Infra**) project is to build the "backbone" public infrastructure for the EU Digital Twin of the Ocean (EDITO), which will be an EU public infrastructure on which local digital twins of the Ocean will be able to be developed and run by, or for, a large variety of users.

PROJECT MANAGER

"What is the optimal placing

for my aquaculture cages?"

Integrating a wide range of existing and new and alternative data sources, EDITO will combine next generation ocean modelling, Artificial Intelligence (AI) and HPC, developing interactivity and transforming the knowledge-sharing paradigm. It will leverage technology to create a digital replica of the ocean, allowing to, for example, test the effects of climate change scenarios and man-made pressures on the ocean climate system, as well as the effectiveness of mitigation and adaptation plans.

The EDITO platform will provide marine researchers, specifically data scientists and modelers, with access to data, tools, computing power, and a co-working environment to engage in open science, enabling them to share resources with other experts, i.e., software developers and programmers, to develop applications and solutions to address Ocean challenges, free from the restrictions of poor data or high computing costs.

SERVICE ECOSYSTEM & MARKETPLACE

Community & Market Driven

**EDITO-Infra is building** 

#### the core infrastructure of the EU DTO for faster, better, more accurate Ocean insights.

#### RESEARCHER

"How might this seagrass habitat change in the next 10 years if the sea temperature rises by 2°C?"

EASY ACCESS TO A TRUSTED, CURATED CATALOGUE OF **HIGH-QUALITY OCEAN DATA** 

DATA SCIENTIST



#### POLICY ADVISOR

"How close are we to delivering SDG14 in the Mediterranean?"

#### **DECISION SUPPORT TOOLS**

Governance, policy & reporting Operational research & blue economy applications ESG-tech & Ocean-tech Citizen science & initiatives

"Will my property be affected by floods in the future?"

CITIZEN

**\* \*** 

**CLOUD-NATIVE STANDARDS & OPEN SOURCE** SOFTWARE

STAC

Open Geospatial Consortium.



**DIGITAL TWINS** 

Baltic & North Sea Lighthouse

Mediterranean Lighthouse

The EU Digital Twin of the Ocean will host a thriving ecosystem of community & market driven applications and services in support of societal needs, leveraging the capabilities of EDITO core infrastructure.

FAST ON-DEMAND COMPUTING

SAVE TIME AND MONEY USING

#### **OCEAN MODELER**

**OPEN-SOURCE, CLOUD-NATIVE** TOOLS FOR SEAMLESS DATA WORKFLOW

SOFTWARE DEVELOPER

**INNOVATION ECOSYSTEM & MARKETPLACE** Public Funding & Venture Capital Driven

Fast on-demand computing

**COMPUTING CLUSTER** DATA ORCHESTRATOR PROCESS REGISTRY



ENGINE

Add & use your own data, Build your applications & services. Engage to inform future requirements.

EXPLORE · CREATE · CONTRIBUTE

On-demand data science tools and Ocean models Clouds Cloud & HPC computing resources On-demand processes for DATALAKE "what-if" scenarios

EDITOInfra

WEKEO



• Atlantic & Artic Lighthouse

• Horizon Europe projects

 Relevant initiatives by Environmental Research Infrastructures

• Local, national and regional digital twinning initiatives

A trusted, curated catalog of high-quality Ocean data

> DATA CATALOG DATA STORAGE

> > Copernicus

**Marine Servic** 





#### **DATA SCIENTIST**

Funded by

the European Union

"I need to harvest data to produce a report of Marine Environmental Indicators for the city council. With **EDITO**, I can easily combine satellite and in-situ marine data and process it to generate my results, with confidence."

#### **OCEAN MODELER**

"I have developed a model that predicts where the spawn of shrimp are likely to flow and deposit in our local Marine Protected Area. By storing it on **EDITO**, other peers might use it for other purposes e.g. to anticipate pollution patterns? "



European Marine

#### SOFTWARE DEVELOPER

" I am building a software application to assess the risk of floods in coastal properties across Europe. With **EDITO**, I can create a workflow of selected climatology data that automatically feeds into my APP. "

**EDITO-Infra is coordinated by** 

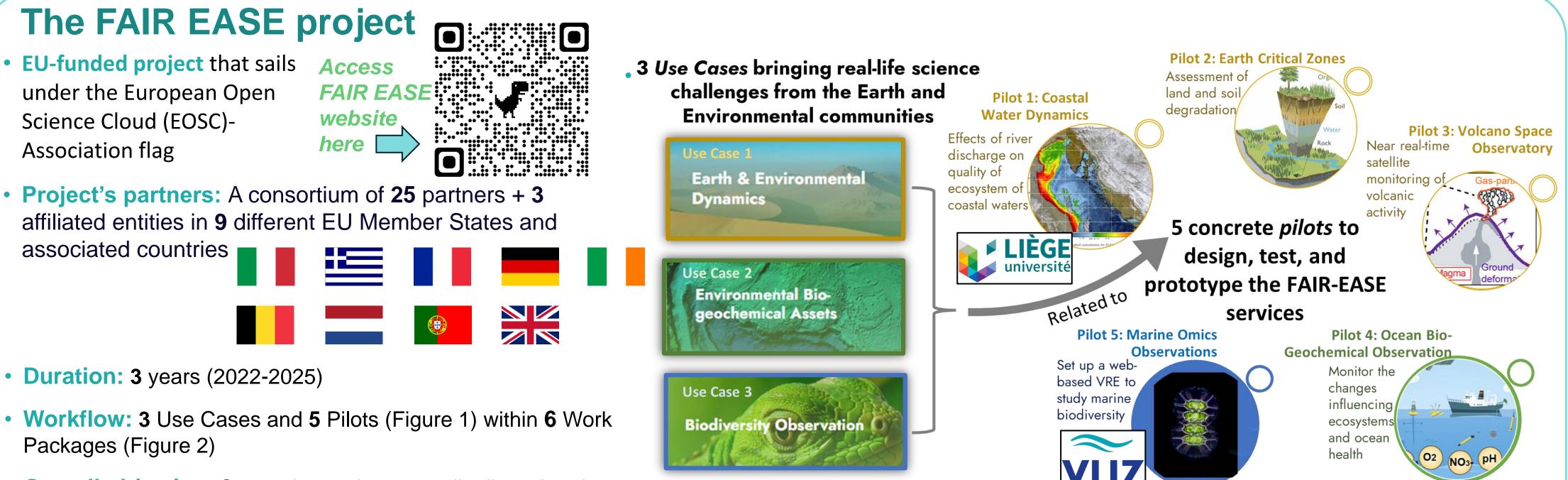


With the support of



### **Trans-regional implication of Belgium** in the EOSC-association's FAIR-EASE project

Lymer Gael<sup>1</sup>, Portier Marc<sup>2</sup>, Scory Serge<sup>1</sup>, Troupin Charles<sup>3</sup> Institute of Natural Sciences, Brussels<sup>1</sup>; Flemish Marine Centre, VLIZ, Oostende<sup>2</sup>; University of Liège<sup>3</sup>



 Overall objective: Customise and operate distributed and integrated services for the observation and modelling of the Earth system, environment and biodiversity to build the first interdomain

#### FIGURE 1: FAIR EASE's Use Cases and concrete Pilots

#### Implication of Belgian institutions in the development of FAIR EASE

#### **3 Belgian institutions involved**

• The Institute of Natural Sciences



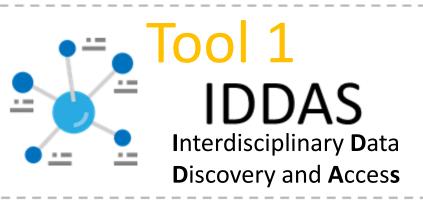
The Flemish Marine Institute



• The University of Liège **GeoHydrodynamics and Environment** Research group (GHER)

LIEGE

• See Figures 1, 2 & 3 for the distribution of **Belgian institutes within FAIR EASE** 



- DAB brokering framework
- Semantic Analyser
- Subsetting service
- **RDF DCAT profil**

