Copernicus Academy Hub for Knowledge, Innovation and Outreach

Research Briefs - input, dissemination mechanism and report on moderation

Deliverable [month due]
Del 3.2 ("Research Briefs input, dissemination mechanism and report on moderation") [v1, m9]

Lead beneficiary and contributing partners
EVF [4], PLUS [1], SPASE [2], UMA [3], UNIBAS [5], Climate KIC [6], GISIG [7], EARSC [8], CUT [10], KU MRI [11], KU Leuven [12]

	Name(s)	Date
Author(s):	Nefeli Politi-Stergiou	17.06.2019
	Lefteris Mamais	
	Dimitri Papadakis	
	Revision: Stefan Lang	19.06.2019
	Revision: Kerstin Kulessa	27.06.2019
	Revision: Christoph Schröder	28.06.2019
	Revision: Nefeli Politi-Stergiou, Dimitris Papadakis	28.06.2019
	Approval: Stefan Lang	29.06.2019

Rationale (brief description from DoA)

As an outcome of one of the initial core tasks within the work package on "Research and Innovation capacities" (WP 3), this deliverable aims is to explain how the consortium unanimously concluded to make a turn towards a more holistic approach and leave behind the Research Briefs and to introduce a methodology for a new proposed approach.

Table of contents

Executive summary

Key research outputs were provided through a catalogue of research briefs in a standardised form. Thus far, the Research Briefs served as a tool for researchers to disseminate research highlights and successful implementation stories to the wider Copernicus community including industries (potential service providers) and authorities (potential service beneficiaries). These documents (provided in PDF format) are a legacy of the CSA GRAAL project, developed within FP-7 some years ago (2011-2013). Building on this legacy, the CopHub.AC project initially aimed to re-initiate the Research Briefs in order to support the Copernicus Academy network towards effectively acting as a key element of the Copernicus User Uptake strategy. However, the Research Brief as a concept needs to be reconsidered as it has failed to deliver viable and sustainable output. Reflecting on the above and considering the diversity of modern ways of communicating and disseminating research, the consortium decided to pursue a more holistic approach, driven by the belief that this would better serve the overall objectives of the Copernicus Academy network. The proposed approach foresees the development of the CopHub.AC pipeline; wherein "Research Briefs" (as a concept) will be an input rather than a single output of this process. The process reflects a series of realistic interactions between the research community and potential service providers (SMEs, start-ups, entrepreneurs, etc.). **Its main objective is to nurture a culture of communications between these two interacting groups of stakeholders, those who produce research output and those who generate services from it.** This will be achieved by steadily building capacity through the various blocks of interactions. The CopHub.AC pipeline shall be regulated by an internal interaction mechanism which is at the core of this capacity building and also acts as the interface of communications between the researchers and the service providers. This interaction mechanism should be able to implement these interactions in various forms and aims to be easily activated and operated.

As an outcome of one of the initial core tasks within the work package on "Research and Innovation capacities" (WP 3), this deliverable aims to explain how the consortium unanimously concluded to make a turn towards this more holistic approach and leave behind the Research Briefs as the only output coming out of this project, and to introduce a methodology for the new proposed approach.

Aims & scope of CopHub.AC

The Horizon 2020 Coordination and Support Action aims to establish a long-term Copernicus hub to consolidate and sustain the Copernicus Academy as a knowledge and innovation platform. To fulfill this several nodes will be created, including interactive web elements showing the distribution and dynamics of Copernicus related expertise and capacities. The project will link ongoing R&D activities in Copernicus-relevant academic fields and sustain the innovation process from academia to business on a high scientific and technical level. We have a clear commitment to a full thematic and geographic coverage for a Europe-wide boost in demand-driven uptake of space technology and geospatial information.

The CopHub.AC objectives and the role of the Research Briefs

The CopHub.AC project was conceptualised in order to support and improve the implementation of the Copernicus Academy network. To have a better understanding of the scope of the current project task, we recall below the Copernicus Academy network and the related CopHub.AC objectives.

What are the Copernicus Academy's objectives?

