Brochure of Use Cases on EOSC and Open Science

Foreword

Open Science and the European Open Science Cloud (EOSC) are continuous processes, in which we engage to improve the working conditions for science by empowering research groups to have easier access to the means they need to progress. Therefore, Open Science has a wide spectrum of axes, from open access to publications, FAIR and open data, open source software, sharing services and e-infrastructures outside the domain they have been created for, and by engaging the wider public through citizen science projects.

It is not always evident how to improve the situation, and we need to share ideas and examples from different domains, various cultural backgrounds, and countries. This brochure is a building block of Open Science, as it wants to draw your attention to the diversity of solutions from the member states of the European Union and countries associated to Horizon Europe. This list, compiled in the context of the EOSC Steering Board survey on National Contributions to EOSC, is by no means complete, but is meant to serve as a motivation to learn and to improve. The next instalment of the survey is on its way, and as for the results of the previous years, you can find the outcomes in the EOSC Observatory (https://eoscobservatory.eosc-portal.eu). For more on Open Science monitoring see also our ERA Talk (https://youtu.be/yXwaRQyNX7E).

We look forward to seeing more Open Science examples in the nearest future!

Volker Beckmann (Co-chair of the EOSC Steering Board)

Acknowledgements

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🎓 Skills/Training

👤⭐ Assessment

✊ Engagement

Introduction

This **Brochure of Use Cases on EOSC and Open Science** offers a selection of use cases showcasing national implementation of EOSC and Open Science. The brochure builds on the EOSC Catalogue of Best Practices (https://zenodo.org/records/7574164). The use cases have been chosen from responses to the surveys on National Contributions to EOSC for 2021 (https://zenodo.org/records/7423952) and 2022 (https://zenodo.org/records/7550797). These surveys were targeted at members of the EOSC Steering Board who represent the member states of the European Union and associated countries to Horizon Europe. Survey respondents were asked to briefly report on national use cases on EOSC and Open Science.

A first selection of possible use cases was made from the short use case responses for 2021 (https://zenodo.org/records/7431677) and 2022 (https://zenodo.org/records/10155992). The aim hereby was to include one use case from each member state and some associated countries and present a variety of use cases from the eight categories relevant for EOSC and Open Science as identified in the Monitoring Framework for National Contributions to EOSC and Open Science (https://zenodo.org/records/7410760).

The members of the EOSC Steering Board were then contacted to discuss the suitability of the use case or propose a more suitable use case. The country representatives in the EOSC Steering Board or their delegated experts lastly filled in a template to explain the selected use case for their country.

This brochure presents 31 use cases on the national implementation of EOSC and Open Science from member states and associated countries in Europe. The use cases are divided across eight categories relevant for EOSC and Open Science: Publications, Data, Software, Services, Infrastructure, Skills/Training, Assessment, and Engagement. Each use case provides the title of the use case along with the country of implementation, a short description of the use case, key facts about the use case, and relevant links for further information about the use case. The use cases and brochure have been validated by the EOSC Steering Board. The annual surveys on National Contributions to EOSC and Open Science are planned to continue to collect relevant use cases on the national implementation of EOSC and Open Science.

Publications

Research publications
that are available
in open access

hrčak
PORTAL OF CROATIAN SCIENTIFIC AND PROFESSIONAL JOURNALS
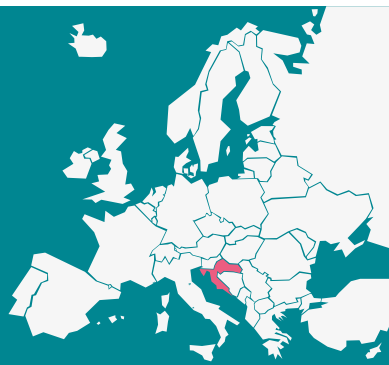
Portal of Croatian Scientific and Professional Journals (HRČAK)

Country

Croatia

Organisation

SRCE - University of Zagreb University Computing Centre

Key facts

- 290,000+ OA papers from 530+ Croatian scientific and professional journals accessed by 70,000+ daily visitors (incl. researchers, public administrators, etc.)
- Researchers can submit manuscripts across disciplines and languages, and link their papers to ORCID profiles (76,000+ authenticated links)
- Services, including OpenAIRE, utilise HRČAK's interoperability through the OAI-PMH interface to enhance the findability and visibility of research outputs
- As an important component of the national data infrastructure, HRČAK is interconnected to the national repository system DABAR and the national CRIS system CroRIS

Website

https://hrcak.srce.hr/en

HRČAK, the central portal for Croatian scientific and professional journals, serves as the national platform for facilitating Open Access publishing. The journals featured on the portal encompass a wide array of scientific disciplines and languages, and submissions are accepted from authors across the globe. HRČAK has been a community-driven idea, and the community contributes to the development of HRČAK through the Advisory Board. The portal is developed and maintained by SRCE – University of Zagreb University Computing Centre.

Since its beginnings in 2006, HRČAK has been promoting and supporting Open Access and good publishing practices. Journal editors and publishers are offered tools to enhance the openness and visibility of their journals, while offering the public a centralised platform to access the content from all available journals. Journal editors can utilise the maintained instance of Open Journal Systems to oversee and streamline the editorial process. HRČAK prioritises interoperability ensuring that its content is discoverable through search services such as Google Scholar and OpenAIRE (data provider since 2015).

The latest functionality added to HRČAK implements Plan S recommendation to provide full text for publications in a machine-readable community standard format such as JATS XML. To share the experience and technological solution for creating JATS XML with the European publishing community, SRCE will provide this functionality as a service in EOSC.

VILNIUS
TECH
Vilniaus Gedimino
technikos universitetas

Open Journal Systems

Country

Lithuania

Organisation

Vilnius Gediminas Technical University

Key facts

- Lithuanian Science Periodicals Association (LMPA) was founded in 2010
- EIFL supported the LMPA's initiated project "Open Journal Systems - opportunities for the development of Lithuanian scientific journals" in 2011
- Over 130 participants involved in publishing attended training events and learnt about OJS and online publishing
- 86 OJS installations implemented by 2023 at research institutions in Lithuania

Website

https://www.eifl.net/resources/promoting-open-access-through-implementation-open-journal-systems-lithuanian-research

https://journals.vilniustech.lt

In 2010, scientists from Vilnius Gediminas Technical University established the Lithuanian Science Periodicals Association (LMPA) to enhance the international recognition of Lithuanian scientific journals. The main objectives were to advance Open Access publishing, showcase Lithuanian scientific achievements globally, and provide support through training and conferences. A survey conducted by LMPA revealed that many Lithuanian research journals had limited online visibility and lacked interoperability. To improve this, LMPA organised an international conference "The Possibilities of Disseminating Lithuanian Research Journals Worldwide" which was attended by over 130 participants.