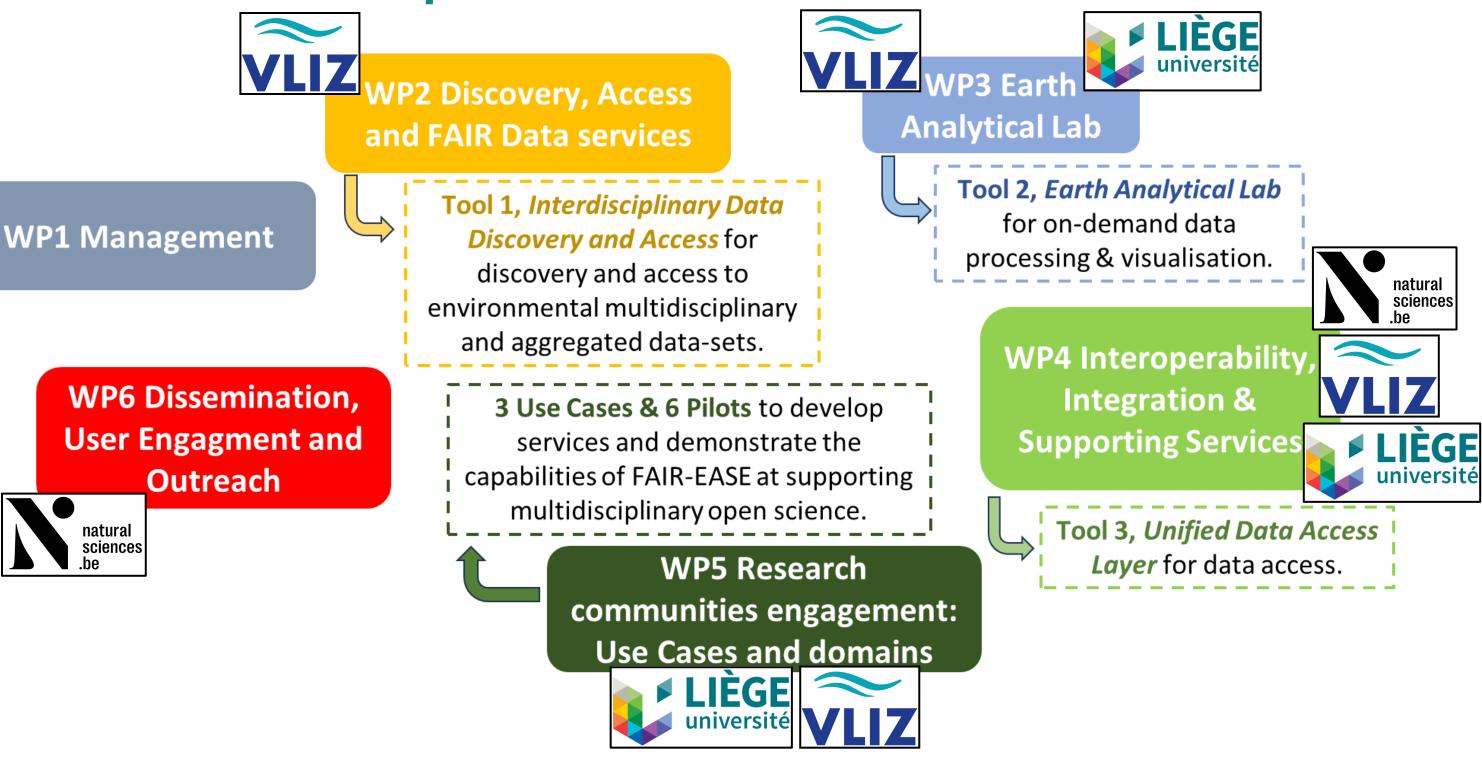


FIGURE 2: Three Belgian institutions involved in 5 FAIR EASE's work packages

#### Links with the Belgian Open Science community

#### The Institute of Natural Sciences

- Open access reports and deliverables via Zenodo
- Models and results of technical aspects tested in WP4 available in thematic repositories respecting EOSC open-access agreements & **Creative Commons Attribution International Public Licence**



Workload automation: Galaxy



- Data exploration & visualisation: WebODV, Examind Community
- Data sciences IDE: JupyterLab (+ binderhub ?)
- Remote processing: Galaxy Pulsar, OGC API processes, OpenEO
- Tools for and from pilots: DIVAnd, Felyx, ...



- ied Data Access Laver
- UDAL interface + first implementation
- Intake ?

FIGURE 3: FAIR EASE's tools developed with Belgian institutions

Evaluation and promotion of the FAIR principles across disciplines

#### The Flemish Marine Institute

- Technical approaches to facilitate open-source and -science data sharing (Coding, standardisation, automatization, mix with industrial software) following the FAIR- and EOSC association-principles
- Daily interactions with local scientists and Research Infrastructures (e.g. EMBRC and LifeWatch).

#### • The University of Liège

- Open-source software tools, scripts, notebooks and source codes for creation of data products (e.g. biodiversity or climate gridded maps) via the GitHub repositories (https://github.com/gher-uliege) and Zenodo



### **DissCo- Unlocking Natural History Collections**

Patricia Mergen, Maarten Trekels, Frederik Leliaert, Meise Botanic Garden, Belgium

DiSSCo (Distributed System of Scientific Collections) is an International Research Infrastructure for managing both physical and digital European natural science collections. It aims to unify these assets digitally across countries, ensuring data compliance with FAIR principles.

#### From the physical specimens



Papilio nireus pseudonireus





DiSSCo Europe: 1.5 billion specimens, 170+ institutions, 23+ Countries

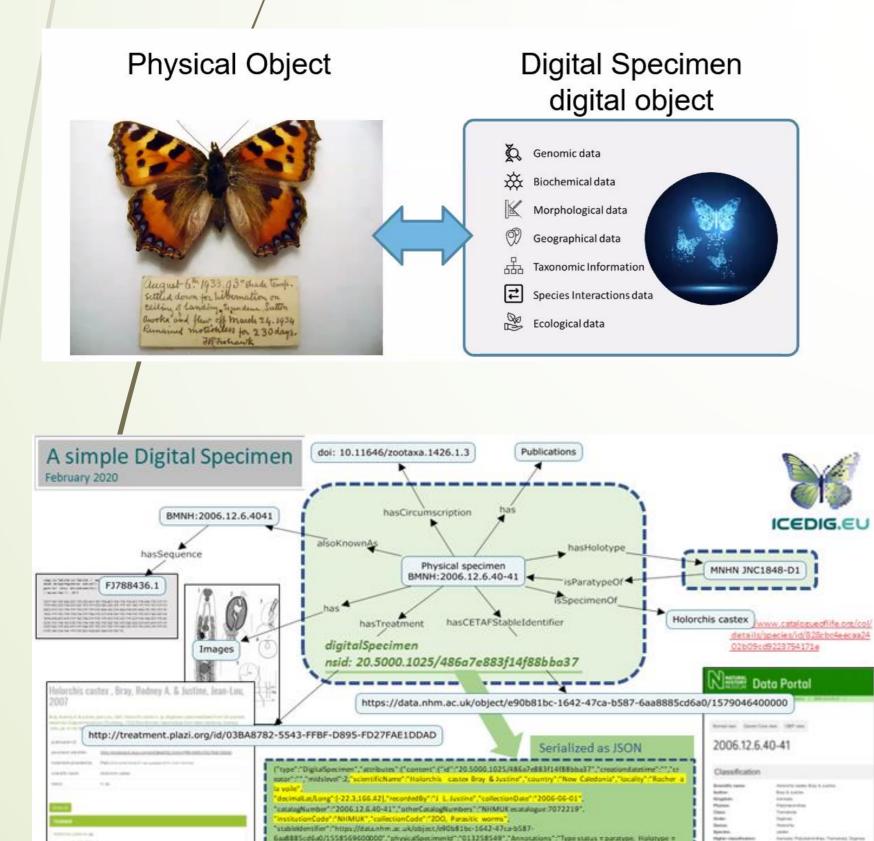
> DiSSCo Belgium 60+ millions specimens 20 Institutions







### To/FAIR Digital Objects



By collaborating with international actors, DiSSCo guarantees the accessibility and re-use of the data. For instance, with Biodiversity Information Standards (TDWG), the Global Biodiversity Information Facility (GBIF), the catalogue of Life (COL), The Biodiversity Heritage Library (BHL) and the Consortium of European Taxonomic Facilities (CETAF)

#### DiSSCo Flanders Portal using the GBIF Hosted Portal system https://dissco-flanders.be/



Bray, R.A., & Jean-Lou J. "Holorchis castex n. sp. ....." Zootaxa 1426.1 (2007): 51-56. doi: 10.11646/200taxa.1426.1.3

> DiSSCo adheres to the FAIR data principles and is compliant with the EOSC requirements by introducing the concept of Digital Extended Specimen uniquely identified by a PID and interlinking with associated information kept in various data repositories.