Overall objective: *As an integral part of the European Space Strategy, the Copernicus Academy network has the ambition to develop new tools, to foster exchanges of knowledge as well as cross-border and cross-sectoral collaboration, with a view to contribute to unleashing the vast potential of Copernicus Sentinel data and service informati*on.

Some of the main sub objectives are:

Objective 1: *The goal of the Copernicus Academy network is to link research and academic institutions with authorities and service providers, facilitate collaborative research, develop lectures, training sessions, traineeships as well as educational and training material to empower the next generation of researchers, scientists, and entrepreneurs with suitable skill sets to use Copernicus data and information services to their full potential.*

Objective 2: *The Copernicus Academy also works to increase the exchange of ideas and best practices across borders and disciplines while contributing to the development of the use of Earth Observation data in general and Copernicus data and information in particular, in various public or private user organisations or industries. Moreover, the Academy fosters collaboration between educational institutions and established commercial operators or entrepreneurs so that innovation can reach the market and benefit the citizens of Europe and the future of the planet*.

What are CopHub.AC's objectives?

Overall objective: As stated in the CopHub.AC's Grant Agreement *"the overall objective of CopHub.AC is to create a knowledge and innovation hub with several nodes (secretariat, research briefs, knowledge landscape, outreach, sustainability) to focus and link ongoing R&D activities in Copernicus-relevant academic fields, and to sustain the innovation process from academia to businesses on the highest possible scientific and technical level, with a clear commitment to a full thematic and geographic coverage for a Europe-wide boost in space uptake".* The overall objective of the project can be broken down to more specific objectives:

Objective 1: CopHub.AC aims to foster the enlargement of the Copernicus Academy ecosystem through a well-orchestrated set of tools and structures.

Objective 2: CopHub.AC aims to reinforce the R&I capacities of Copernicus Academy and channel their outputs within an improved format of research briefs.

Objective 3: CopHub.AC aims to inform industry, educational networks, authorities and the citizens about Copernicus and its societal benefits.

Objective 4: CopHub.AC aims to promote capacity building of and connectivity with the Copernicus Relays Network.

Objective 5: CopHub.AC aims to promote the long-term impact and sustainability of the Copernicus Academy network through the establishment of a secretariat, a monitoring process and a forward-looking roadmap.

Objective 6: CopHub.AC aims to make the wealth of the research capacity and innovation potential. of the Copernicus Academy Network visible and reinforced.

> **Beyond this, the CopHub.AC project intends to nurture a culture and set a solid basis to facilitate efficient communication between the research community and anyone who aspires to innovate (industry, other researchers, etc).**

The Research Brief legacy

Work package 3, "Research & innovation capacities" has the objective of reinforcing the wealth of research and capacity and innovation potential of the Copernicus Academy network and making it more visible and accessible. The description of the action (DoA) includes the provision of a catalogue of research briefs.

Research Briefs (RBs) were developed during the FP-7 project GRAAL (*GMES and Regions - Awareness & Access Link - Fostering downstream services and links with Regions*, under GA 263186, 2011-2013). The RBs are similar to scientific papers, being a more condensed form of output, intended for dissemination beyond the research community. Their purpose was to act as a dissemination tool for research outputs, aiming to maximize the impact of research and potentially enable the value of research results to go beyond the original focus of the study. The RBs were designed to be produced in a standardised form by researchers of the Copernicus Academy members, presenting key elements of a state-of-the-art research or a successful use case based on Copernicus data (see Figure 1). RBs take the form of a one-page document in PDF format. The template was standardised to emphasise the Copernicus services used, the approach, the results and the area of application, following the taxonomy of the Copernicus programme. The elements of a typical RB are the following:

