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## Deliverable 5.3: Pilot findings and progress report

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## Abstract

The pilot findings and progress report describes the work the pilots have done in testing and evaluating the resources, tools and services developed in GraspOS. The report is a detailed description of the activities performed by the pilots and the results achieved. It also offers general reflections on the lessons learned during the project in terms of mutual challenges and opportunities. One of the central results of the pilots' work show that community involvement is key to firstly make sure that the resources, tools and services developed to support responsible research assessment are relevant and useful, and that they ease the evaluation work for both targets of evaluations as well as evaluators, and secondly to make sure that all relevant stakeholders for each evaluation event have a mutual understanding of what is being evaluated and why.



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## Abbreviation List

ARRA - Agreement on Reforming Research Assessment
CoARA - Coalition for Advancing Research Assessment
CNR - National Research Council of Italy
CS - Computer Science
INRAE - National Research Institute for Agriculture, Food and the Environment
KPI - Key Performance Indicator
OS - Open Science
RA - Research Assessment
RFO - Research Funding Organisation
RPO - Research Performing Organisation
RRA - Responsible Research Assessment
SSH - Social Sciences and Humanities
UEF - University of Eastern Finland
UEFISCDI - The Executive Agency for Higher Education, Research, Development and Innovation Funding
UNIBE - University of Belgrade, Faculty of Chemistry
UU - Utrecht University
WP - Work Package

## 1. Executive Summary

This deliverable is a detailed description of the activities performed by the pilots and the results achieved. At the same time it offers general reflections on the lessons learned during the project in terms of mutual challenges and opportunities. The general lessons learned are summarised as follows:

- Community involvement in designing a research assessment is key. Listening to diverse voices from relevant stakeholders supports the recognition of diversity, a key principle of responsible research assessment.
- The project aimed at developing a more open science -aware responsible research assessment. This requires a definition of openness in the context of assessment. While the project does not offer such a definition, it emphasises the need for discussions with relevant stakeholders for each evaluation event to ensure shared understanding of what is being evaluated and why.
- A central consideration in developing new resources, tools and services to support research assessment is making evaluation events less burdensome for the targets of evaluation.
- In addition to involving the targets of evaluation, it is also imperative to include the evaluators in developing new resources, tools and services to ensure these are relevant and feasible, and that they actually ease the evaluation work, not make it more complicated and arduous.
- The pilots call for the need for standardised terminology and classification systems to ensure greater transparency and interoperability across data sources. Especially in developing new indicators to support the assessment of a diversity of research outputs and activities. However, it might be good to consider carefully if new indicators and new ways to measure are really the best way forward.
- Implementing principles of responsible research assessment requires definitions, it is not merely a question of using a resource, tool or service designed to support responsible research assessment, or considering open science better.

## 2. Introduction

The European Commission and many research organisations in Europe have developed ambitious agendas around reforming research assessment and promoting open science (OS). And while there is a reasonably clear vision on the direction in which assessment practices need to develop and the way in which research needs to be made more open, the actual implementation of this vision is lagging and represents a significant challenge for most organisations. The need to tailor assessment practices to differences between disciplines, career stages, and research outputs further increases this challenge. GraspOS set out an ambitious goal to address these challenges, and one of the means to achieve this was to empower and bring together different stakeholder communities to co-design, showcase, validate and evaluate tools, services and resources supporting open science aware responsible research assessment (RRA) developed within the project in real-world pilots.

One challenge identified by the project was that new infrastructures and assessment tools are often developed based on the possibilities offered by new data sources and technologies, rather than on the actual needs of end users. This was considered to lead to metrics and tools that are either ignored by end users or used in research assessments despite their poor fit with the objectives of the assessment. As a solution, GraspOS took a user-centred approach to infrastructure development. In practice this meant the inclusion of nine pilots involving a diverse group of stakeholders to the project. The pilots were selected to represent three different levels of assessment: national, university (including departments and individuals) and disciplinary level. The plan was that the pilots, interacting with the activities from other work packages, would

- co-develop OS assessment protocols and openness profiles,
- identify gaps in local infrastructure and investigate what attributes are needed to support the development of the GraspOS services,
- elicit the characteristics of local or community requirements to support the development of fit-for-purpose services and tools,
- test and evaluate the tools and services developed, and
- publish assessment protocols, profiles and stories.

While the pilots achieved in delivering the tasks assigned to them, they were faced with tasks unanticipated in the project proposal: defining their assessment settings using the INORMS SCOPE Framework<sup>1</sup> and defining OS-aware - what is the openness of science that we should

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<sup>1</sup> <https://inorms.net/scope-framework-for-research-evaluation/>

be aware of in the context of research assessment. Instead of merely addressing the project as a co-development exercise, the pilots approached research assessment as an academic question producing scientifically relevant results supporting the reform towards a more responsible research assessment culture.

### 3. Methodology

The piloting phase, where selected tools, services and resources developed in the project were tested and evaluated in the pilot settings, started halfway through the project. This was marked by the creation of pilot roadmaps. The work leading up to the creation of the roadmaps consisted of testing and evaluating aspects of the SCOPE+i Framework<sup>2</sup>. SCOPE+i Framework is a tailored infrastructure developed by the GraspOS project that works together with the existing INORMS SCOPE Framework by integrating process resources and digital services into it. SCOPE+i is designed to support the transition to responsible research assessment with a particular emphasis on contributions to open science. In practice the testing and evaluating took place in a series of workshops, both online and face-to-face, and the workshops and their results are described in more detail in D5.2<sup>3</sup>. Also, the pilot roadmaps were published in D5.2 as Annex 3. Once the roadmaps were finalised, the pilots' progress was followed up in monthly meetings dedicated to the work package coordinating pilot activities, WP5.

In their piloting activities, the pilots had different starting points. Some were at a more mature level in terms of responsible research assessment as well as considering open science in assessments, and were able to focus on the more technical side: resources, tools or services that could potentially support their assessment settings. For some, the starting point was more ideological: what is it that they want to evaluate and how it should be done. However, all pilots were able to reflect on the resources, tools or services being developed in the project. Many pilot activities focused on assessing the coverage and reliability of data by, for example, by comparing GraspOS data sources with local ones and testing different methods of retrieving information from GraspOS services. GraspOS services were also used to identify gaps in the local data sources, and in some cases this activity led to implementing services to existing systems. Openness profile<sup>4</sup>, and also a more generic researcher profile was of interest for most of the pilots. Some created demos or mock-ups based on the concept of the openness profile for testing, some analysed and reviewed existing researcher profile designs.

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<sup>2</sup> <https://graspOS.eu/?view=article&id=36&catid=15>

<sup>3</sup> [10.5281/zenodo.13629146](https://zenodo.org/record/13629146)

<sup>4</sup> For more details, please see: <https://zenodo.org/records/14066174>, page 24.

In addition, the pilots supported the development of a narrative CV suitable for specific disciplinary groups as well as for highlighting merits in advancing open science.

Pilots engaged different stakeholders to their activities in several different ways. They organised lectures, workshops, user testing, interviews and collected feedback. Most included researchers into these activities, but also university leaders, management, service providers and funder representatives were involved. As a summary it can be said that the research community has been widely represented in the piloting activities.

## 4. Pilot reports

In preparation for this deliverable, the pilots were asked to report on each resource, tool or service they tested and evaluated according to a defined structure laid out as a template (Annex 1). For each resource, tool or service, the pilots were asked to describe the intended aim of the testing and explain how each resource, tool or service was tested in practice. In addition, they were asked to include information on which stakeholders have been involved in the testing. Pilots also reported on the main results, reflected the results with the intended aims, and described the next steps in regard to a given resource, tool or service.

In addition, the pilots were asked to reflect on their original Key Performance Indicators (KPIs), on the pilot's role as part of the reform on research assessment as a representative of a specific evaluation setting, and finally on the usefulness of the project in general to their evaluation setting.

As the individual pilot reports below show, the work is still on-going. In some cases the testing phase has already given grounds for implementing resources, tools or services being developed as part of GraspOS. In some cases the testing still continues, and in these cases the next steps include involving larger groups of stakeholders as the tested resources, tools or services have shown enough potential for wider consultation.

As mentioned in the introduction, the pilots were selected to represent three different levels of assessment: national, university (including departments and individuals) and disciplinary level. The pilots were categorised according to these three levels to enable practical cooperation in their piloting activities. However, it soon became apparent that the pilots even within the same category differed in their level of evaluation, target of evaluation, purpose of evaluation, stakeholders, and their own role in the evaluation setting. So, quite fittingly, the individual reports also show this diversity, the 'one-size-fits-no-one' approach that has been apparent through-out the project. More precisely, some have followed the template, some have not. And those that have not did not find the template as the best way to describe their

activities. In alignment with the findings reported in D5.2, we wanted to respect the pilots' diversity and allow deviations from the template. In the following, the pilot reports are presented under their original categories to structure the deliverable.

## 4.1. Pilots supporting OS-aware RA for funders and national stakeholders

Within the first category there are two pilots: Finland's national CRIS Research.fi (CSC) and the national funding monitoring platforms of the main research funder in Romania, UEFISCDI.

### 4.1.1. Pilot A: CSC (Research.fi)

#### OPENCITATIONS

Aim: enriching [Research.fi](#) Open Access publications with citation information

#### TESTING/PILOTING

The piloting of [OpenCitations](#) (OC) had three stages. The first one was to figure out if using the OC Application Programming Interface (API) or data dump would be the best way to retrieve citation data from the service. It turned out that for the amount of data we were looking to retrieve the data dump was a better option.

The coverage of the OC data compared to the national research information hub (RIH) data was first examined for all RIH publications with a valid (or almost valid) DOI. As a result, of the 210 000 publications found in RIH, 130 000 have at least one citation in OC. Next we moved on to the second examination concerning only such publications with a DOI (or almost valid DOI) that are openly available. In this context openly available means publications that are openly available on the publisher's service or publications that have been parallelly stored in an organisation specific or discipline specific publication archive (i.e. self-archived). As a result, of the 128 000 publications found in RIH, 78 000 have at least one citation in OC.

We found the coverage satisfactory and moved on to the second stage of the pilot regarding the necessary additions to the RIH data model because information about relation types, such as citations, were not included in the model and thus we would not be able to import citation data to our database. While the plan for this pilot is to only include data on citations made to the publications found in RIH database, it has become apparent that other types of relations

need to be considered in developing the data model, as well as attributes of relations, such as the source and time of the relation, as well as relation to an entity external to RIH.

The third stage was the design: how the citation data would be shown in the Research.fi portal. The first test visualisation showed the number of citations a publication had received. But this was considered to go against the purpose of Research.fi, or more likely alter the purpose towards enabling evaluation as numbers make it easier to measure and compare. So the next iteration shows the list of citing publications. There are many unsolved issues still, one of which is the disclaimer required to explain what are the limitations of the citation information we have in the portal. And needing disclaimers always raises the question, if the information is worth showing in the end.

There is a fourth stage to the piloting, which is the discussion with the research community, represented by the Steering group of Research.fi, on the desirability of including citation information into the portal as it can be seen altering the original purpose of the service as well as being potentially misleading as the citation information currently covers approximately 60 % of the openly available publications. Obviously we were not expecting 100 %, but 40 % of publications with a DOI left uncited seems like a fairly large share. But this is work that will be done in the autumn of 2025.

#### MAIN RESULTS OF THE TESTING

The testing of OpenCitations proved that we can retrieve citation information from the service, and that the best way to do that is using the data dump. In terms of coverage, we think it is satisfactory showing that OpenCitations can be a relevant service to enrich the Research.fi data. However, the main result when thinking about the development of our own service (Research.fi) is the development of the RIH data model that has taken place as part of testing OpenCitations. This work will enable us to enrich our data in more diverse ways in the future.

#### ACHIEVING AIMS OF THE TESTING

The original aim was to enrich the openly available publications found in Research.fi with citation information retrieved from OpenCitations. The testing achieved this aim, as technically it is now possible. In addition to the original aim, during testing we realised that the RIH data model needs development for us to be able to enrich the RIH data with citation information (a type of relation). This aim was also achieved during testing, and the development work done in the context of the GraspOS project enables us to enrich our existing data with new types of information, namely information on relations between different data types.



#### NEXT STEPS

Even though showing citation information for a relatively large share (~ 60 %) of openly available publications found in Research.fi would technically be possible, we cannot move forward with the implementation before discussing it thoroughly with our most central stakeholders that are represented in the Steering group for Research.fi. In anticipation of the discussion, we have some concerns relating to:

- a. coverage – while the coverage is satisfactory it is nowhere near comprehensive, especially in relation to the full number of publications currently in Research.fi. And showing citation information for a selected group of publications (but still not comprehensively) would require eloquent disclaimers to ensure service users would understand what are the limitations of the new data.
- b. potential use cases – we have some challenges identifying the potential users for this enrichment. As it is not comprehensive, it cannot be used for evaluation or monitoring purposes, also researchers already have established data sources to find relevant research literature as well as citation information.

The discussion will take place in the autumn, and decisions regarding implementation will be made by the end 2025.

#### OPENNESS PROFILE

Aim: enriching the Research.fi researcher's profile with open science activities, merits and outputs

#### TESTING/PILOTING

The testing of Openness Profile turned out to be testing the concept of an openness profile with the aim of enabling researchers to showcase their activities and merits in advancing open science. Because we were testing a concept, all information to be shown in our version of the openness profile needed to be found in the Research.fi database. The first stage of the testing included defining which types of information within Research.fi could be automatically assigned as "open" and which types needed to be manually assigned as "open". The second stage was the design of the first demo version, which would be subjected to user testing. The first set of user testing focused on the usability of the demo version - how easily and intuitively the test persons figured out how to build an openness profile within the context of their already existing researcher's profile. For this first set of testing we invited members from the research community who had participated in the early user testing of the Research.fi

researcher profile to ensure their awareness of the service in general. The first testing took place online.

Based on the feedback received from the first set of testing, a more developed demo version was created. In the second set of testing we focused on presenting the openness profile to potential users. Two separate face-to-face workshops were organised, the first one including university researchers, and the second one university of applied sciences researchers. This time the participants were not required to have any earlier knowledge of either Research.fi or the researcher profile. In the testing we were interested to hear:

- a) if the test persons found the openness profile a useful feature, in other words if they thought the possibility to highlight one's merits in advancing open science was needed,
- b) if the design was successful in enabling researchers to highlight their merits in advancing open science, and
- c) what was missing in terms of activities, outputs or merits that advance open science.

The final testing was conducted with representatives of Finnish research funders in an online workshop. They were presented the same demo. Here we were interested to find out if merits in advancing open science were something the funders were interested in, and if so, were the merits highlighted in the openness profile the right ones, and if there were some merits missing from our demo.

#### MAIN RESULTS OF THE TESTING

The main result of the testing in terms of the potential users of an openness profile is that researchers in both universities as well as universities of applied sciences find it as a useful application. The demo version we have created allows researchers to showcase some aspects of their role in advancing open science, but as it is, it cannot show the whole story. Especially for researchers affiliated with a university, being able to showcase open access publications seems insufficient, instead merits highlighting capabilities in advancing open science were missed. These merits include, for example, pre-registering, pre-prints, and compliance to FAIR principles. The researchers hoped to be able to maybe link this type of information to their openly available publications, or alternatively they could be considered as independent information entities. The main message for the further development of the openness profile from the researchers was that being able to highlight one's merits in advancing open science is considered useful, but the current information content of this profile is insufficient to show the whole picture - being able to show capabilities and competence was considered as more important than being able to show outputs.

In terms of the potential utilisers of the openness profile, the value of open science is agreed upon, and considering merits in open science is something funders would like to have in their funding criteria. However, it is difficult for funders to define what type of openness should be rewarded when assessing funding applications. There seems to be a real sense of understanding that in the case of assessing to allocate funding, it makes a big difference what is included in the criteria. And in this case there were some concerns over “selecting” the wrong kind of open access and causing unintended consequences like, for example, inadvertently favoring researchers affiliated with research organisations that can afford higher article processing costs if rewarding gold open access.

In addition, one of the main results was the design that allows researchers to select from their own research activities which ones can be considered to advance open science. This was a feasible solution to assign the label of being an activity, a prize or an output that somehow advances open science to the kind of information that can in no way be automatically classified as such. In the long run, it is possible that such self-classification can result in a list of activities etc. commonly assigned as advancing open science and therefore contribute to the future automation possibilities.

#### ACHIEVING AIMS OF THE TESTING

The original aim of the testing was to enrich the Research.fi researcher profile with open science activities, merits and outputs. This aim was not achieved. The openness profile being developed within the project was not mature enough for us to test it as a service, so our alternative plan was to create an openness profile based on its concept, utilizing only such information that already exists in the Research.fi database. The aim of the modified testing was to find out if showcasing open science activities was considered as a useful feature in the researcher profile, as well as if the execution of the concept in the context of the researcher profile was considered successful. The testing showed that researchers consider the openness profile as a useful feature in the researcher profile and that the initial implementation was good, so our aims were achieved.

#### NEXT STEPS

The work continues to implement the openness profile as a new feature to the existing researcher profile in Research.fi. In addition to allowing researchers to showcase their role in advancing open science based on the already existing information, further work is needed to enable retrieving information from external sources on, e.g., pre-registering and preprints, and making this type of information also available for researchers to show on their profiles.

## SCOPE+I RESOURCES

In our original plan, according to the project proposal, one of the KPIs is to create an assessment protocol in the Open Science Assessment Registry (OSAR). During the project, the realisation of OSAR has developed, and it is now a part of the SCOPE+i Framework (called Assessment Protocol Registry). At the time of the piloting phase, we were not able to test the assessment protocol portfolio or the registry, but the first drafts of the resources created to support the design and documentation of research assessment events were available. The aim of the testing was to provide feedback to the WP2 team on these resources.

### TESTING/PILOTING

The resources created for the SCOPE+i Framework were presented to the Finnish network for research assessment in a dedicated face-to-face workshop. The network brings together research administration professionals who are involved in planning and conducting organisational level research assessments in Finnish research performing organisations. The participants were first introduced to the idea of the SCOPE+i Framework and shown the entire list of resources (N=16) with brief explanations on what was the main idea of each of them. As going through all of the resources within one workshop was impossible, four resources were selected for deeper examination: Value statement template, Strategy self-evaluation template, Indicator toolbox and Checklist of responsible assessment.

In the workshop the participants discussed the resource in question following four guiding questions: what is useful, what could be removed, what should be changed, and what should be added.

### MAIN RESULTS OF THE TESTING

The participants were very positive towards the SCOPE+i Framework, as currently there is no comprehensive service taking the entire assessment process into consideration. In terms of the Assessment protocol portfolio, they found the idea that the process could be documented very useful. They suggested that the portfolio could be structured for different stakeholders (targets of the evaluation, evaluators, as well as the organisers of evaluation) in a way that requires them to first read relevant guidelines or checklists before moving forward in the process. In this way it could be made sure (at least in theory) that all stakeholders are aware of the principles and guidelines steering the assessment. The participants also suggested that the resources could be organised chronologically, following the different stages of assessments. At the moment they are classified according to the SCOPE stages, which in essence are somewhat comparable to the chronological stages of assessment, but not known

to everyone. They also suggested that different resources were classified according to different assessment levels.

In terms of the Value statement template, participants felt that a more concrete example of a value chain (according to the SCOPE classification of super values, values and sub values) was needed, instead of long lists of each type. In addition, explaining the relationship between organisational strategy and values defined through this template was considered important. Also it is possible that organisational level values are different from values leading the evaluation. It was not entirely clear to the participants how the template feeds into the planning of the evaluation.

In terms of the Strategy self-evaluation template, it was obvious that the template was based on one specific assessment protocol - the Dutch Strategy Evaluation Protocol. The participants thought that the link to one protocol should not be pronounced, as the context for evaluations is different in different countries, for example. The template was considered to steer the process too heavily with its detailed definitions of, for example, assessment criteria. The participants found that the template should leave room for each assessment process to define its own criteria. Some overlap between this template and the Checklist for responsible assessment was evident.

In terms of the Indicator toolbox, the participants found it useful and clear. They found that as indicators are subject to constant development, and new ones are created relatively frequently, the toolbox would be better as a dynamic web-page than a static pdf document. This goes for the list of introduced databases as well. Including commercial data sources was discussed in terms of their relationship with responsible research assessment, but leaving them out was not considered as a good option, as currently there are not too many feasible open alternatives. The participants also wished that there could be examples of useful indicators also from other areas of research activity than open science. Also information about the suitability of different databases for different contexts was found missing. For example, information on the comprehensiveness in regard to different disciplines. Also information on how resource intensive different databases are could be added.

In terms of the Checklist for responsible assessment, the resource was considered to be very useful and clear. Being able to summarise such a complex issue into an easily readable form was applauded. It was suggested that the checklist would allow answering N/A in those cases where an item is not relevant, so it would not look like something has been overlooked. Also it should be taken into consideration that some of the items in the checklist are very detailed while others are on a more general level. It could also be helpful to highlight which of the

items are relevant for an organisational level assessment and which are relevant for assessing individuals. In general, the participants considered this resource to be the most mature of the four resources discussed providing concrete support to those planning an evaluation.

#### ACHIEVING AIMS OF THE TESTING

N/A as the testing of SCOPE+i resources was not described in CSC's pilot roadmap.

#### NEXT STEPS

When the SCOPE+i Framework is published, it is likely that the Finnish research administrators involved in planning research assessment will utilise the services.

### SUMMARY SECTION

#### REFLECTION ON ORIGINAL PILOT KPIs

The CSC pilot's original KPIs were as follows:

- 1 assessment protocol in OSAR
- 1 Openness profile template
- 100 individual researchers
- 10 national funders

We were not able to publish an assessment protocol in OSAR, as the service was not mature enough at the time of the piloting. Instead we tested the resources included in SCOPE+i using experts involved in the planning of organisation-level assessments to see if the resources are useful in the planning of assessment. In addition, we got the experts' views on the assessment protocol portfolio. We created a version of an openness profile within the context of the Research.fi researcher profile and tested it with 12 researchers and experts, as well as research funders. We will be collecting feedback from a larger group of researchers once we implement the openness profile -featured as part of the researcher profile. In terms of research funders, in the workshop where we tested the openness profile we had 26 representatives from 21 different research funding foundations.

#### REFLECT ON THE PILOT'S ROLE AS PART OF THE REFORM ON RESEARCH ASSESSMENT AS A REPRESENTATIVE OF A SPECIFIC EVALUATION SETTING

CSC's Research.fi is a national level research information system whose specific evaluation setting in the context of GraspOS is collecting and disseminating research information, and providing a landscape of the Finnish research ecosystem and a basis for science policy. It is not an evaluation tool, nor is it designed to support evaluations. However, it enables

evaluation, so RRA considerations apply. As a representative of a national level research information system, this pilot highlights the role of stakeholders. At this level, there are several stakeholders (RFOs, RPOs, governmental actors, business sector, media, general public) that need to be considered when designing developments. However all stakeholders are not equal in terms of their influence. Another important issue is the purpose. In this case the purpose (or need) to consider open science more diversely in the service, and this purpose needs to suit a number of actors. Also in terms of what is considered 'open', different organisations have different meanings and expectations of openness, so on a national level, we need to have a mutual understanding of it, especially if 'openness' is supposed to be a merit. And finally, in the context of a national level research information system, considering open science more diversely is challenged by lack of comprehensive and reliable data on openness. Usually the researcher is the only one with comprehensive information on their research activities, so collecting such information burdens researchers. Therefore it is of great importance to think carefully about the purpose of collecting information, if the potential benefits of it exceeds the prize.

#### [REFLECT ON THE USEFULNESS OF THE GRASPOS PROJECT IN GENERAL TO YOUR PILOT SETTING](#)

Meaningful discussions with several of our stakeholders on the role of open science, what is openness in research, and how it should be considered have been very valuable. Also understanding the high importance of purpose, that it is something that needs to be considered each time new types of information or new features are introduced to the Research.fi service, from the point of view of use cases: who is this new information for, which stakeholders are expected to use this new feature. These are discussions and insights that might have taken place even without the GraspOS project, but the project made sure of it. In addition, the development work the project supported in terms of the Research.fi data model has been very useful, as we are now able to include more diverse information to the service, once the relevance and use case is clear.



## 4.1.2. Pilot B: UEFISCDI

### OPENNESS PROFILE (SECTION AS PART OF A NEW RESEARCHER PROFILE TEMPLATE)

Aim: To analyze, design, and test a template/ mock-up for a new openness-oriented researcher profile as part of our internal platforms (including UEFISCDI's [BrainMap platform](#), with over 65000 registered users). The profile aims to reflect a broader diversity of research outputs and activities aligned with CoARA principles and open science practices.

#### TESTING/ PILOTING

The pilot focused on designing and testing a new researcher profile that includes an Openness profile section. This involved:

- Reviewing [OPUS Research Assessment Framework](#), and other relevant European initiatives on RA and OS.
- Reviewing current national/institutional research assessment and OS practices and indicators.
- Mapping data already collected via BrainMap and EvoC platforms.
- Aligning with CoARA commitments and integrating narrative CV elements.
- Developing and refining a concept for the new profile and then a visual mock-up version for it.
- Internally testing the mock-up with technical and policy teams, as well as with management representatives, and receiving feedback from GraspOS partners.
- Preparing two national workshops targeting over 100 researchers to test the user experience and relevance of the profile.

#### MAIN RESULTS OF THE TESTING

- completion of the concept version of the new profile (available here - [concept](#)) - as a comprehensive conceptual redesign that incorporates new types of contributions to research, contributions to Open Science, and narrative sections.
- completion of the first visual mock-up (available here - [mock-up](#)).
- internal feedback gathered and integrated into a revised version.
- concept prepared for two user workshops (planned for July-October 2025).



#### ACHIEVING AIMS OF THE TESTING

While external testing is ongoing, the aim of creating a new profile format aligned with openness and responsible assessment has been achieved in design form. The profile is ready for testing within the research community and early internal feedback has validated the approach.

#### NEXT STEPS

- Conduct two national workshops.
- Integrate external feedback from researchers.
- Finalize and publish the updated Researcher profile template.
- Disseminate the template and results nationally and via Zenodo and GraspOS channels.

#### OPENAIRE RESEARCH GRAPH (FEASIBILITY ANALYSIS)

Aim: To explore the possibility and feasibility of integrating the [OpenAIRE Research Graph](#) with UEFISCDI platforms in order to enrich researcher profiles with open-linked data on research outputs and activities.

#### TESTING/ PILOTING

The pilot involves an analysis of:

- The type and structure of data covered by the OpenAIRE Research Graph. The main focus was on the type of data OpenAIRE Graph provides, that could be relevant for the BrainMap improved researcher profile, namely: specific metadata, specific openness indicators and the ways in which the Graph could support the population of BrainMap fields and increase the visibility of researchers' Open Science practices.
- Technical requirements for integration.
- Alignment between OpenAIRE data and indicators used in BrainMap and the Openness profile. Engagement included reviewing documentation, joining OpenAIRE/GraspOS community calls and dedicated workshops, and bilateral discussions with service providers.

#### MAIN RESULTS OF THE TESTING

This task is ongoing, with preparatory analysis underway. Key technical and conceptual integration points are being identified. The report will be completed by October 2025.

#### ACHIEVING AIMS OF THE TESTING

A preliminary analysis was done. And the final results will be included in the full final report.

#### NEXT STEPS

- Complete full feasibility analysis by October 2025.
- Define technical requirements for a potential integration.
- Identify potential use cases for OpenAIRE integration into BrainMap.

#### SUMMARY SECTION

##### REFLECTION ON ORIGINAL PILOT KPIs

UEFISCDI pilot's original KPIs were as follows:

- **1 assessment protocol in OSAR** – In progress; connected to GraspOS WP2 SCOPE+i framework resources.
- **1 Openness profile template** – Achieved; a visual template mock-up has been created and internally validated.
- **100 individual researchers** – In progress; researchers will be engaged through two workshops (July–October 2025).
- **1 national funder** – Achieved; UEFISCDI, as the national funder, is leading the pilot.
- **2 workshops** – In preparation; concept, and engagement strategy have been developed.

##### REFLECT ON THE PILOT'S ROLE AS PART OF THE REFORM ON RESEARCH ASSESSMENT AS A REPRESENTATIVE OF A SPECIFIC EVALUATION SETTING

UEFISCDI's pilot contributes to the broader conversation around research assessment reform in Romania by raising awareness and opening up discussions at the national level regarding what types of research contributions are relevant and valued by researchers and research communities. While the BrainMap researcher profile is not currently used in evaluation processes, it serves as a public profile and a resume tool for researchers. (However, BrainMap is used in some cases as a pool for selecting reviewers for certain funding calls.) By introducing a redesigned profile that includes narrative elements – such as a personal summary and a “main achievements” section – as well as a wider range of research contributions, the pilot helps to reflect ongoing shifts toward more comprehensive and inclusive representations of researcher activity.

These piloting activities are complementary to other developments at UEFISCDI, such as the recent introduction of narrative CV formats in funding calls. Moreover, applicants are now asked to list up to 10 research results, without restrictions on the type of output, reinforcing the institutional focus on recognizing diverse contributions. The GraspOS pilot is also aligned with the objectives outlined in UEFISCDI's [Action Plan](#) elaborated as a member of CoARA.

#### REFLECT ON THE USEFULNESS OF THE GRASP<sup>OS</sup> PROJECT IN GENERAL TO YOUR PILOT SETTING

The GraspOS project has provided a valuable framework for exploring how openness and diversity in research contributions and results can be better reflected in national research information systems. Through its activities, shared resources, tools, and mutual learning opportunities, GraspOS has represented a good setting for UEFISCDI to develop and test a more inclusive approach to how researcher activities are documented and made visible. It has also contributed to connecting the pilot to broader European efforts to reform research assessment and implement Open Science principles in practical, system-level ways, including through the integration of elements specific to narrative CVs and researcher profiles aligned with Openness Profile models.

The project has also enabled UEFISCDI to engage with and learn from other pilots, fostering alignment with emerging practices across Europe. More broadly, the pilot activities carried out within GraspOS have helped reinforce institutional reflection on UEFISCDI's existing platforms (such as BrainMap and EVOC), research assessment practices, and the recognition of varied research contributions—all of which are part of UEFISCDI's strategic goals under its [CoARA Action Plan](#).

## 4.2. Pilots supporting OS-aware RA at research organisations

Within the second category there are four pilots supporting OS RA at research organisations: The Copernicus Institute of Sustainable Development in Utrecht University (UU), The Research Council of Italy (CNR), University of Eastern Finland (UEF) and the University of Belgrade Faculty of Chemistry (UNIBE).

### 4.2.1. Pilot C: UU

#### OPENAIRE GRAPH

Aim: informing departmental evaluation of Copernicus Institute of Sustainable Development on open science activities and in particular transdisciplinary research. The theme on transdisciplinary research emerged through in-depth qualitative engagements with a newly instituted group that was tasked to reflect on societal impacts of research, interviews and departmental engagements. As such, we read transdisciplinary research as one of the aspects that concern open science.

#### PILOTING ACTIVITIES

To assess OpenAIRE data, we chose to compare it to data from the CRIS. We collected all available data between 2020 and 2025 from both systems and compared it on four dimensions: (1) towards each other, (2) the ideal extent to which both data sources can inform transdisciplinary research evaluation, and (3) the real extent, respectively. This was done because data was often not at all or not sufficiently available. This produced a distinction between what could be assessed if data were existent and what can be assessed given the data that we had. Finally, (4) we conducted 'sketching interviews' with researchers where we presented them with a visualisation of their combined CRIS and OpenAIRE data and prompted reflection on their work on societal impact by drawing on and extending the printed sheets to further sensitise our learnings from the comparison.

#### MAIN RESULTS

Open science translates in a wide diversity of ways on the workflow. In our case, we found explicit associations to open science through the university-wide strategy and the Dutch [Strategy Evaluation Protocol](#) as formulated by the Dutch knowledge institutions. More implicitly and on the workflow, open science concerns existed, albeit mainly articulated as

aspects of societal impact, transdisciplinary research and generally concerns over societal value creation through science.

In terms of informing departmental evaluations, we found both CRIS and OpenAIRE data serving particular use cases and are limited especially with regard to their appropriation for transdisciplinary research evaluation. One of these limitations is by way of the uniformity of data provided. We found both data sources reproduce dominant categories, such as catering monitoring to research outputs. This is limiting in actualising both the disciplinary and epistemic diversity of the department, but also attending to the shifting value registers that highlight *interactions* as key concerns of evaluation - which are particularly important in transdisciplinary research. For instance, we found strong emphasis on activities, the intended and unintended results of events, long-term relationships and collaborations as key aspects of research in our observations on transdisciplinarity.

Another finding concerns the limitation in terms of the accuracy of research information with OpenAIRE data on the department. We encountered issues of accuracy in different ways: as a matter of duplicates that we addressed in our analysis, as a matter of ambiguity in naming or classifying (e.g. what research output category an item belongs to), and coverage (the extent to which data is available).

Finally, a structural consideration that emerged was the possibility for customisation. While the CRIS can be customised locally and organisational interventions done to amend data in real-time, the use of OpenAIRE data for evaluation also means externalising a degree of customisation and distributing control over what becomes monitored and how.

In terms of the departmental use case, while localised assessments ask for control over the kind of data that becomes monitored and by extension appropriated for evaluation, national-level, or international or European monitoring of open science, for instance, requires other data affordances for which e.g. OpenAIRE is probably better equipped to deliver.

#### ACHIEVING AIMS

The original aim of the testing was to collect knowledge on transdisciplinary research that takes place in the department on different criteria and have the ability to monitor collaborations between researchers and non-academic actors. Whilst both CRIS and OpenAIRE are limited in informing evaluations on the transdisciplinary character of the department, we learned why that is the case and developed recommendations for future departmental evaluations. In this sense, and because the aims of testing were always stretching their realistic achievement and rather acted as points of orientation, we found our pilot to have yielded insightful results and thought-provoking questions for the future. Finally, in the full

report of the UU pilot, we also contextualise these insights in departmental understandings of open science, the development of recommendations for open science assessments, and qualitative vignettes of researchers that were asked to reflect on the PURE and OpenAIRE data that was available about them.

#### NEXT STEPS

As preparations are currently starting to happen departmentally for the next periodic departmental evaluation, the GraspOS insights and recommendations lend themselves greatly to inform this process. As some of our GraspOS team members are part of the preparatory team, we are now translating the insight to purposeful actions, linking them to ongoing developments with e.g. the team concerned with societal impact of research.

For the full and detailed report on the activities done by the UU pilot, see Annex 2. The full report is also available in Zenodo: <https://doi.org/10.5281/zenodo.15727675>

## 4.2.2. Pilot D: CNR

**In a nutshell:** The CNR Pilot focuses on career progression at CNR in the light of the ARRA, frames the current evaluation criteria in relation to the Agreement, and tries to understand how the resources, tools and services developed within GraspOS, and more broadly, Open Infrastructures for Responsible Research Assessment, can benefit the evaluation process in RPOs like CNR.

### OVERVIEW

In 2022, the [National Research Council of Italy](#) (CNR) approved the "Relaunch Plan", which includes a reform of the research assessment system. In November 2022, CNR signed the [CoARA agreement](#) (ARRA), and as per its declared commitment, the whole assessment design for the career progressions of CNR researchers and technologists is deemed to change.