#### GeoCASe Portal using TDWG Earth Sciences data standards https://geocase.eu/



#### Contacts:

Patricia.Mergen@plantentuinmeise.be, Maarten.Trekels@plantentuinmeise.be, Frederik.Leliaert@plantentuinmeise.be



HONTO PLAY HONE GAME

#### National EOSC tripartite event Laura Mesotten, Anouk D'Hont, Hanne Heirman

### From Stranded to Scholar: Navigating Research Challenges with the Research Survival Game

Each player is cast as a researcher who is stranded on a



deserted island. As the players advance along the gameboard, the spaces they land on will familiarize them with key concepts of a research project. When they land on a good research practice, they can draw a card, but landing on a flawed practice requires them to move back or suffer a penalty.

Suffer a penalty The players can be punished by falling off a cliff, being trapped, or by having to return one of their cards.

**GAME DESIGN** 

PRINCIPLES



Draw a card Each card presents a multiple choice or true/false question about Open Access, Research Data Management, or Information Retrieval, followed by the correct answer and a clear explanation.



The game is won by collecting the most cards, as this means

enough skills have been obtained to properly conduct the research.

### Straightforward concept

The game operates with a question- and-answer format, which ensures a quick understanding of the rules and enables gameplay without research support staff present.

#### **Playful elements**

The introduction of entertaining features ensures a fun experience and lowers the threshold for learning about the topics discussed.

#### Easily adaptable game elements

The game can be tailored to the focus of the training and the needs of the participants by determining the themes and difficulty of the questions.

#### **EDUCATIONAL ADVANTAGES**

The Research Survival Game:

highlights the importance of openness, sound data management, and systematic searching

boosts participation and fosters interactive learning

invites players to exchange views and



Interactivity The game's physical format fosters interactive engagement and triggers researchers to share their own experiences.

#### ideas

identifies researcher difficulties that inform the development of future training

The Research Survival Game was developed by Laura Mesotten, Anouk D'Hont, Hanne Heirman, and Jenny Stieglitz in collaboration with Network Research at KU Leuven Libraries. It builds on material from previous games, credited in the rulebook. The materials required to create the Research Survival Game are published on Zenodo under a CC BY-NC-SA license.

#### Scan the QR code to download the game



### The FAIR-GNSS project: an Open Data Portal for European and Belgian GNSS data collections, built upon FAIR guiding principles



A. Miglio, C. Bruyninx, A. Fabian, J. Legrand, A. Moyaert GNSS team - Reference Systems and Planetology, Royal Observatory of Belgium, Brussels, Belgium

S. De Bodt, P. Oset Garcia, I. Van Nieuwerburgh Open Science team, Ghent University Library, Ghent, Belgium UNIVERSITY

In the context of scientific research becoming more and more datadriven, it is essential that data are properly documented, preserved and accessible to both humans and machines.

FAIR data principles are a community-agreed set of guidelines for finding, accessing, integrating, and reusing data. However, FAIR data principles are general principles and putting them into practice can be challenging.

The Royal Observatory of Belgium (ROB) maintains repositories containing decades of observation data from Belgian and European stations permanently tracking Global Navigation Satellite Systems (GNSS) e.g. GPS or Galileo. ROB has embarked on a project focused on the application of FAIR principles to improve GNSS data management and foster reuse of GNSS data.

#### **Motivation**

GHENT



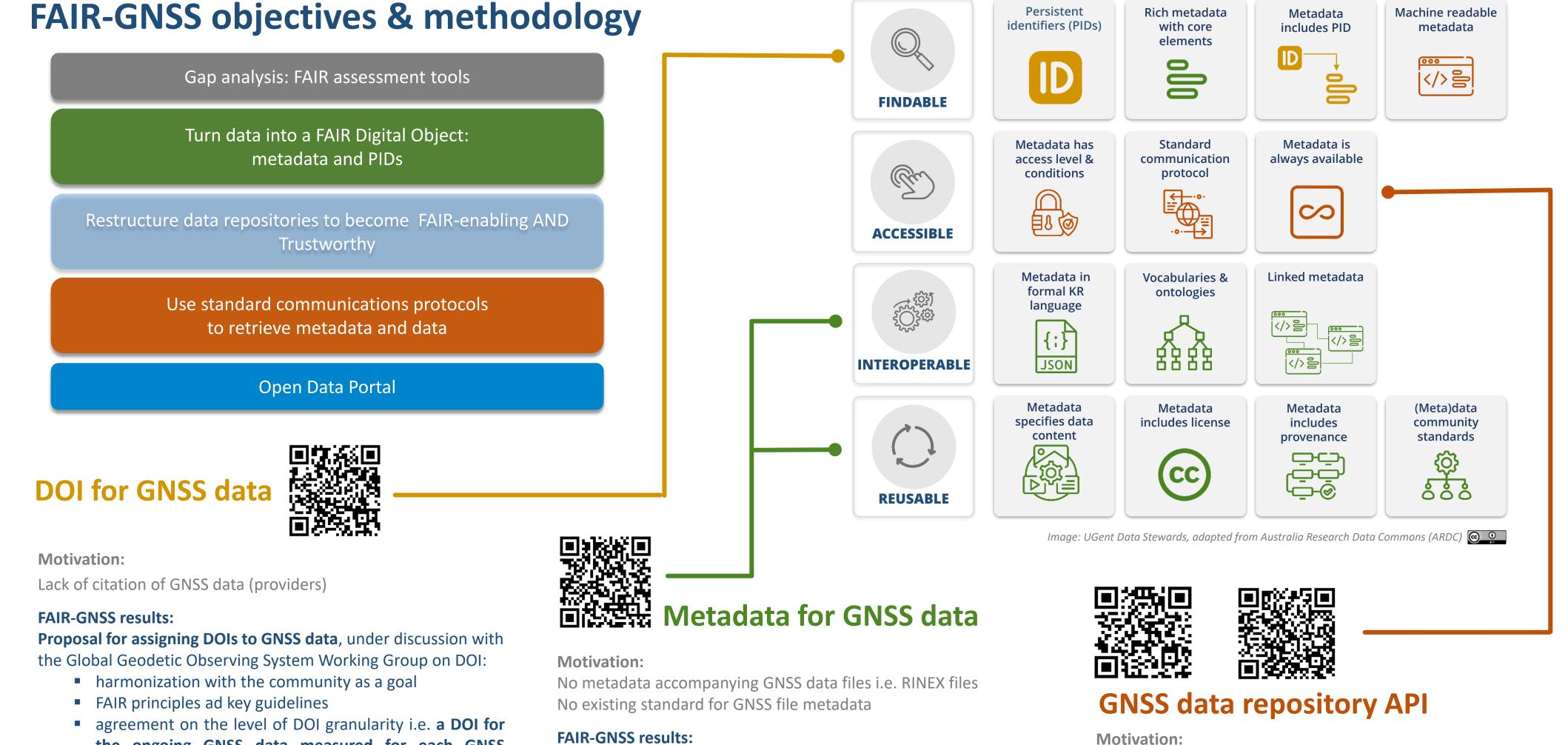
**EUREF and Belgian GNSS stations** 

ROB maintains repositories containing **observation data** from Belgian and European stations permanently tracking Global Navigation Satellite Systems (GNSS).

GNSS data allow precisely measuring ground deformations, monitoring space weather, providing evidence of climate trends, input for numerical weather predictions, etc.

ROB's GNSS data repositories were in need of a thorough modernization and it was also necessary to respond to the demands of GNSS users, station managers and the scientific community:

- acknowledge (cite) data providers
- provide data license information
- maximize interoperability and discoverability of geodetic products/services, ...



**FAIR data principles** 

- the ongoing GNSS data measured for each GNSS station, DOI for GNSS networks are also allowed
- use of DataCite schema and further standardization of DOI metadata content via standardized vocabularies

#### **GNSS-DCAT-AP:** schema proposal for RINEX-dependent metadata. GNSS-DCAT-AP (available on GitHub, see QR code above) is an extension of DCAT Application Profile for open datasets and data portals (DCAT-AP), and includes attributes specific to RINEX files: type of RINEX file (compression format, frequency), antenna type...

provenance, standardization, ...) and community feedback

JSON-LD serialization format

metadata in the GNS-DCAT-AP schema

**FAIR-GNSS results:** 

AND associated metadata:

RESTful API



#### **GNSS.be Open data Portal**

Rich metadata based on user requests when searching &

downloading GNSS data, FAIR data principles (data license, data

API documented on the Open Data Portal and on the Swagger dashboard (see QR codes above, one for each repository)

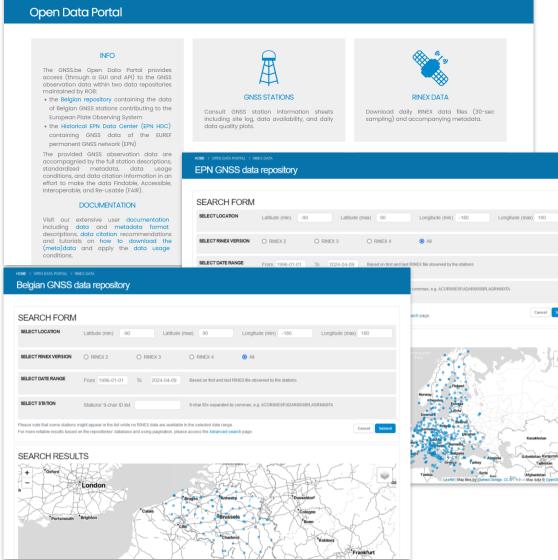
Web **Application Programming Interface (API)** to download RINEX files

Need for machine-operable access to GNSS data AND metadata.