In 2011, the "**Open Journal Systems** - opportunities for the development of Lithuanian scientific journals" project was launched, aiming to introduce publishers and editorial boards to the electronic publishing system (OJS) and encourage its adoption. A Lithuanian version of OJS was developed, along with guidelines for journal editors and publishers. Additional features such as the Digital Object Identifier (DOI), and Cited By (by crossref.org) promoting plagiarism detection tools (CrossCheck) were added to the OJS.

These initiatives paved the way for the widespread adoption of OJS in Lithuania and laid a solid foundation for enhanced openness of Lithuanian scientific journals.

Xjenza
The Malta Council for
Science & Technology

National Open Access Policy

Country

Malta

Organisation

Malta Council for Science and Technology

Key facts

- Implementation of the Open Access policy commenced in January 2022
- Promoting open access-related actions on awareness, skills development, and institutional support
- Immediate open access by 2025
- Strong governance structure to enable the necessary synergies
- Raising awareness of the benefits of practising Open Access

Website

https://mcst.gov.mt/mcst-news/national-open-access-policy

The **National Open Access Policy**, developed by the Malta Council for Science and Technology and adopted in 2021, outlines Malta's commitment to enhancing the scientific landscape by prioritising accessibility to scientific publications and research data. It advocates for the establishment of institutional policies, infrastructure upgrades, and funding mechanisms to support open access initiatives. The policy features a comprehensive roadmap for achieving immediate Open Access by 2025, strengthening the Gold and Green Open Access approaches and fostering a culture of openness and inclusivity in scientific research.

Targeting researchers, research performing and funding organisations, and policymakers, the strategy emphasises collaboration and capacity building through institutional policies, infrastructure enhancements, and funding mechanisms to support open access initiatives. By enabling researchers to maintain ownership of their work and access global resources, the policy aims to elevate citation rates and research impact.

Additionally, the policy encourages stakeholders to adjust research assessment practices to promote Open Access. Aligned with European developments in Open Science, this policy aims to benefit the Maltese scientific community by fostering increased citation rates and broader impacts through open access publishing.

OTVORENÁ VEDA CVTI SR

Analysis of APCs Paid by Institutions in Slovakia

Country

Slovakia

Organisation

Slovak Centre of Scientific and Technical Information

Key facts

- APC fee analysis as key data input for negotiating transformative agreements with big publishers
- After implementing these transformative agreements, publication of open-access articles by researchers from Slovakia has increased
- The national OS policy maker (the Ministry of Education) uses the analysis to build the systematic long-term monitoring of APC/BPC fees paid by the RPIs and the academic institutions in Slovakia

Website

https://otvorenaveda.cvtisr.sk/en-gb/national-strategy-for-open-science

https://zenodo.org/records/7184268

"The **analysis of APC fees paid by Slovak research institutions** for gold open access publishing in 2021" is the first national monitoring of APCs paid by Slovak research performing institutions and universities in Slovakia. The monitoring of APC fees was an action to support the implementation of the Slovak National OS Strategy strategic goals (2021-2028). This analysis was recognized as crucial data input for monitoring public funding and providing additional support for open access funds, facilitating the reimbursement of APCs in high-quality journals. The study also showed how much APCs were paid to "controversial" publishers such as e.g. MDPI which has been criticised for its review processes and faced allegations of predatory publishing practices.

The study provided data for negotiating transformative agreements with big publishers. The first 3 transformative agreements (Springer Nature, IEEE and Elsevier) were concluded in 2023 and allow Slovak researchers to publish open access with these publishers without the burden of APC fees.

Thanks to these agreements, more OA articles are being published by Slovak institutions. In addition, policymakers, RPIs, academic institutions, and funders can use the study results when preparing open access and open science policies and budgets for open access publishing.

Data

Research data management
and research data that
is FAIR/open

DeiC
DANISH · E-INFRASTRUCTURE · CONSORTIUM

National Strategy for Data Management Based on FAIR Principles

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Country

Denmark

Organisation

Danish e-infrastructure Consortium (DeiC)

Key facts

- Guidelines and best practices to properly manage, document, and share data in a standardised and transparent manner
- Promoting data stewardships and providing support for researchers to comply with FAIR principles to improve data quality, reproducibility, and impact in scientific research
- FAIR strategy is part of the curriculum for every levels of researchers

Website

https://www.deic.dk/en/data-management/national-cooperation/National-strategy-for-FAIR-research-data-management

https://www.deic.dk/sites/default/files/documents/PDF/EN_National strategi for data management baseret på FAIR-principper.pdf

The Danish "**National strategy for data management based on the FAIR principles**" (FAIR strategy) targets research institutions and research funding organisations, and aims to strengthen national data management, by increasing the quality, quantity, utilisation, and reuse of scholarly data. The strategy is part of the Danish implementation of the EU Directive on open data and the re-use of public sector information. The demand for the FAIR strategy originates from the Strategy for National Collaboration on Digital Research Infrastructure adopted by the Ministry of Higher Education in December 2018.

The foundation lies in the FAIR Guiding Principles for Scientific Data Management and Stewardship which stipulate guidelines to improve the Findability, Accessibility, Interoperability, and Reuse of digital assets. The strategy draws on FAIR implementation work done by the GO FAIR Initiative, and covers research policies, practices, infrastructure as well as competencies. Several general principles for data management practice that support the FAIR data agenda and actions that aim to establish a data management practice supporting the FAIR principle are outlined. The strategy also investigates funding principles for distribution of expenses, on data management and physical data repositories, in connection with externally funded research projects.

DataCite and DataDOI Estonia

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Country

Estonia

Organisations

- University of Tartu
- TalTech
- Estonian University of Life Sciences
- Tallinn University

Key facts

- 18 repositories in Estonia receive DOIs through the DataCite Estonia Consortium
- DataDOI is indexed through OpenAIRE
- By 2024, Estonia has assigned 2 868 436 DOIs through DataCite
- DataDOI gathers data from all research fields and encourages open science and FAIR principles

Website

https://datacite.ee/en/datacite-eesti-english

https://datadoi.ee

DataCite Estonia was formed to improve the availability and findability of research data created by Estonian researchers. The four founding members of the DataCite Estonia Consortium are the University of Tartu, TalTech, the Estonian University of Life Sciences, and Tallinn University, represented on the DataCite Estonia Consortium Board by the vice-rectors for research of the member universities. DataCite Estonia Consortium offers research data management-related services to Estonian data centres and researchers. The services are free of charge for the researchers of the institutions and data centres that have joined the consortium.

One of the repositories in the DataCite Estonia Consortium is DataDOI. The mission of DataDOI is to offer the long-term preservation and dissemination of Estonian research data from various disciplines. The main goal is to ensure that research data produced by Estonian researchers is findable, accessible, interoperable, and reusable. Through preserving open research data, DataDOI enriches academic quality and collaboration, supports innovative developments, and supports the overall use of scientific materials. DataDOI was originally an institutional research data repository of the University of Tartu, but it is now opened up for the entire Estonian research community. DataDOI is managed by the University of Tartu Library.