The 2023 competitive calls for career progressions (i.e., the latest ones) embody some core principles promoted by the ARRA and the evaluation procedure. As of June 2024, over 2,500 researchers and 500 technologists, across 35 and 10 different Career Advancement Fields (CAFs), respectively, applied to one specific CAF and, in some cases, are still under evaluation. In each CAF, the assessment is run autonomously by a dedicated committee, which received the mandate from CNR to acquire the generic guidelines provided by the main call, translate them by instantiating the evaluation criteria valid for that CAF only, and scrutinise the applications received. Similar criteria were applied in a career progression competition carried out in 2020, before the CNR signed the Agreement.

### THE CHALLENGE

Italian RPOs are generally assessed by the public agency [ANVUR](#), which is in charge of several evaluation processes. These include the periodic assessment of VQR (Evaluation of Research Quality) of RPOs (like the REF in the UK), and the National Scientific Habilitation (ASN) for teaching at the university. This evaluation is limited to the scientific production in terms of 2 to 4 research products (i.e., mainly full papers published in indexed scientific journals) published in a given period (i.e., the last one would consider the period 2020-2024) and also does not take into account the plurality of research products. Therefore, in our view, focusing the pilot on the production of a dashboard monitoring Open Science production and relevant indicators would be non-significant at an institutional level.

Conversely, CNR independently evaluates its research staff whenever a competitive call for career progression is open. Similarly, CNR assesses candidates (potentially external) during

hiring processes involving public competitive calls. After signing the ARRA, it is crucial to understand how the institution complies with and fulfils its commitments.

## OBJECTIVES

Initially, we aimed to conduct a comparative analysis of CNR's 2020 competitive calls for career progression (before the ARRA) and compare them with the 2023 calls, which aim to align with the Agreement and the implementation of the reform. However, the scope of the analysis, the complexity of the assessment process, and its delicate ramifications (e.g., legal disputes) delayed the completion of the selective procedures well beyond our expectations and into the end of GraspOS implementation. As a result, we decided to focus solely on the 2023 competitive calls (four in total).

The pilot setting is primarily conceptual and positioned downstream to the assessment design and evaluation phases. As such, directly testing tools and services federated in GraspOS was not feasible, nor did the working group have an official mandate from CNR to do so. However, analysing the text of the four competitive calls for career advancement at CNR allowed us to examine the narrative CV templates currently required by our institution and to better contextualise them in relation to other available templates (e.g., the Royal Society's template) and understand to what extent an infrastructure can satisfy and/or support the workflow for applying to the selection.

In summary, the pilot's objectives are threefold:

- **Analysis of current evaluation criteria for career advancements at CNR** after the signature of the ARRA; note that the ARRA core commitments were explicitly mentioned in the calls for competition.
- **Liaising with CNR direction to provide recommendations** and engage with the scientific base to understand how the ongoing reform is perceived.
- **Feasibility study of GraspOS resources, tools, and services:** map CNR's assessment design against the GraspOS federated infrastructure and understand how this could benefit the procedure (e.g., Openness profiles, integration with the OpenAIRE Graph and other diverse kind of evidence, novel indicators).

## ANALYSIS OF CURRENT EVALUATION CRITERIA AT CNR

A total of four competitive calls for career advancement were published by CNR in 2023 (see the figure below). The two calls related to researcher career progression encompass 11 different research products and 31 distinct qualifications, totalling 42 unique items (and their



corresponding evaluation criteria) for analysis. The two calls for technologist career progression include 11 research products and 33 qualifications, resulting in 44 unique items and related criteria.

Altogether, this leads to a total of 3,820 individual criteria to analyse, i.e.,

- 42 criteria × 35 competition areas (CAFs) × 2 researcher calls = 2,940
- 44 criteria × 10 CAFs × 2 technologist calls = 880



The analysis was conducted to assess the alignment between the criteria used by the evaluation committees and the CoARA commitments, with particular attention to the first four core commitments (Arentoft et al., 2022), which are explicitly referenced in the calls.

For the record, for each CAF, ARRA Commitment #1 (i.e., recognise the diversity of contributions to, and careers in, research in accordance with the needs and nature of the research) is considered fulfilled when all research products and qualifications are eligible to receive the maximum possible score according to the criteria defined by the evaluation committee, i.e., all contributions are treated as equally valuable.

For ARRA Commitment #2 (i.e., base research assessment primarily on qualitative evaluation for which peer review is central, supported by responsible use of quantitative indicators), we asked: “Can the research product or qualification be assessed without examining its content? Are the points assigned predominantly (i.e., over 50% of the total score) based on mechanical or purely metric-based evaluations?” If the answer to either question is yes, the criterion is considered to violate Commitment #2 and is flagged as predominantly quantitative.

ARRA Commitment #3 requires the “abandon inappropriate uses in research assessment of journal- and publication-based metrics, in particular inappropriate uses of Journal Impact Factor (JIF) and h-index”. Following the examples provided in the Agreement, our analysis flagged criteria where research products were judged based on venue (e.g., outputs published in certain outlets considered inherently superior), language (e.g., English-language outputs assumed to be better than those in other languages), or format (e.g., certain subcategories of products intrinsically valued more than others).

ARRA Commitment #4 (i.e., avoid the use of rankings of research organisations in research assessment) examines whether rankings of any kind (e.g., university rankings) are used to assess the quality of research products or qualifications, potentially influencing career progression evaluations.

By analysing over 3,800 individual criteria in relation to the first four CoARA commitments (as shown in the figure below), we compiled an extensive report to be shared with CNR’s Head of Staff and recruitment offices. This report serves as a self-reflective exercise on how the reform has been interpreted by the evaluation committees and how the mandates have been implemented.

The results of our analysis are also being developed into a research paper, which we are in the process of finalising and plan to submit, likely to Research Evaluation in the first instance.

#### LIAISING WITH CNR DIRECTION TO PROVIDE RECOMMENDATIONS

We are actively collaborating with CNR offices to design a survey targeting both evaluands and evaluators, with the goal of understanding how the new evaluation procedures have been perceived and identifying potential areas for improvement.

However, such a survey can only be conducted once the selection processes are complete and any legal disputes have been resolved, which most probably makes it unfeasible to carry it out before the end of the project.

## FEASIBILITY STUDY OF GRASPOS RESOURCES, TOOL OR SERVICE

As anticipated, since our pilot did not test specific resources, tools or services developed within GraspOS, in this section, we report generic considerations stemming from our pilot setting.

First of all, by liaising with the service and data providers participating in GraspOS, we offered feedback to both OpenAIRE and BIP! Finder teams to help refine and develop tools that support the integration of data-driven evidence into narrative CVs and dashboards.

In particular, we provided feedback to the OpenAIRE team towards the creation of the Researcher Dashboard, while we provided feedback to BIP! Finder towards the development of a templating system for narrative CVs integrated in BIP! Finder. BIP! now is capable of restructuring the information contained in a researcher profile into various formats, one of which follows the CNR CV template.

We also came to realise the value of assessment portfolios, developed within GraspOS. For the first time, downstream of the evaluation, CNR shared the material assessed by the committees, i.e., all candidates' CVs and presented research products and qualification portfolios. Similarly, the assigned scores and synthetic judgment provided by the evaluators have been shared with all the evaluands competing in the same CAF (this data is, however, not publicly accessible).

This has been done in a very basic way via shared zip folders, yet the files are poorly organised and named in a cluttered way. Information is indeed transparent and accessible to candidates, yet in a hard, time-consuming way, which in the end impedes or at least makes it difficult to digest and process the information shared.

This procedure resembles a rudimentary implementation of the assessment portfolio concept designed for the project, which, however, should be refined with better organisation and metadata in order to improve consultation and verification.

This point tightly resonates with the following one. Career progression at CNR is a delicate process because it has a direct impact on the work and life of individuals.

CNR's recruitment offices required a significant amount of time to redesign and carry out the assessment process. In some cases, the procedures remain unresolved for extended periods, largely due to legal disputes filed by candidates. Indeed, several CAFs from the 2023 calls are still far from being settled.

Considering this, our view is that an evaluation process based entirely on a decentralised (albeit open) infrastructure would be unfeasible for conducting large-scale assessments at CNR—and, by extension, at similar RPOs—as it raises non-trivial liability concerns.

As a self-protection from legal disputes and to be accountable for evaluation results, CNR would rather have an understandable preferential focus onto the institutional repository/platform (i.e., [IRIS](#), recently adopted) and explore the feasibility of running evaluation campaigns, availing of the existing tools (i.e., in-house). In this regard, IRIS has a modular design and offers components which may support assessment campaigns.

This aspect highlights a tension between centralised and decentralised infrastructural approaches to Responsible Research Assessment (RRA), which cannot be overlooked. A potential solution could lie in adopting a hybrid infrastructure; one where the evaluation procedure is primarily supported by an on-premise (yet open) system (e.g., an institutional repository or CRIS), complemented by off-premise, open, and decentralised data sources and services from which additional contextual metadata on usage and impact can be semi-automatically retrieved and integrated into the application.

This point is also tightly connected with the coverage of descriptive metadata and depositions openly available about the plethora of diverse individual contributions to research. Not all research products and qualifications that CNR passed to committees for inclusion into evaluation criteria are present in the currently available repositories and registries that could be federated into an open infrastructure for RRA. Actually, aside from data, software, and (most) notable document-based research products and contributions, any evidence for other types of research contributions and qualifications is rarely available through descriptive metadata on open online platforms (see Annex 3. Mapping of evaluated products and qualifications at CNR).

### 4.2.3. Pilot E: UEF

#### UTILIZING NEW INDICATORS AND METRICS IN RESPONSIBLE RESEARCH ASSESSMENT AND IN MONITORING OPEN SCIENCE: HYBRID INDICATOR MODEL FOR RESPONSIBLE RESEARCH ASSESSMENT AND OPEN SCIENCE EVALUATION

University of Eastern Finland (UEF) is one of GraspOS pilot universities, participating in GraspOS as an affiliated entity to [CSC](#) (IT Centre for Science research). In our pilot study, we aimed to analyse, test and evaluate less-used indicators and metrics in assessing research and open science. We also aimed to explore possibilities and to identify the university management's needs to use new methods in university's knowledge management, impact assessment, responsible research assessment and open science evaluation. In addition, we wished to promote open science by enabling recognising merits in open science.

##### PILOTING ACTIVITIES

These aims evolved to concrete results. In our pilot study, we examined the university's societal activities and their significance as part of the assessment of societal impact. The SIAMPI project (Spaapen, J., & Van Drooge, L. (2011). Introducing "productive interactions" in social impact assessment. *Research Evaluation*, 20(3), 211–218. <https://doi.org/10.3152/095820211X12941371876742>) has shown that interaction is prerequisite for impact. Due to difficulties in studying impact directly, we focused on examining interactive societal activities.

We created and piloted a new kind of hybrid indicator model for societal activities. The model combines quantitative and qualitative information, also validating qualitative information. To mitigate the discrepancy of societal interaction between disciplines, we used three routes for our data analysis: (a) societal activities of researchers (UEF CRIS), (b) popularised publications for the general public and professionals ([VIRTA](#)), and (c) for possible other recordings (e.g. OpenAIRE Graph / OpenAIRE Explore). We were interested in the practical applicability of the indicators that is justified by data. For this reason, we used real data from the institutional UEF CRIS and the national VIRTA service (bibliographic data stored in VIRTA is made publicly available in [Research.fi](#)). We proved that these less-used datasets were suitable for creating the model and exploring new indicators.

The hybrid indicator model visualises the importance of noticing the different efforts researchers make to achieve societal impact. The recorded interactions can be utilised in

formulating an intermediary or a "level of effort" for the societal impact. We created an evidence-based semi-quantitative indicator for the level of effort by examining both direct interactions between people and indirect interactions in the form of professional and popularised publications. We call the indicator "hybrid" because it incorporates both direct interactions data and publications data. Fields of science are used as the unifying factor between data of direct and indirect interactions. The semi-quantitative approach is realised by interpreting the numerical indicator values as star ratings. The fields of science are given one to four stars based on normalised numbers of interaction efforts using an adjustable scale. Star ratings help to make the extent of societal interactions visible, they are easy to interpret, and they illustrate hybrid indicators accurately enough to draw conclusions.

As stakeholders, we interviewed key university leaders (n=9) at UEF on their views on the university's societal impact, research assessment, open science evaluation, and knowledge management. The interviews verified that novel methods for assessing research, open science and university's societal impact are of interest to university management. The hybrid indicator model highlights the achievements of the organisation's societal engagement, which sparked interest among university leaders.

#### MAIN RESULTS

We devised a transparent, discipline-independent, "semi-quantitative" indicator to highlight societal interaction. We were able to demonstrate the feasibility of the hybrid indicator. We proved that it is possible to create an evidence (data) based multidimensional indicator model for the levels of societal interactions of open science. These interactions are supposed to induce societal impact over a longer period of time. Thus, the hybrid indicator can be seen as one indirect measure of societal impact of open science.

#### ACHIEVING AIMS

In our pilot study, our initial goal was to analyse and evaluate less-used indicators of publishing activities based on the VIRTAs dataset. Gaining access to the UEF CRIS dataset enabled us to expand our examination to include other research activities as well. This enabled a more comprehensive examination of research activities related to societal interaction, which ultimately led to the development of the hybrid indicator model. The emergence of the hybrid indicator model and the demonstration of its feasibility were outcomes we could not anticipate at the outset of the project.

We studied OpenAIRE metadata fields for the appraisal of open science at the European level, and explored and compared data available from OpenAIRE Graph/Explore. In our interim report, our aim was to select appropriate units and filters, prepare an OpenAIRE Explore

dataset, explore possibilities for summative calculations and standardized indicators, and make observations on the content and consistency of OpenAIRE Graph/Explore data in relation to hybrid indicator calculation. Unfortunately, for the moment the content, structure and user interface of OpenAIRE Graph/Explore does not support systematic comparison of different organisations or sub-organisations that were relevant in our hybrid indicator development. Nevertheless, these aspects present opportunities for further development and refinement.

#### NEXT STEPS

The hybrid indicator model was finalised, thoroughly tested, and systematically evaluated within the project. The concept, operating principles, and technical implementation of the hybrid indicator model are described in an academic article *Tarkiainen, Laitinen & Rintamäki [2025]. Developing novel indicators for verifying societal interactions of open science* submitted for publication. One of the findings in our pilot study was that there are hardly any tools, services or resources for managing and analysing academic activities other than publications. There is a need for openly available bibliometric analysis tools that notice societal interactions, e.g., teaching, citizen science, and opening education and data.

Our hybrid indicator model is applicable in various institutional, national and international data environments, depending on the content and consistency of the data. In principle, the hybrid indicator model could also be used with data from e.g. OpenAIRE Graph/Explore. We wish our hybrid indicator model will be adopted and further advanced to support recognising merits in academic activities, assessing research, and enhancing open science.

#### SUMMARY SECTION

##### REFLECTION ON ORIGINAL PILOT KPIS

- 5–10 university leaders and leading experts interviewed/involved
- University and scientific community informed of project outputs

The original pilot KPIS were achieved. As stakeholders, we interviewed key UEF university leaders (n=9) on their views on the university's societal impact, research assessment, open science evaluation, and knowledge management. Recruiting interviewees was rewarding, and we were able to comprehensively engage all the key representatives from the university and faculty leadership that we had hoped for. This indicated that the themes of the GraspOS project and our pilot study are both topical and significant to university leaders. The university leaders' interviews not only provided information for the pilot study but also offered an



excellent forum to inform university leaders of GraspOS, our pilot study, and the hybrid indicator model.

We have presented and will present our UEF pilot study and the hybrid indicator model to university and scientific community in institutional, national and international seminars and conferences over the course of GraspOS. Throughout the duration of the project period, we have systematically informed the UEF community of GraspOS via online communication channels, most importantly via UEF internal social network Viva Engage. Our article on the hybrid indicator model intended for a scientific journal is currently under peer review. An article intended for a professional publication targeting academia, as well as a blog post aimed at the UEF community, are in preparation at present.

#### REFLECT ON THE PILOT'S ROLE AS PART OF THE REFORM ON RESEARCH ASSESSMENT AS A REPRESENTATIVE OF A SPECIFIC EVALUATION SETTING

UEF participated in GraspOS as one of the university pilots, as CSC's affiliated entity. Our task was to examine the project themes from the perspective and serve as an example of a research performing organisation. Similarly, in our pilot study and in the hybrid indicator model, we were not interested in UEF's research activities as such. UEF CRIS and VIRTAs were used only as test beds without interest in the contents and coverage of UEF CRIS and VIRTAs per se.

Especially the aspects of open publishing are quite established parts of research assessment. However, social interaction has been studied less. There is a shift happening in research policy from quantitative indicators and the hard bibliometrics of scientific publications towards more qualitative narrative reporting and evaluation. Narratives give a researcher a voice of their own, but verifying the information in narratives can be difficult. The hybrid indicator model combines quantitative and qualitative information and also validates qualitative information. It enables evidence (data) based evaluation e.g., to validate and/or support narratives. We see the hybrid indicator model as an innovative tool that not only makes visible societal interaction but also supplements traditional citation-based indicators in research assessment.

The hybrid indicator model can be utilised in monitoring open science as well as in verifying and making visible organisation's societal interaction. Overall, we have created new perspectives for research assessment. We managed to find and create new openings that help to notice a wide range of work done under open science. One of our aims was to promote open science by assessing new ways to use indicators for recognising and rewarding academic activities. The hybrid indicator model could be utilised in this as well.

#### REFLECT ON THE USEFULNESS OF THE GRASPOS PROJECT IN GENERAL TO YOUR PILOT SETTING



The GraspOS project provided us with an opportunity to examine research activities related to societal interaction, which ultimately led to the development of the hybrid indicator model. GraspOS also gave us a collaboration network that supported our work. A similar VIRTAD dataset we utilised has originally been processed and analysed by the project partner Federation of Finnish Learned Societies [TSV](#) - Tieteellisten Seurain valtuuskunta (see Pölönen, J. & Auranen, O. (2022). Research performance and scholarly communication profile of competitive research funding: the case of Academy of Finland. *Scientometrics*, 127 (12), 7415–7433. <https://doi.org/10.1007/s11192-022-04385-8>).

In GraspOS, we tested the tools OpenAIRE Graph and above all OpenAIRE Explore. Our hybrid indicator model is applicable in various institutional, national, and international data environments depending on the content and consistency of the data. In principle, the hybrid indicator model could also be used with data from e.g. OpenAIRE Graph/Explore. OpenAIRE Graph and OpenAIRE Explore have great potential for further development. The GraspOS project partnerships facilitated the advancement of prior work, and the development of new contributions grounded in earlier foundations. We hope our hybrid indicator model will follow a similar trajectory and be further advanced through future development efforts.

## 4.2.4. Pilot F: UNIBE

### PILOT OVERVIEW



The [University of Belgrade – Faculty of Chemistry](#) is piloting a new research assessment model grounded in the principles of Open Science and responsible metrics. At the heart of this initiative is the institutional repository [Cherry](#), which supports collecting and disseminating the Faculty's research outputs. More about the goals of this pilot can be found on [GraspOS website](#). The UNIBE activities, lessons learnt, and plans are recapitulated in Annex 3.

### AUTHORS, PROJECTS, PUBLICATIONS (APP)








To implement the evaluation mechanism in a technical manner, we decided to expand the existing infrastructure, which is already well known among researchers and decision-makers at the Faculty of Chemistry.


The main idea was to build upon and upgrade the [APP \(Authors, Projects, Publications\) tool](#), which has been in use for years in our institution. The goal was to introduce new features that would provide different ways to assess how open science practices are progressing over time - whether at the level of institutions, individual researchers, scientific groups, or specific research results. Figure 1 shows the APP application.

APP Authors Projects Publications

Authors   A

search... 1 - 30 / 8038

Authority Key	Name Variants	Openness metric [Test]
orcid::0000-0003-2559-5234	• Ćirković Veličković, Tanja (400)	 
orcid::0000-0001-7060-9055	• Tešević, Vele (315)	
orcid::0000-0002-6067-2349	• Zarić, Snežana D. (315)	 
orcid::0000-0001-7465-1373	• Stanković, Dalibor (291)	 

Groups  B

search... 1 - 8 / 8




Group Key	Openness metric [Test]
Katedra za analitičku hemiju	
Drugo	
Katedra za nastavu hemije	
Katedra za opštu i neorgansku hemiju	
Katedra za organsku hemiju	
Katedra za biohemiju	
Katedra za primenjenu hemiju	

Figure 1. Screenshot of the external APP application showing three types of badges: one set for A - individual researchers, and another set for B - departments

#### TESTING AND EVALUATION

- Conducting multiple in-person meetings with members of the UNIBE pilot team, sometimes extended with other faculty staff, so we could have an open discussion;
- Reviewing existing badges (e.g., Center for Open Science: <https://www.cos.io/initiatives/badges>) as a model for designing our own;
- Conducted continuous testing of every new software update or upgrade in both testing and production environments to minimize the risk of deploying bugs or errors into the system;

#### MAIN RESULTS OF THE TESTING AND EVALUATION

- Nearly 8,000 research profiles have undergone an evaluation process to assess their success in adopting open science practices;
- Six departments within the faculty were identified and mapped, along with the researchers who are still actively contributing;
- Evaluation metrics were defined and described in a way that allows for quantitative implementation and assessment;
- Positive feedback was received from a testing group of researchers, both on the mock-up version and the live production version of the platform;
- A suitable infrastructure was established to support future improvements, including further implementation at the policy level and integration of new mechanisms into the institutional rulebook.

#### ACHIEVED YOUR AIMS OF THE TESTING AND EVALUATION

- Since the main focus of this tool was to implement mechanisms for monitoring and evaluating open science practices at different levels within the institution, we believe that a satisfactory level of implementation has been achieved;
- Researchers often struggle to adapt to major changes in tools and applications. By preserving the familiar design of the existing platform, we successfully minimized the risk of rejection by the research community.

#### FUTURE PLANS

- Implemented a new version of APIs for external tools integrated with the APP platform;
- Continuously monitored and evaluated the success of researchers in following open science practices over time;
- Disseminated our knowledge and experience with others through collaboration, presentations, and documentation.

#### BIP! RANKER

The initial version of the APP, which existed at the beginning of the project, lacked any module capable of generating dashboards or analyzing data in a way that would support effective monitoring of the level of impact of research.

To address this, we explored tools and data sources that could provide deeper insights into research impact and other relevant indicators. One particularly useful solution we identified

was BIP! Ranker. BIP! Ranker offers valuable tools and indicators for evaluating research and researchers, using data from trusted sources such as the OpenAIRE Graph. It follows best practices for responsible research assessment and clearly explains how each indicator is calculated, what it represents, and its limitations, helping users interpret the results correctly.

#### TESTING AND EVALUATION

- Reviewed the current set of measurable indicators already available within our system to determine their relevance for evaluating open science practices. This helped establish a baseline for finding missing metrics;
- Defining metrics that were either not available or insufficiently covered, especially those related to the quality and context of openness, to ensure a more complete evaluation framework;
- Analysing the methodological concept of BIP! Ranker to understand how it interprets and calculates indicators, ensuring compatibility with our goals;
- Making a subset of DOIs was used to test the integration with BIP! Ranker and to detect any inconsistencies or misleading data before applying to the full dataset.

#### MAIN RESULTS OF THE TESTING AND EVALUATION

- Established API communication protocol to enable seamless data exchange between our system and BIP! Ranker;
- Identified approximately 3,500 records archived in our institutional repository that have a direct link established with BIP! Ranker;
- Identified approximately 3,500 records enriched with metadata from BIP! Ranker, including four key metrics that enhance research evaluation (Popularity, Influence, Citation count, Impulse);
- Implemented the integration across multiple levels, including individual research outputs, researcher profiles, and institution;
- Fully incorporated BIP! Ranker into the APP platform, ensuring users can access enriched data within their familiar interface;
- Maintained a 24/7 live connection with BIP! Ranker, ensuring continuous data synchronization and availability.

#### ACHIEVED YOUR AIMS OF THE TESTING AND EVALUATION

- Since we had not previously collected data that represents metrics at a level sophisticated enough to provide a comprehensive overview of scientific results, we believe we have taken an important step forward in better understanding the state of open science within our institution;
- Similar to the APP upgrade, we succeeded in making only minor adjustments to the existing workflow while simultaneously achieving a major improvement in the quality of analytical data that we can now analyze and present effectively.

#### FUTURE PLANS

- We will closely monitor future updates to BIP! Ranker and ensure synchronization with any new features as they are released.

#### OPENCITATIONS

The integration of OpenCitations within the Cherry repository and its external application (APP) is intended to enhance the visibility and assessment of research output. The primary aim is to provide a comprehensive and open source of citation data to complement existing metrics, thereby supporting a more nuanced and transparent evaluation of scholarly impact.

An example is given on [Open Citations website](#) and shown in Figure 2.

## OpenCitations



If you do not see full results below, please check out this OpenAlex powered version, by [clicking here](#).

OpenCitations Count:	18
Title:	<a href="#">Phycocyanobilin-modified B-Lactoglobulin Exhibits Increased Antioxidant Properties And Stability To Digestion And Heating</a>
Author:	Radomirovic, Mirjana, 0000-0003-3701-6017; Minic, Simeon; Stanic, Dragana, 0000-0003-2576-3074; Nikolic, Milan; Van Haute, Sam, 0000-0003-3727-3603; Rajkovic, Andreja; Ćirković Veličković, Tanja, 0000-0003-2559-5234
Source:	Food Hydrocolloids (2022-02), Vol. 123, p. 107169

Figure 2. OpenCitations count for one of the papers from the UNIBE.

### TESTING AND EVALUATION

- Multiple team meetings were held to evaluate the need for this tool to display citation data and how this information would be useful for researchers and institutional reporting;
- Developing and testing the public API link to retrieve OpenCitations based on DOIs in the Cherry repository;
- Ensuring that the OpenCitations count was correctly integrated and displayed alongside other citation indicators (Altmetric, Dimensions, Scopus, etc.).

### MAIN RESULTS OF THE TESTING AND EVALUATION

- A functional public API link was created, enabling the retrieval of OpenCitations data based on DOIs;
- Approximately 3,500 records in the Cherry repository have DOIs, and around 2,700 of these have been identified as having at least one citation in OpenCitations, indicating a substantial coverage.

- The citation count from OpenCitations is successfully integrated and displayed uniformly with other citation indicators (Altmetric, Dimensions, Scopus, etc.), providing a consolidated view of impact.
- Within the APP, citation information for individual records can be effectively filtered by various criteria, improving data exploration and analysis.

#### ACHIEVED YOUR AIMS OF THE TESTING AND EVALUATION

- The aims set out in the user story for the GraspOS Athens workshop in May 2024 were successfully achieved. The resource/tool/service functioned as intended, and the testing and evaluation process confirmed its relevance and usability. There were no significant challenges or deviations from the original objectives, and the outcomes aligned well with the expectations outlined during the workshop preparation.

#### FUTURE PLANS

- The primary next step is the complete development of the badge display system at the individual and departmental level using OpenCitations, alongside other indicators.
- Gathering extensive user feedback to improve badge system design, criteria, and effectiveness.
- Continuously monitoring the impact of OpenCitations integration on researchers' engagement with Open Science practices.

#### OPENAIRE MONITOR DASHBOARD

The [OpenAIRE Monitor Dashboard](#) is utilized to support a more evidence-based approach to assessing our institution's performance in Open Science. The intended aim of this resource is to provide key metrics and insights into our research outputs, Open Access compliance, and collaboration with international research funders.

For instance, this [tool](#) clearly shows that the Cherry repository is the No. 1 Dataset source at the University of Belgrade, as shown in Figure 3.



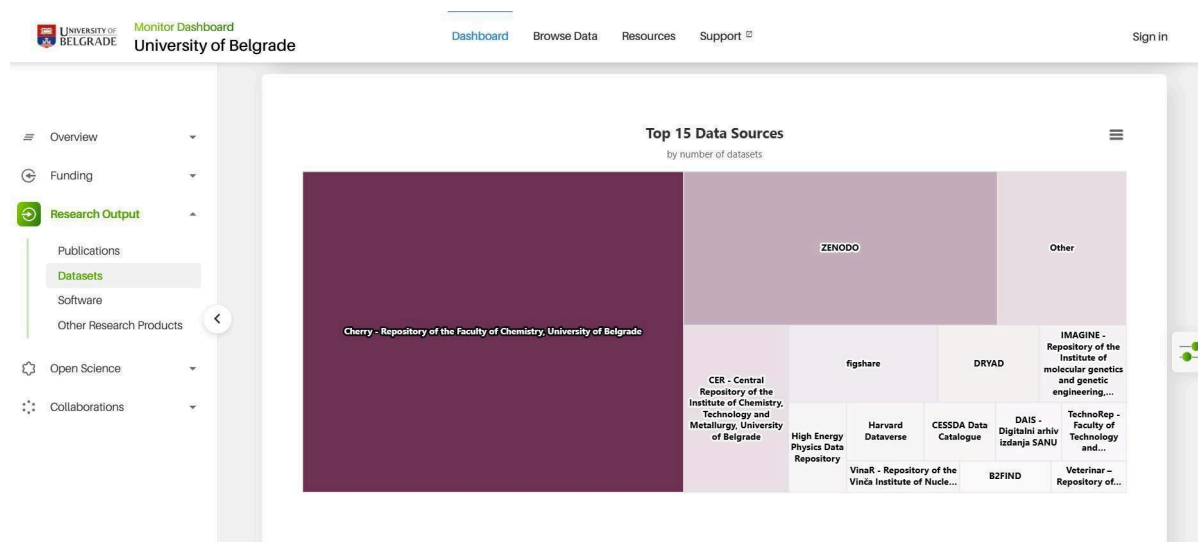


Figure 3. OpenAIRE Monitor Dashboard for the University of Belgrade, Datasets as a Research Output

#### TESTING AND EVALUATION

- The OpenAIRE Monitor Dashboard was not "tested and evaluated" in the traditional sense as a new tool under development. Instead, it was adopted and integrated as an existing, publicly available resource to gain insights into the University of Belgrade's Open Science performance.
- The dashboard's data provided useful context for evaluation and complemented narrative approaches like the APP.

#### MAIN RESULTS OF THE TESTING AND EVALUATION

- The dashboard provides a helpful understanding of the institution's performance in terms of Open Science, offering data on Open Access compliance of research outputs, collaborations with international funders, and overall alignment with Open Science policies.
- The metrics offer useful context for evaluating research activities and can effectively complement qualitative assessments.
- Key insights from the dashboard, particularly regarding research outputs, Open Access compliance, and collaboration with international funders, are directly informing the development of the first institutional researcher reward system in Serbia.

#### ACHIEVED YOUR AIMS OF THE TESTING AND EVALUATION

- This data is directly contributing to the development of the researcher reward system, which is based on three key principles directly aimed at incentivizing Open Science practices.
- The utilization of the dashboard has been instrumental in providing the necessary data to pursue these aims locally, even in the absence of immediate national implementation.

#### FUTURE PLANS

- Proceed with the complete development and launch of the institutional researcher reward system, which is directly informed by the metrics and principles derived from OpenAIRE Monitor.
- Continuously use the dashboard to monitor progress on Open Access compliance and other Open Science indicators.
- Utilize the data from the OpenAIRE Monitor Dashboard to advocate for stronger Open Science policies and practices at both the institutional and national levels, demonstrating tangible progress and impact.

#### SUMMARY SECTION

##### REFLECTION ON ORIGINAL PILOT KPIS

- **1 assessment protocol in OSAF (upgraded Rulebook on Open Science at the UNIBE) -** This KPI is ongoing and partially achieved. The aim to revise and align the current rulebook with the national Open Science Platform 2.0 and integrate a new researcher reward system is actively being pursued. However, as noted, this activity has faced delays due to the current unpredictable crisis in Serbia. While the formal upgrade is not yet finalized, the underlying principles and components (like the reward system design) are being developed with this ultimate goal in mind.
- **1 reward system prototype -** This KPI has been fully achieved. A badge-based reward system prototype is actively being developed. This system aims to recognize researchers who self-archive publications and participate in Open Science training. The badges are already visible within the external application "APP" in the "Openness metric [Test]" column.
- **3 badge models for the reward system -** This KPI has been fully achieved and specified within the reward system development. The system is based on three key principles leading to badge models:

- i. Awarding badges to researchers who share scientific results via green open access through the institutional repository Cherry.
  - ii. Awarding badges to departments that facilitate green Open Access by encouraging researchers to use Cherry.
  - iii. Awarding badges to researchers who actively participate in seminars on Open Science and Responsible Research Assessment.
- **10 individual researchers involved** - This KPI is fully achieved. Although the core UNIBE team consists of 5 people, meetings, lectures, and workshops involved over 50 researchers from the UNIBE.
- **1 department enrolled** - This KPI is fully achieved, since six departments enrolled.
- **1 community of practice** - This KPI is achieved. A successful Community of Practice (CoP) session titled "Monitoring Open Science at university level for research assessment" was held on January 22, 2025.
- **2 lectures/workshops** - This KPI is fully achieved. One workshop and two lectures were held.

#### PILOT'S ROLE AS PART OF THE REFORM ON RESEARCH ASSESSMENT

UNIBE's work on the badge-based reward system directly addresses the reform of research assessment by the following:

- Recognizing actions like self-archiving in institutional repositories, participating in Open Science training, and sharing research data, the pilot shifts the focus from purely quantitative, journal-based metrics to a broader range of Open Science contributions.
- Incentivizing deposits in the Cherry repository directly promotes green Open Access, which is a cornerstone of responsible research assessment, emphasizing open dissemination.
- Awarding badges for workshop attendance fosters a culture of learning and engagement with Open Science principles, moving beyond passive compliance.
- The intention to award badges to departments based on researcher engagement encourages collective responsibility and institutional support for Open Science.
- The use of the OpenAIRE Monitor Dashboard and the integration of OpenCitations demonstrates a commitment to using diverse, openly available data to inform assessment, ensuring transparency, and reducing reliance on proprietary data sources.

#### THE USEFULNESS OF THE GRASPOS PROJECT IN GENERAL TO THE UNIBE SETTING

- GraspOS provided the overarching framework and objectives within which the UNIBE pilot developed its specific activities.
- Being an EU-funded project, GraspOS provided the necessary resources for the development of the reward system prototype and associated activities.
- The project's network likely facilitated access to technical expertise and discussions on tools like OpenCitations and OpenAIRE Monitor Dashboard.
- Participation in WP2, WP5, and WP6 meetings allowed cross-institutional learning, which is crucial for identifying best practices and avoiding pitfalls.
- Being part of a larger Horizon Europe project like GraspOS lends significant credibility and visibility to UNIBE's Open Science initiatives. Presenting at conferences and clustering events under the GraspOS umbrella helps disseminate the pilot's achievements to a wider audience.
- GraspOS promoted the use of specific tools and resources relevant to Open Science monitoring and assessment, such as the OpenAIRE Monitor Dashboard and OpenCitations, which have been directly integrated into the UNIBE pilot's work.

## 4.3. Pilots supporting OS-aware RA for thematic disciplines

The third category includes three pilots in different thematic communities covering computer science (CS), agricultural and veterinary science (INRAE), and social sciences and humanities (SSH).

### 4.3.1. Pilot G: CS

#### BIP! SCHOLAR AND OPENAIRE RESEARCHER PROFILE

Aim: In the context of the Computer Science (CS) pilot, the [BIP! Scholar](#) and/or the OpenAIRE Researcher Profile platform should be used to implement a researcher profile template tailored for the CS domain. The template will be based on the key profile components that have been identified ([10.5281/zenodo.15708653](https://doi.org/10.5281/zenodo.15708653)) by the pilot experts to offer recognition for the full spectrum of CS research activities taking into consideration the efforts related to Open Science and the specificities of the CS domain.