The GNSS.be Open Data Portal provides access (through a GUI and API) to the GNSS observation data within two data repositories maintained by ROB:

- the Belgian repository containing the data of Belgian GNSS stations contributing to the European Plate Observing System
- the Historical EPN Data Center (EPN HDC) containing GNSS data of the EUREF permanent GNSS network (EPN)

The provided GNSS observation data are accompanied by the full station descriptions, standardized metadata, data usage conditions, and data citation information in an effort to make the data Findable, Accessible, Interoperable, and Reusable (FAIR)



Understanding how to put FAIR principles into practice, navigating among different metadata standards, restructuring the repositories and constant interaction with the scientific community required significant effort and time, but were key to the realization of FAIR-GNSS objectives.

Applying FAIR data principles requires investing resources (including considerable manpower), collaboration with experts (e.g., data stewards), building new expertise e.g. on metadata, long-term planning, and a continuous assessment.

Nonetheless, at each new development cycle, the level of FAIRness increases, ROB's repositories evolve towards becoming trustworthy data repositories, and the core services that ROB has been offering to the EUREF and Belgian GNSS communities improve.

E-mail: gnss@observatory.be



**FAIR-GNSS** a BRAIN-be project funded by BELSPO

 $\star$   $\star$   $\star$ GHENT belspo UNIVERSITY



#### Data curators Data stewards The Open Science 7. **Research Data** Management ased at the Coordination E Library Book Scholarly publishing and **Open Access** JUBUS UI!

### **Cultivating collective success:** Ghent University Library in the Open Science ecosystem

Oset Garcia, Paula 1, a, b, c; Mertens, Myriam 1, a, c; Van Nieuwerburgh, Inge 1, c; Hermans, Emilie 1, c; De Bodt, Stefanie 1, c 1 Open Science team, Ghent University Library, Ghent, Belgium a Conceptualization; b Writing (first draft); c Writing (review and editing)

> The **Open Science team** at Ghent University Library consists of specialists in open access and scholarly publishing, data stewardship and curation, and one team coordinator.

> This poster showcases the extensive **web of initiatives and collaborations** involving Ghent University Library's Open Science team, and describes the collaborative ecosystem driving the advancement of open science within the institution and beyond.

**Policy advocacy** 

Make it

possible

Make it

rewarding

- Ghent University has progressively adopted policies to stimulate openness and transparency in research. E.g. Policy on Scholarly Publishing, RDM Policy framework, DMP requirement for PhDs, BOF and IOF.
- Open Science team's role: policy formulation, communication and guidance.

#### Infrastructure development

- Develop and/or give access to open science enabling infrastructure. E.g. Openjournals publishing platform, Biblio repository, RSpace ELN, OSF Institutions, DMPonline.be.
- Open Science team's role: collaborate with central and Central IT and Library Innovation team (e.g. on user requirements), user support for tools.

#### Incentivizing open science

- Adoption of a responsible research assessment approach (RRA), signatory of DORA and CoARA, pioneering of noncompetitive research funding scheme.
- Open Science team's role: awareness raising and advocacy for RRA and recognition of OS practices.

#### **Capacity building and training**

- Equipping researchers with the skills to engage in and implement sound data management and open publishing practices and incorporate open science principles in their workflows
- Open Science team's role: university-wide and faculty-specific training on RDM, open access and open science; curation of (meta)data submitted to data repositories and catalogues (inc. Biblio data register), management of Ghent University research data community in Zenodo.

#### Make it required

Advancing **Open Science** within Ghent University and beyond

Transforming research culture to embrace open science requires a **holistic approach** involving multiple stakeholders and with measures at multiple levels (Nosek, 2019).

Interventions across these layers are already in progress at Ghent University with the Library's Open Science team playing a crucial role.

> Adapted from Nosek, Brian (2019), Strategy for Culture Change, Center for Open Science website

Icons by Flaticon and Microsoft

Make it easy

> Make it normative

#### **Community building**

#### a collaborative ecosystem

**Open science:** 

The **collective success** of Open Science relies on mutual relationships within a wide ecosystem of internal and external stakeholders.

- Development of an active and inclusive bottom-up community of open science to drive change from within.
- Open Science team's role: promoting and facilitating community development, connecting researchers, organisational support, community (co)management.

#### Institutional level

Research coordination office, Doctoral Schools, IT, the Data Protection Officer, TechTransfer, Faculties, researchers and other Library teams

### 

#### **Flemish and Belgian level**

FRDN working and project groups, FRDN Knowledge Hub, FOSB, VLIR, Open Access Belgium, etc.

#### International level OpenAIRE, COAR, EOSC

association, EOSC-Pillar, EOSC Future, etc.

Do you want to know more? Contact us, follow us or visit our website:

ugent.be/en/research/openscience 

openscience@ugent.be

(X) @UGent\_OS











Belgian Collaborative Ground Segment for the Copernicus Sentinel missions

### **TERRASCOPE IN A FEDERATED EUROPEAN ECOSYSTEM**

Paepen, Martine; Clarijs, Dennis; Dooms, Bart; Everaerts, Jurgen VITO (Vlaamse Instelling voor Technologisch Onderzoek), Belgium



Satellite data

• Products derived from satellite data

Selected reference data sets

**Open for everyone** 

(scientists, public authority, industry, citizens)

• Web services (OpenSearch catalogue, OGC web services, openEO, CROPSAR)

5.5

Cloud processing capacity (Jupyter Notebooks, Virtual Machines)

• EOplaza, an exchange area for EO service providers and EO users

#### Free to use for everyone

Funded by BELSPO for next 5 years, governed by Advisory Board

#### EXTENDED ACCESS TO COPERNICUS SPACE ECOSYSTEM

stem 20 Users ecosy



Governmental organizations Universities & Research institutes Commercial enterprises Individuals

O O C

Proof-of-concepts for specific use cases & support Belgian institutional users

8

Uha

Vha

Services



Cloud computing & HPC



Federated Access & Processing APIs



Extend to a federated EOplaza for unique ondemand analytics



Jupyter Lab for prototyping



Visualization





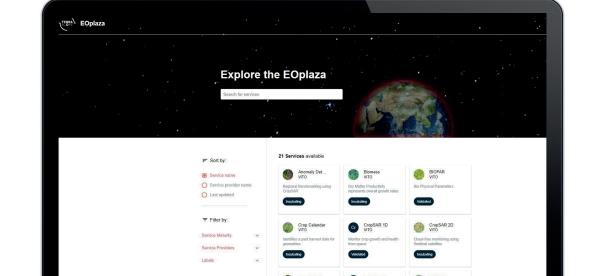


#### TERRASCOPE, EOPLAZA AND OPENEO INTEGRATED IN A FEDERATED EUROPEAN ECOSYSTEM



#### **POWER OF THE DATA CUBE USING STREAMLINED APIS**

- Streamlined APIs generate data cubes
- Access pixels rather than entire files
- On-the fly or batch manipulation of time series
- Scalable



#### **EOPLAZA = MARKETPLACE FOR**

- Service provider to publish services
- End User to explore and use services



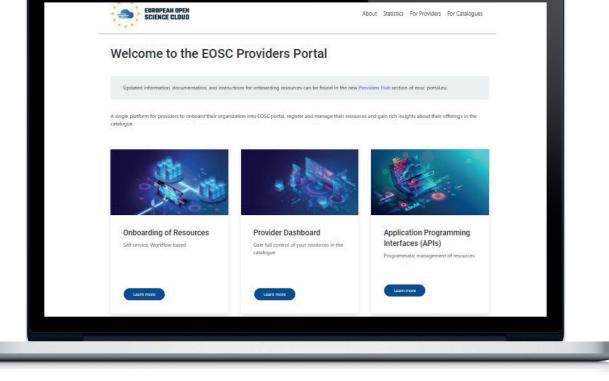
www.wasdi.cloud



eosc-portal.eu

**VITO IS SERVICE PROVIDER EOSC** 









#### Powered by





The FAIRVault project is an interuniversity collaboration between four Flemish universities (Ghent University, Hasselt University, University of Antwerp and Vrije Universiteit Brussel) to develop a generic solution for archiving, in a FAIR-aligned way, research data for which no suitable repository exists, in particular sensitive data.