Luxembourgish Open Data Portal

The **Luxembourgish Open Data Portal** is an online platform that provides public access to a diverse collection of government and public sector datasets in Luxembourg, fostering transparency and innovation. It offers a user-friendly interface for discovering, downloading, and utilising open data for research, business development, and various civic purposes.

Public sector institutions in Luxembourg are encouraged to make greater use of open data according to the principle of data-driven government and decision-making, and to report their 're-use cases' on the national open data portal. Reusing public sector data cuts costs and enhances quality and impact.

A key objective of this strategy is to publish inventories of existing data from public sector institutions, including lists of data sets considered to be of high value, in accordance with the legislation.

A wide range of themes/topics is accepted, the following are considered priorities:
- Geospatial data
- Earth observation and environment
- Meteorological data
- Statistics on population, employment, social conditions, economy, etc
- Mobility data
- Businesses (ownership)

Although there is no obligation to adopt a particular licence for the data sets, the Luxembourg government strongly advocates the use of Creative Commons licences, in particular the Creative Commons Zero (CC0) licence that permits commercial exploitation.

Country

Luxembourg

Organisation

Luxembourg Government

Key facts

- The Luxembourgish Open Data Portal facilitates access to diverse government datasets, promoting transparency and innovation for research, business, and civic purposes
- The access for the data is free and public, to be able to publish you need to create a free account
- The Data Portal has 1858 open datasets from 185 organisations, with 165 reuses and more than 2000 users

Website

https://data.public.lu/en

NATIONAL SCIENCE CENTRE
POLAND

Data Management Plans at National Science Centre Poland

Country

Poland

Organisation

National Science Centre Poland

Key facts

- 2019: the DMP was incorporated as an integral part of research proposal and evaluation process
- Starting from January 2021: all funded projects are mandated to share the underlying datasets related to published articles in alignment with the FAIR principles
- Over 30 000 Data Management Plans have been created in the period between September 2019 - December 2023 (this number represents the total number of DMPs attached to all submitted research proposals, including those that were not funded)

Website

https://www.ncn.gov.pl/en/finansowanie-nauki/otwarta-nauka

https://www.youtube.com/@ncngovpl

The National Science Centre (NCN) has integrated a **Data Management Plan (DMP)** in all research funding applications. The implementation of the DMP form along with accompanying published guidelines, aims to enhance the quality and transparency of publicly funded research.

The DMP form is based on a template developed by Science Europe. It is employed for all calls for proposals, including both national and international calls, across all research disciplines. It is applicable to researchers at every career stage. As an integral component of every research proposal submitted to the NCN, the DMP undergoes merit-based evaluation. Furthermore, an updated DMP, reflecting the actual execution of the plan, must be attached to the end-of-project report and is also subject to merit-based evaluation.

In addition, NCN requires that all underlying datasets related to the published articles resulting from funded research projects should be publicly shared with a CC0 licence unless restrictions justify their closure. The guidelines accompanying the DMP emphasise adherence to FAIR principles in drafting the plan.

Moreover, NCN has allocated additional indirect cost funds for implementing open science-related activities, including data sharing.

Software

Software that enables
research and is available in
open source

Software Heritage

Country

France

Organisation

- Inria
- UNESCO

Key facts

- Open to all public software
- Each software package gets a unique identifier
- Already more than 17 billion unique files archived and available

Website

https://www.softwareheritage.org

https://www.swhid.org

The mission of **Software Heritage** is to collect, preserve, and share the source code (set of programming instructions) making it openly available. It already archives over 17 billion unique files from over 260 million origins, in a single mutualised platform designed for the software archival and reference needs of academia, cultural heritage, industry and society as a whole. This way it offers a European and public alternative to Github.

Each archived artefact gets a unique Software Hash identifier (SWHID) that is persistent, intrinsic, and free of charge, facilitating reproducibility of research results.

Researchers can find easy-to-follow guidelines on the 'how-to' webpage for archiving, referencing, describing, and citing software, and linking it from publications. Instructions are also provided for journals and institutional repositories to deposit code with curated metadata, as demonstrated by the HAL/Software Heritage integration in France.

Initiated by Inria, in partnership with UNESCO, Software Heritage is a non profit shared platform open to users worldwide, free of charge, and funded through memberships open to providers from all over the world. Current supporters are CEA, CNRS, MESR, Sorbonne Université and Université Paris Cité in France, and a number of international private sector and academic stakeholders.

GFOSS

GFOSS Platform - Open Standards, Free Software, & Open Hardware in Greece

Country

Greece

Organisation

GFOSS (ELLAK or the Greek Open Technologies Alliance)

Key facts

- Supporting the Open Software and Open Hardware components of the Open Science agenda
- Advocating for FOSS in Greece
  - Information Hub on Free Open Source Software with news from the World sent out regularly to its Newsletter subscribers
  - Co-organisation of events to introduce students and early career researchers in open technologies

Website

https://gfoss.eu/home-posts

https://www.ellak.gr/images/brochures/broshure_en.pdf

ELLAK, the Greek Open Technologies Alliance or **GFOSS** (est. 2008) is a non-profit organisation that promotes open source development, collaboration, and innovation in Education, Public Administration and Business in Greece. GFOSS comprises 37 Universities and Research Centers, and is a founding member of the Hellenic Open Science Initiative – HOSI aiming to support the alignment of the national R&I ecosystem with Open Science principles and the EOSC developments. GFOSS chairs the Training WG in HOSI producing educational material and collections of informative resources so far prioritised for the training of junior and senior researchers, librarians and data stewards.

GFOSS advocates for unrestricted access to source code, allowing users to study, modify, and distribute software freely. It is competent in engaging with students across education levels and building capacities on open standards and open technologies spanning various domains, including operating systems, productivity tools, and scientific computing applications.

To offer a more practical experience of the impact of open technologies, GFOSS co-organises events, such as FOSSCOM or Hackquake, with leading organisations taking advantage of open resources to develop new products or use them to manage and analyse open data.

Services

Services that enable research data discovery and exploitation

Country

Czech Republic

Organisation

- CESNET
- CERIT-SC
- IT4I

Key facts

- National Data Infrastructure (NDI), with National Repository Platform (NRP), will be developed as part of the implementation of EOSC in CZ
- Data Management Planning realised via the Data Stewardship Wizard will allow governance of FAIR research data during their life-cycle as part of the NRP project
- Four main projects are already realised or in preparation for implementing EOSC on the Czech national level. Their coordination will be distributed to four organisations: Masaryk University, the National Library of Technology, CESNET and Charles University

Website

https://www.e-infra.cz/en

https://eosc.cz

e-Infra Czech Services in EOSC

e-INFRA CZ is a unique e-infrastructure dedicated to research and development in the Czech Republic. It provides a transparent environment offering comprehensive capacities and resources for the transfer, storage and processing of scientific data to all entities engaged in research and development, regardless of the scientific domain. The core activities of e-INFRA CZ gradually shift towards adhering to the FAIR principles.

e-INFRA CZ offers a wide range of services including cloud computing, data storage, and network connectivity solutions for research and education institutions. These services aim to enhance research capabilities and facilitate innovation in various fields and help provide a secure and reliable infrastructure to support scientific projects, collaboration, and data management needs. Most recent efforts focus on incorporating a data steward wizard, a data-management-planning tool, currently under development in the Czech Republic.

e-INFRA CZ consists of three partners, CESNET, CERIT-SC, and IT4I who are also the only partners to the EOSC-CZ – a systemic strategic project which oversees the EOSC implementation on the Czech national level, a nation-wide infrastructure for FAIR data according to the demand of the Czech scientific community.