#### TESTING/PILOTING

A CS researcher profile template was created in BIP! Scholar implementing a subset of the key profile components that have been identified by the pilot experts in a relevant report ([10.5281/zenodo.15708653](https://doi.org/10.5281/zenodo.15708653)). Currently, the template has been used by a group of volunteer researchers in CS to create their own profiles and test it in practice. Valuable feedback was collected from this initial group of volunteers, primarily composed of pilot experts and close colleagues. A broader campaign to engage more researchers and develop an improved version is planned for the final phase of the project (see also 'Next Steps'). Regarding the OpenAIRE Researcher Profile, pilot experts were only able to review early mock-ups of the service and provide feedback to the developers, as a working demo is expected to be released in the coming months.

#### MAIN RESULTS OF THE TESTING

The volunteers who used the BIP! Scholar platform were able to create researcher profiles tailored to the CS domain, incorporating key elements relevant to research assessment processes in this field. Many of the fields (particularly those related to the most important types of research products) were automatically populated based on the ORCID profiles of the researchers and metadata collected by the OpenAIRE Graph and other data sources. At the

same time, other elements (e.g., the educational activities, the achievements, etc) needed manual input from the volunteers. The CS pilot experts had the chance to investigate which of those components were easy for the volunteers to complete and to identify potential standardisation issues based on their inputs. This feedback will be used by the BIP! Scholar developing team to refine guidance materials related to the various types of input and improve automated checks for implementing the respective components. Additional feedback related to user experience and interaction with the platform was collected. Finally, regarding the OpenAIRE Researcher Profile, due to the absence of a production-ready release, testing was based on the mock-ups, hence the most valuable feedback focused on the design and the components that should be prioritised.

#### ACHIEVING AIMS OF THE TESTING

Two of the KPIs of the pilot were related to this piloting activity: CS-KPI1 ("1 CS researcher profile template") and CS-KPI2 ("100 CS researcher profiles created"). CS-KPI1 was successfully met, while CS-KPI2 was partially met. More details on the status of the KPIs can be found in the summary section. In general, most objectives set for testing the BIP! Scholar platform were addressed, while additional testing on the OpenAIRE Researcher Profile is expected to take place in the last months of the project.

#### NEXT STEPS

Following improvements and extensions to the BIP! Scholar platform (guided by the feedback from the initial group of volunteers) a broader campaign is planned for the final phase of the project to engage more researchers and further enhance the platform. Additionally, a set of volunteer CS researchers will attempt to test in practice the OpenAIRE Researcher Profile by creating their own profiles following its production release.

#### SOFTWARE-SYNC, SOFTWARE-VIZ AND SOFTWARE-HUB

Aim: Having identified how much software is part of the scholarly work in computer science, the objective of this experiment was to provide concrete insights into researchers' software productions as mentioned within their publications. The viewpoint was to design a multifaceted dashboard that could be useful at various levels of interest in the analysis of scientific results, from the researcher himself/herself up to the management of an institution.

#### TESTING/PILOTING

The SOFTWARE-Sync tool was developed by Inria on the basis of existing open source tools, Grobid<sup>5</sup> and Softcite<sup>6</sup>. These tools allow one to see if it is possible to identify, inside the full text of scholarly publications, software mentions and to qualify these mentions according to their role in an open science perspective, i.e. if it is described as being created, shared or just used.

The SOFTWARE-Viz tool was used to study and monitor the results and to see the feasibility to link a software mention to authors and to institutions on the basis of the metadata associated with the article and either provided by the corresponding publication repository or automatically extracted by GROBID.

These tools were tested on a dataset of about 1000 publications of various research teams within Inria. The results were then compared with what the teams had declared in their activity reports for the same years (see [radar.inria.fr](https://radar.inria.fr) where all Inria teams' activity reports are made openly available). The dashboard has also been demonstrated to various members of the Inria management (CEO and scientific coordinators).

#### MAIN RESULTS OF THE TESTING

SOFTWARE-viz, which was used to study the results, presented the results by listing all mentioned software by name, allowing it to filter by institution. For each software mention, a citation from the full text allowed to verify visually the accuracy of the mentions. For each software, it was possible to view the list of publications containing the mention, as well as the authors and the institutions.

The tool was able to identify softwares, although it has been necessary to create a "blacklist", in order to exclude some generic software tools, such as "python", "script" or "code". It gave the possibility to identify some softwares that were not included in activity reports by research teams at Inria and to point out some errors in the qualification of mentions.

We could demonstrate that the detection of software mentions within publications provides a much wider perspective on the scholarly activities carried out by researchers than the sole self declaration in activity reports. When demonstrated to the Inria management, it has been an ideal tool for demonstrating various practices within the organisation: usage of other teams' software, balance between open and closed software usages, long tail references to older pieces of software.

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<sup>5</sup> <https://github.com/kermitt2/grobid>

<sup>6</sup> <https://github.com/softcite>

#### ACHIEVING AIMS OF THE TESTING

Initiated as a simple demonstrator that software mentions could be used in research assessment contexts, we could go far beyond our expectations by eliciting concrete observations and tendencies.

We also found that it would be beneficial for this tool to be easily integrated and used by other stakeholders. This triggered Inria to develop an autonomous installation version, SOFTWARE-Hub, that meets this new goal.

#### NEXT STEPS

The HAL open archive (<https://hal.science>) turned out to be interested in incorporating this tool as a service to scholars when they upload their full text on the repository. Inria is now working on this integration, using the COAR notify protocol. The ultimate goal is not only to highlight software contributions in a paper, but also, through user feedback, to provide validated and disambiguated mentions that could be further used to train the Softcite model based tool.

In this perspective, we think that these tools, especially SOFTWARE-hub, are correctly designed to be implemented with any set of scholarly publications of article type. It is linked to Softcite, which is being continuously improved thanks to annotation campaigns and by user feedback as with HAL.

#### OPENAIRE CONNECT

Aim. The tool will be used to provide OS monitoring and analysis capabilities.

#### TESTING/PILOTING

An Inria community was created on OpenAIRE in order to see if a dashboard could replace the current dashboard at Inria. The current dashboard at Inria is based on the publications and source code deposited on the HAL open archive (<https://inria.hal.science>).

#### MAIN RESULTS OF THE TESTING

Our study of the OpenAIRE dump of the Inria OpenAIRE connect community, compared with the Inria corpus in HAL reveals some strengths of OpenAIRE, such as a broader coverage, particularly of software and datasets that are not available in HAL, thanks to the use of multiple sources. OpenAIRE offers valuable post-treatment, such as avoiding duplicates and assembling multiple versions of the same object.

The limitations fall into two categories. In terms of content, although the number of missing references is not so high compared to the total, it represents approximately one year of



research production at Inria over the six-year period covered by the dump. In terms of metadata, while OpenAIRE offers the potential to study the different publications of a single object, it is unclear how easily different types of documents could be evaluated separately, given that they can be grouped (i.e, preprint, conference paper and article for one reference). The results of the country code study also showed a notably lower count of international publications compared with Inria's internal tools, suggesting incomplete metadata for this particular field. Finally, the scope would need to be restricted to Inria project teams.

#### ACHIEVING AIMS OF THE TESTING

It has been possible to compare the datasets used for indicators by OpenAIRE and by Inria. This comparison showed a potential for indicators regarding open source code and datasets notably. One notable benefit of the OpenAIRE Connect community is its ability to surface missing records and metadata gaps, offering an opportunity to complement and enrich the HAL archive for Inria's research outputs.

#### NEXT STEPS

There is a need to further investigate the matter. For example, to study the references mistakenly attributed to Inria, to examine the possibility to restrict the scope to Inria project teams production, maybe based on their ROR ID. We plan to further work with OpenAIRE officials on these questions.

#### OPENAIRE GRAPH, OPENCITATIONS DATASETS, BIP! NDR

Aim: The datasets will be used to provide data inputs for researcher profiles and for statistical analyses. The OpenAIRE Graph provides a range of scholarly metadata and incorporates DBLP, a crucial source of information for the CS domain. OpenCitations datasets – i.e. OpenCitations Index, which contains citation links between scholarly entities, and OpenCitations Meta, which includes the basic bibliographic metadata of the entities involved in the citations – also encompass a variety of scholarly metadata and citations, including those involving software as either citing or cited entities. In addition, the majority of the citations included in the OpenCitations Index are also ingested within the OpenAIRE Graph. Finally, BIP! NDR Dataset includes citations from conference or workshop papers from the CS domain that do not have a DOI (and are not present in other major citation corpora).

#### TESTING/PILOTING

The data from the aforementioned datasets were mainly used to populate the two researcher profile platforms with valuable information. Given the active integration between OpenAIRE Graph and the other two datasets, the platforms obtained aggregated information by consuming data directly from the OpenAIRE Graph.

In addition, pilot experts conducted various analyses to assess the value of the dataset's contents in estimating the citation-based impact of research products, such as publications and software, and to provide relevant insights. Special attention was given to experimenting with the effect of citation data from the NDR dataset, which includes citations from CS conferences and workshops that are not present in major citation corpora, and to calculating impact indicators for research software tools, which are particularly relevant and important in the CS domain.

#### MAIN RESULTS OF THE TESTING

The experimentation and assessment of the referenced datasets, performed through the two researcher profile platforms, are described in more detail in the "BIP! Scholar and OpenAIRE Researcher Profile" section (above).

Regarding experimentation in the context of analysis tasks, the pilot experts found that the effect of missing conference and workshop citations on impact assessment for research products and researchers can be significant, as approximately 3.6 million citations were collected from approximately 193,000 publications that do not have a DOI. The detailed findings are expected to be published in a report in the next few months.

Additionally, the pilot experts explored approaches for calculating impact indicators for research software tools. This work leveraged software-to-publication connections already incorporated in the OpenAIRE Graph and OpenCitations datasets, as well as from the SOFTWARE-Sync and SOFTWARE-Vis tools (discussed earlier). The pilot experts also experimented with identifying both direct and indirect evidence of research software impact, extracting direct citations to software tools, citations to publications that introduced software tools as supplementary material, and informal mentions of software within publications. All this evidence was used to test and refine various types of software impact indicators. More details on the findings of the respective experimentation are expected to be published in a report in the next few months.

### ACHIEVING THE AIMS OF THE TESTING

No KPI directly related to the assessment of the referenced datasets was identified in the CS pilot roadmap. However, all objectives set in the roadmap were successfully addressed and produced valuable insights that have been or will be reported in relevant reports.

### NEXT STEPS

Further experimentation with updated versions of the referenced datasets is expected to be completed by the end of the project. These efforts aim to support the continuous quality assessment of the datasets and to reproduce the findings of the previously described analysis tasks. The researcher profile platforms also plan to continue leveraging these datasets and explore the feasibility of generating additional enrichments based on their content (e.g., improved impact indicators for research software tools). Finally, we will also experiment with approaches to extend the coverage of publication-to-software links by developing LLM-based tools for extracting software mentions from PDF articles, and eventually, to provide these links within the OpenCitations datasets – which, as of 21 June 2025, contains only around 2,000 software bibliographic metadata and 2,000 citation links involving such software as either citing or cited entities.

## SUMMARY SECTION

### REFLECTION ON ORIGINAL PILOT KPIs

The CS pilot has determined the following KPIs:

- CS-KPI1: 1 CS researcher profile template
- CS-KPI2: 100 CS researcher profiles created
- CS-KPI3: 1 report on Open Science engagement and uptake in CS

CS-KPI1 was successfully met, since one researcher profile tailored for CS was created in BIP! Scholar, based on the key components suggested by the report published by the pilot experts ([10.5281/zenodo.15708653](https://doi.org/10.5281/zenodo.15708653)). The respective profile template was used by a set of 10 initial CS researchers, primarily composed of pilot experts and close colleagues, to populate an equal number of profiles on BIP! Scholar (an example profile can be found [here](#)). This performance is below what was originally planned according to CS-KPI2, hence, at this point, the respective KPI was partially met. However we plan to organise a campaign in the following months to reach out additional volunteers to create and test the referenced CS researcher profile. Finally, regarding CS-KPI3, an initial report on Open Science engagement and uptake in CS was created, however without leveraging OpenAIRE Connect as it was originally planned due to the

difficulties described in the respective section. For that reason, CS-KPI3 can be considered to be met. An extended analysis that takes into consideration OpenAIRE Connect is likely to be performed in the last months of the project.

#### REFLECT ON THE PILOT'S ROLE AS PART OF THE REFORM ON RESEARCH ASSESSMENT AS A REPRESENTATIVE OF A SPECIFIC EVALUATION SETTING

The CS pilot explores important aspects of research assessment processes for computer scientists putting particular emphasis on identifying the components that should be included in a CS researcher profile. Those ideas are reflected in the initial report published on Zenodo ([10.5281/zenodo.15708653](https://doi.org/10.5281/zenodo.15708653)), while a more detailed analysis will be published in an extended report that will be published by the end of the project. At the same time, these ideas are put in practical testing with the experimentation of volunteers on the researcher profile platforms offered by the GraspOS projects. In addition, the effect of various particularities of the CS case (like the importance of conference and workshop papers or the importance of activities around research software) is explored by the various analysis tasks performed in the context of the pilot.

The outputs of all those activities provide valuable insights into the research assessment landscape by putting emphasis on the increasingly complex and diverse roles of researchers nowadays, an aspect that should be recognized in research assessment processes. In addition, the activities highlight that certain domains have types of research contributions of unique significance that should be appropriately considered during assessment. This is an important matter, since current platforms that support research assessment processes often fail to support this nuance, as they tend to apply uniform criteria across all domains.

#### REFLECT ON THE USEFULNESS OF THE GRASPOS PROJECT IN GENERAL TO YOUR PILOT SETTING

In general, most of the GraspOS resources tested by the CS pilot have been found to have valuable contributions for the successful completion of the pilot. Regarding the profile template platforms, BIP! Scholar was tested more extensively than the OpenAIRE Researcher Profile due to its technical readiness level (see also detailed comments above). The BIP! Scholar platform was easily configured to create a template that incorporates most of the key components identified by the pilot experts as important for CS researcher profiles. Additionally, the pilot experts plan to test any production-ready release of the OpenAIRE Researcher Profile that will become available before the end of the project. Moreover, all datasets referenced in the pilot roadmap were found to be useful and easy to use, not only through the researcher profile platforms but also when used directly for the analysis tasks described in the respective sections. In terms of data quality of the datasets, the provided

metadata were generally accurate and complete. However, for certain types of contributions, like the research software tools, coverage was limited and some information was missing. Finally, as noted in the relevant section, the use case that attempted to utilize OpenAIRE Connect to analyse Open Science uptake did not succeed to bring concrete results by the time of pilot reporting. Nevertheless, the pilot experts conducted a similar analysis using alternative datasets and plan to investigate completing the work with Connect in the final months of the project.

DRAFT

### 4.3.2. Pilot H: INRAE

For over 20 years, INRAE has employed a research assessment framework that values diversity of research activities at different scales: individuals and structures. For ten years, the institute has had an open science policy (OS), and OS practices are recognized in researchers' assessments. Openness rates of publications are one of the strategic indicators to evaluate the implementation of the OS policy. The French Open Science Monitor (BSO) is used to monitor the INRAE OS policy and is available [online](#). In this context, we are focusing on enhancing open science monitoring and creating openness profiles for researchers.

Here is a brief overview of our approach: We have explored the potential of the OpenAIRE services. Our goal was to provide novel indicators (of interdisciplinarity, impact, and citizen science), propose a narrative CV for researchers including an openness profile, and promote the exchange of knowledge. Considering that the institute is already compliant with the CoARA principles, we had mainly a technical approach, implying a team from the Directorate for Open Science. We were not able to test the narrative CV with researchers, as the services proposed by BIP! Scholar at the beginning of 2025 were less mature than ours. This report details our approach in more detail.

#### OPEN SCIENCE POLICY MONITORING ON OPENAIRE

Following the recommendations of the Barcelona declaration, we see the opportunity to explore the services of the OpenAIRE infrastructure. Our objective was to test and validate multiple OpenAIRE services:

- OpenAIRE CONNECT or "INRAE portal": the INRAE data aggregator;
- OpenAIRE GRAPH: the data and its model,
- OpenAIRE INRAE MONITOR: the dashboard to monitor the research outputs, the openness rate, etc.

To carry out this work, we explored the INRAE data available in the OpenAIRE Graph, assessing quality aspects such as completeness. To provide a comprehensive evaluation, we included comparisons with other databases. We examined research outputs across multiple sources for the period 2017–2022, with a particular focus on publications (specifically articles) and patents. This reference period was chosen to enable accurate comparisons with our Internal Bibliometric Database (BBI, from the French acronym Base Bibliométrique Interne). This methodology allows us to assess how well the OpenAIRE Graph captures and represents various research outputs along three key dimensions: coverage, classification by Fields of

Science (FoS), and openness of science. By comparing these aspects with established databases, we aim to evaluate the performance of the OpenAIRE Graph and its alignment with INRAE's open science goals and pilot themes.

Given the wide range of available bibliometric databases, we selected a subset that either shares similar objectives with OpenAIRE or has already been used in other studies relevant to the institute. Table 1 (please see Annex 5) presents the key characteristics of the databases used in this study. It is important to note that our analytical framework is based on OpenAIRE's definition of a "research product." According to this definition, research products are digital outputs of the scientific process, grouped into four main types: publications, data, software, and other research outputs. Table 2 (Annex 5) describes the search parameters used in this work.

#### KEY FINDINGS REGARDING THE OPENAIRE INRAE PORTAL

First, in terms of the total number of research products, the differences between the OpenAIRE portal and other databases are relatively small (Annex 5, Figure 1). These discrepancies may arise from structural differences between databases and the specific methods they use to collect data. However, when examining the distribution of items across the various types and subtypes of research products, we found that the definition of "research product" is not consistent across databases. As a result, each database categorizes research outputs differently. The most significant discrepancies were observed in the categories of images, software, and videos (data not shown).

Subsequently, we focused on article-type publications. Here again, OpenAIRE shows an advantage, with 72,379 articles compared to approximately 63,000 in other databases (Annex 5, Figure 2). At this stage, we used our reference database, BBI, for a more detailed comparison. BBI is INRAE's internal database, based on the Web of Science (WOS), enriched with HAL INRAE content, and manually validated by our experts. This comparison provides insights into the coverage of each database. To better interpret these results, it is essential to understand the selection criteria used for identifying articles. Differences may stem from factors such as update frequency, author affiliation handling, DOI attribution and management, and ambiguity in institutional naming.

We also analysed how OpenAIRE classifies articles by scientific discipline using its hierarchical Fields of Science (FoS) taxonomy, and compared this classification with that of other databases. Surprisingly, in the OpenAIRE portal, INRAE appears as an organization mainly focused on medicine and health sciences (Annex 5, Figure 3). This result can be partially explained by the varying levels of granularity in the classification systems. Even when



aggregating two major domains closely associated with INRAE, the medical sciences category remains predominant. It is important to note that OpenAIRE classifies articles into six broad categories, whereas HAL uses a 13-domain classification, and BBI adopts a far more detailed system with 230 categories. Therefore, discrepancies in classification across platforms can be attributed to differences in methodology, algorithms, and metadata interpretation. Finally, the lack of a standardized approach to interdisciplinary research adds some more complexity. Nonetheless, our findings suggest that OpenAIRE's classification system does not adequately reflect INRAE's research landscape.

Next, in a key part of this study, we analyzed how open science is represented in the OpenAIRE portal. To do this, we calculated the Open Access Rate (OAR) for article-type publications for each year of the 2017–2022 period (Annex 5, Figure 4). Our benchmark for Open Access is the BSO, a tool developed by the Ministry of Higher Education and Research (MESR) to support France's national open science policy. We also compared these results with our internal database, BBI. As shown in Figure 4 (Annex 5), all three platforms displayed similar growth in open-access publishing around 2019. However, in 2021, the OpenAIRE portal showed a stagnation—or even a decline—in its OAR compared to BBI and BSO. This unexpected trend raises questions about the underlying causes of the discrepancy observed between 2019 and 2022. These findings point to the need for a deeper investigation to determine whether significant changes were made to OpenAIRE's data collection or processing methods between 2020 and 2022. It would also be relevant to consider other potential influences, such as shifts in publisher policies or evolving practices in open-access publishing. Another important factor may be the way "open science" is structured and categorized within the portal itself.

Finally, we examined how OpenAIRE handles patents. Due to the absence of an up-to-date internal patent reference database, we relied on [Espacenet](#), [The Lens](#), and HAL INRAE for comparison. Our findings indicate that OpenAIRE reports fewer patents than these other databases, 179 in OpenAIRE versus 203 in both HAL INRAE and Lens (Annex 5, Figure 5). While the differences in patent coverage are relatively minor, they can be attributed to several factors: the geographical scope of the patents, their legal status (filed, granted, rejected, withdrawn), the diversity of data sources and collection strategies, and the frequency of updates. It is also important to note that within the OpenAIRE portal, patents are categorized as publications.

Supplementary information related to MONITOR and OpenAIRE GRAPH is available in Annex 5.



**Taken together, these findings underscore a significant strength of OpenAIRE: its ability to aggregate, enrich, and openly disseminate a diverse range of research outputs. At the same time, they highlight the pressing need to standardize terminology and classification systems to ensure greater transparency and interoperability across data sources.**

#### NARRATIVE CV AND OPENNESS PROFILE ON BIP! SCHOLAR

INRAE researchers can use a dedicated web tool, available at [HAL export to CSS](#), to assist in preparing their research assessment files. This tool exports data from HAL in a structured document format, organizing research outputs according to the official assessment template. It also highlights which outputs are openly accessible online. Researchers can then edit and enrich the exported document to finalize their assessment report. The INRAE assessment template was implemented in BIP! Scholar but without data integration. We evaluated a preliminary version of the BIP! Scholar profile and provided feedback, including suggestions for improving the platform and better adapting it to our specific requirements. Unfortunately, we have not been able to test it with researchers; however, the BIP! Scholar team is currently working on an improved version. If the suggested modifications are ready soon, we will aim to organize a test in the autumn.

#### OPENCITATIONS

We are particularly interested in OpenCitations as part of our efforts to enhance the fairness and transparency of bibliometric analyses. Our objective is to investigate how OpenCitations can be leveraged to improve bibliometric studies within the field of Agricultural and Veterinary Sciences. Specifically, we aim to evaluate the potential of OpenCitations data to develop bibliometric indicators, with an initial focus on self-citation metrics. This work is ongoing, and we anticipate being able to present preliminary findings and draw meaningful conclusions before the conclusion of the GraspOS project.

## SUMMARY SECTION

### REFLECTION ON ORIGINAL PILOT KPIs

Initial KPI	Results (June 2025)
1 assessment protocol in OSAF	We used the SCOPE approach to analyze our assessment protocol
2-3 Openness profile templates	We only require one template (INRAE)
20 individual researchers enrolled	Services not implemented – impossible to test
2 workshops	1 online workshop “community of practice”

We probably had too ambitious goals when elaborating the proposal:

- Better assessing OS engagement (publications, data, code, citizen science) of our researchers in Agricultural Sciences and Veterinary Science
- Analyze the impact in terms of interdisciplinarity, reproducibility of research results, and on Society (does openness support innovation or contribute to interdisciplinarity).

And we spent too much time on technical issues.

### REFLECT ON THE PILOT’S ROLE AS PART OF THE REFORM ON RESEARCH ASSESSMENT AS A REPRESENTATIVE OF A SPECIFIC EVALUATION SETTING

The AgriVet Pilot and INRAE approach of research assessment can be used as an example of applied research assessment, which needs to recognize different activities such as:

- Production of knowledge
- Expertise
- Training
- Leadership: Animation or direction of institutional groups, major instruments, resources, programs, or networks.

### REFLECT ON THE USEFULNESS OF THE GRASPOS PROJECT IN GENERAL TO YOUR PILOT SETTING

GraspOS helped us to understand:

- The Potential of Data Aggregators (DAs) like OpenAIRE for Open Science Monitoring

OpenAIRE offers significant value for monitoring the implementation of open science policies. As a "one-stop shop," it integrates a wide variety of research outputs, projects, and contributors, making it a valuable resource for institutional and policy-level assessment.

- The Data Quality Requires Serious Attention

Ensuring high data quality is a critical issue that must be addressed collaboratively between data providers and aggregators. Current harvesting methods, particularly OAI-PMH, are insufficient. Institutional efforts to curate and enrich repository metadata—such as accurate author affiliations—are often lost during harvesting. Wider and more consistent use of persistent identifiers (e.g., ORCID, ROR, DOI) is necessary. Additionally, thematic classifications (such as disciplines, SDGs, or FoS) are often inconsistent or lacking in granularity.

- The Need for Standardized Indicators

To accurately measure openness, we need shared definitions and methodologies. For example, calculating the open access rate for publications requires clear, standardized categorization of publication types (e.g., articles, books, book chapters) and openness channels (e.g., green, gold). Measuring interdisciplinarity also presents challenges due to differing classification systems and methodologies.

- The Need for New Practices, Data Sources, and Indicators

To comprehensively evaluate institutional policy goals—such as support for innovation (e.g., citation in patents, data reuse) or contributions to policy-making (e.g., references in policy documents, as tracked by tools like Overton)—we need access to new open databases and the development of novel indicators. Currently, such contributions can only be described qualitatively in narrative CVs.

- The Need for a “Hub of Data Services”

There is a growing need for an integrated hub of data services to support the incorporation of usage metrics (such as citations, downloads, and mentions) directly into institutional repositories. This would greatly enhance the value and usability of those repositories.

- The Researchers' Engagement is Possible When Services Offer Clear Benefits

Researchers are more likely to engage in testing and using these tools when they perceive a clear time-saving advantage or practical utility in their workflows.

- The Evaluators' Perspectives Must Be Taken into Account

The development of such services should also consider the needs of evaluators, specifically, how these tools can support a more accurate, comprehensive, and efficient assessment of research outputs and researchers' activities all along their careers.

### 4.3.3. Pilot I: SSH

The SSH Pilot prioritised the participation of the community and tested some tools that could be relevant in the context of the Social Sciences and Humanities (SSH). As a thematic pilot, the goal was to experiment with possible scalable solutions. Therefore, we present here three key activities:

- 1) **Community Consultation, using the SCOPE Framework, to assess the SSH Landscape.** The consultations provided valuable insights for rethinking outputs, activities, and processes that should be valued, and the challenges when aligning Open Science principles and responsible evaluation approaches. As part of this process, the platform BIP! Scholar was also introduced and received meaningful feedback from participants.
- 2) **Testing the OpenAIRE Monitor Dashboard for SSH outputs.** While initially explored as a monitoring tool, the pilot ultimately decided not to pursue its implementation, for reasons detailed below.
- 3) **Adapting and testing a Narrative CV Template for SSH.** This activity built on the work of WP2 and involved testing the template through the BIP! Scholar platform. The feedback gathered focused primarily on the CV format, while also providing insights into the platform's ability to support individual-level research assessment in the SSH domain.

**COMMUNITY CONSULTATION USING THE SCOPE FRAMEWORK TO ASSESS THE SSH LANDSCAPE**  
As part of our commitment to shaping the pilot through direct community input, the SSH pilot carried out two key activities aimed at bringing together scholars from the Social Sciences and Humanities (SSH). The first took place as a **Community of Practice** session under Task 6.2, held in January 2024 and centred on the question: What is the role of Open Science in fostering a more inclusive research assessment process in SSH?

With the participation of almost 50 scholars, the discussion revealed two key narrative strands. First, participants emphasised the need for **open infrastructures** as a foundation for more accurate and inclusive recognition of Open Science practices. Second, they highlighted that the **diversity of SSH research outputs**, especially non-digitised or performative ones, such as artistic performances, is still insufficiently acknowledged by current research assessment systems. This diversity poses challenges for evaluating SSH scholars, as standardised, digitised outputs are prioritised.

This initial exchange within the Community of Practice laid the foundation for the next phase of engagement: a series of online Consultation Workshops organised by OPERAS in March and April 2024. These workshops were a central element of the SSH pilot in the GraspOS project, aimed at improving research assessment practices by **rethinking the outputs, activities, and processes** that should be valued, while embedding **Open Science principles** and promoting **responsible evaluation approaches**.

Participation was open via an online registration form shared across multiple channels within the GraspOS and OPERAS networks. Several time slots were offered to ensure broad and inclusive engagement. We ended up organising three workshops that brought together 18 participants from 11 European countries.

Key themes discussed included defining **core values and priorities** for SSH assessment, **balancing quantitative and qualitative criteria**, the **diversity of research outputs and scholarly activities**, the **alignment of assessment processes with Open Science principles**, the **responsible use of indicators**, and **the potential role of digital platforms and tools**. The insights gathered made a valuable contribution to developing criteria for responsible research assessment in SSH.

It is important to highlight that our approach aligns with one of the core values of the **SCOPE Framework: Evaluate with the Evaluated**. This principle has become central to our methodology. We also tried to explore other elements of the SCOPE framework individually. The "S" — **Start with what you value** —, for instance, was the focus of our first workshop. Participants reflected on the types of super-values, values, and sub-values that matter to individuals and institutions in SSH. While there was broad agreement on shared super-values as common guiding principles, reaching consensus at more granular levels proved more complex. Values and sub-values often reflect organisational priorities and the ways in which institutions motivate and support their staff.

A wide range of outputs and practices were discussed, including open access publications, FAIR datasets, preprints, software, multilingual and non-traditional outputs, open peer review, CRediT roles, PhD supervision, public engagement, data management plans, educational materials, and collaboration. Many of these are still poorly supported or recognised in standard assessment systems.

Discussions also revealed that **understandings of Open Science in SSH vary significantly across disciplines**. While some associate it mainly with public engagement or open outputs, others emphasise infrastructure, transparency, and fairness. Key challenges include the **undervaluation of Open Science practices, an over-reliance on quantitative metrics**

**ill-suited to SSH, difficulties in tracking outputs, and the risk of increased bureaucratic burden.** Participants stressed the need for **more qualitative, context-sensitive evaluation** — particularly at the individual level — and for SSH-specific indicators that reflect the diversity of research practices.

Suggestions for improvement included adopting narrative CVs, prioritising human judgment and qualitative assessment, offering clear guidance to evaluators, and developing open, federated infrastructures.

Tools and platforms were among the topics discussed, especially in workshop 2. We highlighted **BIP! Scholar**, an open digital platform developed within the GraspOS project to support research assessment at the individual level. Features include support for CRediT roles, open access visibility, and plans for SSH-specific templates and non-metric-based evidence of expertise. Tools like BIP! Scholar and national barometers were seen by participants as promising, particularly when tailored to the needs of SSH. However, feedback from SSH participants also pointed to important concerns.

The prototype presented was criticised for **its quantitative, STEM-oriented emphasis, with metrics like citations and H-index prominently featured.** Participants voiced a **clear preference for narrative-first assessment**, stressing the need to better reflect SSH-specific contributions such as monographs, national-language outputs, community engagement, peer review, and mentoring. Additional concerns included the limited relevance of standard metrics to SSH, the risk of oversimplification, and the need for interoperability with systems like ORCID and CRIS. There was broad agreement that the workshops should lead to the **development of more narrative-driven profiles, SSH-appropriate indicators, and clearer contextualisation of metrics.**

Overall, the discussions underscored the need for **flexible and inclusive assessment systems that recognise SSH-specific practices and Open Science contributions**, shifting away from metric-based evaluations towards more **meaningful, qualitative approaches.**

As a final step, the feedback gathered through this activity will inform the development of guidelines and recommendations for research assessment in the SSH domain. These will be validated in a dedicated workshop held in collaboration with experts in Open Science and research evaluation. The session will serve to refine the recommendations and explore how they can be effectively implemented within the GraspOS infrastructure and its associated data, tools, and services.

## MONITORING DASHBOARD: OPENAIRE/GoTRIPLE

The aim of testing a dashboard was to explore the types of monitoring capabilities available for the SSH domain. A central challenge in SSH research assessment is the need to account for a broad range of research outputs, as well as activities and processes. However, at this stage, the dashboard was limited to research outputs only. We reached out to the OpenAIRE team to explore **the feasibility of creating a dashboard for testing and review**. It was agreed that we would use the GoTriple curated dataset - that feeds the GoTriple Discovery Platform, one of the OPERAS services— as the basis for exploring the dashboard and its features.

**OpenAIRE provided access to the dashboard**, and we organised **a session with representatives from OPERAS to gather initial feedback** on its usefulness and feasibility. It's important to note that OPERAS is deeply involved in developing services related to open access books, such as OPERAS Metrics and PRISM, and was also the coordinator of PALOMERA, a project focused on the policy landscape for open access monographs. Given this background, OPERAS was considered a key stakeholder, well positioned to provide valuable input and feedback on this activity. In the session, a small group of people provided thoughtful comments and raised some points that spoke to the challenging nature of maintaining a dashboard as it was originally envisioned.

The first major challenge concerned **data provenance, quality, and representativeness**. Participants questioned the extent to which the dashboard could offer a trustworthy and comprehensive view of SSH research outputs. While the dataset is reliable for search and discovery, it would be difficult to trace the origin of specific records or understand how the data were curated for display in the dashboard. More critically, the data are sourced from a limited set of repositories, making it difficult to capture the full diversity of SSH research. These limitations raised concerns about using the dashboard as a formal or representative tool for monitoring SSH activity.

Closely related to the challenge above is a fundamental nuance of SSH: **the diversity of its research outputs often extends beyond conventional forms of scholarly productivity**, such as journal articles. What truly matters, and should be prioritised, is how to make visible the wide range of unique outputs in SSH, including audiovisual materials, performances, exhibitions, and other non-traditional formats. In this regard, the current dashboard approach is not well-suited to reflect or support this level of diversity.

As an alternative, we were encouraged to consider testing the **dashboard for a minimum viable product (MVP)**, narrowing our scope to a specific type of output. We explored the



possibility of focusing exclusively on Open Access monographs, or even more narrowly, on books available through Diamond Open Access. However, this approach proved unconvincing in the context of the project. The main reason was the existence of more mature and targeted tools already in use within the community. We concluded that **pursuing this MVP approach would not add significant value or insight.**

Given the early stage of the SSH dashboard's development and the challenges outlined above, **we decided not to move forward with integrating it into the pilot's activities.** Still, the feedback gathered remains valuable and was shared with our partners in the project to support ongoing improvements.

As for involving additional stakeholders, we believe that the feedback provided by OPERAS representatives was sufficiently comprehensive. Given the expertise in SSH monitoring, platform development, and SSH data sources, it is unlikely that a broader audience at this stage would have provided substantially different insights.

#### SSH NARRATIVE CV TEMPLATE EVALUATION

Narrative CVs have been recognised as qualitative tools that can be used to replace traditional CVs in assessment contexts, particularly for hiring and promotion of individuals. Within the GraspOS project, the WP2 team has been working on a template based on the [Royal Society's Résumé for Researchers](#). Building on that, the **SSH pilot developed a version tailored to the specificities of the Social Sciences and Humanities (SSH) domain.**

Ten researchers from the SSH community were invited to evaluate this SSH Narrative CV template, embedded in the **BIP! Scholar platform**. The main goal was to **assess whether the template effectively captures their key research contributions**, with **particular attention to Open Science practices**. Feedback collected during this process will inform further refinements and guidance for adapting Narrative CVs to SSH contexts.