- *Title*
- *Key words*
- *Application field (key words)*
- *Abstract*
- *Methodology used/workflow*
- *Key results*
- *Innovative impact*
- *Status of the application (key words) - 1st page*
- *Area / region of interest*
- *Algorithms & data used (key words)*
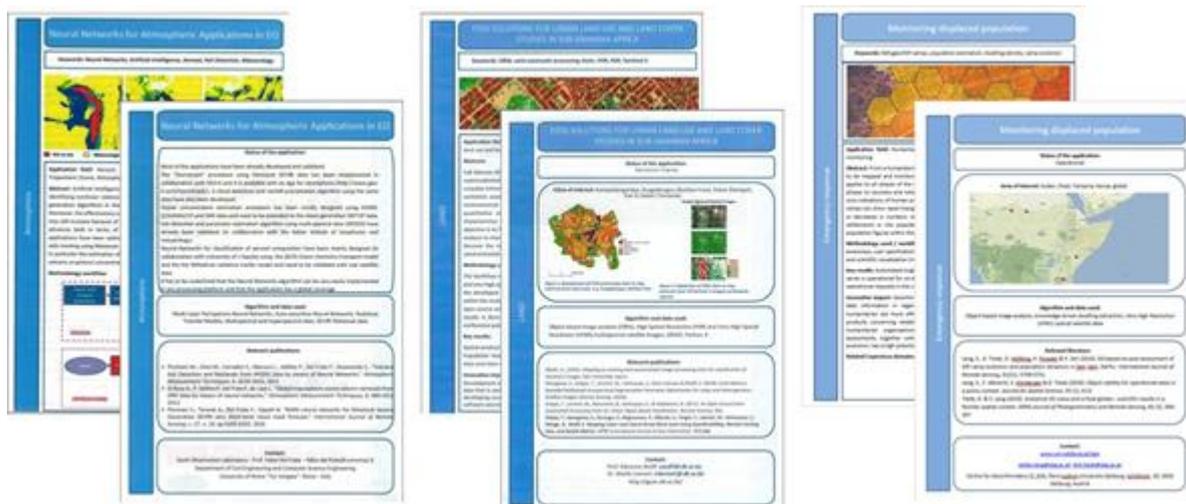- *Relevant publications*

● *Contact*

Figure 1: Three Research Briefs examples.

Although the detailed process of their generation was not fully documented and rarely implemented as primarily designed, the overall process has involved making the template (which included all the above elements and space for images) available to Copernicus Academy members, who were invited to populate it with successful research use cases. The exact distribution process and channels of dissemination remain unclear.

Why is a new approach necessary to deliver the CopHub.AC mission?

CopHub.AC builds its objectives on the scientific and academic capacities of the Copernicus Academy network. The membership of the Copernicus Academy network includes the majority of Copernicus-related research institutions. Yet, the potential of their capabilities has not been fully exploited outside the scope of the research environment. To move in this direction, refining and establishing a procedure around the RBs was the initial plan presented in the CopHub.AC DoW. Although at that time, this approach seemed to be the most appropriate, it was necessary to reassess it in order to ensure that this would be the best way to move forward. To do so, the following question was posed: "*Have the Research Briefs served their purpose so far?*". If yes, the path described in the project's DoA would have been followed. Otherwise, attention should be paid to what adjustments should be made in order to optimize their effectiveness .
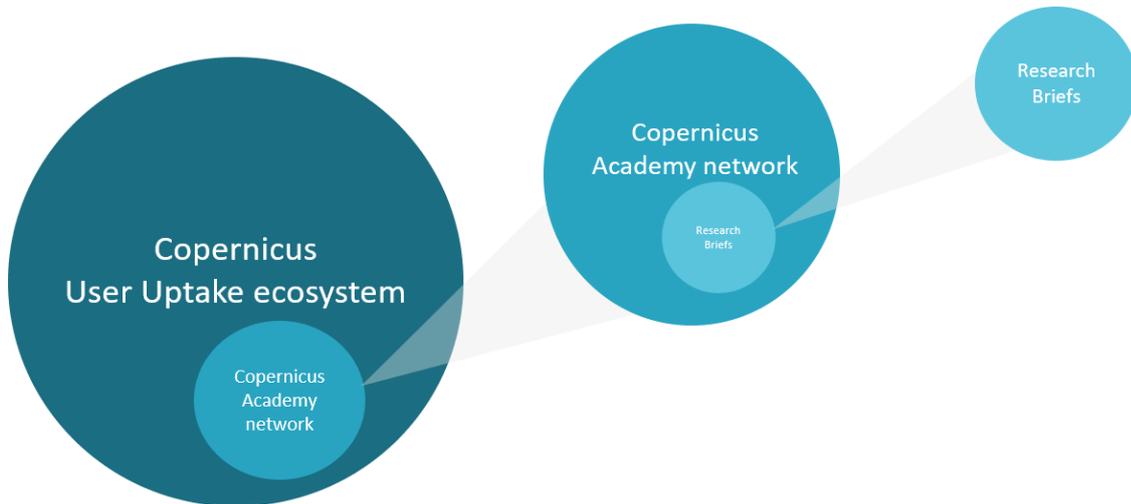
Figure 2: The Research Briefs as a research dissemination tool placed within the bigger picture of the Copernicus User Uptake ecosystem.