CSC Services in EOSC
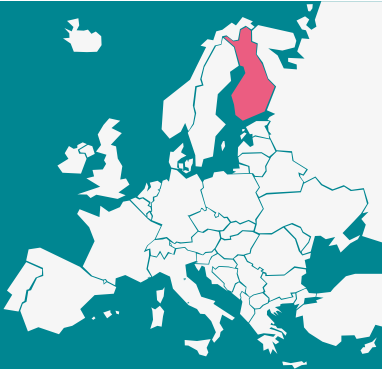
Country

Finland

Organisation

CSC – IT Center for Science

Key facts

- The Fairdata services consist of the following service components:
    - IDA – Research Data Storage
    - Etsin – Research Data Finder
    - Qvain – Research Dataset Metadata Tool
    - Auxiliary services, such as Metax, identity management, download component for published data
    - Digital preservation service for Research Data (including management and packaging)
- The services are not tied to a specific field of science. They are free of charge, targeted for users in Finnish higher education institutions and research institutes and their partners

Website

www.csc.fi

https://www.fairdata.fi

CSC – IT Center for Science, the Finnish centre of expertise in information technology owned by the Finnish state and higher education institutions, provides expert information and communication technology services for higher education institutions, research institutes, culture, public administration and enterprises in Finland.

During the EOSC Future project (2021-2024) CSC piloted the onboarding of some of its services on the EOSC Portal. Currently several CSC services are available through the EOSC Portal, for instance the Fairdata Services (Fairdata.fi) that support users to meet the FAIR principles when managing their research data. Fairdata.fi services include components such as research data storage (IDA), research data finder (Etsin), research dataset metadata tool (Qvain), auxiliary services (e.g. Metax, identity management, download component for published data), and a digital preservation service for Research Data that includes management and packaging.

Interoperable services provide safe storage and functionalities for data sharing, describing and discovery, as well as digital preservation. Fairdata services is part of Finland's national contribution to European Open Science Cloud (EOSC).

base4 nfdi

Base4NFDI Basic Services for the German NFDI
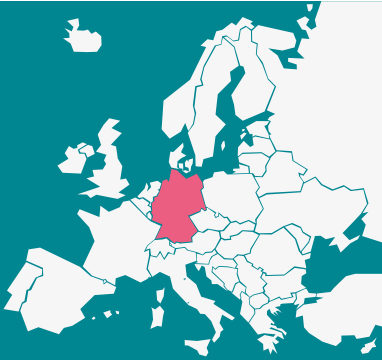
Country

Germany

Organisation

National Research Data Infrastructure (NFDI)

Key facts

- Joint initiative of all NFDI consortia covering 26 scientific domains
- Involvement of infrastructure providers from all major disciplines and of all major research organisations in Germany and of the German National Research and Education Network (DFN)
- Goal is the development of common basic services based on needs and expertise from the different research disciplines

Website

https://base4nfdi.de

Base4NFDI is a joint initiative within the German National Research Data Infrastructure (NFDI). Base4NFDI creates a framework for an agile and quality-assured portfolio of basic services across all disciplines. This portfolio builds on existing solutions being interoperable with the EOSC infrastructure and following EOSC guidelines. NFDI is being implemented in a user-driven and cross-disciplinary effort. It builds on research communities organised in 26 consortia and targets improved research data management as well as permanent digital repositories of knowledge.

Initially, an Identity and Access Management (IAM4NFDI) service will connect and expand existing and emerging Identity and Access Management systems in a federated manner, enabling researchers from different domains and institutions to access digital resources within NFDI as easily as possible. This includes access to and exchange with external infrastructures and resources like the EOSC. Users from around 400 German research and higher education institutions plus around 5000 organisations worldwide - number increasing - will benefit from this NFDI Community Authentication & Authorisation Infrastructure (AAI).

Further topics under development are a foundation service for persistent identifiers (PID4NFDI) and a terminology service to support cross-discipline consensus on knowledge representation (TS4NFDI). Base4NFDI will systematically connect NFDI Basic Services with EOSC initiatives.

Services from 11 Centres in Spain in EOSC

The Spanish EOSC community plays a significant role in contributing, either directly or indirectly, to a diverse array of services available in EOSC. Their services help enhance the overall offerings and functionality of EOSC, benefiting users and stakeholders within the EOSC ecosystem.

The main contributors to these services are CSIC-IFCA, GBIF.ES, UPV, INSTRUCT-ERIC, CSIC-CNB, BSC, INB, CESGA, Univ. Granada, CIEMAT, and BIFI-UNIZAR, which develop sustainable services that are maintained and extended beyond the project lifecycle.

Altogether, the institutions contribute with technological and thematic services covering different disciplines and challenges. Regarding the technology challenges, Spanish institutions contribute with infrastructure services (such as the EGI Cloud Compute and the B2SAFE storage), Cloud management services (such as EGI IM, EC3, OSCAR, Vault and DNS on demand), SW and Data Evaluation platforms (SQAaaS and FAIREva) and Data Analytic platforms (DEEP and AI4EOSC). The contribution on thematic scientific areas cover mainly environment (oceanic and freshwater, dust forecast or taxonomy data and services) and Life-Sciences (Structural biology - outlining Scipion, OpenEBench and COVID19 services) but also astrophysics (LAGO).

All these services are active and have jointly generated more than 10.000 visits and hundreds of downloads through the portal.