The evaluation process began with a 30-minute onboarding session, where participants were guided step-by-step through creating a BIP! Scholar account, introduced to the Narrative CV template, and instructed on how to provide feedback via a dedicated form. After this session, they had one month to independently test the tool. The process concluded with a one-hour group discussion, offering participants the chance to reflect on their experience, exchange perspectives with fellow SSH researchers, and provide further suggestions to improve the Narrative CV model.

While the SSH template builds on the foundation of the *Résumé for Researchers*, it introduces **specific modifications** in the module prompts **to better represent diverse scholarly**



**contributions, emphasise Open Science, and align with the realities of SSH disciplines.** It also includes “Tips” for each module, offering structured guidance, practical examples, and a word limit for each section. The module themes remain:

**Module 1 - Generation of Knowledge**

**Module 2 – Development of Teams or Individuals**

**Module 3 – Contribution to the Wider Research Community**

**Module 4 – Contribution to Broader Society**

In addition, the SSH version promotes **a more inclusive, context-aware approach** to assessment by **recognising different career stages** and **encouraging researchers to explain the context and significance of their work.** These enhancements make the SSH Narrative CV a more appropriate tool for capturing the richness, diversity, and societal relevance of SSH scholarship.

#### [EVALUATION EXERCISE: OPEN SCIENCE IN THE SPOTLIGHT](#)

Open Science emerged as a key, yet challenging, theme during the evaluation of the SSH Narrative CV template. While **participants generally valued the inclusion of Open Science practices,** they often **struggled to define, frame, and consistently represent their contributions** within the CV's structure.

A recurring issue was the **lack of clarity and consensus on what truly constitutes an Open Science contribution.** Early career researchers, in particular, expressed uncertainty, and feedback from the session highlighted Open Science as the area with the least agreement among participants. There was **a call for clearer definitions, concrete examples, and context-specific guidance** to help identify relevant contributions.

Discussions also revealed differing views on whether Open Science should be addressed in a dedicated module or integrated throughout the CV. Most participants ultimately agreed that integration across all modules, supported by targeted prompts and examples, was preferable. This approach was favoured to avoid redundancy and better reflect the inherently cross-cutting nature of Open Science.

The session also touched on broader reflections around responsible assessment. Some participants questioned whether **openness alone should define research quality,** highlighting the **need to balance the encouragement of Open Science with the recognition of diverse research practices,** especially within the SSH domain. Technical suggestions included **automating Open Science indicators,** such as linking DOIs and

visualising openness metrics directly within the CV template. Finally, some participants even proposed including the word "open" in the CV title itself to emphasise its importance.

In summary, while Open Science is widely regarded as essential to modern research, meaningfully integrating it into narrative CVs requires **clearer framing, thoughtful guidance, and flexible infrastructure** that truly reflects the diversity of academic work, particularly within the SSH community.

More generally, although the provided tips and prompts were appreciated, concerns were raised that they could overly constrain responses. Suggestions included offering these tips through a hover tooltip, for instance, allowing participants to choose whether to read them, and tailoring them to different career stages.

#### INTEGRATING FUNCTIONALITY: THE POTENTIAL OF BIP! SCHOLAR

The discussion also included BIP! Scholar as a potential platform for **integrating automated functionalities into the narrative CV**. Specifically, its connection to the OpenAIRE Graph could enable features like auto-filling DOIs. While this particular functionality was not part of the current SSH CV template exercise, participants responded positively to the idea. They found it **appealing for efficiently linking research outputs and deliverables, especially within open access environments such as Zenodo**. Based on this feedback, the team behind the platform plans to further explore and develop such functionalities.

The final step within the SSH Pilot will be refining the Narrative CV based on the feedback gathered to provide clearer guidance on how to present Open Science-related activities and outputs. The revised SSH Narrative CV template will be also included in the validation workshop mentioned above and later made available in BIP! Scholar as one of the GraspOS outputs.

## SUMMARY SECTION

#### REFLECTION ON ORIGINAL PILOT KPIS

The SSH pilot was initially set out with a focused set of Key Performance Indicators (KPIs), largely structured around recognising and enhancing the visibility of diverse research outputs in the SSH domain, particularly Open Access monographs, within evolving research assessment practices. At the outset, the KPIs were centred on improving the representation of non-traditional outputs and testing infrastructural tools for monitoring and assessment.

As the pilot evolved, the community engagement pushed the pilot's scope beyond outputs alone. This led to a necessary and productive shift in KPIs, expanding them to include broader

scholarly activities and underlying research processes that are often undervalued. This shift was aligned with the values articulated in the SCOPE Framework and reflected the co-creative nature of the pilot, where iterative feedback loops informed evolving priorities.

Originally, success metrics were tied to the deployment and testing of tools like BIP! Scholar and the OpenAIRE Dashboard. While the BIP! Scholar platform proved a useful space for prototyping a Narrative CV tailored to SSH, the dashboard pilot, built using data from the GoTriple platform, did not meet expectations for coverage or representativeness and was therefore deprioritised. Importantly, this decision reflects the value of honest evaluation.

A significant KPI related to community engagement was fully achieved. The organisation of a session with the Community of Practice and the organisation of consultation workshops and evaluation sessions for the SSH Narrative CV template not only met the goal of involving SSH stakeholders but deepened the pilot's impact. These interactions ensured that the insights gathered directly informed the GraspOS **SCOPE+i Framework** guidelines. **Thus, while the emphasis and scope of certain KPIs shifted, the broader objective, promoting more inclusive, Open Science-aligned research assessment practices, was effectively met and enriched by this adaptive process.**

#### REFLECT ON THE PILOT'S ROLE AS PART OF THE REFORM ON RESEARCH ASSESSMENT AS A REPRESENTATIVE OF A SPECIFIC EVALUATION SETTING

The SSH pilot functioned as both a practical testbed and a conceptual intervention within the broader context of research assessment reform. Representing a distinct evaluation setting, the pilot made the case that SSH requires tailored approaches that acknowledge the diversity of outputs, epistemologies, and societal engagements typical of these disciplines.

The pilot's alignment with the SCOPE Framework was instrumental in grounding it within an emerging reform-oriented paradigm. "Evaluating with the evaluated" was a guiding principle, not just in rhetoric but through active structures such as the Community of Practice and the co-design of tools like the Narrative CV. These efforts embedded transparency, reflexivity, and dialogue into the heart of the pilot and exemplified how assessment reform can and should be implemented in context-sensitive ways.

Moreover, the pilot demonstrated the importance of recognising research activities beyond publication metrics. It highlighted how qualitative narratives, when supported by structured yet flexible formats such as the SSH-specific Narrative CV, can complement indicators and provide a richer understanding of a researcher's contribution. In this sense, the pilot also contributed to advancing the reform agenda by offering concrete alternatives to purely metric-based evaluations.

By explicitly involving the SSH community in the shaping of tools, the pilot served as a microcosm of what research assessment reform might look like if truly co-created. The pilot's contribution to the wider reform process lies in proving that assessment systems can be designed with disciplinary specificity and researcher agency in mind, values central to any meaningful change in research culture.

#### REFLECT ON THE USEFULNESS OF THE GRASP<sup>OS</sup> PROJECT IN GENERAL TO YOUR PILOT SETTING

The GraspOS project provided critical infrastructural and conceptual support to the SSH pilot, enabling it to test both tools and ideas in a real-world context. The availability of open platforms like BIP! Scholar and the connections to platforms such as GoTriple and OpenAIRE allowed the pilot to experiment with practical implementations of narrative evaluation and monitoring. The BIP! Scholar platform in particular proved to be highly relevant to the SSH context. It supported the development and user testing of a Narrative CV tailored to SSH researchers, an outcome that responded directly to the community's call for assessment formats that better reflect qualitative, process-driven work. Despite the challenges of capturing Open Science practices within a modular CV format, the pilot affirmed the platform's potential as a vehicle for alternative forms of evaluation.

In contrast, the attempt to use the OpenAIRE dashboard to monitor SSH research outputs highlighted the limitations of current infrastructures. The lack of sufficient data coverage revealed important gaps, especially in how SSH scholarship is captured and represented in existing systems. This result, though less successful in technical terms, was valuable in demonstrating where infrastructural improvement is most needed.

More broadly, GraspOS offered a shared space to align pilot-level experimentation with systemic reform efforts. It enabled the SSH pilot not just to explore local needs but to feed findings into a broader, federated framework, ensuring that SSH-specific insights contribute to collective learning and policy development. OPERAS's role as a federated infrastructure provider also ensured that the pilot maintained a continuous dialogue with the research community, embodying the participatory ethos that GraspOS promotes. Ultimately, GraspOS proved indispensable in equipping the SSH pilot with both the tools and conceptual frameworks necessary for testing and advocating for more inclusive, values-driven approaches to research assessment.

## 5. Conclusions

### 5.1. Reflections on original KPIs, pilots' role in reform on research assessment and GraspOS's usefulness for the pilots

In general it can be said that the pilots achieved their originally assigned KPIs. However, it is important to note that most of the KPIs were tied to the deployment and testing of GraspOS resources, tools or services and if these were not sufficiently mature – as was the case for some – this understandably affected the ability to achieve them. In addition, the pilots' maturity in terms of responsible research assessment influenced KPI achievement, and indeed much of their effort focused on defining and analysing their evaluation settings, which was not anticipated in the proposal phase. This effort provided more than just testing and test results, it provided insight into the challenges involved in complying with the principles of responsible research assessment as well as taking open science more into consideration in different evaluation settings and levels.

Community engagement was also a prominent KPI for all pilots, and here again the KPIs regarding it were achieved. However, the pilots were very conscious not to engage too much of the community if the resource, tool or service was not considered mature enough, to avoid wasting people's time. In some cases the involvement of a wider community is planned for a later stage in the project life-cycle to ensure that involvement is worth the community's effort.

The pilots considered their role in reforming research assessment as important. The project provided the pilots an opportunity to act as practical test beds in supporting the reform, which highlighted some of the challenges there are in realising principles of responsible research assessment. For example, how promoting an open science -aware responsible research assessment is not straightforward if the definition of 'open' - especially as a merit - is not clear, or how recognising a diversity of research outputs and activities hindered by a lack of supporting data. The pilots highlight the importance of context, and in terms of reform, the importance of purpose – reform for the sake of reform cannot be the purpose. In the pilot reports also the importance of stakeholders is emphasised in the context of co-creation. It is pivotal to identify key stakeholders for each evaluation setting and define their roles in the reform. The pilots were able to prove that assessment systems can be designed with

disciplinary specificity and researcher agency in mind, which are central values to any meaningful change in research culture.

In terms of GraspOS's usefulness, the pilots find that it provided both infrastructural and conceptual support, enabled testing and experimenting with actual resources, tools and services and helped identify gaps in available infrastructures supporting research assessment. Pilots were able to explore how openness and diversity in contributions can be better reflected, and what is the purpose of that. Again, not just adding new information for the sake of having new information. In addition, the project provided a reason to interact with stakeholders in a meaningful way, widening the impact of pilot activities beyond the project partners.

## 5.2 Key findings

Based on pilot experiences, community involvement in designing an assessment is key. Listening to diverse voices from relevant stakeholders supports the recognition of diversity, a key principle of responsible research assessment. It also aligns well with one of the underpinning principles of the SCOPE Framework: evaluate with the evaluated. But the pilots highlight the need to also evaluate with the evaluators, especially in developing new resources, tools and services for evaluation to make sure they are relevant and feasible, and that they actually ease the evaluation work, not make it more complicated and arduous.

A central consideration in developing new resources, tools and services for evaluation is also making evaluation events less burdensome for the evaluated. The pilots were keen to find solutions to lessen the burden of researchers in regard to submitting information to various systems through the possibilities of automatisisation. However, a pronounced solution in GraspOS to capture a diversity of research outputs and activities is the concept of researcher profile where almost all the required information comes from researchers. In further development of researcher profile -type of services, the pilots call for better integration of automated functionalities to make the services more appealing for researchers.

GraspOS is developing an open infrastructure to support responsible research assessment, well in line with the RRA principle of infrastructures being open and community governed. However, the pilots identify some challenges with this direction in development. While aggregating services are considered as a valuable resource as one-stop-shops for research information, there is a feeling that using centralised services gives to some extent the decision on what is being monitored and how, to an external actor. In addition, and especially in the



case of more sensitive assessment events such as recruitment, external and centralised services can cause more legal issues than internal ones. One solution developed within the project is the SCOPE+i assessment portfolio that has relevant limitations to access to data.

Another key consideration is the definition of openness in the context of assessment. If it is to be considered as a merit, as something that is assessed, what type of openness should be rewarded and why? What are we evaluating when we are evaluating open science? The pilots bring forth several dimensions to be considered: openness of outputs, community engagement, activities advancing openness, openness of infrastructures, transparency of processes, and fairness. The project does not offer a definition, instead it emphasises the need to have the discussions with relevant stakeholders for each evaluation event to have a mutual understanding of what is being evaluated and why.

Many of the pilot reports note the limitations in the current data available, in terms of type of outputs and activities, as well as in terms of accuracy. Some of the highlighted challenges include the inconsistency across databases in their definitions of different types of outputs than journal articles which makes it safer to only consider articles in evaluations. This obviously does not endorse diversity. Another inconsistency is found in the definition of fields of science, giving different outcomes for entities under evaluation based on the database used. The aim should be to have standardized terminology and classification systems to ensure greater transparency and interoperability across data sources.

The pilots also identify certain locked ins with technical infrastructures supporting research evaluations that are set in historical developments. It is evident that changing research assessment traditions as well as traditions of collecting data for evaluative purposes is slow. But the question is, do we actually need new indicators? The role of qualitative descriptions (i.e. narrative CVs) is becoming more and more pronounced, in line with the RRA principle of prioritising qualitative assessment methods. However, considering the apparent keenness to collect new types of information to be able to develop new types of indicators, it needs to be asked if narrative CVs are not considered as trustworthy material for assessment if they are not backed with quantitative evidence. There is perhaps a good momentum here to step back and consider carefully if new indicators and new ways to measure are really the best way forward.

The project identifies two approaches to reforming research assessment, the first one very central for GraspOS: assessment driven by data and indicators, and the other one driven by context and ideology. The project aimed at bringing these two approaches together, but the struggle is reflected in the pilots with their more technical or more ideological starting points.

The project proposal considered the role of the pilots as quite straightforward: to support the development of fit-for-purpose services and tools, test and evaluate the tools and services developed, and publish assessment protocols, profiles and stories. But what was not anticipated was the complexity involved in each of the pilot settings reflecting the reality that no evaluation setting is the same. This became apparent in the earlier work with the SCOPE Framework (for more details, please see D5.2<sup>7</sup>), which highlighted the importance of context and recognising not only diversity in the targets of evaluation, but also diversity in evaluation settings.

The pilots' experiences show that just as there are challenges in implementing RRA principles, there are challenges in implementing new resources, tools and services, even when there is a strong motivation to do so. In their work, the pilots have unearthed some of the challenges of realising the reform on research assessment. Implementing principles requires definitions, it is not merely a question of using a resource, tool or service that is designed to support responsible research assessment, or considering open science better. There are challenges with new types of data required to recognise a diversity of outputs and activities, with data quality and coverage, but also with changing evaluation traditions. People are mostly reluctant to change their ways, especially if it requires extra work, and this is something that needs to be taken into consideration.

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<sup>7</sup> [10.5281/zenodo.13629146](https://doi.org/10.5281/zenodo.13629146)



## 6. Next steps

As mentioned earlier, the pilots are planning various ways to include a wider representation of the researcher community into testing the services already piloted in the project. Especially narrative CVs and different implementations of researcher profiles (including the openness profile) are of interest. The pilots are hoping to see better integration of automated functionalities to make researchers' life easier, it being a key to make the services more appealing for researchers.

Pilots are also continuing their work with data sources developed in GraspOS for producing new bibliometric indicators as well as enabling the recognition of new types of information in relation to, for example, software contributions.

There are also plans to implement piloted GraspOS services, but the desirability of implementation still requires careful consideration with key stakeholders. The piloting activities have provided information on the services' feasibility in terms of, for example, data coverage and usability. But as the pilots are conscious of the importance of considering the purpose of implementing new resources, tools or services, being technically able to add something new is not a good enough justification.

## 7. Annexes

### Annex 1. Template for pilot findings and progress report

The final deliverable of WP5 is a detailed description of the activities performed by the pilots and the results achieved. The report also includes lessons learnt from the pilots and the plan for the future period.

The pilots will report on each resource, tool or service they have tested and evaluated, regardless of the results.

The individual pilot reports will be included in the deliverable as such, so all reports should follow the same structure, use the same titles, and keep to the page limit.

Please report on each resource, tool and service you have tested and evaluated according to the following structure. The maximum limit for *each individual resource, tool or service* is two pages. If more space is needed in order to, for example, go over some technical details more thoroughly, use an appendix (separate appendix for each resource, tool or service). In addition, there are some summarising sections, where the limit for each question is half a page.

The report should be uploaded to the GraspOS Google Drive directory folder titled D5.2 FINAL REPORT in Word format.

The DL for the report is 9 June 2025.

#### ***The name of the resource, tool or service***

As an introduction, describe the intended aim of this resource, tool, or service (you can check this from the user story prepared for the Athens workshop in May 2024).

1. Explain here how the resource, tool or service was tested and evaluated in practice. Include information on which stakeholders were involved: why they were involved and how they were involved. If (in hindsight) there are stakeholders who should have been involved, please explain here who, why their involvement would have been beneficial, and (if applicable) why they were not involved.

2. What are the main results of the testing and evaluation of this resource, tool or service?
3. In reflection with the user story prepared for the Athens workshop in May 2024, did you achieve your aims for this resource, tool or service or not? If the aims have changed, please explain here how and why. If the aims were not achieved, please explain why not.
4. What are the next steps? Will the resource, tool or service be implemented in one way or another? If yes, how? If not, why? Also, if the testing and evaluation continue beyond the reporting period, explain here what will be done.

### ***Summary section***

1. Reflection on original pilot KPIs. Check your KPIs and summarise here how well they were achieved. Explain all possible changes.
2. Reflect on the pilot's role as part of the reform on research assessment as a representative of a specific evaluation setting
3. Reflect on the usefulness of the GraspOS project in general to your pilot setting.

## Annex 2. Utrecht University: Broadening open science: data affordances for assessing transdisciplinary research

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## Division of responsibilities and contributions

This taxonomy is based on the Contributor Roles Taxonomy<sup>8</sup>. We are aware that beyond the five main contributors and authors to this report, a plethora of people contributed to its creation. This includes critical and productive meetings with other pilot representatives from GraspOS, especially under coordination of Laura Himanen and Iris Liinamaa from CSC in Finland, the thought-provoking consortium meetings of GraspOS, the colleagues at OpenAIRE as well as research managers at Utrecht University, hallway conversations with colleagues at Utrecht University, the administration and the secretariats from both CWTS in Leiden and Copernicus Institute and more.

	Anestis Amanatidis	Arne Hefting	Jarno Hoekman	Carolina Castaldi	Jeroen Bosman
Conceptualization	X		X	X	X
Data curation		X			
Formal analysis	X	X			
Funding acquisition			X	X	
Investigation	X	X			
Methodology	X		X		X
Project administration	X		X		
Software		X			
Resources					
Supervision	X		X	X	
Validation	X	X	X		X
Visualization	X				
Writing – original draft	X	X			
Writing – review & editing	X		X	X	X

<sup>8</sup> See <https://credit.niso.org/contact/>

## 1. Introduction

This document serves as a final deliverable concerning the Utrecht University pilot of the GraspOS project conducted at the Copernicus Institute of Sustainable Development (hereafter: Copernicus Institute) at Utrecht University. Primarily, it examines the use of current research information systems for assessing transdisciplinary research at an institute level and with two audiences in mind: research information providers on the one hand, and evaluators who consider their use on the other. Practically, it documents the GraspOS pilot project at the Copernicus institute using the INORMS SCOPE approach<sup>9</sup> and presents the emergent learnings we had throughout our use of this approach.

General concerns with research assessment are well-documented and discussed in a variety of places, including the Leiden Manifesto (Hicks et al. 2015), the San Francisco Declaration on Research Assessment (DORA), the Agreement on Reforming Research, Assessment (CoARA), the Position paper of the national programme for Recognition & Rewards, the Hong Kong principles for assessing researchers (Moher et al. 2020), and the Dutch Strategy Evaluation Protocol (SEP) 2021-2027. These concerns rest on the broad consensus that the way that research(ers) are traditionally assessed do not support healthy research cultures and are not in line with contemporary research practices and attached expectations, for example in view of demands that spring from socioenvironmental pressures. These concerns include the limitations of primarily metrics-based assessments and the unintended consequences they produce (Wilsdon et al. 2015); or the narrow enactments of what counts as research output, for example scholarly papers published in international peer-reviewed journals, which become designed into systems usually deployed for evaluating research - like institutional repositories (Aubert Bonn and Bouter 2023). They also relate to the proprietary nature of information, data and knowledge held by research information companies which makes dominant research assessment practices that rely on these databases for informing their evaluations not transparent (Barcelona Declaration on Open Research Information et al. 2024).

The emerging concerns already led to actions to address these issues through various primary framings. For instance, the Coalition for Reforming Research Assessment is primarily concerned with 'research quality' and 'impact'<sup>10</sup>. The position paper that springs from a collaboration of the Dutch national research funders and knowledge institutions<sup>11</sup> addresses a wider variety of concerns, including the diversification of career paths, recognition of teams as units of evaluation, an emphasis of quality of work rather than maintaining an emphasis on quantities of research outputs, as well as leadership and open science. These framings increasingly highlight the interconnectedness between research assessment and open science and also stress that policy initiatives to incentivise research assessment and open science risk developing in isolation from one another (UNESCO 2021; European Commission 2016).

The GraspOS project can be understood as one initiative that mobilises various actions to address concerns regarding dominant forms of research assessments and connect them to open science initiatives. Funded by the European Science Cloud<sup>12</sup>, GraspOS is a collaborative project across 18 organisations that aimed at understanding open science and responsible research assessment practices to "develop fit-for-purpose tools and services with the necessary characteristics to accelerate adoption [of Open Science and RRA practices]"<sup>13</sup>. Amongst others, it aims to tinker and test (largely pre-existing) tools and services for responsible research assessment in the contexts of nine pilots spanning different organisations: from national research funders to university departments and national (research)

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<sup>9</sup> See (International Network Of Research Management Societies-Research Evaluation Group 2023)

<sup>10</sup> See CoARA. The agreement, 2022. URL <https://coara.eu/agreement/the-agreement-full-text/>. Accessed 02.06.2025.

<sup>11</sup> VSNU, NFW, KNAW, NOW and ZonMw. (2019). Room For Everyone's Talent. Towards a new balance in the recognition and rewards of academics. Accessed 02.06.2025 via [https://www.nwo.nl/sites/nwo/files/media-files/2019-Recognition-Rewards-Position-Paper\\_EN.pdf](https://www.nwo.nl/sites/nwo/files/media-files/2019-Recognition-Rewards-Position-Paper_EN.pdf)

<sup>12</sup> GraspOS is funded under HORIZON-INFRA-2022-EOSC-01-01 call.

<sup>13</sup> GraspOS Application Form; p.2

information portals. These pilots are the sites where evaluative events are to be studied, tested and learned from for the development of tools and services that support the transition to an open science-aware assessment system, whilst adhering to principles of the Coalition for Reforming Research Assessment<sup>14</sup>.

Utrecht University assumed the role of one of nine pilot projects. The Utrecht University pilot concentrates on one of four departments of the Faculty of Geosciences, namely the Copernicus Institute of Sustainable Development. The mission of the Copernicus Institute is to develop high quality and relevant knowledge related to sustainable development and to have a significant impact on the transition to a sustainable society. The research is marked by interdisciplinary collaboration and transdisciplinary engagement. It is structured along five multidisciplinary sections, namely Energy and Resources, Environmental Sciences, Environmental Governance, Innovation Studies, and the Urban Futures Studio. The first two have a predominantly science and engineering perspective, while the latter three mostly draw on social sciences. Below we document the findings of this GraspOS pilot, which operated across multiple organisational levels with different evaluative needs. The pilot followed the SCOPE approach that underlies the working structure of all GraspOS pilots, and the report is structured accordingly.

The next chapters will offer methodological reflections on the pilot process, speaking from the point of view of the GraspOS project team at Utrecht University. We first introduce three different organisational contexts in which our inquiry took place. With this contextualisation, we offer qualitative insights of departmental open science (evaluation) by presenting a case study on the departmental evaluation that took place in 2021 covering the period 2014-2020. We also expand on a departmental initiative formed to discuss and promote societal impact of research of the department. As elaborated upon below this then provided an overview of evaluation and monitoring values and demands concerning societal impact creation and transdisciplinarity as a particular matter of concern on the intersection of Open Science and Responsible Research Assessment. In line with this we subsequently present a bifold analytical comparison of research information infrastructures including the UU local CRIS system the CRIS and of OPENAIRE to test the extent to which they can be appropriated for assessing transdisciplinarity. This is complemented by a section that describes hermeneutic additions of researchers' interpretations of themselves and their research group based on the two data sources mentioned before. Finally, we draw conclusions and formulate recommendations.

## 2. Goals of the pilot

The initial goals of the UU pilot were the following:

- (1) Document how Open Science is understood, operationalized, and evaluated in context at Utrecht University
- (2) Co-develop Open Science assessment protocols at three respective levels.
- (3) Test the viability of the indicators, tools, and services, particularly how they can inform OS monitoring and narrative CV writing activities as well as their societal impact.
- (4) Inform the VSNU Knowledge Base on practices and integration feasibility.

Throughout the piloting period, these goals were refined based on new knowledge that we elaborated in the roadmap document internal to the GraspOS project in September 2024<sup>15</sup>. This resulted in a

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<sup>14</sup> See CoARA. <https://coara.eu/>

<sup>15</sup> See Appendix (10.6)



reformulation of the goals as follows, with slight changes:

- (1) Document how Open Science is understood, operationalized, and evaluated in context at Utrecht University with specific attention to OS evaluation on a Departmental level
- (2) Co-develop open science assessment recommendations for the university department
- (3) Test the viability of OpenAIRE data and the local UU repository (the CRIS), particularly how they can inform OS evaluation on the level of the department
- (4) Inform the VSNU Knowledge Base on practices and integration feasibility

These changes were done in consideration of the GraspOS project goals and an assessment of what was being valued within the pilot in line with the first phases of the SCOPE approach (see Chapter 4-6). In particular, based on an analysis of open science assessment values and needs at the Departmental level, it became apparent that an important part of how Open Science is understood within the department related to activities focused on societal impact creation and transdisciplinary ways of working. In line with this and during pilot conduct, the department also put in place a working group for societal impact, with complementary goals to the pilot. We aligned with the working group by asking how societal impact can be evaluated on a departmental level and focused our efforts on (1) providing input for the next departmental evaluation, (2) scrutinising the (publication) data that is normally used for evaluating (open) science. This resulted in lessons for evaluating transdisciplinary research at the departmental level and feedback for the data providers (here: the CRIS and OpenAIRE) as to how they afford the evaluation of more holistic open science, such as transdisciplinary research, and how they can improve their services and tools in line with this.

### 3. **SCOPE methodology**

#### 3.1. **Working structure**

The project team had a working structure where biweekly meetings were used to discuss the progress of the ongoing work and recalibrate between each other. Anestis Amanatidis focused mostly on the execution of the work, where Jarno Hoekman and Carolina Castaldi took up an advisory and supervisory role. Jeroen Bosman joined the team meetings in order to shape the process as an open science expert from the Utrecht University library. During the comparative work, Arne Hefting joined the team to assist the data extraction and analysis. Writing was primarily done by Anestis Amanatidis with inputs and feedback from the team.

#### 3.2. **SCOPE and subsequent learnings**

The SCOPE methodology (International Network Of Research Management Societies-Research Evaluation Group 2023) was used for structuring the pilot activities. SCOPE stands for (S)tart with what you value, (C)ontext considerations, (O)ptions for evaluation, (P)robing and (E)valuating one's evaluation. Using the SCOPE method as a structuring device for the entirety of the process proved useful in that it allowed us to keep learning and adjusting course as new learnings emerged. While we used SCOPE as intended in the first three stages, we diverted from the SCOPE guideline for Probing and Evaluation. Where according to SCOPE probing is a matter to identify harmful impacts, we are thinking of probing as 'testing' of and 'experimenting with' the options for evaluations that were identified previously with an emphasis on

reflexive learning throughout the process. In line with this, we use the 'evaluation' stage to draw conclusions from the entirety of the SCOPE process of 'executing' the pilot, where our evaluation (of the research information systems tested) is considered part of the probing stage. Table 1 broadly summarises the guiding questions per stage and methods and approaches used. Each stage will be described in more detail from the next section onwards.

<b>S</b>	Guiding research question: how does open science emerge as a matter of evaluation at Utrecht University, and the Copernicus Institute in particular?  Methods: exploratory interviews, document analysis, informal conversations
<b>C</b>	Guiding research question: how is open science enacted in departmental evaluations at Copernicus Institute?  Methods: interviews, document analysis
<b>O</b>	Guiding research question: what GraspOS tools and services afford the evaluation needs of the department and how?  Methods: service provider workshop in Athens 30.01. and 31.01.2024 and assessment and justification in the project team based on S and C.
<b>P</b>	Guiding research question: how does OpenAIRE and the CRIS compare for use in departmental evaluations considering transdisciplinary research?  Methods: bibliographic comparison, 'data snapshot' interviews
<b>E</b>	Guiding research question: what did we learn and what recommendations can we formulate for the departmental evaluation of Copernicus Institute?  Methods: Discussions in the project team and informal conversations

Table 1: SCOPE overview, research questions and methods

## 4. Start with what you value

This section documents how Open Science is understood, operationalized, and evaluated in context at Utrecht University. It introduces aspects surrounding open science emergence on a university-wide level, how open science is conceived of and assessed on a departmental level, and also introduces the societal impact working group, which is a considerable initiative within the department. We focus specifically on the evaluative concerns each of these aspects raise for research(ers) in the pilot university department.

### 4.1. Three levels

We encountered three contextual aspects and attached evaluative processes at different levels:

- the *Open Science Programme*, who are concerned with *monitoring and evaluating open science on a university-wide level*
- the *department*, which is subject to the strategy evaluation protocol, a *periodic evaluation*
- the *Impact Working Group*, a bottom-up initiative that is concerned with evaluating societal impact

These three aspects of open science were the primary focus of our initial pilot analysis. We discuss how open science comes to bear on these levels.

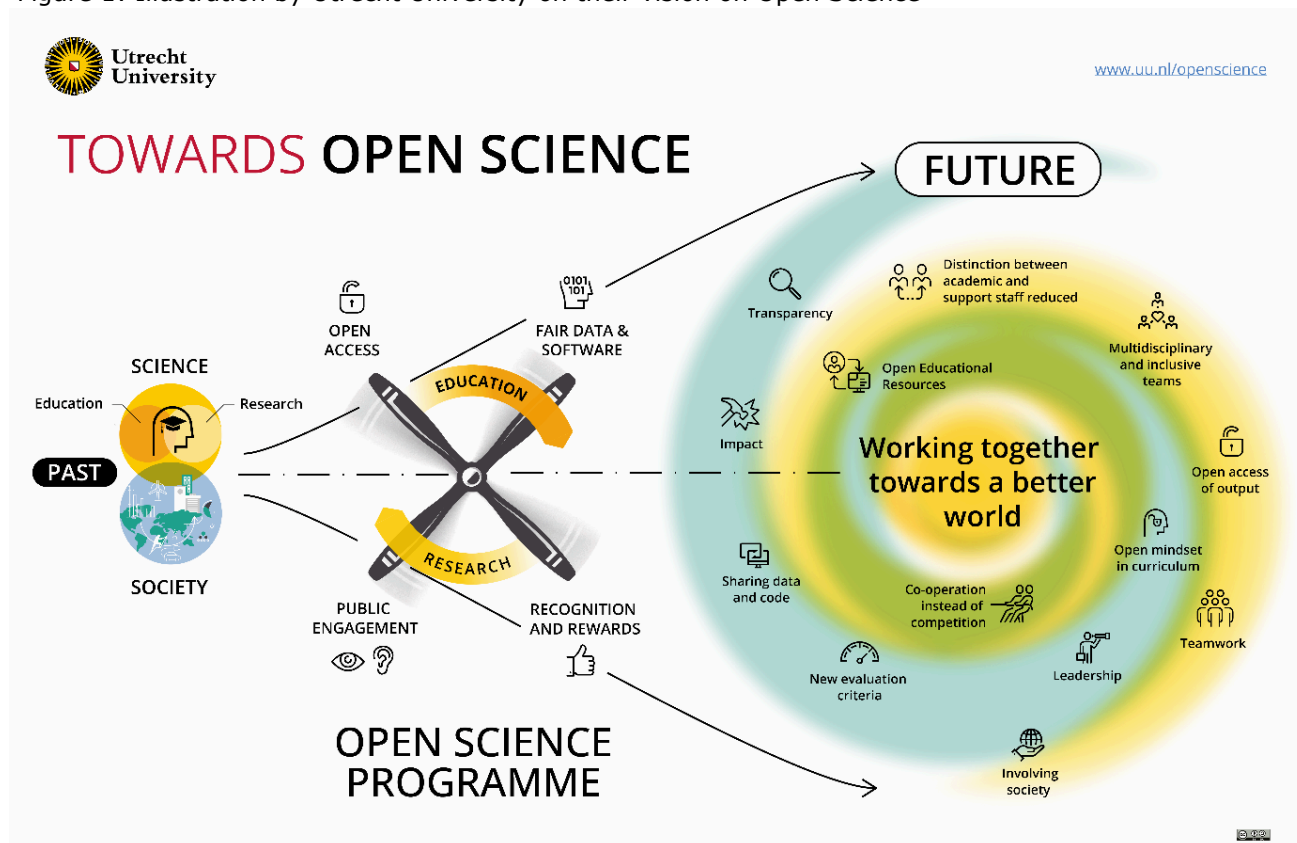
On a strategic level of the university, open science is organised in a university-wide *open science programme*. The scope of the programme is broadly conceived of as five pillars that represent the strategic priorities for implementation of open science, including issues surrounding Open Access, FAIR Data and Software, Public Engagement, Open Education, and lastly Recognition and Rewards<sup>16</sup>. Activities are supported by the Open Science office and an Open Science platform which offers guidance and advice regarding Open Science implementation. Within the five strategic priorities, one can find different aspects surrounding openness and formulations of open science ambitions. This includes direct endorsements to national strategies and goals<sup>17</sup> concerning publishing open access; the promotion of reuse and verifiability of data, data management and consideration of FAIR principles when handling data within research; engagement of citizens and other stakeholders whose lives and activities may be affected by knowledge produced at the university; responsible research assessment practices; as well as open education, meaning re-use and findability of teaching materials, but also accessibility to education concerning language or financial barriers (Miedema 2022).

<sup>16</sup> Detailed descriptions about the emergence of the open science programme and descriptions about what these priorities entail can be found on p.16 of this report and the corresponding section overall.