The observations regarding the RBs were: (1) there is a limited number of RBs generated. The consortium has available only three examples of RBs (see Figure 1 above), with the two more recent applications of RBs being available online through the Copernicus Academy portal; (2) taking a closer look at the content of the documents, it seems that standardisation of the template was not fully respected. In addition it is not clear how widely these documents were distributed outside the specific research community. Based on these observations the utility of RBs was further questioned.

We have also examined a similar initiative in the field, ESA's *"Sentinels Users Bulletin Board"* (SUBB). The SUBB is an open space provided by ESA, promoting open sharing of information from users of the Sentinel missions and usages of Copernicus Sentinels data. SUBB is implemented in the form of announcements including a short description, links and smart tagging for easy sorting. This tool targets analysts and developers, business, educators, general public and policy makers, and scientists. To this day there are a few entries, mostly provided by ESA's prime contractors or ESA. The number of visits and views suggest that there is some visibility – although we do not have any indication from who.

When the CopHub.AC project was still in a conceptual stage, the partners believed that continuing the legacy of these documents would be a powerful tool to achieve the Copernicus Academy network's aim of effectively disseminating their research to facilitate user uptake. The outputs of our research and the assessment of RBs showed that, in practice, the reality is different. The major weaknesses identified with respect to this approach are the following:

1. **The sole usage of a Research Brief catalogue as the means to trigger innovation is not sufficient**. Triggering innovation is a dynamic process that evolves along with the evolution of socio-economic needs and customs. As mentioned, the original approach did not deliver the expected impact - the same is true of the ESA SUBBs (see box above). The team responsible for WP3 has carried out a thorough desk study to examine how different kinds of research are disseminated to different target audiences. The (perhaps unsurprising) finding was that a variety of content formats and communication techniques are used to approach different audiences. It

was observed that static documents (e.g. in PDF format) are generally used for explaining research in layman's terms to the general public or within the research community.

2.   **Copernicus Academy members' potential is not restricted to scientific results**. Innovation can be driven by multiple factors and is not limited to scientific documents presenting research highlights. By envisaging a procedure which only generates and disseminates static documents the innovation-triggering process is rendered monodirectional. Evaluation of the RBs has demonstrated their weakness as a tool for disseminating innovation. RBs should evolve to become complementary to broader research communication efforts.

3.   **Limited motivation combined with limited resources of researchers.** Part of the regular work of researchers is the dissemination of their research results to the scientific community. For the vast majority it is also important to attract commercial or industrial interest in the implementation of their technological solutions. Analysis of the RBs indicates that researchers may benefit from (a) simplification of input requests and (b) additional support in adjusting their language to better communicate to service providers and other stakeholders.

4.   **Limited assessment of the processes of various target groups that can trigger innovation**. The main audiences that could adopt research highlight in order to innovate are mainly: service providers such as SMEs, start-ups, entrepreneurs and potential future entrepreneurs among the wider general public. The aspect presented here is linked to item number 1. In order to develop viable dissemination solutions, we need to have a clearer understanding of what the requirements of these groups are, starting from the service providers, with respect to innovation processes. From this point onwards, we will refer to these audiences as one group named the "beneficiaries", as research can add value and benefit their work.