Country

Spain

Organisations

- CSIC-IFCA
- GBIF.ES
- UPV
- INSTRUCT-ERIC
- CSIC-CNB
- BSC
- INB
- CESGA
- Univ. Granada
- CIEMAT
- BIFI-UNIZAR

Key facts

- Spanish institutions show a clear commitment to EOSC through the release and contribution to tens of services
- The Spanish community is multidisciplinary and internationally connected
- Spanish institutions contribute to the implementation and sustainability of EOSC through services in EOSC

Website

https://www.e-ciencia.es/en

Infrastructure

Data stewardship,
data repositories,
and data preservation

AUSSDA
AUSTRIAN
SOCIAL SCIENCE
DATA ARCHIVE
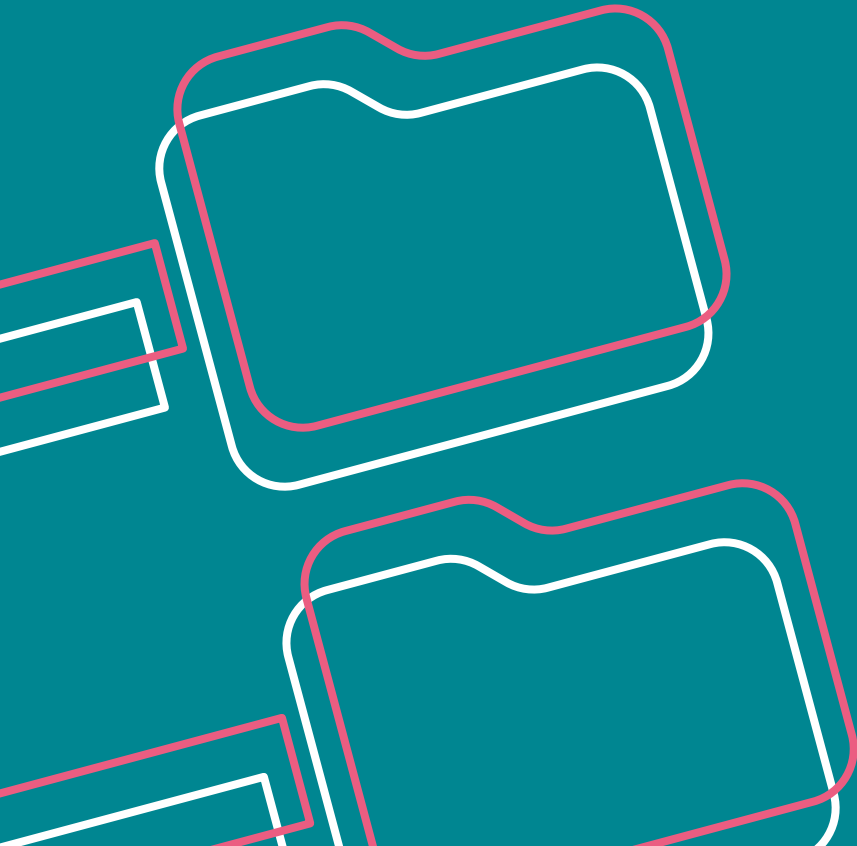
Austrian Social Science Data Archive (AUSSDA)

Country

Austria

Organisations

- University of Vienna
- University of Linz
- University of Graz
- University of Innsbruck

Key facts

- AUSSDA offers more than 1.500 social science data sets to the research community
- Wide array of services in data archiving, data protection, data management, RDM training
- New focus on Open Educational Resources (OER) in the social sciences
- Connects Austrian research datasets to the EOSC

Website

https://aussda.at

AUSSDA - The Austrian Social Science Data Archive is a data infrastructure for the social science community in Austria. It offers a variety of research support services, primarily data archiving and help with data re-use. It connects Austrian or Austria-related datasets to the data catalogue of the European ESFRI-research infrastructure CESSDA and therefore to the EOSC.

AUSSDA contributes to the idea of Open Science and EOSC by providing findable, accessible, interoperable and reusable (FAIR) research data. AUSSDA facilitates research by providing reusable high quality data and supports researchers in making their data FAIR, meeting funding requirements and enhancing visibility of their research. It also provides training and guidance on research data management (RDM).

AUSSDA's target users are mainly social science researchers who want to make their data FAIR by sharing it in a certified repository, or researchers looking for social science data they can use for their research - and anyone who is interested in reusing high quality social science research data.

DEPARTEMENT
ECONOMIE
WETENSCHAP &
INNOVATIE

Vlaamse
overheid

Flemish Open Science Board

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The **Flemish Open Science Board (FOSB)** together with the Flemish Open Science Policy represents a collaborative effort to develop and implement Open Science policies and Key Performance Indicators at the regional level. The main goals include fostering a shared vision of Open Science, promoting the adoption of Open Research Data principles, and enhancing data stewardship practices across Flemish research institutions. By addressing key challenges identified through consultation and study, such as the lack of a shared vision and insufficient data stewardship, the FOSB aims to facilitate the integration of Open Science principles into Flemish research culture.

The FOSB promotes open access to research data, facilitating collaboration between institutions, and enhancing the visibility and impact of Flemish research outputs. Research institutions in the Flemish research ecosystem are targeted beneficiaries of the FOSB and the associated policy initiatives.

The FOSB and the Flemish Open Science Policy support researchers by providing a framework for integrating Open Science principles into their workflow, enhancing the reproducibility and transparency of their research, and facilitating access to research data and resources. Through collaboration with stakeholders, the FOSB aims to ultimately empower researchers to contribute to a more open and collaborative research environment in Flanders.

Country

Belgium (Flanders region)

Organisation

Vlaamse overheid - Departement EWI

Key facts

- Founded in spring 2020, with a yearly investment of €5 million
- Platform for collaboration and policy development facilitating Open Science adoption and governance
- Enhance data stewardship practices, including the development of Data Management Plans and adherence to FAIR data principles, through the FRDN network FRDN Homepage - FRDN
- Supporting researchers by providing guidance and resources for implementing Open Science practices via Open Science policies and Key Performance Indicators (KPIs)

Website

https://www.ewi-vlaanderen.be/nieuws/flemish-open-science-board-fosb-opgericht

https://www.ewi-vlaanderen.be/en

BPOS | Bulgarian Portal for Open Science

Bulgarian Portal for Open Science (BPOS)

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Country

Bulgaria

Key facts

- BPOS received the CoreTrustSeal in 2019
- BPOS provides REST-based API and supports main formats (CSV, JSON, XML) for datasets
- Priorities of the National OS Plan of Bulgaria:
  - Trusted infrastructure for OA publications and data
  - Incentives for researchers to adopt OA practices
  - Alignment of national and institutional OA policies
  - Promotion of OA practices and fostering of new skills and competences

Website

https://bpos.bg

The **Bulgarian Portal for Open Science (BPOS)** serves as a single point of entry allowing access to scientific information and publicly funded research outputs, including resources from institutional open access repositories in Bulgaria.

Recognised as a Trustworthy Data Repository by meeting the CoreTrustSeal Standards, BPOS provides the research community free, accessible, trustworthy infrastructure for long term preservation and sharing of scientific publications. Its main purpose is to support the work of researchers and institutions that do not have an institutional repository available.

The portal incentivises researchers to adopt OS practices, expanding and strengthening the capabilities of the national infrastructure for archiving research data. It fosters the development of skills and competences and promotes the benefits of OS practices. Over 900 researchers took part in organised training and workshops.

The portal is supported through measures and funding schemes outlined in the Bulgarian Open Science Plan for 2021-2025. The Council of Ministers adopted the national OS plan aiming to induce the publication activity, as well as promote the culture of OA sharing.