<sup>17</sup> See National Programme on Open Science Strategy 2030:

[https://www.openscience.nl/sites/open\\_science/files/media-files/final\\_npos2030\\_ambition\\_document\\_and\\_rolling\\_agenda.pdf](https://www.openscience.nl/sites/open_science/files/media-files/final_npos2030_ambition_document_and_rolling_agenda.pdf)

Figure 1: Illustration by Utrecht University on their vision on Open Science



On a *departmental level*, meaning the Copernicus Institute of Sustainable Development, we have analysed how the departmental evaluation of research according to the periodic strategy evaluation protocol plays out vis-à-vis open science. In particular, we focused on the writing of the self-assessment report covering the period 2014-2020 that forms the basis of the Departmental evaluation in line with the so-called Strategic Evaluation Protocol. In this protocol, open science comes as assessment criterion: "(a) the extent to which the research unit involves stakeholders, (b) the extent to which the research unit opens up its work to other researchers and societal stakeholders in the context of its strategy and policy. Finally (c), it also considers the extent to which the research unit reuses data where possible, how it stores data according to FAIR principles, how it makes its research data, methods and materials available, as well as when publications are available through open access." (VSNU, KNAW, and NWO 2020, p.9). It is clear from this description that open science is broadly conceived of and, next to publishing, data and software concerns, includes a focus on engaging societal stakeholders. This explicit reference to societal stakeholders persists throughout and is also formulated as explicit criterion in the protocol, which emphasises under the heading of open science that 'research units' are encouraged to evaluate to which extent the department opens up its work to non-academic stakeholders and how it does so exactly. Importantly, this criterion encourages to formulate how such interactions with societal stakeholders will take shape in the strategy of the department. Of course, this emphasis under this heading is interesting in that it diversifies concerns of open research publication that oftentimes accompany notions of open science, especially so in (inter)national strategic documents (VSNU et al. 2019; UNESCO 2021).

Also on the departmental level, but as a less formalised bottom-up initiative, we followed and contributed to the *impact working group*. This group was put together to assess what it means to have societal impact and formulate recommendations to the board of the Copernicus Institute of Sustainable

Development concerning societal impact. Whilst the group didn't form in explicit reference to open science, the group discussed research and teaching in ways that, in other contexts, would be labelled as open science. Moreover, within the context of the aforementioned UU-wide open science programme and Strategic Evaluation Protocol, public and stakeholder engagement are considered a key pillar of open science activities. For us, observing the 'impact working group' entailed staying sensitive to matters of openness in science that may travel in different forms. Although they were not called in a certain way, we noticed that departmental-level research and teaching practices, values and strategies did align and resonate with open science and its operationalisation in specific strategic ambitions at the university level and within national science system contexts. For the 'impact working group', some exemplary practices include collaboration with non-academic partners by way of facilitating open spaces for constructive discussion and engagement with wider public, or elimination of output orientation in research assessment and reconsidering hiring practices and adjusting reward and recognition for individual researchers<sup>18</sup>. All of which are, arguably, considered as important aspects of open science (evaluation) elsewhere, particularly when considered in a holistic way. These observations in the impact working group were supported by informal conversations: at the printer, over lunch, at the coffee machine or during after-work gatherings. There, it became clear that the notion of impact is a much more prominent topic of conversation than more 'traditional' concerns of open science.

In the end, through iterative loops with the different sections, the group formulated 'impact pathways' that address different social groups that the group knew researchers and teachers in the department interact with: policymakers, civic communities, and private sector actors. Figure 2 presents the model that was drawn up and agreed upon depicts a temporality and directionality toward what seems to be a universally-accepted concern across the department in line with its mission: that research and teaching contribute to resolving sustainability challenges around food, land, water and the circular economy. Whirling arrows that represent researchers from different disciplinary backgrounds cut through different social groups towards this goal, indicating collaborations. In general, the model is drawn to depict a relatively high complexity of the environment in which research and teaching happens. This model also became the working model for the formulation of the societal impact strategy.

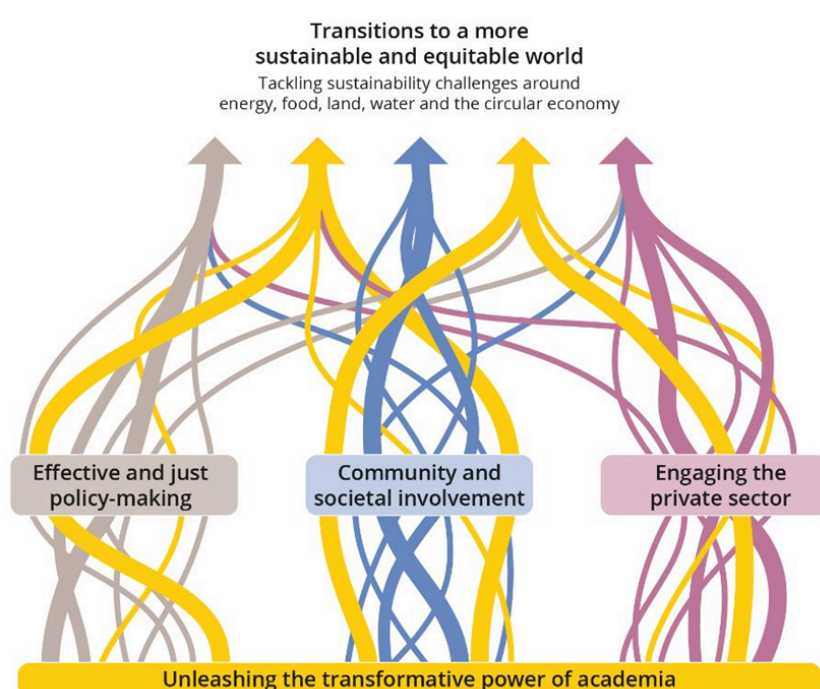


Figure 2: Illustration of societal impact strategy of Copernicus Institute

identifying what research and

What is important to note is that these multiple paths represent varying research repertoires that become concerned with extra-academic domains, such as policymaking, public participation, or engagements with private sector actors; on sustainability issues regarding energy, food, land, water or circular economy. As such, from the get-go, the very problematisation of societal impact becomes a stakeholder-inclusive affair which is in line with what is put central as an assessment criterion for Open Science in the Strategic Evaluation Protocol. We also note that the interactions between scientists and societal actors go by different terms in different communities (e.g., public participation and engagement, co-creation, stakeholder engagement, transdisciplinary research). Each of these terms come with their own histories, connotations and differences (Schrögel and Kolleck 2019; Fritz and Binder 2020). In the context of the pilot we decided to speak of 'transdisciplinarity' (i.e. transdisciplinary research). We do so because we noted in informal conversations and the impact working group that academics in the department frequently use *this* term to refer to both existing and emerging practices regarding stakeholder interactions as well as broader aspirations with regard to creating societal impact. Moreover, we also use this term because the literature surrounding transdisciplinarity explicitly engages with questions surrounding reflexive learning and experimenting with expansion of existing research repertoires.

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Table 2 summarises the key differences and similarities between the three levels:

	<b>OS Monitoring (Open Science Programme)</b>	<b>SEP Evaluation</b>	<b>Societal impact working group</b>
<b>Key Evaluation Carrier</b>	Questionnaire Knowledge from representatives of the Open Science Platform	Self-assessment report	Series of meetings + department-wide workshop
<b>Level, Purpose</b>	University-wide, to understand and monitor	Departmental, To monitor (both learning and accountability)	Departmental and faculty, to improve
<b>Collaborative science-society encounters as</b>	Stakeholder engagement	Societal impact	Transdisciplinarity
<b>Ideas of open science</b>	Clear idea of openness, narrow (e.g. focused on digital infrastructures for research, stimulation and uptake through policies and support)	Mixed ideas between open science and other forms of openness (e.g. societal impact). Often occurs as 'open access'.	Issues of openness, without speaking of them as issues of open science (societal engagement, translation of research outputs)
<b>Role of publication data</b>	Used to evaluate the share of open access articles	Used to exemplify departmental outputs, including share of OA	None
<b>Period</b>	Was biyearly, now discontinued as focus groups are now used	Six-yearly	Single action
<b>Use of research information infrastructure</b>	CRIS, DOAJ, Unpaywall, SAP/BI for OA Monitor	Bibliometric analysis, CRIS (The CRIS)	No

Table 2: Evaluative events that the UU-GraspOS team has identified and inquired

## 4.2. Conclusions for GraspOS Pilot

The parallel inquiry into the three levels during the first year of GraspOS showed that formalised strategic activities at the open science programme feature 'open science' prominently and treat it largely as a set of new research practices to become implemented in everyday routines of researchers through a combined approach between top-down policies and bottom-focused support services, such as recognition and reward structures<sup>19</sup> as well as the exchange of learnings across university structures. These include implementation measures and learnings on both publishing practices (open access) and broader research practices (stakeholder engagement).

Within the Department, there is little explicit reference to 'open science' as a term with stabilised meanings and practices. However, its broader ambitions which emphasise engagement of societal actors in knowledge production feature prominently in the strategy evaluation protocol and the concerns of the Department focused on societal impact and transdisciplinarity.

<sup>19</sup> See [Open Science Monitor](#) from Utrecht University, which has surveyed the state of open science twice so far (2020, 2022).

Based on these observations we present three key learnings:

Firstly, the analysis of what is being valued showed that an implicit ambition of open science as enacted at the department and university more broadly indeed concerns the production of knowledge with societal actors. In particular, 'transdisciplinary research' features as a prominent process-oriented approach for stakeholder engagement and societal impact creation.

Secondly, and in effect, this concerns both bottom-up institutionalisation and top-down implementations of 'open science' which we consider as equally important empirically for what concerns 'open science at UU' as both carry normative implications on how research should be done, recognised and rewarded - albeit being enacted differently. Such symmetrical treatment allows us to recognise policies, strategies, and other formalised initiatives emerging from the executive level of the university as equally meaningful for GraspOS as everyday, mundane research practices that we observe in the department.

Finally, our situatedness within the department called for conducting this analysis in the context of decision-making and decision-makers at the departmental level. As a consequence, we refined the pilot aims based on this step as to making the mentioned points regarding broadly defining OS and acknowledging top-down and bottom-up relevant in the context of the departmental evaluation.

In terms of evaluation, we also understand our observations as signifying a knowledge gap in evaluating stakeholder engagement as open science practices proliferate, although high-level reflections are already being articulated for open science (Rafols, Meijer, and Molas-Gallart 2024).

This observation and the nascent institutionalisation of transdisciplinary research also surfaced new evaluative concerns: How to make transdisciplinary research practices visible for evaluations? And how to do so on a *departmental* level specifically?

## 5. Context

The preceding analysis emphasised a knowledge gap that we wanted to address. Namely to understand how open science as a matter of transdisciplinarity is evaluated departmentally. For informing the context in which this evaluation takes place, we analysed more closely how the departmental periodic evaluation attends to such reading of open science.

The departmental evaluation is underpinned by the national strategy evaluation protocol of the Netherlands. The assessment process, as well as the criteria, follow the protocol that is set by VSNU<sup>20</sup> – a coalition across 14 Dutch universities with its own legal organisational structure and 45 staff who represent the Dutch universities. This 'Strategy Evaluation Protocol' is renegotiated periodically and explicitly complies with and refers to DORA<sup>21</sup>, which indicates the interconnectedness to global movements in research evaluation.

The protocol outlines three broad assessment criteria: *research quality*, *viability*, as well as *societal relevance*. Next to these broad assessment criteria, the SEP protocol specifies four aspects of research culture that the evaluation should address, *open science*, *PhD Policy and Training*, *Academic Culture*, and *Human Resources Policy*.



Figure 3: Cover of the SEP evaluation protocol 2021-2027

<sup>20</sup> 'Universities of the Netherlands' (UNL) in English. See <https://www.universiteitenvannederland.nl>

<sup>21</sup> See San Francisco Declaration on Reforming Research Assessment. <https://sf-dora.org/>. Accessed 06.07.2023.



As such, in the last SEP evaluation, open science was on the agenda as (at least) one of four criteria for conducting Copernicus Institute's evaluation. A stronger strategic focus on open science had also been recommended by the evaluation committee in the prior evaluation which prompted the institute to put in place vehicles to promote open science practices among the institute's researchers.

This resulted in several initiatives, including the development of research hubs with the purpose of connecting university researchers with stakeholders and data stewards to support researchers with open—source data sharing and open access publishing, interlinking research assessment with open science on a departmental level.

In our analysis, we understood the SEP evaluation as an event where values surrounding openness, but also the Copernicus Institute's values come to bear. The last SEP evaluation was concluded in 2021 (for the period 2014-2020). To illuminate the process around which the SEP evaluation was conducted, we focused on the categories used to describe concerns of open science and issues that emerged in the writing 'SEP evaluation self-assessment report', which underlies the evaluation and is then complemented by the visit and external evaluation of a committee. This allowed us to develop the GraspOS value proposition at Utrecht University as one that attends to a specific evaluative event. Hence, we could reflect on how evaluative knowledge was gathered to account well for open science. This is particularly interesting as the last SEP evaluation was the first one to use the new evaluation protocol, which made the job for the evaluation committee and the self-assessment writing team particularly challenging as there was no inspiration to be drawn from by any preceding example.



#### Open Science<sup>3</sup>:

The assessment committee considers the extent to which the research unit involves stakeholders, if possible and relevant, in the preparation and execution of the aims and strategy. It also considers to which extent the research unit opens up its work to other researchers and societal stakeholders in the context of its strategy and policy. Furthermore, the committee considers whether the research unit reuses data where possible; how it stores the research data according to the FAIR<sup>4</sup> principles; how it makes its research data, methods and materials available; and when publications are available through open access. Even if Open Science was not yet considered by the research unit for the past period, the assessment committee evaluates the unit's considerations and plans for the future with regard to Open Science.

In the self-evaluation, the research unit reflects on how it involves stakeholders, to which extent the research unit opens up its work to other researchers and societal stakeholders, how it pays attention to other aspects of open science and what its future plans are in this respect.

Figure 4: Open Science criterion description from SEP evaluation

In general, the self-evaluation is expected to be a coherent narrative argument reflecting on the aims and the strategy of the department. The idea is that the narrative argument is "supported by factual evidence" (p.19) and, "where appropriate", quantitative indicators (ibid.). The protocol stresses that the choice of indicators should be based on the argument which the self-assessment report wants to develop, rather than enrolling such indicators non-reflexively. Then, the protocol also suggests benchmarking against peer research units and presenting case studies to highlight distinctive and societally relevant accomplishments. This should then be followed by strategic implications for the future of the department and through the use of an analysis of the strengths, weaknesses, opportunities and threats that exist in the institutional context of the department.

As such, the self-assessment report can be understood as the assembly of (evaluative) choices made by both the Board of Directors of Copernicus Institute, the team who supported the preparation and the conduct of the process, but also the technical affordances offered by both the research information infrastructures that were available to the composition of the self-assessment report and the technical ability and advice of the Utrecht University Library who supported the process. In view of open science specifically, the protocol suggests the evaluation to reflect on three key themes:

- (a) the extent to which the research unit involves stakeholders,
- (b) the extent to which the research unit opens up its work to other researchers and societal stakeholders in the context of its strategy and policy.

(c), it also considers the extent to which the research unit reuses data where possible, how it stores data according to FAIR principles, how it makes its research data, methods and materials available, as well as when publications are available through open access.

By examining the self-evaluation document and through interviews with those involved in compiling the report we created an overview of the evaluative aspects which were employed and that indicate associations to open science as presented either explicitly or implicitly. Table 3 outlines categories that were used, and indicators that fall under these categories, and what data source and/or form these evidencing practices took. A detailed table can be found in appendix 10.1.

<b>Research products for societal target groups</b>		the CRIS
	<i>Published policy reports (national, European, global)</i>	
	<i>Visits on Copernicus Institute website</i>	
	<i>Examples of (research) interaction with stakeholders</i>	Form; short text
	<i>Example of research output for different audiences</i>	Form; short text
<b>Use of research products by societal target groups</b>		
	<i>News mentions related to publications</i>	Altmetrics
	<i>Newspaper items (national, international)</i>	
	<i>Radio appearances</i>	
	<i>Television appearances</i>	
	<i>Other news items</i>	
	<i>Mention of publications in Wikipedia articles</i>	
	<i>Mentions of publications in blogs</i>	
	<i>Social media mentions (Facebook and Twitter)</i>	
	<i>Mentions in policy documents</i>	
	<i>Publications co-financed by ministries in NL and abroad</i>	
	<i>Publications co-financed by the European Commission</i>	
	<i>Examples of co-creation, knowledge networks and platforms</i>	Narrative
	<i>Examples of use of research products by societal target groups (international, national)</i>	Narrative
<b>Marks of recognition from societal target groups</b>		Form
	<i>Examples of marks of recognition by societal target groups (films, presentations, committee membership, etc.)</i>	Form

Table 3: Indicators used in association to open science in the self-assessment report

Whilst this is only a selection of quantitative and qualitative indicators that were employed, there are a couple of observations that deserve explicit mentioning.

One is that an explicit effort was made to contextualise the knowledge that was presented in the form of research data. For example, the self-assessment report outlines a column next to every indicator that elaborates in a short description what actually is evidenced by the indicator. This speaks to the limits, or wrong interpretations of quantitative and qualitative indicators.

Another observation is that primarily, evidence of both academic and non-academic achievements usually come in the form of *objects* of research or collaborations. Some examples include presentations, papers, or policy documents. Some indicators, such as *examples of use*, or *examples of interaction* usually take the form of narrative descriptions. These are exceptions to the dominant use of objects for evidencing.

From our interviews with a member of the writing team of the self-assessment report, the local university repository was only of little help in evidencing as it provided only little data that they felt could be appropriated for the self-assessment report. This prompted them to manually collect case descriptions of projects or other interactions by directly communicating with the department's staff and asking them to send in descriptions. Other data sources included the Human Resources Management system for current staff data and also research information providers that were used by the Utrecht University Library to conduct a bibliometric analysis.

Importantly, the case descriptions of colleagues resulted in the development of a number of case-studies showcasing the activities of colleagues focused on various sustainability challenges. These case studies are written as narratives of approximately 1.5 pages including key references to research outputs. As mentioned in the self-evaluation report they are meant to showcase "how rigorous research has proven to be highly relevant for societal partners" and illustrate how impact has been achieved on various topics such as "global and European policies related to sustainable development" and "day-to-day policy processes related to circular economy". It is also explicitly mentioned that these forms of impact are hard to grasp: "most of these high impact processes are not highlighted in the media and therefore less visible. However, it is these types of impacts that make us most proud".

In sum, what is striking is that 'societal impact' is reiterated extensively in the text of the self-assessment report, which in itself indicates the relative strategic importance of boundary-spanning work between science and society for the department. Coupled with the observation that collecting evidence systematically for evaluation of such work turned out to be more difficult than anticipated, the question that may result from the SEP evaluation for GraspOS is one of sourcing evaluative data: What GraspOS tools and services afford the evaluation needs of the department and how?

## 6. Options for evaluation

The preceding two analyses showed us that assessing how GraspOS can support the evaluation of transdisciplinary research on a departmental level would be beneficial as evaluative knowledge on such interactions was difficult to get a hold on and demanded improvised methods for collecting evidence by the writing team. This provides GraspOS with an opportunity for intervention. Importantly, the service providers internal to GraspOS was the extent of tools and services that could be considered, which on the one hand allowed for collaboration on our issue at hand; but also limited us in the sense that other, 'external' services and tools could not be considered. We therefore took the repertoire of tools and services that GraspOS providers offered as options for evaluation assessed and justified what tool or service provider fits our pilot purpose based on the assessment of what is valued (S) as well as the context (O). The table below summarises the process of assessment and justification in the project team:

Value proposition	GraspOS Tools and Services	Justification
Enrichment of research outputs with missing attributes	OpenAIRE Broker, OpenAIRE text mining modules, OpenAIRE Metadata Validator, SCRE Pipeline	The focus on transdisciplinary research focused on <i>interactions</i> and there were no sufficient existing outputs that indicated transdisciplinary

		research
Enrichment of research output links	Semantic Citation Classifier, BIP! Citation classifier	Focus on academic citations only (Semantic Citation Classifier), focused on computer science (BIP!)
Enrichment of research outputs with novel metrics	EC KIP OS indicators, BIP! Services (toolbox)	Potentially interesting to link outputs to non-academic entities. However, the services focused either on academic indicators (BIP!), or focused on research products (EC KIP OS Indicators)
Enrichment of research outputs with usage data	EOSC accounting for services, UsageCounts, OPERAS Metrics	Impact metrics signifying impact in academic field (EOSC accounting for services), focus on scientific data sources (UsageCounts), focused on monographs and books (OPERAS)
Dashboarding	OS Institutional Dashboard (OpenAIRE), EOSC OS Researcher Dashboard (BIP!Scholar)	Potentially interesting, but focused on research output of researchers (both)
Scholarly resources	OpenAIRE Graph, OpenCitations, Scholexplorer, BIP! DB, OpenAIRE Usage Counts, OPERAS Metrics, GoTriple Platform, FAIRCORE4EOSC RAiD	Diverse applications. OpenAIRE Graph seemed like a promising service to analyse in order to understand the 'base' data underlying OpenAIRE services. Other services were field specific (e.g. OPERAS), focused on citations (e.g. OpenCitations), etc.

Table 4: GraspOS tools and services in relation to UU pilot

Based on this exercise, working with OpenAIRE Graph data seemed to be the most viable and useful for our purposes, as it allowed us to assess how the basic data that OpenAIRE Graph can be appropriated for evaluations of transdisciplinary research. Also, as the context considerations showed that a lack of evaluation data was underlying the departmental evaluation previously, we decided to focus on a collaboration with OpenAIRE in order to analyse to what extent OpenAIRE can enrich the already-existing data in the local repository of Utrecht University.

We found that particularly interesting as the strategic and scientific importance of transdisciplinary research further blurs the distinction between science and society. For us, this also means that

infrastructures that cater to research evaluation increasingly need to cater to the evaluation of research practices that, oftentimes, remain invisible in traditional research information as noted in the self-evaluation report of the Copernicus Institute as well.

### Comparison between the CRIS and OpenAIRE data

In order to assess OpenAIRE data in that regard, we chose to conduct a comparison between OpenAIRE data and data from the CRIS. The CRIS usually provides a baseline of research information that Utrecht University has available. As such, the comparison compares externally generated and organised data with internally generated and coordinated data. The comparison is based on two criteria: the *ideal extent* to which both data sources can inform transdisciplinary research evaluation, and the *real extent* respectively. This difference emerged after receiving the data corpuses and realising that relatively many columns (i.e. monitoring functions) were insufficiently populated with data of Copernicus Institute or not at all. This produced a distinction between *what could be assessed if data were existent (potential data)* and *what can be assessed given the data that exists (actual data)*.

### CRIS and OpenAIRE data affordances for evaluating transdisciplinary research

To evaluate how the real data can potentially afford evaluations of transdisciplinary research, we drew up a 'table of interactions' that was also sent to OpenAIRE colleagues in order to prompt a first brainstorm about the kind of data that the Utrecht University pilot needed and to prompt reflections on potential data limitations. For this end, we had asked the OpenAIRE colleagues to fill in a column with notes which reflect on the limitations for monitoring and capturing data or respective interactions (rows). Unfortunately, these reflections and notes had not been filled in when the document was received back.

The left column describes *Interactions* that we observe mattered in transdisciplinary research. The second column elaborated on the 'entities' that are involved in every particular interaction, such as persons, outputs, datasets, or other potentially computationally capturable entities. Finally, the right column describes potential publication-based data that exists in the realm of GraspOS.

\*Includes academic events (conferences, symposia...), peer-reviewed publications, pre-prints, reviews...

\*\*includes non-academic events (civic, artistic, governmental), policy briefs, tv-appearances, newspaper articles...

interactions	entities	data
acad. co-authorship*	authors COP, authors other UU, output	publication data, with author information and author affiliations, ORCID, Authors PIDs
acad. co-authorship*	authors COP, authors non-UU acad affil., output	publication data, with author information and author affiliations
<b>acad. co-authorship*</b>	<b>authors COP, authors non-acad affil, output</b>	<b>publication data, with author information and author affiliations</b>
share non-acad. co-authorship**	authors COP, authors other UU, output	publication data, with author information and author affiliations
share non-acad. co-authorship**	authors COP, authors non-UU acad affil., output	publication data, with author information and author affiliations
<b>share non-acad. co-authorship**</b>	<b>authors COP, authors non-acad affil, output</b>	<b>publication data, with author information and author affiliations</b>
share research project (w. grant)	persons COP, persons other UU, project grant, grant agreement	project/grant data, with consortium details and/or participant data, acknowledgements publications
share research project (w. grant)	authors COP, persons non-UU acad affil., project grant, grant agreement	project/grant data, with consortium details and/or participant data, acknowledgements publications
<b>share research project (w. grant)</b>	<b>persons COP, persons non-acad affil., project grant, grant agreement</b>	<b>project/grant data, with consortium details and/or participant data, acknowledgements publications</b>
interacted in research project (as in: not a formal project)	person COP, persons non-UU academic affiliation	final project reports, mentioned in publications, evaluation reports, media coverage
<b>interacted in research project (as in: not a formal project)</b>	<b>persons COP, persons non-acad affil</b>	<b>final project reports, mentioned in publications, evaluation reports, media coverage</b>
shared (creating and giving a) presentation	persons COP, authors other UU, presentation, event	data on e.g. conferences (abstract submissions, proceedings) / media coverage of shared presentations/events
shared (creating and giving a) presentation	persons COP, authors non-UU, presentation, event	data on e.g. conferences (abstract submissions, proceedings) / media coverage of shared presentations/events
<b>shared (creating and giving a) presentation</b>	<b>persons COP, authors non-academic affil., presentation, event</b>	<b>data on e.g. conferences (abstract submissions, proceedings) / media coverage of shared presentations/events</b>
<b>give presentation to non-academic receivers</b>	<b>person COP, organising entity, presentation, event</b>	<b>data on e.g. conferences (abstract submissions, proceedings) / media coverage of shared presentations/events</b>
interacting expertise	persons COP, persons other UU, problem statement(s), advisory board, government	grant agreements, other funding descriptions (CORDIS)
interacting expertise	persons COP, persons non-UU acad affil, problem statement(s), advisory board, gov	grant agreements, other funding descriptions (CORDIS)
<b>interacting expertise</b>	<b>persons COP, persons non-acad affil., problem statement(s), advisory board, govern</b>	<b>grant agreements, other funding descriptions (CORDIS)</b>
framing a problem	persons COP, persons other UU, problem statement(s)	grant agreements, other funding descriptions (CORDIS)
framing a problem	persons COP, persons non-UU acad affil, problem statement(s)	grant agreements, other funding descriptions (CORDIS)
<b>framing a problem</b>	<b>persons COP, persons non-acad affil., problem statement(s)</b>	<b>grant agreements, other funding descriptions (CORDIS)</b>
<b>provide information to stakeholders</b>	<b>persons COP, persons non-UU</b>	<b>(internal) data on transfer of IP, data or insights</b>
<b>stakeholders provide information</b>	<b>persons COP, persons non-UU</b>	<b>(internal) data on transfer of IP, data or insights</b>
meaningfully mentioned together in (full text) of output	COP (org), academic organisation, output	co-word analysis of full-text academic and non-academic publications
<b>meaningfully mentioned together in (full text) of output</b>	<b>COP (org), non-academic organisation or person, output</b>	<b>co-word analysis of full-text academic and non-academic publications</b>
meaningfully cited together in academic output	person non-UU, persons COP, output	academic publication data, with author information and author affiliations
<b>meaningfully cited together in non-academic output</b>	<b>person non-UU, persons COP, output</b>	<b>non-academic publications, with author information and author affiliations</b>
mention (full-text) in acad. output	authors COP, authors other UU and vv.	full-text publication data, ideally contextualised
mention (full-text) in acad. output	authors COP, authors non-UU acad affil and vv.	full-text publication data, ideally contextualised
<b>mention (full-text) in acad. output</b>	<b>authors COP, authors non-acad affil and vv.</b>	<b>full-text publication data, ideally contextualised</b>
mention (full-text) in non-academic output**	authors COP, authors other UU and vv.	full text publication data, ideally with data on mentions of (output/outcomes) research of COP or its members
mention (full-text) in non-academic output**	authors COP, authors non-UU acad affil and vv.	full text publication data, ideally with data on mentions of (output/outcomes) research of COP or its members
<b>mention (full-text) in non-academic output**</b>	<b>authors COP, authors non-acad affil and vv.</b>	<b>full text publication data, ideally with data on mentions of (output/outcomes) research of COP or its members</b>
received funding	COP, org, public research funder, project	project funding data (e.g. CORDIS, OpenAire, National Research Funders)
received funding	persons (COP), public research funder, project	project funding data with participant information (e.g. grant agreements)
received funding	COP (org), private research funder, project	funding acknowledgements, private funder websites
received funding	persons (COP), private research funder, project	funding acknowledgements, private funder websites, researcher profiles

Table 5: List of interactions. Note: boldly marked rows correspond to transdisciplinary processes

## Hermeneutic additions to data snapshots

Next to this bibliographic comparison, we collaborated with the newly instituted impact team of the department and elaborated on a questionnaire that we sent collaboratively to the department. This questionnaire asked researchers to reflect on how they believe their work makes a difference. After the responses came in, we invited a selection of these researchers into a conversation about their research data that we sourced from the CRIS and OpenAIRE and invited them to reflect on their previously formulated 'impact statements' by extending the printed sheet with a network visualisation of their research data with what they deem important. The assumption that we rested this exercise on is that we thought that such addition can provide insights to the kinds of entrenched categories by which research information is conceived and that this would be important feedback to the GraspOS partners, especially in view of emergent research practices. The triangle in Figure 5 visualizes and summarises our operationalisation.



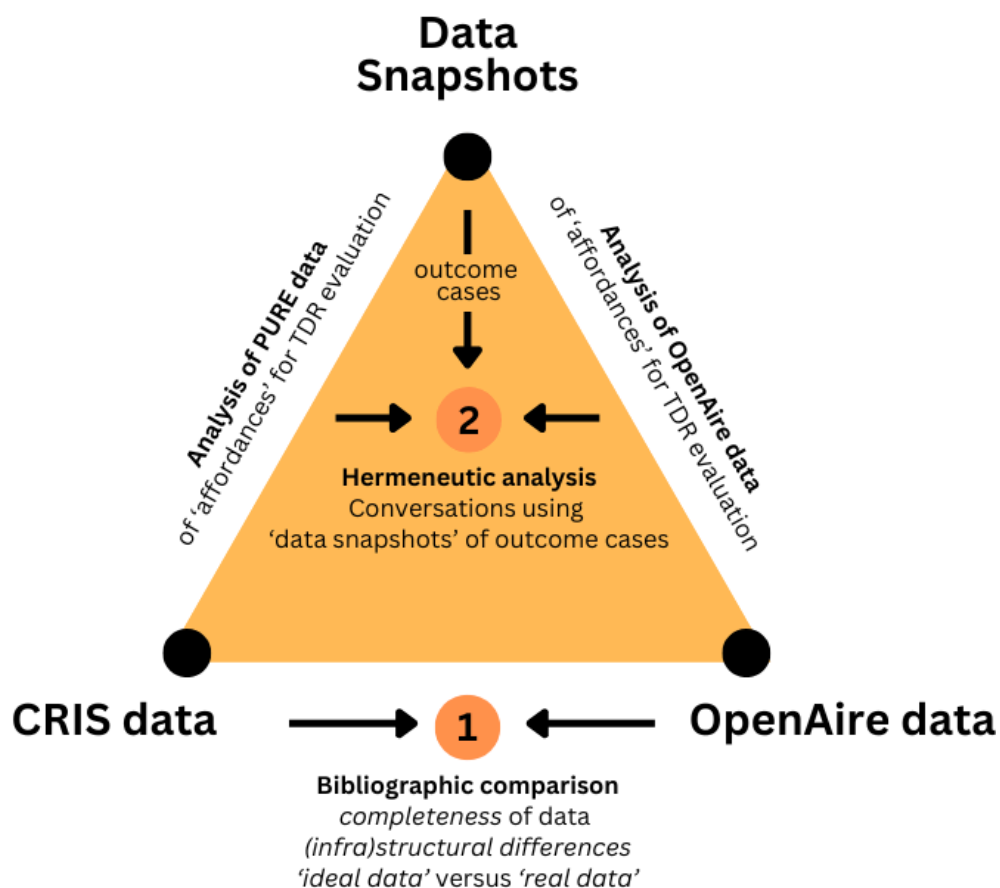


Figure 5: Overview of analyses of UU pilot

In the next section, probing, we will present the results from both analyses. We will first describe how we retrieved the necessary data from the CRIS and OpenAIRE respectively, which we follow up on by describing the datasets. Lastly, we compare both datasets. In section 7.2, we describe the hermeneutic analysis ('data snapshots').

## 7. Probing

### 7.1. Comparison of data sources

In this chapter we discuss the comparison between *OpenAIRE* and CRIS data. We describe data retrieval efforts, main findings from the comparison and how both sources afford for the evaluation of transdisciplinary research. In each section we also add notes, reflections and limitations on the process which serve as learnings from the comparison.

Analytically, the OpenAIRE and CRIS corpus were analysed **potentially** and **actually**. We made this distinction because we learned that the *evaluative potential* of each corpus (i.e. what claims can be made with each corpus) is different from the *actual evaluative potential*. That is, because while both datasets offer an extended taxonomy for monitoring research outputs (and also research activities in the case of the CRIS), the data is often not populated, or at least not enough for evaluative purposes. This resulted in two analyses that will be presented below: a comparison between the *potential extent of data* and the *actual extent of data* between OpenAIRE and CRIS.

#### 7.1.1. Data retrieval<sup>22</sup>

We focused the comparison between OpenAIRE and CRIS data on the period 2020–2025, as this timeframe aligns with the upcoming research evaluation of the Copernicus Institute of Sustainable Development. In this context, the comparison also functions as an exploration, or mock-up, of the evaluative potential offered by the two data sources. In order to compare OpenAIRE data on the department with CRIS data on the department, we first had to get access to the two datasets.

**For the OpenAIRE dataset**, the first issue was that we had to determine the parent-child relations between different organisational units of Utrecht University so that individual items or researchers can be linked to the department unambiguously in the data architecture of OpenAIRE. After a couple of iterations and meetings with the OpenAIRE team, one solution to this problem seemed to be the use of another OpenAIRE service, namely OpenOrgs. This service has as its goal to aggregate information on research organisations from a variety of different research organisation registries, such as ROR<sup>23</sup>.

While this step entailed a manual disambiguation of different instances of that Copernicus Institute name, the administrative processes surrounding this intervention were complex. What in essence was a matter of logging into a portal and classifying items that related to varying search terms of the department's name in a database; became rather complex because it involved processes attached to the OpenOrgs curation process specifically, including one-on-one training and the signing of a 'volunteer contract'.

In a second step, the updated hierarchies between research units were imported ('dumped') into the new version of the OpenAIRE Graph. Based on this new version, in March 2025, OpenAIRE colleagues extracted a corpus listing all information of researchers being affiliated to the Copernicus Institute of Sustainable Development in the period between 2020 and 2025. The corpus was a collection of .json files, which we subsequently converted to a readily interpretable format. For the conversion, the OpenAIRE scheme was used.

After extraction, the OpenAIRE dataset included 1406 entries, all of which were publications. From this dataset, we deduplicated 310 entries<sup>24</sup>. The final dataset included 1096 unique items.

Limitations and notes:

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<sup>22</sup> See Appendix 9.2 for further methodological notes

<sup>23</sup> See <https://ror.org/>

<sup>24</sup> See appendix 10.2 for deduplication technique description



- One limitation is that the request may not have been non-ambiguous to OpenAIRE. Meetings took place and so on to clarify the request, but we cannot be sure that our request was translated correctly, technically.
- Later in the process, it became apparent that 298 entries of the initial 1406 entries were published before the requested time period. Given that the analysis was based on the initial dataset including the older entries, we can assume a slight overestimation of OpenAIRE data.