Compliance with applicable **legislation/regulations**?

### 1. Project's proposition



#### Adressing unmet needs

Domain-agnostic, FAIR-enabling archiving solution, even for sensitive research data, aligned with local (regulatory) context



#### Institutional control

Custom storage, centrally controlled access to institutional research data assets



Not always trusted by researchers

ullet

Sometimes dissemination rather than preservation focus

Current research data 'archiving' practices are often suboptimal



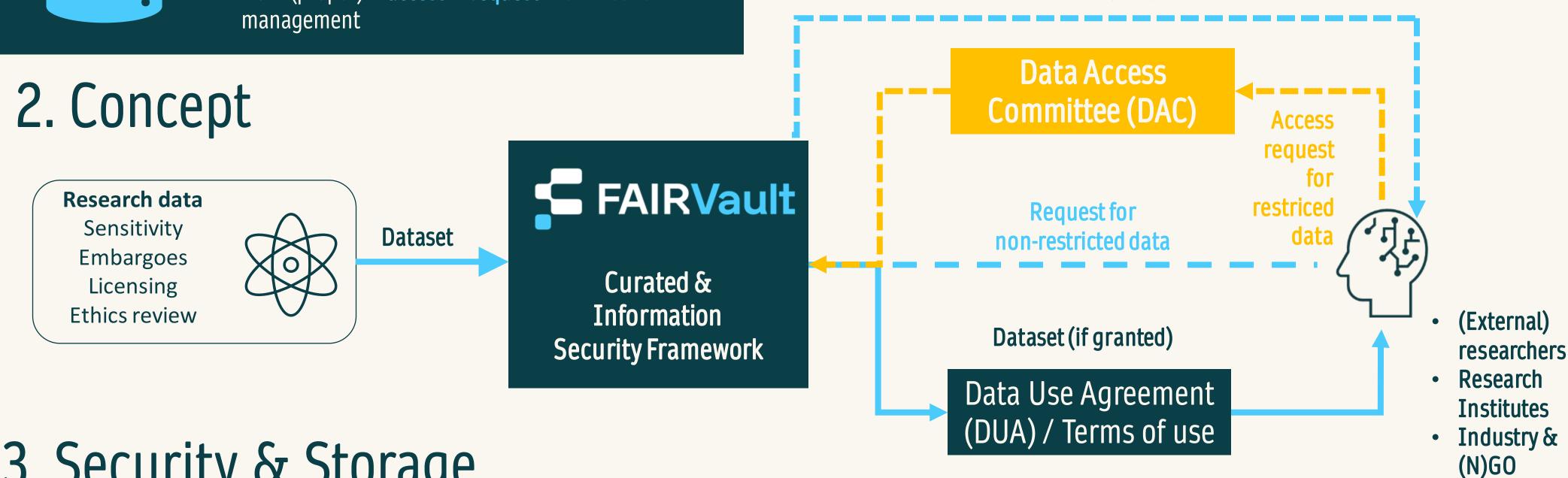
- Use of expensive, 'active data' storage types
- Lack of metadata & documentation ٠
- Risks of data alteration
- No clear disposal process
- No (proper) access request & reuse



#### **Collaborative**

Metadata (CCO)

With potential for expansion beyond universities



### 3. Security & Storage

Data Tags (originally developed at Harvard University) are a tool to quickly assess the level of sensitivity of a dataset in a standardized way that is easy to understand for both humans and machines. We tailored Data Tags to be in line with the EOSC-Hub recommendations and to optimize user-friendliness of the FAIRVault.





Non-confidential and non-sensitive Clear storage information Clear transmit



Non-confidential and non-sensitive Clear storage information with some access control Clear transmit



Encrypted storage Confidential and sensitive information **Encrypted transmit** 



Very confidential and sensitive information

Encrypted storage **Encrypted transmit** 

None. The dataset can be freely downloaded without registration.

Contractual obligations are agreed upon clicking a checkbox, button or link to indicated consent.

Contractual obligations are defined in a pre-set DUA that needs a signature of the data requester. Access request approval via an institutional employee.

Contractual obligations are defined in a pre-set DUA or a custom-made DUA agreement that needs a signature of the data requester. Access request approval via a DAC.

Open, accessible to registered users or restricted

Accessible to registered users or restricted

Restricted

Restricted















### Appraisal guidelines for the preservation of research data

### Sybren Slegers

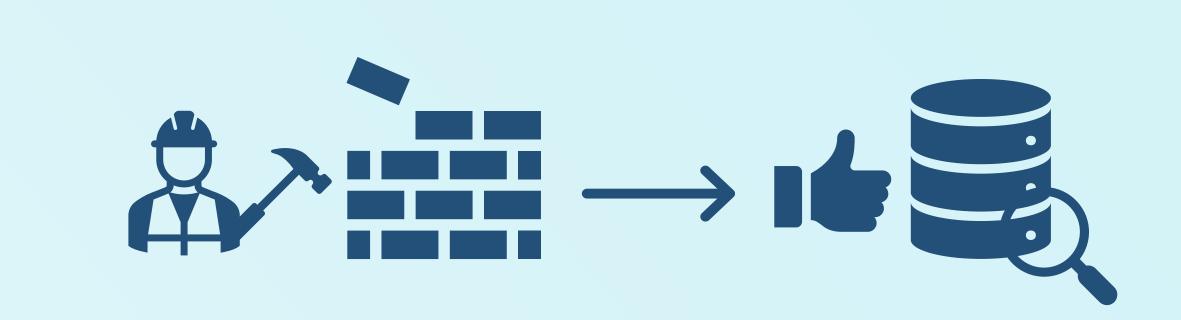




### What is appraisal?

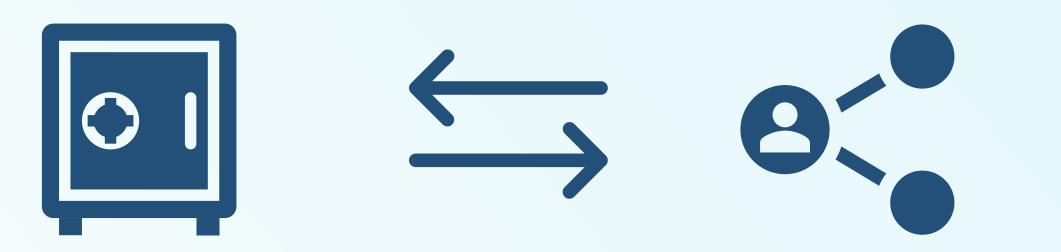




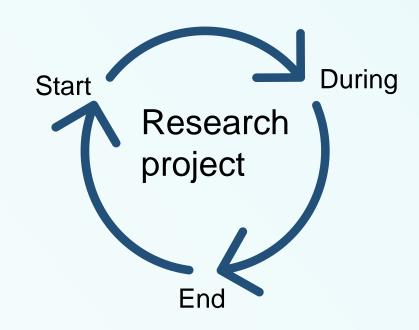


> Appraisal?