During the working meetings held in early April 2019 in Salzburg the consortium recognised that these observed facts cannot be ignored. CopHub.AC now has a unique opportunity to pave the way towards helping the Copernicus Academy members to maximise the exploitation of their capacities and promote themselves and their research outputs outside the research community. Looking at the bigger picture, the consortium unanimously agreed that the most appropriate way forward is to leave the static, one-way concept behind and work towards a larger vision.

> **This larger vision is to develop an impactful methodology to support researchers to disseminate their cutting-edge research amongst industrial stakeholders to trigger innovation in a viable and sustainable way. Considering all the above, we concluded that a holistic approach is the best way to move forward.**

A holistic approach - the CopHub.AC pipeline concept

With a view to maximising the innovation potential of research, we need to understand the common needs of service providers with respect to adopting cutting-edge research for the purpose of implementing innovative commercial solutions. CopHub.AC does not aim to optimise the beneficiaries' internal processes, but rather understand how innovation triggers - coming from outside their organisations - affect different target groups.

In the cases we are investigating under the CopHub.AC framework, innovation potential can be provided by the introduction of (1) **new technologies** (from related or completely different fields) or (2) through **new approaches** to existing solutions. Market trends, technology trends, societal challenges and digitalisation, offer a multi-source environment for innovation. Innovation sources must be constantly and meticulously screened; CopHub.AC can facilitate this process by providing a preliminary screening and ensuring the recipients of the innovation triggers get information that is tangible and easy to adopt in their internal processes (*Copernicus Innovation Monitor* developed under Task 3.4 can be a key tool to implement this action). Therefore, it is necessary to understand what the different target communities want to see from the researchers, in which format they would prefer to receive information, etc. The first question is how should we best collect this feedback to answer these questions and best serve the beneficiaries' needs? That is where the holistic approach comes into the picture. With the ultimate goal being to effectively bridge the gap between innovators and the research community, the CopHub.AC project plans to develop a process, referred to as the CopHub.AC pipeline.

The CopHub.AC pipeline aims to be a bidirectional channel between the suppliers (research community) and the beneficiaries regulated by an internal interaction mechanism operated by the project and its Thematic Working Groups (see Figure 2). These three nodes comprise the elementary parts of the pipeline. The objective is to nurture capacity building among the two main stakeholders groups across the two marginal nodes of the pipeline (i.e. the research community and the beneficiaries), and to allow identification of the most impactful ways to communicate with the beneficiaries, through due consideration of their needs.