**For the CRIS dataset**, the data was retrieved via Research in Context Graph (Ricgraph)<sup>25</sup>, an application that retrieves the data from CRIS. The data listed all information of researchers while being affiliated to the Copernicus Institute of Sustainable Development in the period between 2020 and March 2025. Similarly to OpenAIRE, the json files were converted into an interpretable format using python. The total number of entries was 3866, of which 289 appeared to be duplicates. After deduplication<sup>26</sup>, the final dataset included 3577 unique items.

Limitation and notes:

- Limitation for retrieving data is that we don't have reference material for triangulation to assess the completeness of the data
- The Research in Context Graph application was not used before in a mock-up and working with the application and retrieving the CRIS data resulted in valuable user feedback and learnings for the developers of the application.

### 7.1.2. Overview of unique items and overlaps between datasets

Figure 6 shows the distribution of unique OpenAIRE entries (red), CRIS entries (blue), and entries found in both datasets (green).

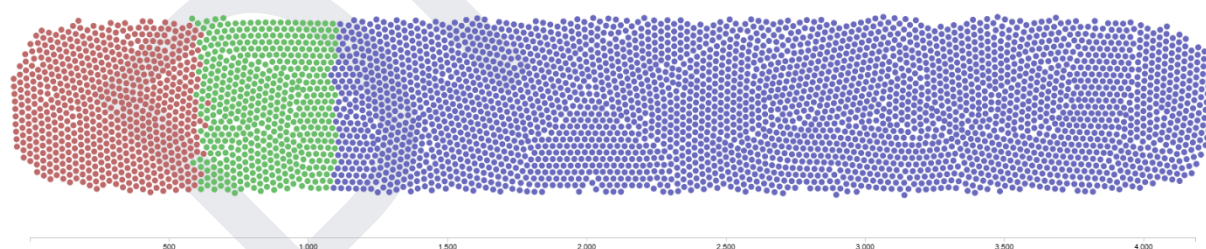


Figure 6: Unique and Overlapping Entries between the CRIS and OpenAIRE based on corpora on the Department of Sustainable Development at Utrecht University<sup>27</sup>.

<sup>25</sup> see Janssen 2024. Ricgraph was used after being recommended to us by the central administration of research information of Utrecht University either as a user interface for data retrieval or as a tool itself that can perform different analyses. We used it for the former purpose.

<sup>26</sup> See appendix 10.2

<sup>27</sup> Visualisation was produced using RAWGraphs (Mauri et al. 2017)

### 7.1.3. Comparison of 'potential' data

Below is an overview of the *potential* items that the CRIS and OpenAIRE monitor. For every table, a description of the rows is given per classification.

#### OpenAIRE

Category	Column (ideal)	Content
Identifier	id	OpenAIRE internal Identifier
	doi	Digital object identifier
	originalIds	Other identifiers for OpenAIRE internal use
	pids	persistent identifiers
Content	mainTitle	Title of the output
	subTitle	Subtitle of the output
	description	Summary of the output
	subjects	Keywords related to the content of the output
	language	Language the output is in
	coverages	The time and/or locations covered by the publication
	geoLocations	Geolocation information
Output	type	See output types
	sub_type	See output types
	formats	See output types ( <a href="https://www.iana.org/assignments/media-types/media-types.xhtml">https://www.iana.org/assignments/media-types/media-types.xhtml</a> )
Open Access	isGreen	Whether the output has at least the Green Label for Open Access
	isInDiamondJournal	Whether the resource is in a Diamond journal
	BestAccessRightCode	The code describing the level of Open Access (according to COAR <a href="https://vocabularies.coar-repositories.org/documentation/access_rights/">https://vocabularies.coar-repositories.org/documentation/access_rights/</a> )
	BestAccessRightLabel	The label describing the level of Open Access (from COAR label)
	openAccessColor	The Open Access colour of the output (levels: gold, hybrid or bronze)
	embargoEndDate	Date when embargo ends and result becomes open access
Indicators	downloads	Number of downloads an output has
	views	Number of views an output has
	citationCount	Number of citations an output has
	impulse	Initial momentum of output, based on citation network
	influence	Popularity of output over the whole period, based on citation network
	popularity	Current popularity of output, based on citation network
Publication details	publisher	The name of the entity that holds, archives, publishes prints, distributes, releases, issues, or produces the resource.
	publicationDate	The date on which the resource is published
	journal (from container)	Name of journal or conference
	volume	Volume in which the resource appears
	startingPage	Page on which the resource starts
	endingPage	Page on which the resource ends

	collectedFrom	Information about the sources from which the record has been collected
	dateOfCollection	Date on which the output is collected for the document containing the data
	lastUpdateTimeStamp	Timestamp of last update of the record in OpenAIRE
	sources	A Reference to a resource from which the present resource is derived
	version	Version of the result
Funding	publiclyFunded	Whether the resource is publicly funded
	Project (definition)	List of projects (i.e. grants) that (co-)funded the production of the research results
	acronym	Abbreviated project title
	project_title	Project title
	funding_stream	Stream of funding (e.g. for European Commission can be H2020 or FP7)
	jurisdiction	Geographical jurisdiction (e.g. for European Commission is EU, for Croatian Science Foundation is HR)
	funder_name	The name of the funder (e.g. European Commission)
Author	authorFullName	The full name of an author
	authorOrcid	The ORCID identifier of an author
	authorRank	The rank of an author
Groups belonging to output	countries	The different countries related to the output
	communities	The OpenAIRE communities the output is part of
	contributors	Contributors for the result
	organisations	List of organizations in an affiliation relation with the research results

Table 6: Potential aspects for evaluation of the OpenAIRE dataset

What is noticeable are the multiple identifiers that OpenAIRE uses. Column "id" is a local identifier for OpenAIRE, whereas the OriginalIds are identifiers of other sources that OpenAIRE uses. The PIDs have the same function, although there the scheme is also provided, so that other users can access it as well.

There are four overarching output types, each pertaining to a set of subtypes. These include:

- a. Publication
- b. Research data
- c. Research software
- d. Other

Of these, a new categorisation of output types has been created to increase granularity and better divide the subtypes over the overall output type. These include:

- a. Publication
- b. Thesis
- c. Non-textual
- d. Event/activity
- e. Membership
- f. Other

- g. Collection
- h. Conference object
- i. Data management plan
- j. Data paper
- k. External Research Report
- l. Internal report
- m. Project deliverable, milestone and proposal
- n. Research
- o. Software paper
- p. InteractiveResource
- q. Model
- r. PhysicalObject
- s. Research Activity Identifier
- t. Research Object
- u. Bioentity

In general, the combination of the title, description and subjects can provide a general idea of what the output is about. Unfortunately, there is no concrete information on what 'coverages' entails exactly, but we presumed it to describe timestamps and geolocation of a certain output. The separate geoLocations output, on the other hand, appears novel. Nonetheless, we are not sure what it aims to describe concretely. Type and subtype are interesting, especially with regards to transdisciplinary research as some relate to activities that researchers may engage in (e.g. 'event/activity' or 'membership', which may tell about collaborations or other external relations that researchers may have).

In terms of open access, there are various columns aiming at describing whether a publication is in a green, bronze, gold, hybrid and/or in a diamond journal.

Furthermore, the indicators that are provided have the classical citation scores and additionally the views and downloads of any given item. 'Impulse' describes the influence and the popularity that the citation scores are elaborated on.

Publication details appear to be classical scientometric values. There are, on the other hand, 3 columns describing the collection process of OpenAIRE. These are dateOfCollection, collectedFrom and lastUpdateTimeStamp. The columns can be relevant, but are similar to other columns, such as instances and sources for the CollectedFrom column, and dateOfCollection resembles lastUpdateTimeStamp. Also, there appears to be considerable overlap in terms of where the data is retrieved from. OpenAIRE provides data on the sources, instances and collectedFrom. This makes it complicated to use, since it is unclear which of these columns would be the best to use and why.

The funding columns of OpenAIRE appear extensive. The projects relating to the output are clearly given through the project\_title, as well as the funding\_stream, funder\_name and jurisdiction relating to the projects.

In terms of the author section, OpenAIRE has only the full name and (potential) ORCID. Even though organisations are also provided in the data, there is no connection between the author and the organisations.

For the groups belonging to the output, there are the countries, contributors, communities and organisations. The contributors and organisations are not the same, but in terms of function they appear

to resemble one another. These points are mainly relevant for making organisational connections, which may be of importance to transdisciplinary research.

## CRIS

Category	Column (ideal)	Content
Identifier	the CRISID	Identifier used in the CRIS
	uulD	Identifier used in the UU
	ExternalID	Identifier that is not the CRIS or UU
	ExternalIDSource	Source the identifier belongs to
	PrettyURLIdentifiers	Variable resembling "Title"
	AdditionalExternalIDs	Additional identifier
	IDSource	Source the identifier belongs to
Output	Output_type	See ideal output (output)
	Output_category	Professional area in which the output is produced (academic, professional, other)
	Event_name	Name of the activity
	Event_type	See ideal output (activity)
Content	Title	Title of the output
	Abstract	Abstract of the output
	Keywords	Keywords associated with the output
	BibliographicalNote	Variable resembling "event_name"
	Language	Language the output is in
Open Access	OpenAccessPermission	Whether the output is open access (not known how this is identified)
	Visibility	Whether the output is publicly visible
	Workflow	?
Publication details	Publication_year	Year of publication
	Publication_month	Month of publication
	Publication_day	Day of publication
	publisher_name	Name of the publisher
	publisher_type	Type of the publisher (?)
	journalAssociation_name	Name of the journal
	journalAssociation_type	Type of the journal (?)
	Publication_status	Published or not
Authors	totalNumberOfAuthors	The number of authors working on the output
	Person_the CRISID	The the CRIS identifier of an author
	CorrespondingAuthor	Whether an author is the corresponding author of the output
	Person_uulD	The UU identifier of an author
	Person_fullName	The full name of an author
	Person_firstName	The first name of an author
	Person_lastName	The surname of an author
	Person_role	The role of an author

	external_person	Whether the person is external to the UU
	Person_organisation_uuid	The UU identifier of an organisation an author belongs to
	Person_organisation_name	The name of an organisation an author belongs to
	Person_organisation_type	The type of an organisation an author belongs to
Groups belonging to output	OrganisationalUnits_uuid	The UU identifier of the overarching organisation the output belongs to (e.g. research programme)
	OrganisationalUnits_name	The name of the overarching organisation the output belongs to (e.g. research programme)
	OrganisationalUnits_type	The type of the overarching organisation the output belongs to (e.g. research programme)
	commissioningBody_name	The name of the organisation that commissioned the output
	commissioningBody_type	The type of the organisation that commissioned the output
	ManagingOrganisationalUnit_Value	The name of the organisation managing the output (e.g. a department where a report is stored)
	ManagingOrganisationalUnit_Type	The type of the organisation managing the output (e.g. a department where a report is stored)

Table 6: Potential aspects for evaluation of the CRIS dataset

A peculiar aspect about the identifiers in the CRIS dataset is that there are both the ExternalIds and the AdditionalExternalIds: they contain the same type of data, but split up. It is not clear as to why this is the case. Moreover, the PrettyURLIdentifier appears to resemble the "title" column, but with hyphens between the words.

For the Outputs, there is the output type and event type. The distinction between the two is interesting, as it relates to the difference of having a work as output, as opposed to having an event/activity as output.

In terms of content, the main items are represented: There is a title, abstract and keywords to identify the general content of an output. Moreover the BibliographicalNote provides additional information regarding funding and collaborations with people/organisations. This resembles the section of Funding and Acknowledgements at the end of a scientific publication.

The OpenAccessPermission column is the only one describing open access statuses. The possible values here are not known. However, the column on visibility provides information on whether there are any restrictions for viewing the output.

The Workflow column appears to be for internal use in the CRIS, but this has not been verified. The values in this column can be "Validated", "Approved", "For approval" and "Entry in progress", suggesting that it regards the workflow of the CRIS rather than that of the output.

The PublicationDetails again mainly contain classic variables, such as publisher and journal names. Additionally, the 'publication status' is provided, providing information on whether the output is already published or not. Presumably this applies to academic publications only. Whether preprint-publishing are part of this classification is unknown.

The authors section is extensive. There are three columns for the names of the person (first, last and full). The Person\_role and external\_person provide useful additional information on the authors. Lastly, the authors can be connected to specific organisations.

The last category contains the groups related to a respective item (Organisational\_Units), funding of an item (commissioning\_Body) or its management (ManagingOrganisationsBody).

#### 7.1.4. Comparison of 'actual' data

We also analysed and compared the 'actual' extent to which data on the department was provided by both the CRIS and OpenAIRE. To assess this, we calculated the number of occupied rows by counting the total rows and maximum number of unique rows. This might lead to an overestimation of the number of occupied rows for the unique titles, but it provides a general indication for how occupied the dataset is.

##### OpenAIRE

Most of the columns of the OpenAIRE ideal data were occupied, and of those most had 500+ instances. The specific occupancy of the columns can be found in the following table, with underneath a description about the interesting findings.

Classification	Column	Maximum items (n)	Actual Occupancy (%)
Identifier	id	1400	78.21
	doi	672	100.00
Content	mainTitle	1400	78.21
	subTitle	138	100.00
	description	1314	83.33
	subjects	1290	84.88
	language	1400	78.21
	coverages		
	geoLocations		
Output	type	1400	78.21
	sub_type	1400	78.21
	formats	944	100.00
Open Access	isGreen	618	100.00
	isInDiamondJournal	618	100.00
	BestAccessRightCode	1362	80.40
	BestAccessRightLabel	1362	80.40
	openAccessColor	571	100.00
Indicators	downloads	94	100.00
	views	94	100.00
	citationCount	1400	78.21
	impulse	1400	78.21
	influence	1400	78.21
	popularity	1397	78.38



Publication details	publisher	729	100.00
	publicationDate	1397	78.38
	journal (from container)	562	100.00
	volume	549	100.00
	startingPage	400	100.00
	endingPage	270	100.00
	dateOfCollection	1400	78.21
	version		
Funding	publiclyFunded	618	100.00
	acronym	478	100.00
	project_title	622	100.00
	funding_stream	623	100.00
	jurisdiction	532	100.00
	funder_name	609	100.00
Author	authorFullName	1400	78.21
	authorOrcid	582	100.00
	authorRank	1400	78.21
Groups belonging	countries	1248	87.74
to output	communities	1400	78.21
	contributors	712	100.00
	organisations	1400	78.21

Table 7: Openaire output extent

Below we present some observations:

- Only 7 of the 138 the subtitles are not in the main title. This means that subtitles are generally unoccupied and it provides additional information for only 7 of them.
- Language is often also "undetermined". This is peculiar, since in other columns, any missing information translates into an empty cell.
- In OpenAIRE, there can be multiple same articles. This is because the subtype of an output is based on the information that OpenAIRE obtained from the instance of the output. Since there are multiple subtypes and multiple instances, it is difficult to assess what the most accurate subtype is.
- The formats of the data are derived from a list of media types an output can have (<https://www.iana.org/assignments/media-types/media-types.xhtml>). However, there are also formats that are not included in the list of media types. These generally contain only numbers.

- The information that exists on OpenAccess is mainly BestAccessRight.
- For the publication details, only the publication date and date of collection are complete. The other publication details are only half filled.
- AuthorORCID: only 582 rows with authors also provide at least one author with ORCID.
- In the organisations, there are duplicate organisations, where some organisations have a list of pids, and other organisations have no pids.

### CRIS

It is not possible to assess the completeness of this dataset, it cannot be compared with the total amount of outputs since that total cannot be assessed manually. There are 289 duplicate titles, where most of the duplicates have the title like "Author Correction", "Corrigendum" or "Editorial". Of these rows, most of the data of the ideal columns is empty in the real data.

Classification	Column	Maximum items (n)	Actual Occupancy (%)
Identifier	CRISID		
	uuID	3866	92.52
	ExternalID		
	ExternalIDSource		
	PrettyURLIdentifiers		
	AdditionalExternalIDs		
	IDSource		
Output	Output_type	3866	92.52
	Output_category		
	Event_name		
	Event_type		
Content	Title	3866	92.52
	Abstract		
	Keywords		
	Language		
	OpenAccessPermission		
Open Access	BibliographicalNote		
	Visibility		
	Workflow	3866	92.52
Publication details	Publication_year	3866	92.52
	Publication_month	2864	99.23
	Publication_day	1266	98.66
	publisher_name		

	publisher_type		
	journalAssociation_name		
	journalAssociation_type		
	Publication_status	3866	92.52
Authors	totalNumberOfAuthors		
	Person_the CRISID	3866	92.52
	CorrespondingAuthor	3866	92.52
	Person_uuid	2096	99.14
	Person_fullName	2096	99.14
	Person_firstName	3861	92.64
	Person_lastName	3864	92.57
	Person_role	3866	92.52
	external_person	2721	98.71
	Person_organisation_uuid	2039	99.26
	Person_organisation_name	2039	99.26
	Person_organisation_type	2039	99.26
Groups belonging to output	OrganisationalUnits_uuid		
	OrganisationalUnits_name		
	OrganisationalUnits_type		
	commissioningBody_name		
	commissioningBody_type		
	ManagingOrganisationalUnit_Value		
	ManagingOrganisationalUnit_Type		

Table 8: CRIS output extent

Below we present some observations:

- A lot of useful information appears to be missing. It is unclear how this could be the case.
- The identifiers are empty, with the exception of the UUID. External Ids would be especially useful, since these can connect the CRIS database to other databases.
- The column of event type is empty. However, from the column output type it is evident that there are still some activities present. It is unclear how activities identified from the column output type differ from that of the column event type.
- From the content, the only remaining column is the titles. The abstract, keywords and bibliographic notes are empty.
- The OpenAccessPermission and visibility are also empty. The workflow is the only column that still remains, but this column contains the least interesting information.

- It is remarkable that the publication date and status are present, but that publisher and journal is missing from the data.
- In contrast to the other columns, the person and organisation data is still completely present. The only columns that are not 100% filled are Person\_uuid, Person\_fullName and organisations. These have above 2000 rows each.
- The external person column has 2721 rows. This means that for the other rows, none of the authors was external.
- Lastly, the total number of authors is not mentioned, but this can be derived from the rest of the data.
- Organisational Units is empty, but perhaps it could be that this information is contained in the Person\_organisational\_units.

#### 7.1.5. *Overall comparison of data sources*

For the comparison of data sources between CRIS and OpenAIRE, we analysed the key differences, strengths and weaknesses. This was done by documenting the processes of data retrieval, processing and analysis. In that sense, the comparison does not only relate to the corpuses themselves, but also to their embeddedness in the (organisational, technical) systems of origin. For the datasets themselves, both 'ideal' and 'real' were taken into consideration.

##### **Differences:**

- OpenAIRE tends to focus on traditional bibliometric aspects of research information. The dataset contains primarily publication data, such as indicators, publishers or journals, and open science features primarily as open access publications.
- OpenAIRE includes funding data. In particular whether or not a resource is publicly funded, grants, project titles, funding streams and name of funder. It is unclear how OpenAIRE collects this data.
- OpenAIRE does not connect researchers to organisations. Rather, it maintains a full list of authors and a full list of organisations. Especially since OpenAIRE does not appear to use author identifiers other than ORCID, connecting authors to each other or to organisations through OpenAIRE data is complicated.
- OpenAIRE does have an extensive list of data categories for the publication, making it very useful to describe the contents of that publication and what organisations and funds are related to it. Additionally, OpenAIRE has identifiers available for publications, which can be useful for interconnecting databases.
- The CRIS is much more focused on different output types, and connections between the output types, the persons and the corresponding organisations. The inclusion of the role of a person and whether they are external or internal to Utrecht University also emphasises the focus on individuals.
- In comparison to OpenAIRE, the CRIS invests on different identifiers, output types and output categories, and the persons related to the output. For our purposes, the distinction between outputs and events is particularly interesting.

- Data on organisations in the CRIS include their roles related to an output, differentiating between commissioning, creating and managing organisations. This enables insight into what the output was and how it came to be.
- A key difference between OpenAIRE and the CRIS is that OpenAIRE harvests the information from online sources, such as publication repositories, research data archives, or funder databases, whereas the CRIS obtains the data directly from the authors and extends this data by relying on automatic population from e.g. Scopus (e.g. metadata).

### Strengths

- A primary strength of OpenAIRE is that it is interconnected with the total OpenAIRE database for projects. For many outputs, OpenAIRE can identify research projects and grants, and has more data on this internally.
- A primary strength of the CRIS data is that it contains information on the role and position of a person.
- Furthermore, CRIS data has an extensive set of output types in the event/activity category which can be of relevance for evaluating transdisciplinary research.

### Weaknesses

- The biggest weakness of OpenAIRE seems to be its completeness. The difference between 3577 items on the CRIS and only 1400 items on OpenAIRE data seems concerning. This also came back in the data-interviews (see data snapshots (7.3) and evaluation (8)).
- One weakness of the OpenAIRE database for our purposes is that it does not connect authors to respective organisations. I.e. 'author' is not an entity in the OpenAire graph. This means that in order to assess research collaboration in general and transdisciplinarity research specifically using the OpenAIRE database, an organisation-level analysis can be performed but not an individual-level analysis. The extent of a collaboration can therefore not be assessed, as it is unclear how many people from how many organisations are involved. For example, if one of the contributors is a researcher who works at an academic and a non-academic organisation, that would appear the same as when one contributor works at an academic organisation and another one works at a non-academic organisation.
- The indexed outputs in the OpenAIRE database are the largest extent academic<sup>28</sup>. This presents a significant challenge when evaluating transdisciplinary research, which may result in non-academic outputs such as e.g., policy reports.
- There is only limited information on event types in the OpenAIRE database.
- Quite a large selection of the information on the OpenAIRE database is for internal use and relates primarily to identifiers.
- While the OpenAIRE corpus has useful information on research outputs, funding and organisations, other parts of the database are not intuitive and require the use of other OpenAIRE data, or data from other data sources to become sensible.

<sup>28</sup> There are instances of 'reports', but the vast majority are academic objects (e.g. articles, theses, books, DMPs, etc.)

- The main weakness of the CRIS is that no funding data is available for a particular output, and neither what research project the output is related to.
- Another weakness of the CRIS is that it requires manual curation particularly of non-traditional outputs such as events which can be labour intensive and incomplete.

Finally, both datasets lack full text, as well as concrete citations or references that are used in the work<sup>29</sup>. This would potentially enable further analysis on the transdisciplinarity of the outputs.

## 7.2. Potential for evaluation of transdisciplinary interactions

As we were interested in testing how the two corpuses afforded the evaluation of *transdisciplinary research processes* between academic and non-academic actors, we listed possible interactions (see Table 5), which were based on observations of research practices within the department relating to transdisciplinarity. These interactions thus describe research processes and activities, such as 'academic co-authorship' between an employee of Copernicus Institute and an external 'non-academic' author, , which arguably can be used for evaluating transdisciplinary research. We were particularly interested to learn how OpenAIRE data and CRIS data afford their evaluation.

In what follows, small paragraphs will elaborate on each (or collections of) items:

### - Co-authorship on either academic or non-academic output

Although the OpenAIRE database allows for assessing whether an academic and non-academic affiliation appear on a single item, it is difficult to assess the co-authorships of academic and non-academic affiliated persons in the OpenAIRE database. Outputs can have organisations or contributors from both academic and non-academic backgrounds, but it is not possible to assess this on an individual-level. Only the organisations linked to the output can be used. At the same time, it would be possible that there is one author who is affiliated with both an academic and a non-academic organisation. This would mean that the output did not enable the collaboration between the two organisations, but that there is an author who already was connected to both organisations, who now collaborates on the output. In consequence, the number and range of non-Copernicus and non-Utrecht University organisations related to an output is an interesting datapoint, although highly contextual that cannot be understood by relying on the data point alone.

The CRIS does allow this analysis. Persons are considered external or not, and they are each linked to an organisation. This makes the identification of whether a person has an academic or non-academic affiliation possible. In extension, it can determine whether there was a collaboration between an author with both an academic and non-academic affiliation.

### - Share research project (w. grant)

Sharing here specifies that non-academic actors and academic actors are both partners in a research project Share research project with grant funding. This can, in theory, be analysed using OpenAIRE, as funding data is collected by harvesting metadata directly from research funding agencies or by full-text mining of articles when they are made available<sup>30</sup>. Currently, direct import of metadata comes from exclusively Euro-American agencies. In the CRIS data that we have from the department, no data on funding is available, so it's not possible to assess whether the research project also received a grant. The CRIS has the organisation type "research programme", which could describe a research project.

<sup>29</sup> At least in the data that we have received by our OpenAIRE colleagues, as the OpenAIRE Graph does have references to citation relations (see <https://graph.openaire.eu/docs/data-model/relationships/relationship-types>).

<sup>30</sup> See <https://www.openaire.eu/blogs/openaire-research-graph-data-dump-of-funded-products>

- **Interacted in research project (non-formal partnership)**

OpenAIRE does, currently, not allow the analysis of non-formal project partners. The persons that are found in the data that OpenAIRE provided are direct contributors to an output (i.e. authors). There is no other category where persons can be found.

In the ideal CRIS, the 'BibliographicalNote' may contain additional information, such as acknowledgements of interlocutors acknowledgements and may be therefore used to at least document informal partners (after revision). In the real data, no 'BibliographicalNote's were present.

- **Shared presentation and presenting to a non-academic audience**

While 'presentations' as output are listed in *ideal* OpenAIRE data and constitute presentation files sourced from Zenodo, the *real* OpenAIRE data not the CRIS data included any presentations. In the CRIS, there is an output that is a podcast which could be considered as presentation to a non-academic audience. At the same time, understanding the presentation as an *interdisciplinary event* is also not viable with the data available.

- **Interactions between diverse expertise**

While interactions between scientific disciplines may be approached bibliometrically by way of delineating fields and analysing their interconnections, a non-scientific extent of expertise (which is important in transdisciplinary research) is not an explicit phenomenon for monitoring in either CRIS or OpenAIRE.

- **Framing a problem**

Project and grant data is available in OpenAire, but not the proposal or agreement, through which problem framings of research could be approached in combination with corresponding project descriptions and the formal project partners. This means that OpenAIRE allows for the identification of some forms of problem framing in relation to projects. The CRIS only contains titles of collected outputs in the real data, making it impossible to accurately consider the framing of problems.

- **Information from and to stakeholders**

For the CRIS and OpenAIRE there exists no output of solely information sharing. In OpenAIRE, output a type of "contribution to newspaper or weekly magazine" exists. The CRIS contains the output type "report" and "podcasts", which could have the function to share information to stakeholders.

- **Meaningfully mentioned or cited together in (full-text) of output**

Neither OpenAIRE nor the CRIS allow for this. The full text is not available and there are no citations known for the outputs. For OpenAIRE, the doi is available, making it possible to link the outputs to another database and get the full text from there. The CRIS only uses internal IDs and does not disclose DOIs.

- **Advancing of / handling of matters of concern**

OpenAIRE contains grant data, the description, subjects and title. Combined, these can give an indication as to what the problem statement and the anticipated results are. CRIS only contains the title, and therefore does not allow such an indication.

### 7.3. Data snapshots (hermeneutic additions)

A large part of the comparative work introduced before focused on existing categories and affordances of data that is commonly used for research assessments. With this exercise, we wanted to understand what kinds of work of researchers is and is not captured by both the CRIS and OpenAIRE.



For this, we reached out to five researchers across the different sections of the institute and seniority. We invited them into a conversation where we presented these researchers, individually, with printed visualisations of their data in both OpenAIRE and the CRIS. Using these printed sheets as conversational prompts about how they understand their research work, and in particular impact-related work, in view of the visualisation in front of them. Then, we 'sketched' and 'extended' these visualisations until the researchers would recognise themselves satisfactorily in them. Find below a blurred example of these sheets.

Figure 7: Blurred example of printed visualisation of researcher data for interviews

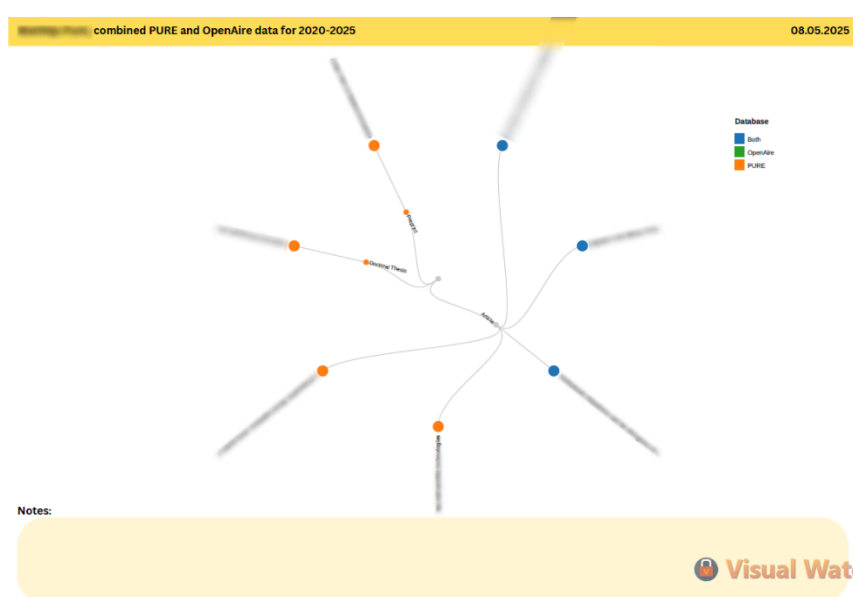




Figure 8: Blurred example of printed and filled in visualisation of researcher data for interviews

### 7.3.1. Results

#1 Assistant Professor	<b>Note:</b> Immediate reflection was that the listed items were only 'very formal' aspects of their work.
<b>Existing data:</b> Doctoral thesis Preprints Articles	<b>Added aspects:</b> Supervision of PhDs at other university Peer reviewing Engagement in advisory committee Involvement in facilitation of scholarly impacts Non-academic speaking: - as panellist - as speaker
#2 Postdoctoral researcher	<b>Note:</b> They had immediately the feeling that they don't relate to this [the visualisation of their CRIS and OpenAire data], nor as well as "scores and metrics on Google Scholar" [unprompted]. Stressed that they don't want to be motivated by that. They described that intrinsic motivation is very important to them and started at Copernicus Institute exactly for transdisciplinary research and the kind of work that is available at the institute.
<b>Existing data:</b> Abstracts Review Articles Articles	<b>Added aspects:</b> Communications: - facilitating a community of practitioners - developing grey literatures: (e.g. workbooks, guides, worksheets, blogs) Supervision of PhDs and MScs Developing courses for professionals 'Direct Impact' projects: - mapping, building and maintaining network - Organising series of workshops and events - Long-term collab. with societal partners

#3 Researcher on project funding	<b>Note:</b> They edited and added the data into the CRIS themselves based on prompts from the secretariat. Felt like the proportions between the web publication and the sheet do not match in terms of impact.
<b>Existing data:</b> Web publications Posters	<b>Added aspects:</b> Global South collaborations: - academic collaborations - non-academic collaborations Building capacity of Global South junior Academics: - funding allocations through collaborations Communications: - grey literature - newsletters - conference papers - social media Policy interventions - building a database for African case studies
#4 PhD	<b>Note:</b> Privacy-related issues inhibit the publication of data. Has a focus of finishing the PhD, which is why the data that exists makes sense to them (Seeing 'paper one, two and three') of the PhD project. If they had more time, they would develop high school teaching materials, but the PhD takes too much toll.
<b>Existing data:</b> Articles Book	<b>Added aspects:</b> Working in an interdisciplinary research project Mental load of proposal-writing
#5 Assistant Professor	<b>Note:</b> They mentioned that they got frustrated with the CRIS and stopped adding items. The secretariat would send annual emails, collect data of employees and add this data themselves. They recognised considerable duplicates and wrongly classified outputs from the CRIS and OpenAire. They also mention an aspect of temporality: one item was a preprint, then became a published and peer-reviewed paper. It appears twice in the data. The category 'review articles' suffers a lot from misclassifications ranging from a literature review to an opinion paper. Felt uncomfortable with pub data.

<b>Existing data:</b> Abstracts Review articles Articles Comments/Letters to the Editor Preprints Report Web publications Posters Papers Letters	<b>Added aspects:</b> Scientific community contributions: - peer reviewing - editing / editorships - managing activities PhD Supervision Education Articles in newspapers Initiating scientific reflections in quarterly reports of the particular scientific field (journal).
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Table 10: Results and notes from data snapshots

### 7.3.2. *Conclusions*

In this section, we briefly outline some key aspects that emerged from the sketching-interviews. These can be read as indicative of topics and items that would deserve more inquiry in assessment of transdisciplinary research. In any case, these aspects are interesting as these show the boundaries of what actually can and cannot be grasped by research information infrastructures, whether proprietary or not.

#### **Temporality of research outputs**

Some respondents noted that duplicate items in the visualisation (and/or item list) change while retaining the same title. This is exemplified by one respondent who noted that at first, they published an article as a preprint, which then became an article after going through peer review. This was the case multiple times.

#### **Misclassifications**

There were multiple misclassifications that were spotted by the respondents, or at least resulted in confusion. This was particularly so in reference to the CRIS's output type 'Review Article', to which respondents had a wide array of publications attached that they did not understand as 'review' articles per se.

#### **OpenAIRE coverage**

What is striking is that in this small sample of five researchers, the use of OpenAIRE resulted in one added item that was not documented by the CRIS. This exceeds the ratio that we presented previously multiple times.

#### **(Transdisciplinary) grey literature**

Two of the respondents who engage strongly in transdisciplinary research with different communities mentioned a vast array of *objects* that become produced; but mechanisms are not in place (and the question is whether there should be) to capture these objects. This includes workbooks, or guides that are written for practitioners.

#### **(Extra-)academic collaborations**

Researchers that engage in collaborations, both academic and non-academic, tended to flag that these were missing in the representations that we presented them. This was in part due to choices in visualisation, as data of co-authors, for instance, exists in the datasets. We find it important to flag nonetheless; especially those collaborations that are non-academic, as these are untraceable as of now.

### Administrative processes

Being from different sections of the department, these researchers also experience different ways of actually documenting their work. While one once 'stumbled' on the CRIS and added items, including web publications, another respondent mentioned that the secretariat periodically collected the section's research works and documented these *for* the researchers themselves.

### Invisible work

In what has been mentioned as 'invisible work', most respondents spoke of 'scientific community work' as an integral part of their work that needs different evaluation processes and methods to recognise and make rewardable. This work includes editorships or peer reviews, for instance. For transdisciplinary research practice in particular, invisible work also spans community building and maintenance of long-term relationships, which some respondents flagged.

Additionally, what we find worth noting is that two interviewees, when being presented with their CRIS and OpenAIRE data (which spanned doctoral theses, articles and preprints), declared that they do not see themselves in this visualisation and avoided adding to this visualisation. As a result, they started a totally new sketch; and one of them also on a different sheet of paper. Upon following-up, our interpretation was that for them, academic objects are only *documentations* of what they understand being their 'actual' (transdisciplinary) research work, which they spoke of as 'direct impacts'.

## 8. Evaluation: discussion and recommendations

We will use this section as a space to share reflections and discuss recurring aspects. Whilst it does not follow SCOPE per se in that we don't evaluate our interventions, the idea is to capture learnings from the pilot for both OpenAIRE (and more widely other GraspOS research information services and tools) and the teams dedicated to the design and conduct of future research evaluations within the pilot institute.