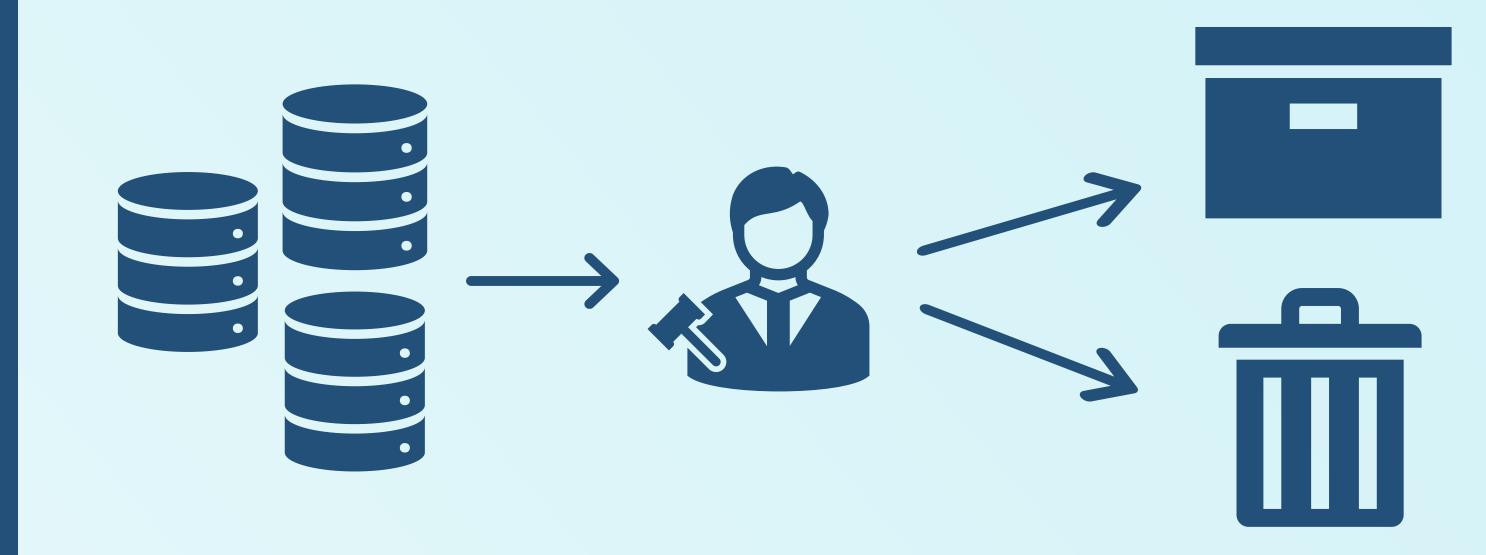
- Archival sciences
- The process of determining whether records have retention value (temporary or permanent)



Mandatory data preservation and optional data publishing



#### > Archive-Research-ICT: Provide RDM infrastructure



Scientific research produces large amounts of research data, but it is unrealistic to preserve all research data



Guidelines for the appraisal of research data Researcher makes informed decision Purpose of research data preservation > FAIR

> When to start the appraisal process?



### Appraisal process

Future use

#### > Data types







Synthesized data

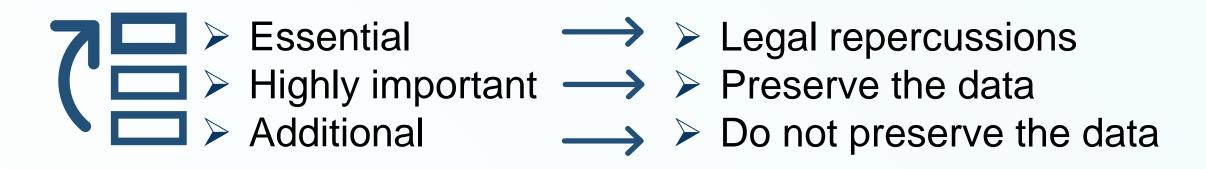
Raw data Processed data Data supporting the publication

#### Data quality & distribution potential





#### > Tiers of importance



> Appraisal criteria







Legal requirements

Stakeholder Scientific or interest historical value

Preservability of Uniqueness content



#### Currently as checklist

> Later as application

### KU LEUVEN

#### **KU Leuven RDM Competence Center**

Dieuwertje Bloemen, Ingrid Barcena Roig, Johan Philips, Kim Sterckx, Veerle Van den Eynden

### Unlocking Research Data Management (RDM) at KU Leuven



### **Navigating Support and Services**

One-stop-shop for inquiries with growing knowledge base and referral to experts



Assist departments and faculties to customize the RDM policy with guides on storage, onboarding and offboarding



Review and feedback on data management plans managed via the DMP monitoring tool



to prepare and publish data in RDR with quality reviews for FAIR data

Association & Partners and projects to develop and implement RDM procedures and workflows

Share knowledge, skills, training and events with association members and partners and provide customized advice and training

Research Data Management (RDM) services coordinated by the KU Leuven RDM Competence Centre and delivered by a network of support staff at KU Leuven Libraries (2Bergen, LIBIS and Nexus), the Research Coordination Office and ICTS, the central computer department. Overseen by the RDM Steering Group for strategy and direction, with Working Groups for Policy, Infrastructure and Advise, training & communication.

# 2010

### SOCIAL SCIENCES AND **DIGITAL HUMANITIES** ARCHIVE

New Belgian repository !

### WHAT IS SODHA?

The Social Sciences and Digital Humanities Archive is a brand new digital archive, freely available for Belgian researchers active in the fields of social sciences and digital humanities. In light of the international trend towards opening up research results, SODHA offers Belgian researchers the opportunity to safely store and share the results of their work. Furthermore, the platform encourages and facilitates deposits in accordance with the FAIR-principles: findable, accessible, interoperable and reusable.

To researchers active in social sciences and digital humanities, SODHA offers an overview of available (open) research data



What is the Social Sciences and **Digital Humanities Archive?** 

**NEW NATIONAL DATA ARCHIVE** is a disciplinary repository NEW facilitating the findability, accessibility interoperability and reuse of Belgian research data in the social sciences and digital humanities.



SODHA provides a single access point for a variety of datasets from different data providers. The online platform allows you o discover new data without cost



SAFE AND EASY DATA PRESERVATION SODHA offers long-term, data storage by experts without cost, × × × allowing researchers to easily follow their Data Management Plans and fulfil grant obligations.

in Belgium, as well as multiple options for data retention and for opening up their valuable datasets. Data stored in SODHA are safely backed up and preserved.

SODHA\* is led by data experts from the State Archives of Belgium and financed by the Federal Science Policy Office (BELSPO). Research Groups DEMO (UCLouvain) and BRISPO (Vrije Universiteit Brussel) offer support for the further development of the archive.

\* SODHA is the official Belgian representative in the Consortium of European Social Science Data Archives (CESSDA).



SODHA is a domain-specific repository. SODHA focuses on research data from the social sciences and digital humanities. Interdisciplinary datasets related to these domains are also welcome. By being domain-specific, SODHA makes your research extra visible and easy to find to colleagues from your discipline.

#### How much does it cost?

Data users can browse the SODHA platform and deposit datasets without costs. Open Access Datasets can be accessed and reused without costs. Restricted Access Datasets are under the competence of the data owner/depositor, who may stipulate a costs for the access and reuse.



### WHY SODHA?

#### 1. Ensure a safe deposit of your research data.

SODHA aims at long -term data storage. Uploading your data in SODHA prevents your valuable work of remaining unnoticed or getting lost. Therefore, SODHA can be of value when you are looking for sound data management. The repository has been developed to help you establish a *data management plan*. Such a carefully drafted plan is essential for efficient research and can be useful for future funding applications!

The main characteristics of your deposited datasets are clearly described in the metadata on SODHA. You are free to provide personal descriptions related to the metadata. SODHA stipulates limited mandatory fields, including your name, contact information, possible future publications related to the dataset and a short description of the data collection. Not 100% sure about uploading the full dataset yet? SODHA also accepts' uploads' of only metadata. This will help build an overview of data collection and expertise of Belgianresearchers.

#### FREEDOM FOR DATA DEPOSITORS



When entrusting their research data in data depositors remain responsible for their data. Depositors are free to choose open or restricted access and have different data reuse options. Removing deposited data is possible.



#### Why use the Social sciences and (Digital)



#### Choosing an access and reuse regime

When depositing data in SODHA

#### **Does it offer long-term storage?**

Yes, research data are deposited in SODHA for an indefinite period. Removing deposited data is possible at any time. SODHA archives the data in accordance with (inter)national law, standards and good practices.

#### Does it suit your data needs?

All research data from the social sciences and digital humanities can be stored in SODHA. The powers of decision remain with the depositor. Depositors are free to select one of the five access and reuse regimes and specify the preferred license. The SODHA guide provides an overview of the legal requirements for data protection, as well as a list of the accepted file formats

#### What will happen to your data?

Once deposited, team SODHA will perform minor security checks and publish the record for your dataset online. SODHA automatically assigns a digital object identifier (doi) to the deposited database. SODHA will now create a separate landing page for your database with the metadata publicly available. Depending on the chosen access and reuse regime, the landing page will include the open access data files or more information on the access procedure. Thanks to our membership to the Consortium of European Social Science Data Archives, your metadata will also be findable in the CESSDA Data Catalogue.

#### Is SODHA certified?

As a part of the Belgian State Archives, SODHA follows the State Archives principles and is subjected to the same strict criteria for data archiving. Team SODHA is currently preparing the application for the Core Trust Seal.