Open Science Slovenia - Access to Knowledge from Slovenian Research Organisations

Country

Slovenia

Key facts

- National approach to building open science infrastructure and FAIR digital objects
- Common services offered by the national portal (national PID service, national big data archive, recommendation system service, and plagiarism detection service)
- Development of adapted processes for depositing publications, research data sets, and other research results from Slovenian students and researchers
- Integration with the national bibliographic system, national current research information system, ARNES AAI, Crossref, Datacite, university information systems, and university authentication systems

Website

https://www.openscience.si/OProjektu.aspx?lang=eng

The **Slovenian open-access infrastructure** consists of six repositories and a national portal that aggregates content from the repositories and other sources of digital objects. The national portal provides a common search engine, a recommender system, a national persistent identifiers service, a big data archive, and text-matching software. The repositories are connected to the national bibliographic system COBISS.SI, and the national current research information system SICRIS.

The repositories and the national Open Science portal make the research results of Slovenian research organisations accessible to researchers, students, businesses, and other users in Europe and around the world. Researchers have an infrastructure that enables them to comply with the provisions on mandatory open access to research results from publicly funded research. Aggregated data from repositories enable funders to check the actual openness of scientific publications, research data, and other research results. Metadata from repositories is harvested by OpenAire, and other directories, aggregators, and search engines. The digital objects from the national infrastructure are used in the Slovenian national supercomputing network.

The infrastructure enables Slovenia to implement the policy of open access to the results of nationally funded research, as expected of the EU Member States participating in the ERA.

Skills/Training

Skills and training for researchers to practise Open Science

University of Cyprus Library

Cyprus National Policy for Open Science Practices - Libraries' Responsibility for Skills and Training Actions

Country

Cyprus

Key facts

- Part of the action Plan for the implementation of the National OS Policy
- Around 8 public awareness, training, dissemination activities per year
- ±110 participants per webinar on average
- Collaboration with EU funded OS projects and national OS experts

Website

https://gnosis.library.ucy.ac.cy/handle/7/39728

The **Cyprus National Policy for Open Science Practices** delegates the responsibility for the skills and training actions to Libraries. As part of the collaboration between the Greek and Cyprus OpenAIRE National Open Access Desks (NOADs), the University of Cyprus Library organises regular webinar series covering a variety of OS aspects including legal topics, services, infrastructure, policies, citizen science, DMPs etc.

The main goal of these training sessions is to fill any potential knowledge gaps of any type of stakeholders including researchers, policymakers, funders, librarians, and citizens/general public audience that are interested in the topic. The webinars are always open to the public and informal discussions are encouraged at the end of every session. A significant amount of training material and recordings was created in Greek and are openly available and easily accessible through the UCY Library Institutional Repository GNOSIS. There is a lot of interest for - not only understanding - but also practising Open Science at different levels and from different stakeholders.

The Deputy Ministry of Research, Innovation and Digital Policy is closely collaborating with the national OpenAIRE NOAD in Cyprus to monitor the national research ecosystem ensuring the implementation of the national policy and Open Science.

ICDI Competence Centre including Open Science and FAIR

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Country

Italy

Key facts

- 7 courses delivered since 2021, with 600 researchers trained and with the involvement of ESFRI RIs
- 24 Open Science Cafés since 2021, with more than 2,800 participants
- Open-science.it as a reference point for information and news, resource catalogue and event showcase. It contains the newly produced catalogue of nonprofit scientific publishing in the Italian landscape (those responding to Diamond Open Access model)

Website

https://open-science.it/en/english

The mission and activities of the **ICDI Competence Center** build on collective experiences from initiatives on Open Science and FAIR principles. The goal is to facilitate knowledge sharing, empowering each actor to be both a user and a service provider, enabling them to share their specific knowledge and utilise the expertise of others.

The Italian Computing and Data Infrastructure's, ICDI, primarily supports Open Science through researcher training. This includes training new professional profiles, defining appropriate career paths, enhancing the skills of existing staff, and implementing continuous learning mechanisms in line with FAIR principles. Additionally, ICDI provides support to Italian coordinators of Horizon Europe projects in the production of Data Management Plans.

ICDI organises Open Science gatherings where experts discuss best practices and news about EOSC and open science. Through collaboration, ICDI and the experts define and update the profile of competencies and skills for specific roles, provide competency-based services, offer a reference point for different communities, and foster continuous learning between peers.

National Data Stewards Network

Country

Latvia

Key facts

- 20 data stewards
- Organiser: VPC.LV, Higher Education and Science IT Shared Service Centre
- 4 participating research universities: University of Latvia, Riga Technical University, Riga Stradins University, and Latvia University of Life Sciences and Technologies

Website

https://www.izm.gov.lv/en/media/17072/download

https://www.vpc.lv

The **National Data Stewards Network** initiative is part of the Latvian Open Science Strategy and tackles main obstacles to Open Science in Latvia: shortages of data-related experts and skills, inconsistent and low-quality data management practices across institutions, and diverse and inefficient ways of storing and publishing data, which reduce their accessibility and usability.

The Network is organised by the VPC.LV, Latvian Higher Education and Science IT Shared Service Centre, and employs 20 data stewards, four working at each of the four participating research universities and another four covering smaller institutions. Stewards support institutions developing and standardising research data management and provide hands-on data-related assistance and consultations to faculty and researchers. They help systematise and publish research data, develop collaboration with external data sources, and organise events to promote data use.

The Network provides training for stewards and data managers of institutions on research data management, data methods, and topics covering specific sectoral or institutional needs. The stewards collaborate on the best practices and standardisation and organise joint events.

To foster collaboration and understanding between researchers and data holders, data staff from all other organisations (government, businesses) are invited to participate in the Network activities such as training, workgroups, and events. The Network also develops examples for data use agreements, procedures, and technical solutions, and is active in developing national policies and regulations.

Open Course Platform

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The **Open Course Platform** is an educational platform designed to strengthen education and research e-infrastructures, inform users about emerging technologies, support open science, and to provide open-source solutions for institutional needs. By offering a variety of educational resources and courses it serves as a hub for researchers to acquire knowledge and skills related to Open Science. The Open Course Platform aims to raise awareness about Open Science and associated topics in Turkey, enhance existing knowledge and support research projects.

The platform offers a range of courses, for instance on the use of Aperta (Turkish Open Science Repository), responsible research practices, and evaluation of open publications. Researchers can register on the platform, follow courses, take exams, and obtain certificates upon successful completion.