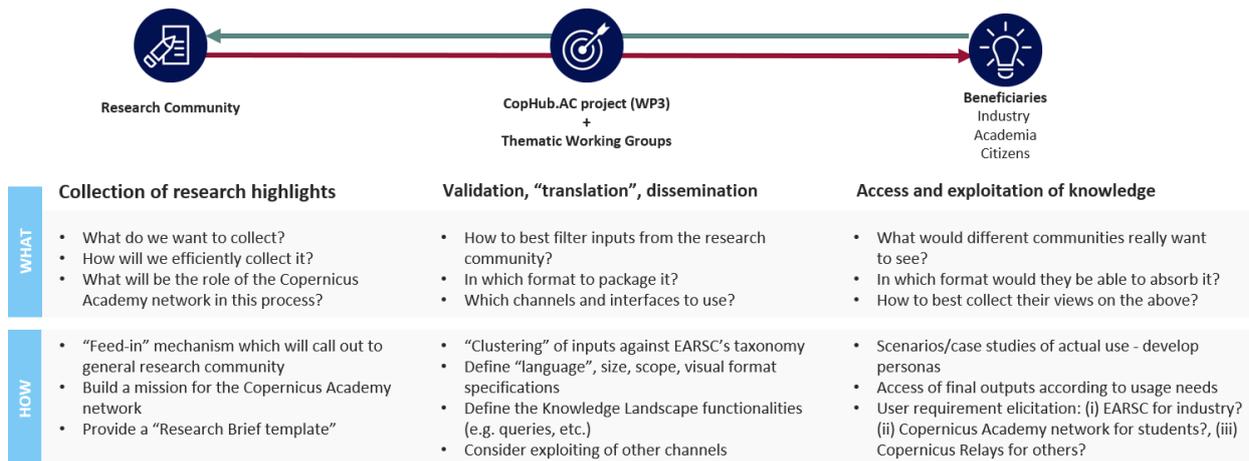|	**Research Community**	**CopHub.AC project (WP3)** + **Thematic Working Groups**	**Beneficiaries** Industry Academia Citizens
	Collection of research highlights	**Validation, "translation", dissemination**	**Access and exploitation of knowledge**
WHAT	• What do we want to collect? • How will we efficiently collect it? • What will be the role of the Copernicus Academy network in this process?	• How to best filter inputs from the research community? • In which format to package it? • Which channels and interfaces to use?	• What would different communities really want to see? • In which format would they be able to absorb it? • How to best collect their views on the above?
HOW	• "Feed-in" mechanism which will call out to general research community • Build a mission for the Copernicus Academy network • Provide a "Research Brief template"	• "Clustering" of inputs against EARSC's taxonomy • Define "language", size, scope, visual format specifications • Define the Knowledge Landscape functionalities (e.g. queries, etc.) • Consider exploiting of other channels	• Scenarios/case studies of actual use - develop personas • Access of final outputs according to usage needs • User requirement elicitation: (i) EARSC for industry? (ii) Copernicus Academy network for students?, (iii) Copernicus Relays for others?

Figure 2: This figure presents the proposed CopHub.AC pipeline, what we want to achieve in each interaction between the nodes, and how this could be achieved. On the one side of the pipeline are the beneficiaries, i.e. those who can take scientific invention and use it to develop innovative solutions, while on the other side there is the research community which generates research invention. The middle node is an interaction mechanism acting as regulator and catalyst through this bidirectional communication process.

We start from the beneficiaries, reflecting on how best to collect their needs. In the CopHub.AC pipeline, we will seek to collect them directly (for example we could consider conduct dedicated brief surveys through EARSC if it is done during the project lifetime) while also offering them an open

channel to make their requests (for example through inquiries, a searchable knowledge landscape, etc.). These inputs will be processed to understand how best to address them. To do so, we need to define what feedback to request from the research community and how to efficiently collect it. As the research community representatives, Copernicus Academy members will play a key role in this procedure, which should be clearly defined. The feedback will be filtered, processed, and made available to the beneficiaries. Considering the beneficiaries' needs, the CopHub.AC interaction mechanism has to identify the most appropriate ways (including the packaging format, dissemination channels and interfaces, etc.) to communicate the validated results to them. To this end, the moderation process should be defined (see Chapter *"Moderation as part of the CopHub.AC pipeline"*).

The CopHub.AC pipeline will be tested and validated during the lifetime of the project. The full CopHub.AC pipeline implementation goes beyond the lifetime of this project as it is a rather ambitious, although feasible, initiative. Our aim within the project is to propose a methodology to make it work. To this end, we will test and assess several ideas and provide the basic guidelines for further implementation. It is important to note, that the CopHub.AC pipeline should be and remain a flexible, easily activated and operated interaction mechanism in order to stay up to date and responsive.

How the CopHub.AC pipeline approach will work in practice - some scenarios

To recognise viable ways of answering the expected questions, a number of scenarios were developed, which reflect real-life experiences in different situations. The list is not exhaustive; however, it aims to give tangible cases, assess them and try to extract conclusions that will help us to incrementally put the CopHub.AC pipeline to work in practice. The scenarios attempt to facilitate the different audiences' needs. Each scenario is based on the operational reality profile of a ***persona*** (i.e. a fictional character) that could be beneficiaries in the CopHub.AC pipeline. It explains who is concerned, what are their objectives and needs and what led them to CopHub.AC. For each scenario we present the challenges the persona deals with today and how CopHub.AC could address these challenges.