Of course, there are several observations that we could address here, but we find it important to go back to the starting point of GraspOS and our pilot project. This is why we will discuss each SCOP(E)-step individually after an initial general reflection.

The way we read the inquiries that we conducted in each step is that they contribute to an increasingly clear picture of the (social, organisational and technical) complexity in which departmental research evaluations happen.

Finding open science therein is a fragmented affair. In our case, we found explicit associations to open science through the university-wide strategy and the strategy evaluation protocol as formulated by the Dutch knowledge institutions. From a 'bottom-up' perspective, open science concerns existed, albeit implicitly and mainly articulated themselves in aspects of societal impact, transdisciplinary research and generally concerns over societal value creation through science.

As all levels referred to transdisciplinarity<sup>31</sup> as one of the major concerns for doing science openly, we focused our efforts on its evaluation and tried to understand how GraspOS tools and services may play a role in it. After an assessment of existing tools and services, we decided to test with OpenAIRE data as an addition to the data sources that are already used for the departmental evaluation of the department, which is now, in May 2025, in planning. We also did so because our team may have direct, sustainable GraspOS impacts through being involved in that evaluation.

The main analysis revolved around the comparison of the CRIS and OpenAIRE data on the department with two focal points: one being the general comparison of *potential* data that is being monitored by each

<sup>31</sup> As mentioned earlier, there were various ways to refer to transdisciplinarity that all described similar concerns. Namely inclusive research processes across academic and non-academic actors.

provider. The other revolved around the extent to which usable data exists on the department for each provider. To highlight valued research practices that we had observed in the preceding analyses, we did a projection exercise where we estimated to what extent data from both providers affords making claims on transdisciplinarity. Finally, to sensitise our findings, we conducted exploratory interviews asking respective researchers to reflect on their existing data in view of their work on societal impact, which highlighted further a key insight from our work at UU: namely that the CRIS and OpenAIRE data are serving particular use cases and are limited especially with regard to their appropriation for transdisciplinary research evaluation. We provide a number of discussion points below regarding what can and cannot be grasped by this data.

### Grasping (aspects of) open science

In our case, we found that the same department is implicated in different movements that advocate for reconfiguring the value registers by which the organisational strategy is formulated and research is conducted and evaluated. One major source of this complexity emerges through the sheer interdisciplinary character of researchers that share the department. Everyone makes sense of and values their research with their own specific histories and field-specific epistemic practices.

As this diversity is sought to be accommodated in (Dutch) research assessments<sup>32</sup>, the *uniformity* of data provided – for instance by way of rehearsing dominant categories such as forms of knowledge transmission (research outputs) – is limiting in actualising the disciplinary diversity of the department. We found uniformity at odds in at least the following dimensions:

### Designed to work with research outputs

One major limitation of both datasets is that they have been shaped (and are the result of) infrastructures for research information that value *research outputs*. At the same time, we observe shifting value registers that highlight *processes* as ingredients of evaluation. For instance, we found strong emphasis on *activities*, *the intended and unintended results of events*, *relationships* and *collaborations* as key spaces where research happens in our observations on transdisciplinarity.

If we relate this to the data sources we compared, we can see some limitations. For instance, in OpenAIRE data categories, there is emphasis on *Content* as a matter of outputs; a dedicated 'Outputs' category; '*Open Access*', which again refers to outputs; '*Indicators*' that reinforce an output orientation (e.g. counting the number of downloads, views, citations, and calculating the relative popularity of an *output* in a specific field). *Publication details* and '*Groups belonging to output*' act similarly, where '*Publication Details*' can be understood as specifications of outputs. There are some sub-types of the OpenAIRE output category that transcend this object-focus. These include the sub-types 'Non-textual', 'Event/activity', and 'Membership'. Unfortunately, none of these subtypes were populated for the dataset concerning Copernicus Institute. As to the CRIS, the categories also seem to speak to outputs with some exceptions. Namely organisational data, person-specific data and affiliations.

This is not surprising as 'lock-in' happens in technological development<sup>33</sup> where research information infrastructures are shaped as much by the socio-political environment as they themselves shape research (assessment) cultures. They don't exist in vacuums, so to speak. At the same time, transcending this lock-in requires considerable effort, especially as the information infrastructures are not designed to accommodate for other logics of valuation. In the movement for responsible research assessment, this is bypassed with the argument that qualitative evaluative knowledge should be enrolled and that quantitative indicators serve particular use cases, which we agree with. This pilot leaves us wondering

<sup>32</sup> And is also advocated for Dutch national strategic interventions such as 'Room for Everyone's talent'. See <https://www.nwo.nl/en/position-paper-room-for-everyones-talent>.

<sup>33</sup> See, for instance Rip, A. and R. Kemp (1998), 'Technological change', in: Human choice and climate change: resources and technology (S. Rayner and E. L. Malone, eds.), Battelle Press: Columbus, 327-399



nonetheless how we can think of monitoring otherwise beyond the standard repertoire that is covered computationally already.

The two categories that are monitored by OpenAIRE that are not directly associated with outputs are 'Funding' and 'Author' information. As mentioned previously, these two categories are interesting in that they may allow the monitoring of (at least) formalised collaborations. Although informal collaborations – which often involve civil society in particular – would not appear by that approach.

### **Transdisciplinary research**

In view of what this kind of data can tell us about transdisciplinary research at the department, we need to realise that a lot of customisation or further developments would be needed by, for instance, expanding research funding data in order to make high-level claims about collaborations (although this wouldn't say anything about the *quality* of the collaborations) or find alternative strategies to monitor and capture them. As an example, currently, the existence of funding data in combination with organisational data (i.e. affiliations), as well as memberships and activities can (potentially) approximate evaluations of transdisciplinary research (or relations across actors, to be more specific), especially in combination with non-academic or quasi-academic outputs, such as 'External Research Report'. Nonetheless, care should be exercised as to what can actually be said about academic and non-academic collaborations, as this data usually refers to the former and the data is also targeted at monitoring academic achievements.

In this sense, it is sensible that currently, stories of societal impact, stakeholder engagements and transdisciplinary research are accounted for through short narrative cases that introduce the reader to a transdisciplinary research setting. Such qualitative descriptions can be enriched by, e.g. research outputs that are attached to these processes, but cannot sufficiently indicate the depth and quality of collaborations across academic and non-academic actors.

Overall, the emergence of transdisciplinarity comes with a shift of focus from *outputs* to *interactions* (Brenninkmeijer 2022). This presents a major challenge to both the CRIS and OpenAIRE, at least if they are to be appropriated for evaluation. Both datasets are not designed for monitoring interactions and as such only hardly accommodate informing claim-making about transdisciplinary research. Despite this finding, the CRIS demonstrates that potentially, *activities* and *events* could be documented to make sense of transdisciplinary encounters provided there is a reliable list of interlocutors of research.

### **Accuracy**

Another recurring issue that we found was accuracy. In particular, the data that we had to our availability suffered from duplicates (for instance because of the temporal changes to a research output, as mentioned earlier) or simply because of ambiguous naming and sourcing. Another issue of accuracy is the right classification of research objects into categories of research products (e.g. paper, preprint, review paper, other research product etc.). In most snapshot interviews, this issue was addressed by our respondents. Additionally, working through the comparative analysis also showed misclassifications (e.g. all 'other research products' were, in fact, papers) and we expect other ones as well for which we don't have the knowledge to determine.

We want to speak of accuracy as a matter of coverage. It was striking to us that OpenAIRE data had – in terms of unique items – a rather limited coverage of items associated with Copernicus Institute. We are unsure why that is (and inquiring about that would have transcended the pilot's focus). Inherently, this observation results in caution for how OpenAIRE data may be used as a source in (departmental) evaluations. For instance, understanding OpenAIRE as an *additional source* to CRIS data (next to other sources), could be interesting following an analysis of exactly what kind of data OpenAIRE can offer in contrast to what data exists in the CRIS.

## Control and customisation

A fourth and final aspect includes the possibility for customisation. This organisational consideration concerns a fundamental logic that is woven into each of the two data sources. That is, the CRIS can be conceived of as a data space that can be locally adapted as its information is collected locally by the researchers themselves. It is an intra-organisational affair. OpenAIRE in contrast offers an aggregation service by which the control of what data is submitted lies beyond Utrecht University (or the department in any case). This results in dependencies where instead of addressing dedicated employees of Utrecht University whose job is to maintain the CRIS for questions and requests for customisation, this process would have to go by employees of OpenAIRE. For instance, in order to increase accuracy of research output classifications, the departmental secretariats could prompt researchers to submit their activities, events and publications via the CRIS, which would result in real-time changes to the database that could be appropriated for evaluations. These organisational strategies for increasing data accuracy can only be done indirectly with OpenAIRE and would seem to import more dependencies (e.g. of future 'data dumps' as we have experienced with OpenOrgs in our classification of the department).

Finally, these considerations are telling of the *scope* and *scale* for which the CRIS and OpenAIRE can be used, respectively. While localised assessments ask for control over the kind of data that becomes monitored and by extension appropriated for evaluation, national-level, or international or European monitoring of open science, for instance, requires other data affordances for which e.g. OpenAIRE is probably better equipped.

## 9. Conclusion

The goal of this pilot was to critically examine what data and research information infrastructures is, and can be, used for evaluating open science at a departmental level of a university using the SCOPE approach. Based on a contextual assessment of how open science matters at the Copernicus Institute of Sustainable Development, Utrecht University, we learned that a key pillar of what is valued in open science at this institute relates to societal impact creation and transdisciplinary research. Taking this as a starting point for choosing options for evaluation we examined how data from Utrecht University's local repository and OpenAIRE data can together inform evaluation of transdisciplinary research from the institute. For this, we defined a framework that focuses on the evaluation of research *interactions*, rather than *outputs*.

In particular, we probed evaluation options based on data that the OpenAIRE colleagues provided us about the Copernicus Institute of Sustainable Development after we defined the parent-child relationships in OpenOrgs. This data was complemented and compared with data from UU's local repository. Both datasets were assessed for completeness and relevance for evaluation purposes with a specific focus on transdisciplinary research.

Once we defined research processes relating to societal impact creation and transdisciplinarity as 'units' of evaluation, we saw a lack of relevant research information from both UU's local repository and OpenAIRE. That is particularly so with respect to data on involvement of non-academic stakeholders and when activities are highly collaborative and show high levels of engagement (e.g. 'co-designing a course for professionals' or 'co-producing knowledge with non-academic stakeholders'). On the one hand, this emphasises the importance of reflexive and intent use of quantitative research information for those purposes. On the other hand, it leads to new questions on how to inform alternative forms of evaluation such as narrative descriptions or impact case- that do justice to these types of activities. These questions were also discussed with researchers in the department using snapshots of relevant data which they complemented with a diverse range of outputs, activities and events that they valued as an integral part of transdisciplinarity.

During the process we provided real-life feedback to the researchers and engineers of OpenAIRE and those managing the local repository at Utrecht University, showcasing how they can adapt their tools and services to a changing research landscape. In that sense, the pilot is allowed to sensitise the assumptions with which transition towards an Open Science-aware research assessment system is being approached and offers recommendations from the 'shop floor' of an academic institute focused on sustainability. In addition, the pilot also helped showcasing how transdisciplinary research processes can be an important unit of evaluation of an Open Science-aware research assessment system. Importantly, for the institute it generated valuable lessons about and experiences with OS-aware responsible research assessment. These lessons will be taken forward as part of future research assessment endeavours within the institute.

DRAFT

## 10. Appendix

### 10.1. Indicators used in the SEP self-evaluation

Target of assessment/monitoring Tools, services used*	Data source(s) **	Challenges***
<b>Composition of staff according to gender, nationality, age</b>	HRM System	See below
Share of female and male tenured staff		
Share of Dutch, other EU, non-EU tenured staff		
Nationalities of all staff and PhDs		
Nationalities of tenured staff, non-tenured staff and PhDs		
Age distribution tenured staff		
Number of research staff (#) and research capacity (fte) according to function		
<b>Funding and Expenditure</b>	(Beta) management system	See below
Total research capacity (fte) per year according to the source of funding		
Total research capacity (fte) per year and in % according to source of funding		
Total funding for research and education (kEUR) per year in %		
Expenditure on research, (kEUR) per year		
Expenditure on research, (kEUR) per year and in %		
Prestigious grants and transdisciplinary projects (ten highlights); narrative	Narrative; internal; questionnaire	See below
<b>Duration and success rate of the PhD Programme</b>	Management Systems	See below
PhD success rates, according to year of enrolment		
External PhDs, by number, organisation and status		
Type of first employer after graduation		
<b>Research products for peers</b>	UU profile pages (internal); NARCIS (national)	See below
Research products for peers, per year and format		
Publications between 2014-2020, by accessibility		
<b>Use of research products by peers</b>	Bibliometric analysis with the support of the Utrecht University Library: indexed in Scopus and covered by SciVal)	See below
Number of citations		
Average citation impact		
Average number of citations per publication		
Field Weighted Citation Impact (Top 10% and # and Top 1% and #)		

	Type of collaborations, based on affiliations of authors of articles, reviews and conference papers		
	Network visualisation of research collaborations		
	Research collaborations by number of joint publications with research organisations		
	Map of active research collaborations by countries of origin and number		
<b>Marks of recognition from peers</b>		Form***** the CRIS	See below
	Six highlights of marks of recognition by category		
	Examples of awards and scholarly prizes		
	Examples of keynote lectures at major conf.		
	Organisation of international scientific conf.		
	Editorships and editorial boards		
	Memberships of academies		
	Visiting professors, visiting fellows		
<b>List of awards by year, granting organisation and recipient</b>		the CRIS	See below
	Awards (miscellaneous)		
	Nominations		
	Citation awards		
	Paper awards		
	Poster and presentation awards		
	PhD and MSc supervision, student awards		
<b>Personal Grants</b>		the CRIS	See below
<b>Research products for societal target groups</b>		the CRIS	See below
	Published policy reports (national, European, global)		See below
	Visits on Copernicus Institute website		See below
	Examples of (research) interaction with stakeholders	Form; short text	See below
	Example of research output for different audiences	Form; short text	See below
<b>Use of research products by societal target groups</b>			See below
	News mentions related to publications	Altmetrics	See below
	Newspaper items (national, international)		
	Radio appearances		
	Television appearances		
	Other news items		
	Mention of publications in Wikipedia articles		
	Mentions of publications in blogs		
	Social media mentions (Facebook and Twitter)		

	<i>Mentions in policy documents</i>		
	<i>Publications co-financed by ministries in NL and abroad</i>		
	<i>Publications co-financed by the European Commission</i>		
	<i>Examples of co-creation, knowledge networks and platforms</i>	<i>Narrative</i>	<i>See below</i>
	<i>Examples of use of research products by societal target groups (international, national)</i>	<i>Narrative</i>	<i>See below</i>
	<b>Marks of recognition from societal target groups</b>	<i>Form</i>	<i>See below</i>
	<i>Examples of marks of recognition by societal target groups (films, presentations, committee membership, etc.)</i>		
	<b>Overview of PhD Courses offered</b>	<i>Form</i>	<i>See below</i>
	<i>PhD courses with contributions from Copernicus staff</i>		
	<b>List of top publications Copernicus Institute 2014-2020</b>	<i>Bibliometrics</i>	<i>See below</i>
	<i>Highlights (cross-)topical themes to highlight breadth, interdisciplinarity, societal relevance, scientific impact, collaboration across career stages (top 10%, 5%, 1% best cited).</i>		
	<b>Five detailed case studies to illustrate themes, interdisciplinarity, challenges and societal impact</b>	<i>Internal; narrative; Form</i>	<i>See below</i>

Table 11: Indicators used in the SEP self-evaluation

\*) indicators, metrics, monitoring tools (dashboards, PowerBI, aggregations, etc.), services supporting calculations, implementation, different templates (portfolio, cv, narratives, etc)

\*\*) include also if they are internal or external, national or international, if there are issues with quality of data, etc.

\*\*\*) limitations, restrictions, openness to interpretations, etc. to do with tools, services and/or data sources used

\*\*\*\*Textual examples were collected by one of the team members by creating a shared document, meeting with senior staff members and asking them to share examples.

\*\*\*\*\*Underlined terms need to be confirmed by the respondents. We have asked, but no reply came in yet.

## 10.2. Further methodological notes

### Deduplication

Deduplication was based on the first 20 and last 20 characters of the titles. If these matched with the next item's title's beginning and end, the initial row was considered a duplicate and excluded from the original table.

### Data processing

These are additions to the processing of OpenAIRE data in order to arrive at a workable and interpretable, deduplicated corpus of items attached to the Copernicus Institute.

## OpenAIRE

### 1. Deduplication.

- a. In order to determine the duplicates, all titles are ordered from a-z. Then, the first 20 characters and last 20 characters of the title are taken. If these match with the next row, then the current row is considered to be a duplicate of the next row. In such a case, the current row gets a "true" at the end, and this row is excluded from the original table. This methodology is imperfect. For example, looking at the title starting with "The PMIP4 contribution to CMIP6", it is evident that there are 4 rows with the same title, yet the ending of the title has different characters and therefore it is not observed. It is difficult to perform a quick analysis that is 100% accurate, and therefore this methodology is taken to be sufficiently functional to address that duplicate rows do in fact exist.
- b. In the duplicate rows, it happens that there exists data in one of the two rows that does not exist in the other row and vice versa. Therefore, in calculating the total occupancy of the table, the total number of instances are counted, but capped at 1095. This means that for any duplicate row, if only one of the two has a datapoint, the total will end up at 1095. However, if both duplicate rows contain a datapoint, then for the rest of the datapoints there will be an overestimation. This methodology is not perfect, but it is a simple calculation and still provides a good estimate for the total occupancy of the table.

### 2. Missing data based on triangulation

- a. In order to test the completeness of the data, we extracted OpenAIRE data from 2020-aug2025 and a sample of 21 titles from the CWTS database that then were compared to the titles of the data set retrieved from OpenAIRE. From this sample, five titles did not occur in the OpenAIRE data. This makes us question the completeness, and in extension quality, of the OpenAIRE corpus.

### 3. Notes on specific columns

- a. Subtitle is in about 90% of the cases only the part of the main title that comes after the ":", which makes it a duplicate of the main title. Only in 7 of the 138 occurrences with a subtitle, the subtitle was unique.
- b. Description sometimes has html coding ("`<p>`") or (???) coding ("`<jats:p>`"). Unnecessary.
- c. Language is very often Undetermined. Making a column for this is odd, since more often the values are left empty if the real data (e.g. if the journal is not known, it doesn't say "undetermined" but is simply left empty).
- d. Formats have a very strange format of the table. Most occurring are "application/pdf" and "image/pdf", but there are also some that have the format "text" and "pdf". Some of them are (page) numbers and others are variations on the "../pdf" or "text/..".
- e. BestAccessRight is always the same value, or empty.
- f. The starting page sometimes contains letters, and sometimes very high values (e.g. 129758).



- g. Author names have strange characters in them. Either not properly retrieved or the source material is wrong. Could be given attention.
- h. Funding data seems very accurate, especially when focusing on the projects. The "publiclyFunded" column is very scarcely populated and mainly contains FALSE values, even when the funder is "EU".
- i. The contributors and organisations are poorly aligned. In the sense that a result with many organisations sometimes only has one contributor.
- j. The countries do not always overlap with the countries that could be derived from the "organisations" column. The second result (Title: Conceptual framework for the study of food waste generation and prevention in the hospitality sector), for example, has as countries Malaysia and Netherlands, where the UK should really also be in there (universities Leeds and De Montfort).

## CRIS

### 1. Obtaining API Key and authorisation

- a. See the CRIS API documentation here<sup>34</sup>
- b. We received the API key from the person responsible for the CRIS at Utrecht University

### 2. Ricgraph

- a. Installed 'Virtualbox', and a virtual machine with Ubuntu 24.04.02
- b. Installed the make command
- c. Then followed Ricgraph documentation from point 1.1 until step 4.0<sup>35</sup>
- d. Afterwards, we checked the initiation file (ricgraph.ini) and edited the UU URL portal and the UU URL API key
- e. Edited harvest\_CRIS\_to\_ricgraph.py so that running it would provide the dataset of all entries from only 2025 to test for errors
- f. Afterwards, the harvest file was edited to harvest the data per year from 2020-2025.
- g. The jsons that existed in the /ricgraph\_venv/harvest folder were transferred outside of the virtual environment for transcription to csv

### 3. Filtering Copernicus Institute (department)

- a. Filtering was done by first determining the organisation names that were part of the Copernicus Institute by filtering out all organisation names containing the word "university" and then manually looking through the dataset to check the names that could be part of the GEO faculty.
- b. This was done by including any words such as "geography", "innovation", "sustainability". Then, from that list, samples of authors were taken to assess whether that person was part of the CIRD.

<sup>34</sup> See <https://research-portal.uu.nl/ws/api/documentation/user-guide/api-keys.html>. Accessed 14.05.2025

<sup>35</sup> See [https://docs.ricgraph.eu/docs/ricgraph\\_install\\_configure.html](https://docs.ricgraph.eu/docs/ricgraph_install_configure.html). Accessed 14.05.2025

- c. If that was the case, then the organisation name that the person was ascribed to was also considered part of the CISD.
- d. This was later verified using the organisation's csv file that was included in the harvest folder. This led to both having 28 organisation names under the CISD, therefore having double verified that the data was correct.

### 10.3. Potential objects of evaluation of the OpenAIRE dataset

Category	Column (ideal)	Content
Identifier	id	OpenAIRE internal Identifier
	doi	Digital object identifier
	originalIds	Other identifiers for OpenAIRE internal use
	pids	persistent identifiers
Content	mainTitle	Title of the output
	subTitle	Subtitle of the output
	description	Summary of the output
	subjects	Keywords related to the content of the output
	language	Language the output is in
	coverages	The time and/or locations covered by the publication
	geoLocations	Geolocation information
Output	type	See output types
	sub_type	See output types
	formats	See output types ( <a href="https://www.iana.org/assignments/media-types/media-types.xhtml">https://www.iana.org/assignments/media-types/media-types.xhtml</a> )
Open Access	isGreen	Whether the output has at least the Green Label for Open Access
	isInDiamondJournal	Whether the resource is in a Diamond journal
	BestAccessRightCode	The code describing the level of Open Access (according to COAR <a href="https://vocabularies.coar-repositories.org/documentation/access_rights/">https://vocabularies.coar-repositories.org/documentation/access_rights/</a> )
	BestAccessRightLabel	The label describing the level of Open Access (from COAR label)
	openAccessColor	The Open Access colour of the output (levels: gold, hybrid or bronze)
	embargoEndDate	Date when embargo ends and result becomes open access
Indicators	downloads	Number of downloads an output has
	views	Number of views an output has
	citationCount	Number of citations an output has
	impulse	Initial momentum of output, based on citation network
	influence	Popularity of output over the whole period, based on citation network
	popularity	Current popularity of output, based on citation network
Publication details	publisher	The name of the entity that holds, archives, publishes prints, distributes, releases, issues, or produces the resource.
	publicationDate	The date on which the resource is published
	journal (from container)	Name of journal or conference
	volume	Volume in which the resource appears

	startingPage	Page on which the resource starts
	endingPage	Page on which the resource ends
	collectedFrom	Information about the sources from which the record has been collected
	dateOfCollection	Date on which the output is collected for the document containing the data
	lastUpdateTimeStamp	Timestamp of last update of the record in OpenAIRE
	sources	A Reference to a resource from which the present resource is derived
	version	Version of the result
Funding	publiclyFunded	Whether the resource is publicly funded
	Project (definition)	List of projects (i.e. grants) that (co-)funded the production of the research results
	acronym	Abbreviated project title
	project_title	Project title
	funding_stream	Stream of funding (e.g. for European Commission can be H2020 or FP7)
	jurisdiction	Geographical jurisdiction (e.g. for European Commission is EU, for Croatian Science Foundation is HR)
	funder_name	The name of the funder (e.g. European Commission)
Author	authorFullName	The full name of an author
	authorOrcid	The ORCID identifier of an author
	authorRank	The rank of an author
Groups belonging to output	countries	The different countries related to the output
	communities	The OpenAIRE communities the output is part of
	contributors	Contributors for the result
	organisations	List of organizations in an affiliation relation with the research results

Table 13: Complete overview of item categories in OpenAIRE dataset

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## Annex 3. Mapping of evaluated products and qualifications at CNR

In this appendix, we report our exercise in mapping the possible sources for the products and qualifications denoted from CNR as possible evaluation items to present in the application for 2023 competitive calls. For this selection, the application has been entirely manual<sup>36</sup>, i.e., not facilitated by automatic components, via templates to be filled in document editors and online forms on the [CNR online platform](#). However, we posed ourselves the following question: *could an evaluator retrieve structured information about a research product or qualification they intend to include in their application from an open data source or service, rather than having to support the claim solely with unstructured evidence, such as attached files?*

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<sup>36</sup> Considering an optimistic estimation of two weeks (10 full working days) to prepare the application, multiplied by 3.864 applicants, yields a total of ~105 years “lost” in preparing for the evaluation.

**Legend:**

y - yes

n - no (to the best of our knowledge)

~ - partially

? - unknown/hard to verify

! - most probably

Unstructured sources of information: web pages (web), email exchange (email), digital documents (files), official documental proof (CNR prot), originals, hard-copies and printouts (physical).

ID	Original description [Italian]	Translated description [English]	Structured information				Unstruct .
			CNR IRIS	GraspOS sources	Other open sources	Oth. closed sources	
P1	Contributo in rivista [articolo, lettera, review, perspective, software/data paper, recensione, scheda bibliografica, traduzione, nota a sentenza]	Journal contribution [article, letter, review, perspective, software/data paper, review, bibliographic record, translation, note on judgment]	y	y	y	y	web physical files
P2	Contributo in volume [capitolo, saggio, prefazione/postfazione, introduzione, voce (in dizionario o enciclopedia), traduzione, recensione, scheda di catalogo]	Contribution in volume [chapter, essay, preface/afterword, introduction, entry (in dictionary or encyclopedia), translation, review, catalog card]	y	y	y	y	web physical files

P3	Libro [monografia o trattato scientifico; edizione critica; curatela di volume o trattato con capitolo, pubblicazione di fonti inedite; traduzione di libro]	Book [monograph or scientific treatise; critical edition; editorship of volume or treatise with chapter, publication of unpublished sources; book translation]	y	y	y	y	web physical files
P4	Contributo in Atti di Convegno e poster	Contribution in Conference Proceedings and poster	y	y	y	y	web physical files
P5	Brevetto	Patent	y	y	y	y	web physical files
P6	Banca Dati, Software, Data set	Database, Software, Data set	y	y	y	y	web files
P7	Progetti e prototipi [disegno; technical design report; progetti architettonici o opere di design; prototipo di strumentazione; prototipo d'arte e relativi progetti]	Projects and prototypes [drawing; technical design report; architectural projects or design works; instrumentation prototype; art prototype and related projects]	y	~	?	?	web physical files
P8	Esposizione; Mostra; Applicazione o prodotto multimediale (video o documentario)	Exhibition; Show; Application or multimedia product (video or documentary)	y	~	?	?	web physical files
P9	Prodotto cartografico o mappa	Cartographic product or map	y	~	?	?	web physical files



P10	Concordanza; indice; bibliografia critica o ragionata; commento scientifico	Concordance; index; critical or annotated bibliography; scientific commentary	y	~	?	?	web physical files
P11	Relazione o Rapporto tecnico [rapporto pubblicato in repository di istituzione scientifica o inviato a committenti interni o esterni all'Ente; deliverables di progetti nazionali o internazionali]	Report or Technical Report [report published in the repository of a scientific institution or sent to internal or external clients of the Institution; deliverables of national or international projects]	y	y	y	y	web physical files
Q1	Responsabilità scientifica per progetti di ricerca internazionali e nazionali, ammessi al finanziamento sulla base di bandi competitivi che prevedano la revisione tra pari	Scientific responsibility for international and national research projects, admitted to funding on the basis of competitive calls that include peer review	n	y	?	!	email files web CNR prot.
Q2	Responsabilità di campagna di rilevamento/scavo archeologico	Responsibility for archaeological survey/excavation campaign	n	n	?	!	email files web CNR prot.
Q3	Responsabilità di infrastruttura di ricerca	Responsibility for research infrastructure	n	n	?	!	web email CNR prot.
Q4	Partecipazione a progetti di ricerca internazionali e nazionali, ammessi al finanziamento sulla	Participation in international and national research projects, admitted to funding	n	y	?	!	email web files

	base di bandi competitivi che prevedano la revisione tra pari	on the basis of competitive calls that include peer review					CNR prot.
Q5	Partecipazione a campagna di rilevamento/scavo archeologico	Participation in archaeological survey/excavation campaign	n	n	?	!	email web files CNR prot
Q6	Partecipazione a infrastruttura di ricerca	Participation in research infrastructure	n	n	?	!	email web files CNR prot
Q7	Responsabilità di studi tecnico/scientifici o di gruppo di ricerca	Responsibility for technical/scientific studies or research group	n	n	n	!	web files CNR prot
Q8	Attribuzione di incarichi di ricerca (fellowship) presso istituzioni di ricerca	Awarding of research assignments (fellowship) at research institutions	n	n	?	!	web files CNR prot
Q9	Direzione d'Istituto	Institute Directorate	n	n	n	!	web files CNR prot
Q9 a	Direzione di Istituto f.f., o Responsabile di sede secondaria	Acting Institute Directorate, or Head of secondary office	n	n	n	!	web files CNR prot
Q10	Incarichi di docenza universitaria	University teaching assignments	n	n	n	!	web files

Q1 0a	Altri incarichi di docenza	Other teaching assignments	n	n	n	!	web files
Q11	Partecipazione a Commissioni di valutazione e monitoraggio di programmi e progetti di ricerca, e di Istituzioni di ricerca	Participation in Evaluation and Monitoring Committees of research programs and projects, and of Research Institutions	n	n	n	!	email web files CNR prot.
Q11 a	Partecipazione a commissioni di valutazione per l'attribuzione di posizioni lavorative a tempo indeterminato o passaggi di carriera presso Istituzioni nazionali o estere, commissioni di dottorato e specializzazione medica	Participation in evaluation committees for the assignment of permanent positions or career advancements at national or foreign institutions, doctoral and medical specialization committees	n	n	n	?	email web files CNR prot.
Q1 2	Incarichi di direzione di associazioni, fondazioni e società scientifiche nazionali o internazionali	Management positions in national or international associations, foundations and scientific societies	n	n	n	!	email web files CNR prot.
Q1 3	Partecipazione a organi e organismi di natura tecnico-scientifica o gestionale nazionali o internazionali	Participation in national or international technical-scientific or management bodies and organizations	n	n	n	?	email web files
Q1 4	Direzione di riviste e collane scientifiche	Direction of scientific journals and series	n	n	n	y	email web

Q1 5	Coordinamento di congressi o eventi scientifici nazionali o internazionali	Coordination of national or international congresses or scientific events	n	n	n	y	email web files
Q1 6	Partecipazione a comitati di redazione e comitati scientifici ed editoriali (Editorial Board) di riviste/collane, enciclopedie nazionali o internazionali	Participation in editorial boards and scientific and editorial committees (Editorial Board) of national or international journals/series, encyclopedias	n	n	n	y	email web files
Q1 7	Assegnazione di "ERC Grant" o altri premi e/o riconoscimenti nazionali ed internazionali assegnati da Istituzioni scientifiche di particolare rilevanza e prestigio, inclusa l'affiliazione ad accademie di riconosciuto prestigio nel settore	Awarding of "ERC Grant" or other national and international prizes and/or recognitions awarded by scientific institutions of particular relevance and prestige, including affiliation with academies of recognized prestige in the sector	n	n	n	!	email web physical files
Q1 8	Lezioni magistrali ad invito / Keynote in congressi nazionali e internazionali	Invited lectures / Keynotes at national and international congresses	n	n	n	?	web email
Q1 9	Incarichi di consulenza e supporto tecnico-scientifico	Consultancy and technical-scientific support assignments	n	n	n	?	email web files
Q2 0	Incarichi di diplomazia scientifica, e/o di Addetto Scientifico presso rappresentanze diplomatiche e	Assignments in scientific diplomacy, and/or Scientific Attaché at diplomatic	n	n	n	?	email web files

	organismi internazionali, supporto alle istituzioni europee come Esperto Nazionale Distaccato	representations and international organizations, support to European institutions as a Detached National Expert					
Q2 1	Attività di certificazione	Certification activities	n	n	n	?	email web files
Q2 2	Attivazione e partecipazione di Start-up e Spin-off	Activation and participation in Start-ups and Spin-offs	n	n	n	!	email web files
Q2 3	Organizzazione di iniziative ed eventi di divulgazione (public engagement)	Organization of outreach initiatives and events (public engagement)	n	n	n	?	email web files multimedia
Q2 4	Incarichi tecnico-gestionali interni all'Ente (responsabilità o coordinamento di Laboratorio, di Apparato sperimentale, di altra struttura di valenza scientifica, responsabilità gestionale di progetto o programma di ricerca, Responsabile Unico del Procedimento per gare sopra soglia comunitaria per strumentazione scientifica)	Technical-managerial assignments within the Institution (responsibility or coordination of Laboratory, Experimental Apparatus, other structure of scientific value, managerial responsibility for research project or program, Single Responsible for the Procedure for tenders above the EU threshold for scientific instrumentation)	n	n	n	y	email web files CNR prot.

Q2 5	Posizioni organizzative ad alto contenuto professionale (es. DPO, RSPP, Tecnico Sicurezza Laser, Radioprotezione, Medico competente)	Organizational positions with high professional content (e.g. DPO, RSPP, Laser Safety Technician, Radiation Protection, Competent Doctor)	n	n	n	y	email web files CNR prot.
Q2 6	Abilitazione scientifica nazionale	National scientific qualification	n	n	n	y	email files
Q2 6a	Abilitazione professionale	Professional qualification	n	n	n	y	email files
Q2 7	Supervisione studenti di dottorato	Supervision of doctoral students	n	n	n	y	email files web
Q2 8	Incarichi gestionali interni all'Ente (es. responsabilità di strutture amministrative, delega di funzioni dirigenziali)	Internal management assignments within the Institution (e.g., responsibility for administrative structures, delegation of managerial functions)	n	n	n	y	email files CNR prot. web
Q2 9	Incarichi tecnico-amministrativi (Responsabile Unico del Procedimento, Responsabile del Procedimento di selezione del personale, Direzione dei lavori, Coordinatore della sicurezza in fase di progettazione o di esecuzione lavori, Direzione esecuzione contratto,	Technical-administrative assignments (Single Procedure Manager, Manager of Personnel Selection Procedure, Works Management, Safety Coordinator during the design or execution phase of works, Contract	n	n	n	y	email files CNR prot. web

	Responsabili di procedimenti amministrativi, ed altri non menzionati da specificare)	Execution Management, Heads of administrative procedures, and others not mentioned to be specified)					
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DRAFT



## Annex 4. University of Belgrade

### Pilot overview

The [University of Belgrade – Faculty of Chemistry](#) is piloting a new research assessment model grounded in the principles of Open Science and responsible metrics. At the heart of this initiative is the institutional repository [Cherry](#), which supports collecting and disseminating the Faculty's research outputs. More about the goals of this pilot [here](#).