Currently, the platform features 'Open Courses with Certification' in the following general categories with specified modules:

- Research Data Management
- Open Access
- Responsible Research and Innovation
- Open Citations
- Open Peer Review
- Text and Data Mining
- Open and Reproducible Research

Subject specific open courses from the 'National Competence Center' (via the EuroCC Project) include:

- Molecular Dynamics Simulations of Small Molecules
- High Throughput Virtual Screening with AutoDOCK Program
- Molecular Dynamics Simulations with LAMMPS

Country

Turkey

Key facts

- 7 open courses provided covering research data management and open science content
- 3 additional HPC (High Performance Computing) courses based on the NCC (National Competence Center) activities
- As of February 2024, the number of users registered on the platform is 1,591, and the given certificate is 66

Website

https://acikders.ulakbim.gov.tr

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Assessment

Incentives and rewards for researchers to practise Open Science

NWO

Open Science Fund (OSF) – Support for Projects Designed to Implement and Stimulate Open Science Practices

Country

Netherlands

Key facts

- 86 projects awarded funding since 2021, covering a broad spectrum of open science practices across all research disciplines
- High level of interest from the research community, with167 eligible applications received in 2021 and 162 in 2023
- Open science track record of the main applicant included in the application form and part of the evaluation criteria
- Details of the successful and unsuccessful proposals, including the evaluations, openly available, where there is applicant's consent

Website

https://www.nwo.nl/en/researchprogrammes/open-science/open-science-fund

https://www.nwo.nl/en/overview-pages/open-science-practice

The **Open Science Fund** was launched in 2020 by the Dutch Research Council (NWO) as a step forward towards changing the way academics are recognised and rewarded in the Netherlands, in line with the Dutch national program on Recognition and Rewards.

The Open Science Fund provides dedicated financial support for projects that are specifically designed to stimulate open science practices. Its primary aim is to advance open science by incentivizing and rewarding researchers who are or would like to be at the forefront of this movement.

In 2021 and 2023, researchers from all disciplines could apply for projects of up to €50,000 and one-year duration in the broad area of open science. Particularly encouraged were projects that:

- improved how good open science practice is recognised and rewarded
- transformed the way researchers publish
- developed or adapted interoperability standards
- developed, tested or adapted open platforms or tools for wider community use
- stimulated wider adoption of open science practices among researchers
- furthered the adoption of citizen science approaches

Toolbox for Recognition and Rewards in Academic Careers (NOR-CAM)

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Country

Norway

Organisation

Universities Norway

Key facts

- Flexible and holistic framework for recognition and rewards in academic research assessment
- Generic and applicable on different levels in the academic system, from individuals, research groups and departments, to universities and other RPOs, as well as in different national contexts
- Six areas of competence with respect to results and competencies, documentation and reflection, incl. examples that might be adapted according to purpose and context

Website

https://www.uhr.no/en/news-from-uhr/nor-cam-a-toolbox-for-recognition-and-rewards-in-academic-careers.5780.aspx

https://youtu.be/Qyjc_gRp0ys?feature=shared

The **NOR-CAM**, Norwegian Career Assessment Matrix, offers a systematic approach to assess general academic activity, including results and competencies, across multiple areas of expertise, aligning with a university's mission.

The framework covers competence areas that are relevant for appointments and promotions in the higher education sector as well as for funders, authorities and researchers. This includes various forms of research output, the research process, pedagogical competence, impact and innovation, academic leadership and organisational experience, and also other experience (e.g. outside academia).

An important starting point for developing NOR-CAM was the rapid and many-faceted transformation towards Open Science and open research processes and its implication on research and research career assessment. Open Science is no longer considered as a mere supplement to the other academic activities, but will be an integral part of all production and dissemination of knowledge. It will then be natural for all results, activities and competencies to be assessed in light of the goal of Open Science principles.

NOR-CAM supports researchers by expanding career options, providing transparency in evaluations, documenting accomplishments across all academic activities, and aiding in career planning through self-recognition of achievements and competencies.

uefiscdi   MINISTERUL EDUCAȚIEI

White Book of the Transition to Open Science (Objective 7)

Objective 7 of the Strategic Document on the Framework for Open Science Development in Romania addresses the research assessment process. The objective requests revising the current evaluation system to incentivise open science practices, such as early sharing of research findings, collaborative efforts, and free access to research results. The goal is to update the evaluation criteria to encompass a broader spectrum of research activities and outcomes.

This initiative targets researchers, research organisations, and funding bodies with the aim of nurturing a research environment which values and promotes Open Science principles. The strategy outcome aims for a more inclusive evaluation system by 2026 that recognises and rewards a diverse range of Open Science-specific research activities and results. In addition, acknowledging a wider array of research outputs and activities further promotes inclusivity and diversity in academic contributions.

For researchers, this objective offers opportunities to enhance the visibility and impact of their work through transparent and collaborative research approaches.

Country

Romania

Organisation

Executive Agency for Higher Education, Research, Development, and Innovation Funding (UEFISCDI)

Key facts

- Increase recognition of more diverse range of Open Science-specific research activities and results
- 20 organisations from Romania have committed to the Agreement on Reforming Research Assessment, abandoning single dimension metrics like the Journal Impact Factor
- Increase the capacity of cloud infrastructures through synergies between national research and innovation funds and structural development funds: https://www. poc.research.gov.ro/uploads/competitii/ rezultate-competitii/actiunea-1-1-2/2020/ rezultate-finale-selectie-poc-398.pdf

Website

https://www.open-science.ro
https://uefiscdi.gov.ro/ro-nosci
https://www.open-science.ro/resurse/the-white-book-of-the-transition-to-open-science

Open4UA

National Open Science Plan (Objective 5)

Objective 5 of the National Open Science Plan is focused on advancing research assessment in Ukraine based on the DORA principles. This ambition aligns with the aims of the Coalition for Advancing Research Assessment (CoARA), even though the plan was approved even before CoARA was formed. Ukraine is in the early stages of its journey towards Open Science and fair research evaluation, with clear advantages.

Ukraine is at an early stage of its journey towards Open Science and fairer and more flexible research assessment, nevertheless the associated advantages and benefits are fully recognised. Reconstructing Ukraine's conflict-affected scientific system through the adoption of the UNESCO Recommendations on Open Science has been welcomed by the international research community.

This requires the implementation of an assessment reform that should affect academia on all levels: national, institutional, and individual.

Currently, there are three interconnected groups collaborating to achieve the Plan's objective 5. These groups are the Ministerial working group on reforming the state certification of HEIs, the consortium of the EU-funded Open4UA project (Erasmus+ KA2), and the recently established CoARA National Chapter Ukraine. All three groups are closely working with international partners to exchange knowledge and learn EU best practices to reform research assessment.

Engagement

Research that engages
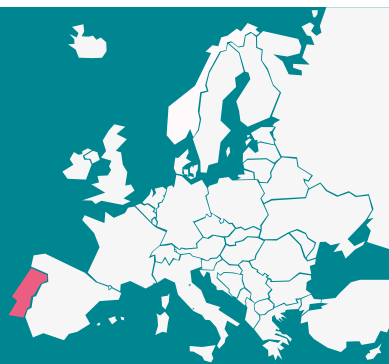and involves citizens
via citizen science

Senior Family Dog Project

The Family Dog Project with a strong focus on scientific communication started in 1994. It is aimed at understanding how dogs interact with humans and how they evolved to become one of our closest animal companions. Research topics include social behaviour, ageing, communication, problem-solving, memory and emotions in dogs. Dog owners volunteered to take part in tests together with their dogs placing them in diverse types of situations. There are no restrictions regarding the breed, age or skills (training level) of the dogs involved.