#### Where can I find more information?

More information is available via <u>sodha.be</u>. Team SODHA is happy to answer any further questions you may have (sodha@arch.be).

SODHA ensures a deposit according to the FAIR principles for scientific datamanagement and stewardship: findable, accessible, interoperable and reusable. Other researchers can easily find your datasets via the SODHA website or via search engines. You choose how accessible, interoperable and reusable your data will be.

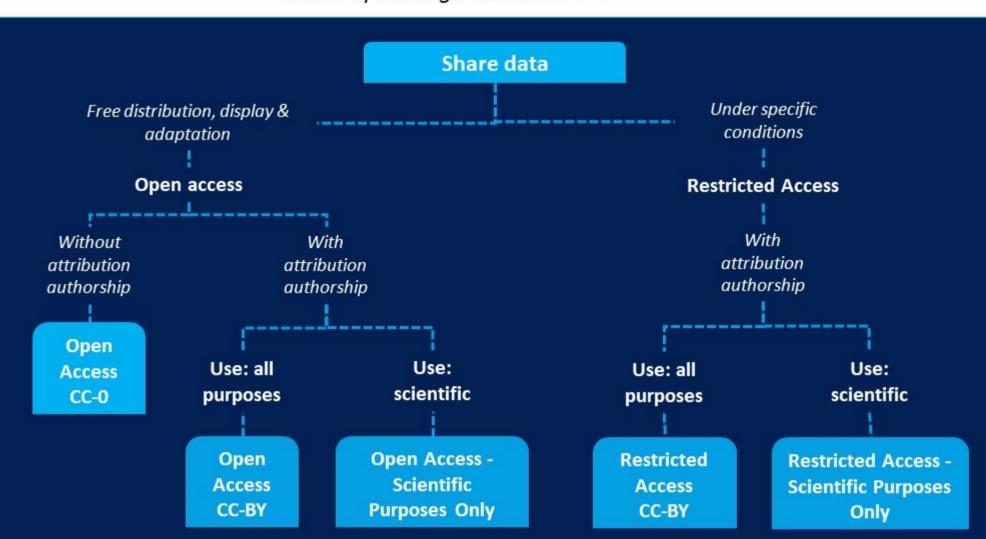
#### 2. Facilitate the potential reuse of your research data.

Each dataset available through SODHA receives a *Digital Object Identifier*, more commonly known as a DOI, which enables simple and transparent references to your dataset possible. SODHA allows targeted searches to specific datasets using DOIs. Furthermore, the use of DOI is a good way to validate your data collection efforts. You -as the owner of the dataset can be cited in publications that build on your deposited dataset.

#### 3. Ensure international visibility for your work and build a network beyond your university!

Your research (meta)data are not only visible on the SODHA website, but also international **CESSDA**\*\* data catalogue (available in the on www.datacatelogue.cessda.eu).

\*\* CESSDA stands for: Consortium of European Social Science Data Archives. CESSDA brings together 22 social science data archives across Europe, with the aim of promoting the results of social science research and supporting national and international research and cooperation.



## for sharing your data



Certain types of research data are not (immediately) ready to be shared in open access. This checklist helps you identify data issues and choose the right access and use regime in SODHA.

#### NO personally identiable information

Make sure your data do not contain information which may (in)directly identify living natural persons. SODHA does not allow datasets with respondents' real names, addresses and other contact information. Doublecheck that respondents cannot be identified using a combination of variables (e.g. Job title: Mayor; Postcode: 1234). Confidential data (e.g. collected with a non-disclosure agreement) should not be deposited.





Team Leader: State Archives of Belgium



**Academic Partner:** Center for Demographic Research (UCLouvain)



**Academic Partner:** Brussels Institute for Social and Population Studies (VUB)



**Funding Agency:** Belgian Science Policy Office (BELSPO)

### NTERESTED?

### Check www.sodha.be or contact us: sodha@arch.be



#### Sensitive data?

Does sharing your data have ethical and societal implications, e.g. with regard to harming vulnerable groups? Consider depositing your data under 'Restricted Access CC-BY' or 'Restricted Access - Scientific Purposes Only'.

#### **Copyright and database rights?**

Check if your data or data format (e.g. audiovisual data) have specific copyright or database rights. If so, ask permission from all rights owners.

#### **Third-party data?**

Does your dataset consist of or contain data supplied by a third party (e.g. government agency)? Check your data contract whether you have permission to share the data or excerpts of the data (e.g. general processed data tables). Consider depositing your data under 'Open Access - Scientific Purposes Only'; 'Restricted Access CC-BY' or 'Restricted Access - Scientific Purposes Only' to comply with the third party's restrictions.

#### Data with commercial/economic potential?

Do you want to pursue commercial or economic valorization with your data? If so, consider depositing your data under 'Restricted Access CC-BY' or 'Restricted Access - Scientific Purposes Only' and specify an embargo period (Terms section: Availability Status)





### **Amail: Bridging Voices in Al Development!** A Mission-Oriented Participatory Approach

Annelies Duerinckx<sup>1</sup>, Karen Verstraelen<sup>1</sup>, Jef Van Laer<sup>1</sup>, Isaak Vandermaesen<sup>1</sup>, Charlotte Vandooren<sup>3</sup>, Michiel Vaes<sup>2</sup>, Carina Veeckman<sup>2</sup>, Neena Singh<sup>2</sup>, Pieter Duysburgh<sup>2</sup>

> <sup>1</sup> Scivil (Flemish Knowledge Centre for Citizen Science), Leuven, Belgium <sup>2</sup> Knowledge Centre Data & Society, imec-VUB-SMIT, Brussels, Belgium <sup>3</sup> Brightlab, Leuven, Belgium



Involve citizens in each step of the process

**1. Collecting research questions** 

**3. Open call for proposals** 

- Goal = give citziens a voice in Al research and development
- Method = participatory approaches in each phase from idea to application
- **Outreach** component of Flemish Al Action plan

General approach:

- **Insight**: How is AI part of our lives?
  - Why should you care about AI?
  - What do you need to know about AI?

 $\rightarrow$  Science communication

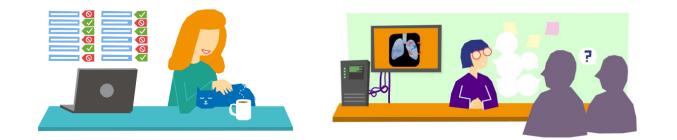
- **Ideas:** What should AI be used for?
  - Capture how citizens think about AI and  $\bullet$ what is important to them.
  - Involve them in all steps of the process
  - $\rightarrow$  Citizen science
- **Impact!** We give consortia a chance to make citizens' ideas come true
  - Funding call
  - Projects with a citizen science approach

#### Focus on **4 societal themes**:



#### **Accessible information**

Stories that connect to daily lives of citizens e.g. Sara's spamfilter, Julie the oncologist



- **Fun elements** to lower barriers: Social media test: AI in the supermarket Interactive wall for events Card game about AI
- **Broad communication** to general public: social media campaigns media partnership with radio and newspaper
- **Guided conversation** leading citizens to formulate their ideas on Al +1000 ideas collected

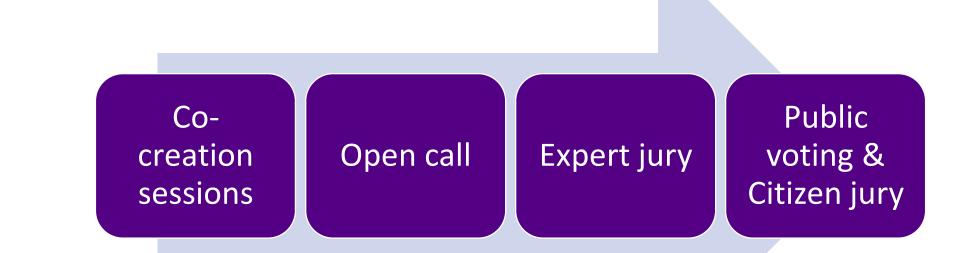
Go where the people are (festivals, markets)