### Activities

Many different activities were planned and realized to meet the Pilot's objectives, among which are the following:

- **UNIBE team meetings** – A team consisting of one librarian (Ana Bošković), a developer (Vladimir Otašević), and three junior researchers (Slađana Savić Jovanović, Mihajlo Kulizić, Aleksa Savić) had multiple meetings to brainstorm ideas regarding the reward system and its integration within the external application "Authors, Projects, Publications" (APP) of the Cherry repository. More about the APP will be provided later in this report.
- **WPs meetings** – UNIBE team members also attended WP2, WP5, and WP6 meetings to stay updated with the tasks planned and completed within the respective WPs by other GraspOS partners.
- **Data Management Plan for Cherry repository** – This plan was prepared and added to [Deliverable D1.2: Data management plan \(DMP\)](#), pages 35-46.
- **Upgrading the Rulebook on Open Science at the UNIBE** – This activity is ongoing and not yet completed due to current challenges in Serbia. The aim is to revise and align the [current rulebook](#) with the national [Open Science Platform 2.0](#) and integrate a new researcher reward system.
- **Workshops** – One workshop titled "[Open Science and GraspOS at the Faculty of Chemistry](#)" was held in Serbian by Ana Bošković for UNIBE's researchers on 16 May 2024. Attendees were involved in a discussion on the practical implementation of open science principles. With a focus on responsible research assessment, the session highlighted exemplary practices aligned with the objectives of the GraspOS project. Following the presentation, an open discussion allowed attendees to discuss the specific requirements of the scientific community within the UNIBE. The GraspOS project UNIBE team provided insights into both completed milestones and upcoming tasks.
- **Community of Practice (CoP)** – Held on 22 January 2025 and titled "[Monitoring Open Science at university level for research assessment](#)", this CoP session was focused on university-level

monitoring of Open Science. Speakers were: Rita Morais (European University Association), Biljana Kosanović (University of Belgrade), Ana Bošković (University of Belgrade), and Nicolas Fressengeas (University of Lorraine) shared different angles of the discussion. The speakers from the University of Belgrade presented [Open Science Platform 2.0](#), the overview of the Open Science University of Belgrade, [Cherry repository](#), and the [OpenAIRE Monitor Dashboard for the University of Belgrade](#).

- **Lectures** – One lecture titled

“[Project, Network and Initiative - GraspOS](#)” was given by Ana Bošković at the Open Science Day V at the University of Belgrade, Serbia, on November 5, 2024. Another lecture titled “[GraspOS Pilot activities](#)” was given by Slađana Savić Jovanović at the BEAMING Hybrid Open Science clustering event, held at the University of Novi Sad, Serbia, on November 18, 2024. In those lectures, Cherry repository, GraspOS project, and UNIBE pilot were presented. Another lecture titled “[News in open science and research data management](#)” was held by Ana Bošković on the novelties in Open Science, GraspOS activities and research data management on 14 January 2025.

- **Development of the rewarding system** – To enhance open science practices at the UNIBE, a badge-based reward system has been developed. By recognizing researchers who actively self-archive publications in the institutional repository and participate in Open Science trainings, this system aims to stimulate a more engaged research community. The badges are awarded for specific actions, such as self-archiving publications, attending workshops, and sharing research data, at the individual and departmental levels. These [badges](#) are now visible within the "APP", the external application, within the column “Openness metric [Test]”. The evaluation and testing are ongoing. By examining each case, the UNIBE team is examining how badges motivate researchers to self-archive peer-reviewed versions. In the final phase, the effectiveness of the new institutional rulebook will be evaluated.

- **Dissemination**

- *Conferences* – the GraspOS project and the UNIBE activities were presented at two international conferences:
  - Bošković A. Scientific integrity at the University of Belgrade – Faculty of Chemistry, in the context of responsible research assessment. In the International Scientific Conference: Scientific and Publishing Integrity in Biomedicine, Skopje, 25th April 2024. 2024; [https://hdl.handle.net/21.15107/rcub\\_cherry\\_6501](https://hdl.handle.net/21.15107/rcub_cherry_6501)
  - Bošković A. Communication in the Multiverse of a Library. in the 7th international workshop: Communication of Science and Literature in the multiverse, Aegina, Greece, July 3-5, 2023. 2023; [https://hdl.handle.net/21.15107/rcub\\_cherry\\_6502](https://hdl.handle.net/21.15107/rcub_cherry_6502)
- *Website and social media* – the GraspOS project and the UNIBE activities were shared on UNIBE’s and the Library’s website and social media (in Serbian)
  - <https://www.chem.bg.ac.rs/pz/news1.py?q=4405&l=0>
  - <https://www.chem.bg.ac.rs/pz/news1.py?q=4217&l=0>

- <https://www.chem.bg.ac.rs/pz/news1.py?q=4139&l=0>
- <https://www.chem.bg.ac.rs/pz/news1.py?q=4034&l=0>
- <https://graspos.eu/connecting-the-dots-monitoring-open-science-at-university-level-for-research-assessment>
- *Interviews* - Two interviews with Ana Bošković were posted on the GraspOS project website
  - Inside stories from the pilot studies:  
<https://graspos.eu/inside-stories-from-the-pilot-studies-open-science-and-responsible-research-assessment-strategies-at-the-university-of-belgrade-faculty-of-chemistry>
  - Connecting the dots:  
<https://graspos.eu/connecting-the-dots-monitoring-open-science-at-university-level-for-research-assessment>
- *Magazine* – the GraspOS project was also disseminated through the UNIBE's students' magazine "Pozitron" (in Serbian)
  - <https://cherry.chem.bg.ac.rs/handle/123456789/6504>
  - <https://cherry.chem.bg.ac.rs/handle/123456789/6503>

## Lessons learnt

- Importance of interdepartmental collaboration: The UNIBE team meetings highlighted the crucial role of close collaboration between librarians, developers, and researchers for effective brainstorming and integration of new systems like the reward system within existing applications (APP).
- Challenges in policy alignment: The ongoing effort to upgrade the Rulebook on Open Science revealed that external factors, such as unpredictable crises, can significantly impact the timeline for policy revisions and alignment with national platforms. This emphasizes the need for flexibility and contingency planning in project timelines.
- Initial positive reception of reward system: The initial evaluation and testing of the badge-based reward system indicate a promising approach to incentivize Open Science practices. Observing how badges motivate researchers to self-archive provides valuable data for further refinement.
- Ongoing need for advocacy and training: Despite various activities, the continuous development of the rewarding system and the ongoing evaluation underscore the need for sustained advocacy and training to ensure widespread adoption and understanding of Open Science principles and tools.

**The plan for the future period includes:**

- The evaluation and testing of the reward system by examining each case;
- Finalization of the Rulebook on Open Science at the UNIBE;
- Development of training modules for researchers;
- The examination of the effectiveness of the new institutional rulebook;
- Exploration of departmental recognition;
- Long-term monitoring and impact assessment.

## Annex 5. INRAE: OpenAIRE

**Table 1.** List of databases used in this work

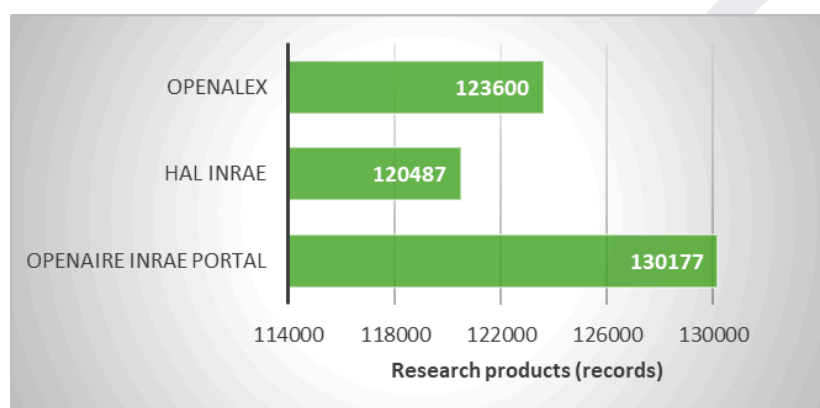
Database	Description	Purpose	Justification	Website
HAL INRAE	Multidisciplinary open-access archive for sharing research outputs, published or unpublished.	Benchmark INRAE portal data	Most comprehensive INRAE data source	<a href="http://hal.inrae.fr">hal.inrae.fr</a>
OpenAlex	Open scientific knowledge graph aggregating scholarly metadata.	Benchmark INRAE portal data	Dataset closely aligned with OpenAIRE Graph	<a href="http://openalex.org">openalex.org</a>
Lens	Open knowledge base aggregating metadata from academic publications, patents, and biological sequences.	Patent comparison	Dataset similar to OpenAIRE Graph	<a href="http://lens.org">lens.org</a>
Espacenet	Free online service providing access to the European patent register.	Patent comparison	Official reference source for patents at INRAE	<a href="http://worldwide.espacenet.com">worldwide.espacenet.com</a>
BBI (Base Bibliométrique Interne)	INRAE's internal bibliometric database generates production indicators. Based on Web of Science (WOS) and enriched with HAL INRAE data. Manual content validation (e.g., affiliations).	Data validation (e.g., INRAE-associated DOIs)	Internally enriched and validated data within INRAE's WOS scope	<a href="http://indicateurs-ist.inrae.fr">indicateurs-ist.inrae.fr</a>
BSO (Baromètre Science Ouverte)	Database from the French Ministry of Higher Education and Research (MESRI), fed by open data sources (HAL, PubMed, Unpaywall, DOAJ, etc.). National reference dataset on open science in France.	Compare open science indicators	Nationally recognized reference data on open science	<a href="http://barometredelascienceouverte.esr.gouv.fr">barometredelascienceouverte.esr.gouv.fr</a>

**Table 2.** Parameters, filters, and date of access used for searching research outputs in the different databases.

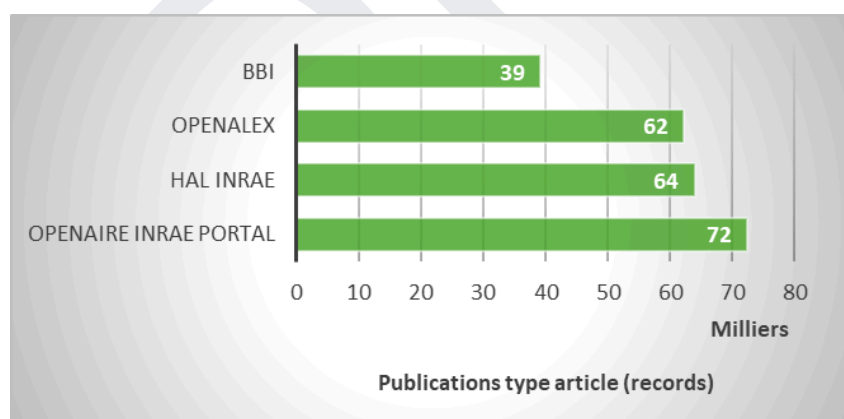
Parameter	Database	Document Type	Filters	URL	Date of access
Research outputs					
	OpenAIRE portal	Research products	Year range: 2017-2022	<a href="https://opensearch.inrae.fr/">Openaire/search</a>	December 19, 2024

	HAL INRAE	Dépôts	Publication Date: 2017+2018+2019+2020+2021+2022	<a href="#">HAL/search</a>	December 19, 2024
	OpenAlex	Works	Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement ; year range : 2017-2022	<a href="#">Openalex/search</a>	December 20, 2024
Article-type documents					
	OpenAIRE portal	Article	Research products: type article; document type: Publications; Year range: 2017-2022;	<a href="#">OpenAire/search/publications</a>	January 8, 2025
	HAL INRAE	Article dans un revue	PublicationDate 2017+2018+2019+2020+2021+2022; type de document: article dans un revue	<a href="#">HAL/search/publications</a>	January 8, 2025
	OpenAlex	Article	Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement i4210088668; year range 2017-2022; Type: article	<a href="#">OpenAlex/search/publications</a>	January 8, 2025
Patents					
	OpenAIRE portal	Patents	Year range: 2017-2022; Research products: type article; document type: Patents; Year range: 2017-202	<a href="#">Openaire/search/patents</a>	November 25, 2024
	HAL INRAE	Patent	Publication Date 2017+2018+2019+2020+2021+2022; Type de document: Brevet	<a href="#">HAL/search/patents</a>	November 28, 2024
	Espacenet	Brevets	Smart search: pd = "2017:2022" AND pa = "INSTITUT NATIONAL DE RECH POUR L'AGRICULTURE L'ALIMENTATION ET L'ENVIRONNEMENT"; Langue de la requête: en / de / fr; Demandeurs - pays: FR	<a href="#">Espacenet/search/patents</a>	November 25, 2024
	Lens	Patents	Patent Search; Published Date = (2017-01-01 - 2022-12-31 ) Document Type = ( Patent_application ) Applicant Name Exact = (Inra Institut National De La Rech Agronomique, Inst Nat De La Rech Agronomique Inra, Institut National De Rech en Informatique Et en Automatique Inria, Institut National De Rech Pour Lagriculture Lalimentation Et L'environnement Inrae)	<a href="#">Lens/search/patents</a>	November 25, 2024
Open Science					
	OpenAIRE portal	Article	Filters: Access-Open Access; Type-Publication; Document type-Article; Year range- 2018-2022 (a search by year)	<a href="#">OpenAIRE/search/OS</a>	November 26, 2024
	BBI	Publications with DOI	Indicators INRAE via LODEX without filtering, using the "browse results" tab	<a href="#">BBI/search/OS</a>	November 28, 2024
	BSO	Publications with DOI	Open access rate evolution of INRAE scientific publications by year (a search by year). Observation of 2023	<a href="#">BSO/search/OS</a>	November 28, 2024
FOS					

OpenAIR E portal		Research products: type article; document type: Publications; Year range: 2017-2022; distribution across the six main categories	<a href="#">OpenAIRE/search/FOS</a>	November 28, 2024
BBI		Using Lodex. Directly, without filtering, using the "browse results" tab. Top 10 out of 230 disciplinary fields.	<a href="#">BBI/search/FOS</a>	November 28, 2024
HAL INRAE		Publication date 2017+2018+2019+2020+2021+2022; Document type: Article dans une revue. Distribution across the thirteen fields,	<a href="#">HAL/search/FOS</a>	November 28, 2024

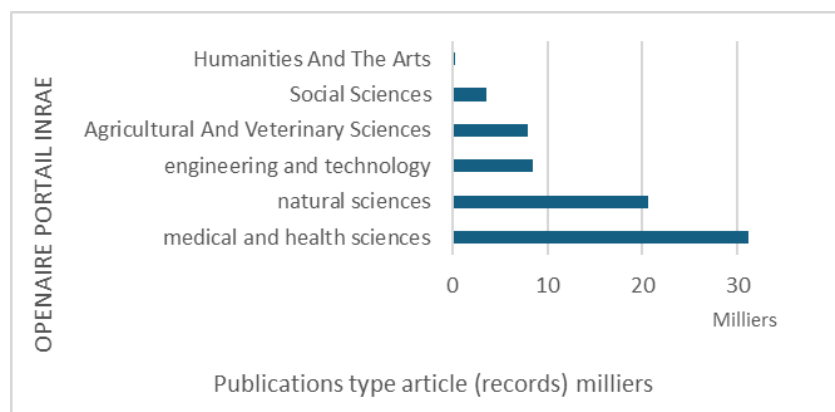


**Figure 1.** INRAE research products across different databases for the period 2017-2022. (Data from December 19-20, 2024)

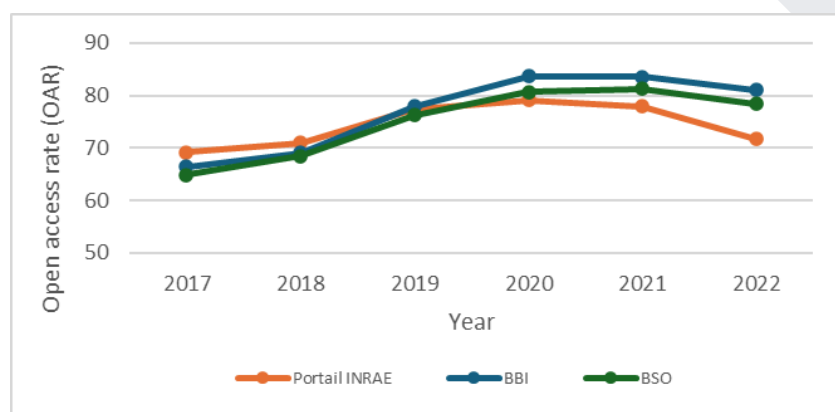


**Figure 2.** Number of article-type publications recorded across different databases for the period 2017-2022. (Data from January 8th)

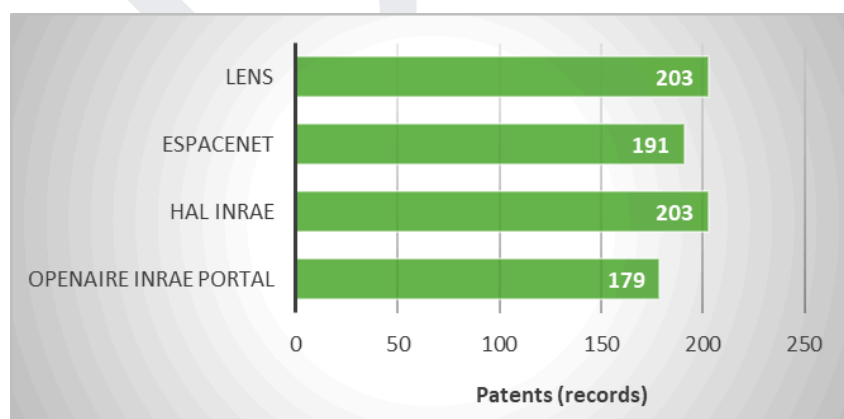




**Figure 3.** Distribution of article-type publications across the six main categories of INRAE's portal OpenAIRE. (Data from November 2024)



**Figure 4.** Open access rate (OAR) of article-type publications for each year of the period (2017-2022). OAR = Number of "Open Access" articles \* 100 / Total number of articles. (Data from November 2024)



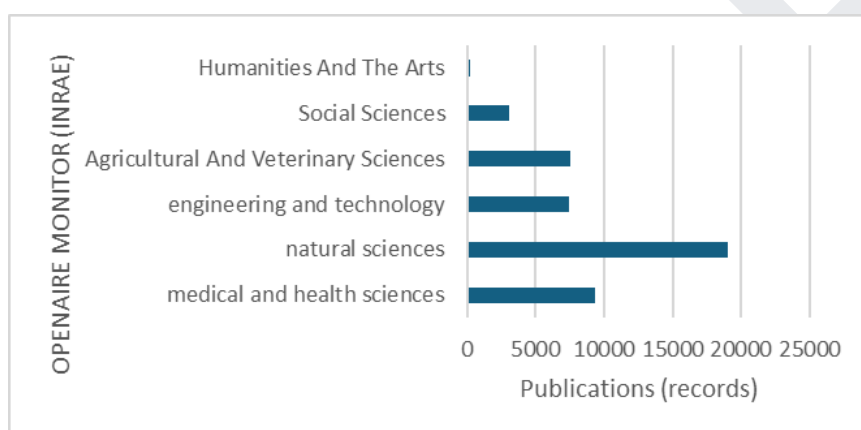
**Figure 5.** Number of patents registered across different databases for the period 2017-2022. (Data from November 2024)

### Key Findings Regarding OpenAIRE MONITOR

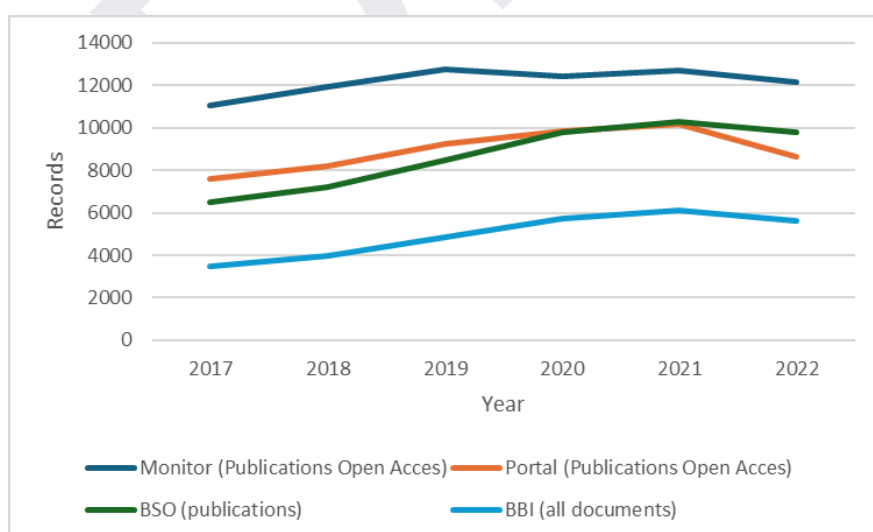
Monitor offers an excellent opportunity to track multiple aspects, including research priorities and topics, community networks, and the mapping of access to and reuse of resources. We are very excited about this tool and its potential. However, we have experienced some connection issues with the platform, which caused a delay in our analyses and, consequently, in the results.

We started with a general overview of the dashboard, with a focus on two key aspects: FOS (Figure 6) and Open Science (Figure 7). Surprisingly, our initial observations suggested that the results from Monitor differed from those of the INRAE's portal.

Shortly, in close collaboration with the OpenAIRE team, we will work to gain a deeper understanding of the reasons behind these differences.



**Figure 6.** Distribution of publications across the six main categories of INRAE's MONITOR. (Data Export from Monitor on February 5, 2025)

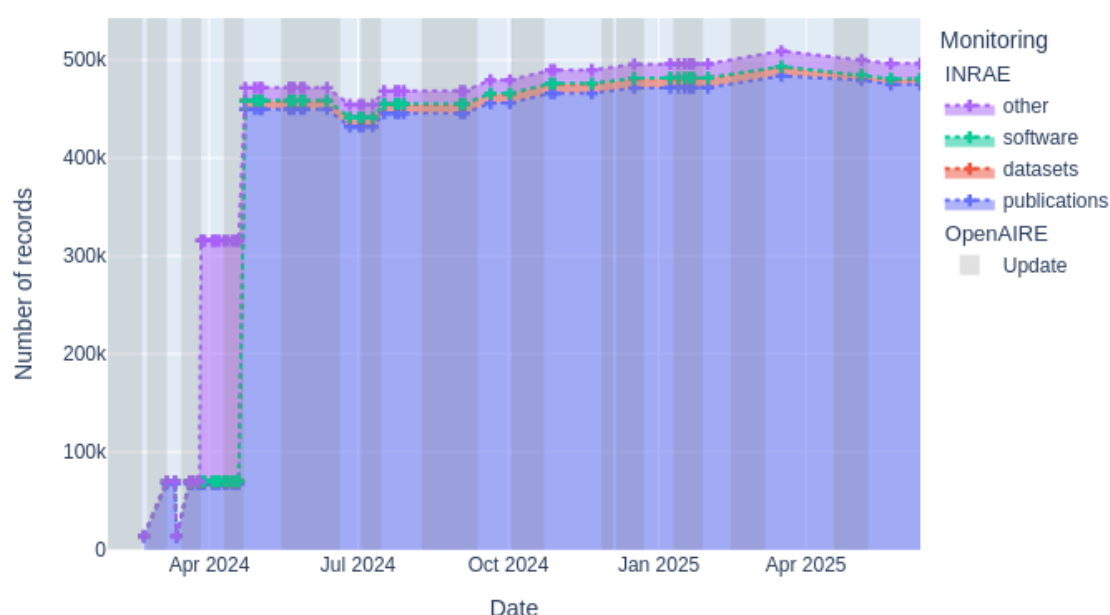


**Figure 7.** Evolution of open science from 2017 to 2022, comparing data from different sources (Data Export from Monitor in February 2025)

### **Key Findings Regarding the OpenAIRE GRAPH**

OpenAIRE Graph Dataset can be accessed not only through the gateway (INRAE portal) but also via several Application Programming Interface (API) and as dumps. Thus, we also observed OpenAIRE graph through its [Search API](#).

HAL INRAE was not registered as a data source in OpenAIRE. The registration request was submitted on March 7, 2024. As shown in Figure 8, the first changes appeared several days later. Initially, the records were not properly recognized and were classified as “other”. Currently, the API contains nearly 500,000 INRAE’s records, primarily publications.



**Figure 8:** Monitoring of OpenAIRE Graph ([source code](#)). Number of records associated with INRAE through time

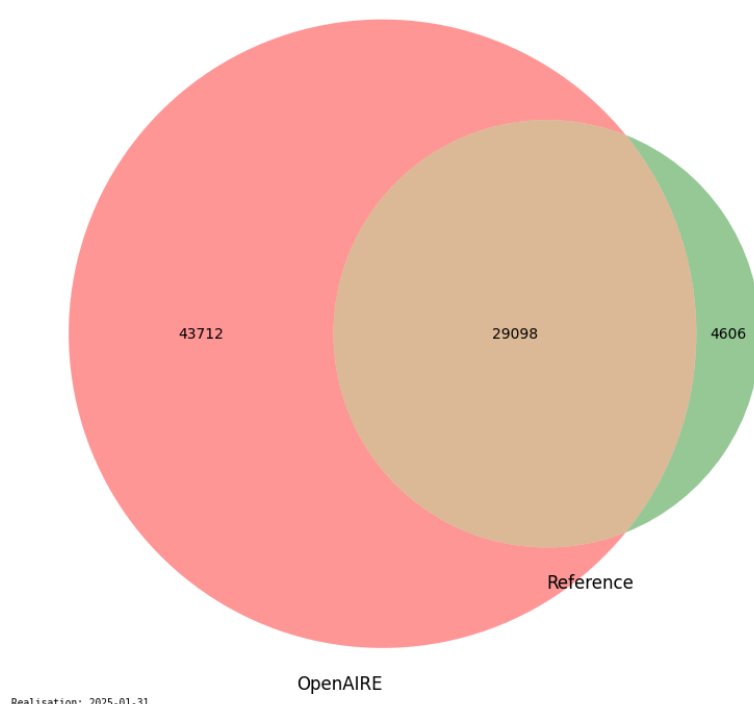
Nevertheless, OpenAIRE’s API sometimes gives incorrect results (e.g., number of records per FOS...), and thus cannot answer all our questions, necessitating a more in-depth study based on a data dump.

We compare OpenAIRE’s dump (covering INRAE’s community) with our internal data BBI to analyze: i) coverage (to know if all the relevant information is included), ii) completeness (to know whether all required data elements are present for each record in a dataset), and iii) accuracy (to try to evaluate errors, distortions, or misrepresentations).

The coverage analysis is limited to scientific publications with a DOI, which is a necessary condition for identifying the same publication in both bibliometric databases. We thus

identified 29,098 items shared between the two databases, while 43,712 are unique to OpenAIRE and 4,606 are unique to BBI (Figure 9). It is not surprising that the circle representing OpenAIRE (the left circle) is larger than that of BBI (which is equivalent in coverage to the Web of Science), since OpenAIRE Graph encompasses a wider variety of documents, including books, book chapters, preprints, theses, and others. However, what is really surprising is the presence of a small fraction missing from OpenAIRE (4,606 documents). To better understand, we used a sample of 50 BBI publications missing from the OpenAIRE dump, and we found that this was mainly due to an affiliation error. The publications were indeed present on OpenAIRE Explore, but they were not associated with INRAE.

Coverage (publications with DOI): OpenAIRE vs. Reference

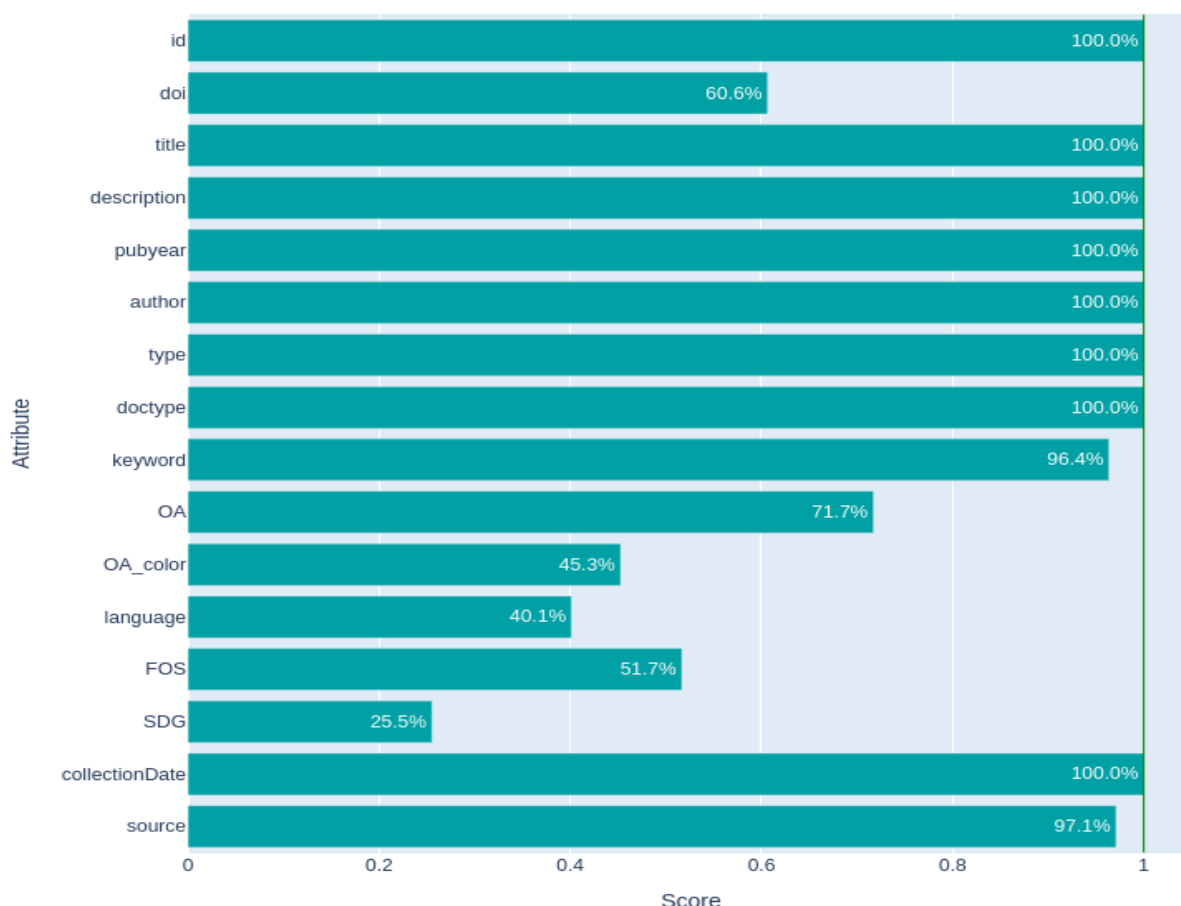


**Figure 9.** OpenAIRE Coverage. Article-type publications with a DOI for the period 2017–2022. Extraction from the dump given by OpenAIRE on August 8, 2024. Reference: BBI export from LODEX for the period 2017–2022.

We then focus on completeness per attribute as shown in Figure 10. This figure clearly shows mandatory attributes, which are always filled in (eg, title, description, type...). Whereas other attributes seem to be optional such as language, SDG, and FOS.

### Completeness per field: publications

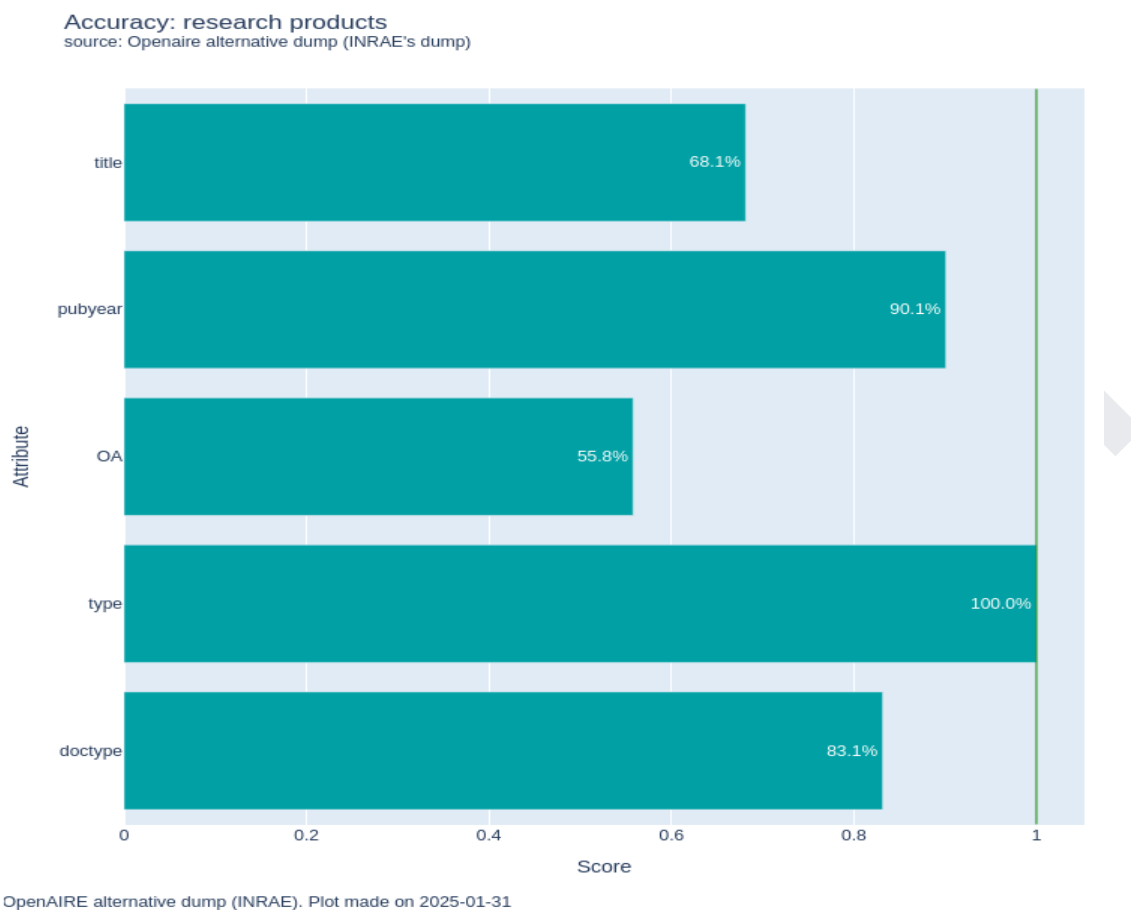
source: Openaire alternative dump (INRAE's dump)



source: OpenAIRE alternative dump (INRAE). Plot made on 2025-01-31

**Figure 10.** OpenAIRE Completeness

Finally, we looked at the accuracy of OpenAIRE's data. *NB: No Data are ignored here as they are already considered in the completeness measure.* In Figure 11, the accuracy observed ranges from very good (type of record, document type, and year of publication) to medium (title, Open Access (OA)...). Open Access is one of the aspects we are most interested in, but the quality of INRAE's data in OpenAIRE prevents us from considering going any further: completeness and accuracy are not enough (at least for open access) for the moment. Discussions are ongoing with OpenAIRE, and a number of possible improvements were identified.



**Figure 11.** OpenAIRE Accuracy. Reference dataset: BBI.

The source code of this study is publicly available on [https://forge.inrae.fr/dipso/graspos/-/tree/main/test\\_openaire](https://forge.inrae.fr/dipso/graspos/-/tree/main/test_openaire).