The **Senior Family Dog Project** is a sub-project of the Family Dog Project (FDP). The main research target is the development of a methodology at different levels covering behavioural, genetic, and neuronal biomarkers that allows to monitor dogs' cognitive ageing, to help expand dogs' healthy lifespans, and to contribute to the understanding of the processes of human ageing. More than 100 ageing dogs were followed for 4 years during the project and 16,000 dogs were studied in cross-sectional research.

The research covers versatile topics, and is widely known domestically and internationally as well. Its implementation is managed by the Department of Ethology of the Faculty of Science at the Eötvös Loránd University (ELTE).

Country

Hungary

Key facts

- 20,000 members in the family dog Facebook group
- 14,000 followers of Family Dog projects on Facebook
- 300-400 publications

Website

https://ethology.elte.hu/Senior_Family_Dog_Project

https://www.facebook.com/FamilyDogProject

Portuguese Citizen Science Network

Country

Portugal

Key facts

- 4 National Meetings held since 2017
- 1 online platform for sharing Citizen Science projects, resources, tools (based on the EU-Citizen.Science infrastructure)
- 3 active working groups: communication and community building; mapping of citizen science initiatives; online platform

Website

https://www.cienciacidada.pt

Rede Portuguesa de Ciência Cidadã, the **Portuguese Citizen Science Network** (CC.pt), is a nationwide network that aims to unite communities involved in citizen science initiatives and projects in Portugal. Its primary objective is to promote scientific openness and inclusivity by encouraging engagement and participation in scientific pursuits.

CC.pt actively encourages the participation of various social actors, including the academic and scientific community, business sector, third sector, and civil society, in the collaborative construction of knowledge. The network facilitates dialogue, shares best practices, and operates a platform that acts as a central hub for sharing and disseminating citizen science projects and activities in Portugal.

For researchers engaged in citizen science, CC.pt offers numerous benefits. It provides networking opportunities that allow researchers to connect with peers in the field and expand their professional contacts. Additionally, CC.pt offers a platform for promoting and disseminating their projects or events on both national and international levels, thereby increasing their visibility and impact. Furthermore, CC.pt serves as a knowledge hub, providing resources and information about citizen science to assist researchers in involving the public in scientific research effectively.

Scoping the Use of Citizen Science for Improved Water Quality Monitoring

Country

Republic of Ireland

Key facts

- Citizen Science initiatives in Ireland aimed at supporting SDG Indicator 6.3.2 by assessing the proportion of bodies of water with good ambient water quality
- Initiatives lay a foundation for future research and underscore opportunities to integrate citizen-generated data into monitoring activities and advancing global efforts towards achieving SDG 6
- The Cork Open Research Archive (CORA) contains many publications (including the two studies) on citizen science

Website

https://cora.ucc.ie/search?query=citizen%20science

https://hdl.handle.net/10468/10467

https://hdl.handle.net/10468/14061

Scoping studies have been carried out at University College Cork (UCC) to showcase the benefits of **Citizen Science for Water Quality Monitoring**.

In southwest Ireland, water quality monitoring was conducted in at-risk bodies of water as part of a citizen science initiative involving participants recruited from St Brendan's College in Killarney. The aim was to support Sustainable Development Goal (SDG) Indicator 6.3.2, which assesses the proportion of bodies of water with good ambient water quality. Through theoretical and practical training, citizen scientists gained skills to contribute to monitoring activities, fostering interest in science, and environmental issues among young participants.

Another study focused on developing a Citizen Science Stream Index. This index is a rapid biomonitoring tool utilising six easily identifiable macroinvertebrates to assess water quality in streams and enable non-experts to determine the ecological status of a stream. Validated through various data sets and field studies, the index proves accurate and feasible for citizen science initiatives, contributing to improved water quality monitoring efforts in Ireland.

The two initiatives highlight the potential of citizen science in generating high-quality data for water quality monitoring. They also underscore the role of citizen science in not only gathering data but also fostering environmental awareness and scientific interest among citizens.

These and other citizen science initiatives set a foundation for future research and highlight opportunities for integrating citizen-generated data into monitoring activities as well as contributing to global efforts towards achieving SDG 6 and promoting Open Science principles.

Swedish National Hub for Citizen Science

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Country

Sweden

Key facts

- 248 active in the network via social media
- On average 1000 viewers per project on the site since launch
- Right now 20 projects
- Almost 500 participated in the launch conference online and about 50 on site (during the omicron outbreak)

Website

https://medborgarforskning.se/eng

The **Swedish National Hub for Citizen Science** "Medborgar-forskning" provides information on citizen science, including guidance on how to start a citizen science project. The initiative aims to assist Swedish universities in utilising citizen science in a responsible and sustainable manner to engage with society.

The portal offers tools, guidelines and inspirational content as well as a discussion forum for researchers and stakeholders who want to get involved in citizen science. It also links to the directory on citizen science projects on the EU Citizen Science portal and hosts a discussion forum.

Additionally, there is an interactive directory showcasing on-going citizen science projects in Sweden, where projects can upload information via the EU Citizen Science portal in both English and Swedish. The overarching goal is for the portal to serve as a central hub and a valuable resource for individuals keen on citizen science.

The portal was developed in a collaboration effort from the University of Gothenburg, the Swedish University of Agriculture (SLU), Umeå University and the non-profit association Vetenskap & Allmänhet (VA) and launched in 2021.

Swiss Citizen Science Network

Key facts

- Citizen science projects can be uploaded to the portal and accessed for free
- The The Swiss Citizen Science Network has developed resources such as the 10 Swiss Citizen Science Principles
- Hosted the Second European Citizen Science Conference ECSA 2018 in Geneva with 400 participants
- Hosted the second Swiss Citizen Science Conference CitSciHelvetia23, furthering discourse and collaboration within the field

Website

https://www.schweizforscht.ch

The **Swiss Citizen Science Network**, Schweiz Forscht, allows individuals to participate in various research activities. It promotes public involvement in science across three main areas:

- The network informs, sensitizes, and communicates about Citizen Science to diverse target groups, offering an overview of CS projects and defining Citizen Science.

- The network offers activities targeting multiple levels and actors, including education policymakers and project leaders. This involves workshops, working groups, and collaborations with Austria and Germany to foster mutual learning and cooperation in Citizen Science activities.

- The network monitors national and international developments, helps shape them, transfers them to the Swiss context, and contributes Swiss experiences. Examples include developing Swiss Citizen Science Principles and hosting webinars on Open Data in Citizen Science.

Members of the Citizen Science Network can participate in a variety of network activities year-round and explore numerous projects where they can actively contribute to research. The platform offers the opportunity to upload projects and to see and engage in existing ones.