#### Jullie bijdragen

uidse alucose chip uitbi

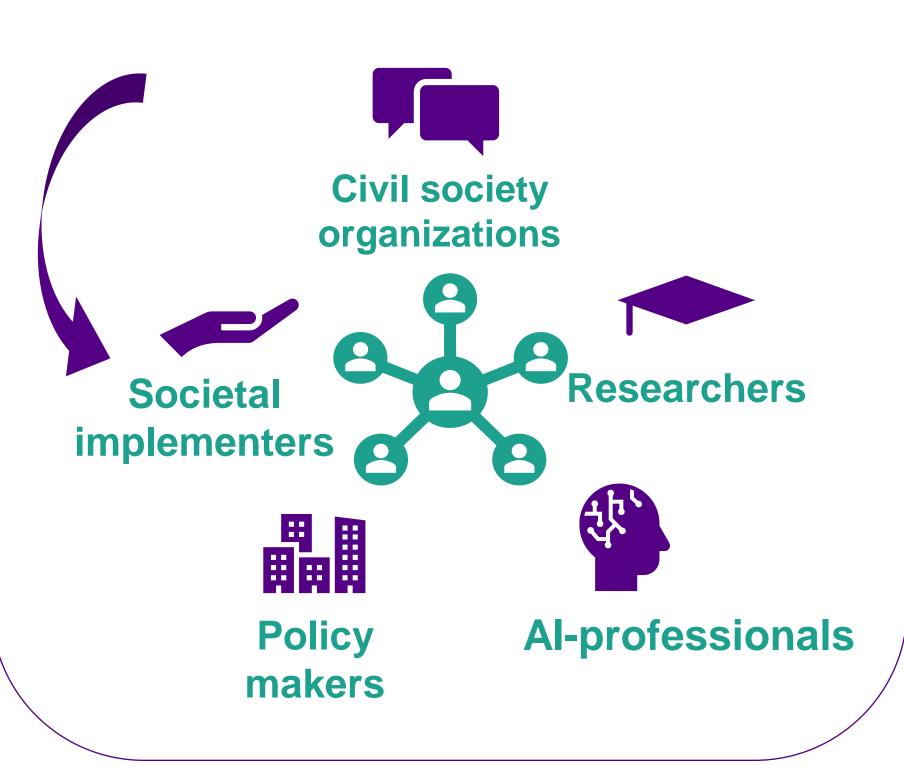
Kan Al er voor zorgen dat je al utomobilist via alleen maar ene lichten ie bestemn rkeerslichten houden rekenina m et verkeer dat hun richting uitkom

- Proposals start from an idea of a citizen
- 2 stage application process with in between feedback, matchmaking and support
- Funding call open for mixed consortia consisting of:
  - non-profits and **civil movements**
  - local governments
  - knowledge institutions
  - IT-companies
- Selection of projects 1) Jury of experts assessing quality 2) Citizens have the final voice:
  - large scale **public voting**
  - citizen panel to check societal impact



**Target audience:** "societal implementers":

- Little interest in technology
- Highly engaged by societal issues

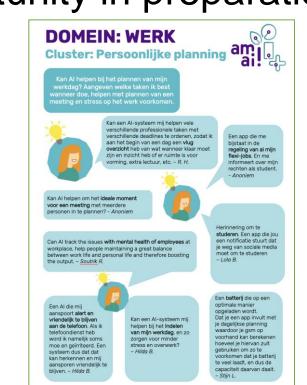


Log in om te stemmen	lees meer	Log in om te stemmen	lees meer	Log in om	te stemmen	lees r	neer
♥1	< 0 📃 🗩 0	Ψ 0	< 0 🔎 0		• 0	< 0	<b>9</b> 0
Els V.		Tim L.		Tine W.			

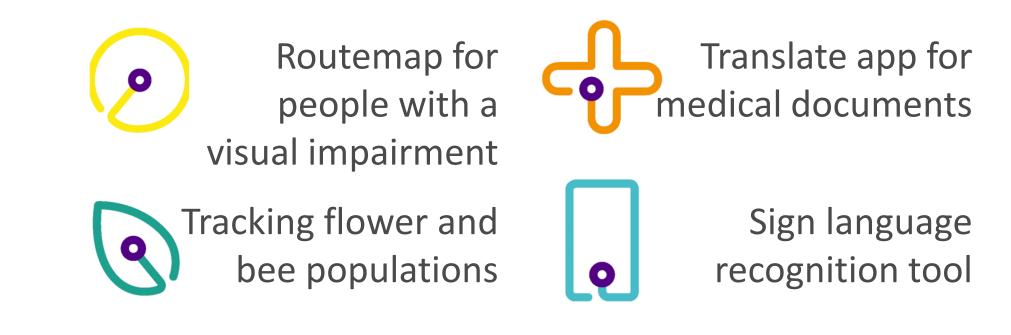
#### 2. Co-creating solutions

- **Clustering** of ideas e.g. all ideas on personal planning
- **Co-creation sessions:** 
  - bringing together **quadruple helix actors**: citizens, experts in societal challenges, Al professionals and policy makers
  - defining scope of issues and requirements for solutions
  - **networking** opportunity in preparation of project call

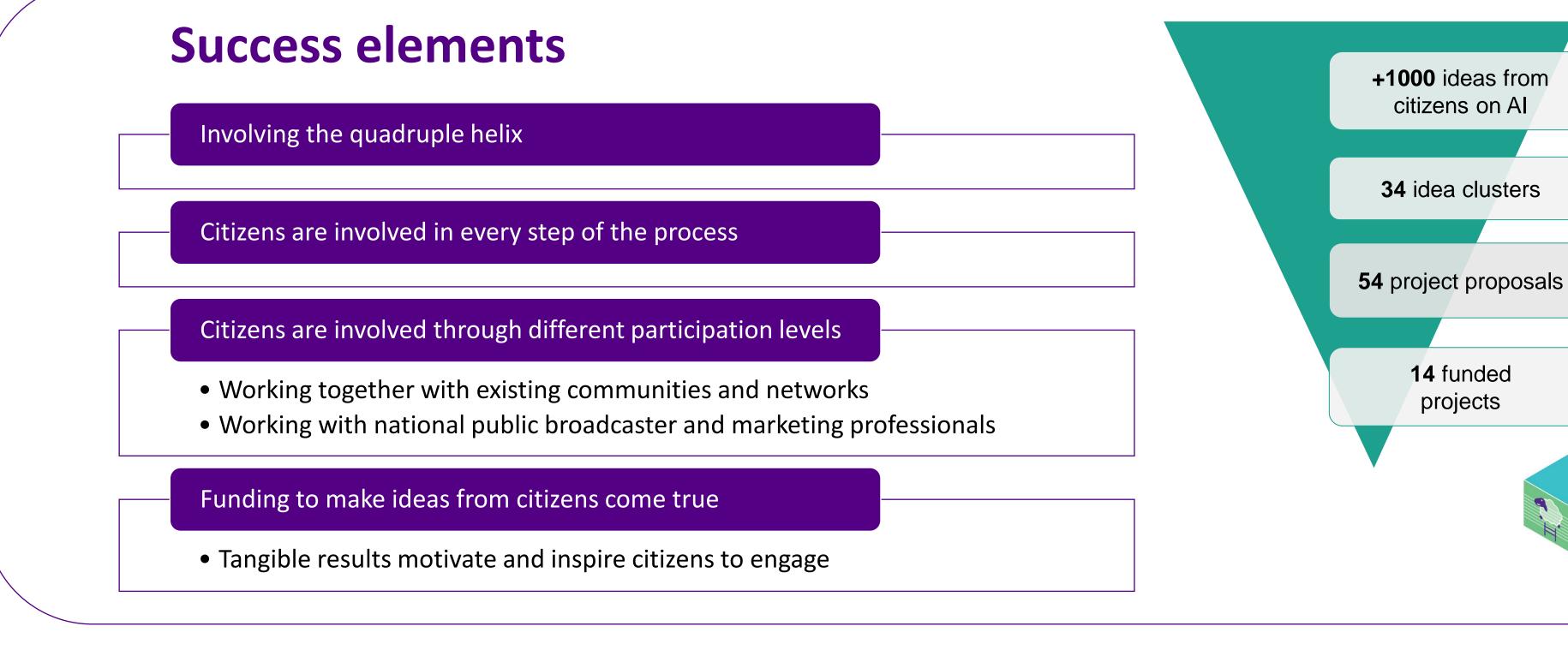
34 clusters of ideas



#### 4. Developing solutions with citizen science approach



- **Citizens** involved in development: e.g. focus groups, collecting data, annotating data...
- **Overarching support** for funded projects:
  - Community of practice
  - Integrated communication and outreach
  - Workshops on specific themes



#### **Activities**

#### Several target groups

- educational material for people with low literacy levels

- Outreach events in low technology-areas
- idea booth for events
- info-, brainstorm- & train-the-trainer-sessions

**Card game**: build your AI-solution! - Al-solutions based on ideas from citizens - collect all the cards needed also cards about ethics, law... - for +8 year olds, to play at school or at home



#### www.amai.vlaanderen