Event organiser

Ralph is an event organiser and is currently organising a specialised workshop on the use of EO for cultural heritage preservation aimed at end users such as Ministries, regional administrations, preservation organisations, etc. One of his main tasks is to find key speakers and to ensure the coherence of the presentations. Typically, when he looks for speakers, he searches internal databases and carries out online desk research using professional networks such as LinkedIn. Despite providing guidelines to his invited speakers, he realises that most presenters approached their contribution to the workshop in widely different ways. Although the speakers were experts in their fields, many presentations were too technical, and they failed to clearly transmit the key messages to the target audience. This lack of coherent messaging confused the audience and the impact of the event was less strong than expected.

Current situation

What is at stake (challenges):

- Identify best-suited presenters for a particular thematic area and target audience. Despite being experts in their area of interest, they may have limited presentation skills, or may not be the best match to deliver the right messages to a specific audience.
- Limited selection of presenters in events. It is a common observation that events are bound to host the same individuals (or those of the same affiliation) as presenters.
- Limited overview of the latest advancements in the sector at the specific moment in time.
- Variability in presentations. Sometimes presentations fail to deliver the appropriate message to a specific audience.
- Limited resources for preparatory research. Often, events have limited impact in adding value, as event organisers generally have incomplete information about other similar past events to build on.
- Limited feedback as a result of a structured procedure on presentations and presenters' performance.
- Gender imbalance. It is common to have mostly male presenters (this applies to the Copernicus ecosystem as it does to other technical domains), while there are equally skilled female experts. However, there is limited information about equally good female candidates.

Current process (blocking factors):

- Search for presenters using desk research including active web search and LinkedIn search, and established contacts.
- Limited knowledge of different potential information sources.

Future state, facilitated by the CopHub.AC pipeline

For event organisers:

- Provide open access to a landscape with the latest advancements in a thematic area or sector.
- Provide answers to basic questions when it comes to thematic areas, who is researching what, who has the latest use cases.
- Provide lists of specialists (including gender information) on specific topics.
- Have easy and open access to a searchable knowledge landscape.
- Easily trigger an enquiry mechanism to access high-level expertise.

For Copernicus Academy members:

- Identify sector "champion" presenters. Identify champion affiliations and individual per thematic area and per target audience.
- Create a repository with potential speakers and their affiliations which should be gender-agnostic but balanced. The repository can be used when an event organiser wants to find the best-suited presenter for an event.
- Access to specific material such as presentation templates.
- Standardise presentation material (i.e. create presentation templates).
- Train champions and other appointed individuals by their affiliations, to further improve presentation skills.

Input needed from the Copernicus Academy members

- Latest research results and successful use cases (i.e. latest scientific publications, cutting-edge methods, successful use cases)
- List of potential presenters: Copernicus Academy will be able to indicate the best candidate for representing a section based on their skills and capacities.
- Identify the "champions" from each thematic area.

Start-up manager

Stefka is a sales manager in a newly-founded company specialised in environmental consulting. One of her clients requested a complete report concerning the reconstruction of an area next to a lake which has been affected by large-scale dredging activities. Her company has expertise in land monitoring but only basic knowledge about water quality monitoring. To generate a complete report with recommendations for the reconstruction, it is important to also obtain an assessment of the lake's ecosystem status (for land-cover dynamics). She searches online for companies who offer the service she needs and contacts various stakeholders. She remembers that during ESA's "Living Planet Symposium" she watched a presentation from a start-up company on water quality monitoring with the use of EO. She finds out that they also provide what her company is looking for and decides to contact them.

Current situation

What is at stake (challenges):

- Limited knowledge of the sectoral and interrelated capabilities landscape.
- Limited sources of new contacts.
- Limited access to information about emerging companies.
- Lack of information on cutting-edge impactful and validated research results.
- Bias towards larger companies with time-proven competences.
- Scepticism about newly-developed methods.
- Limited time and resources to find the best-fitting solution.

Current process (blocking factors):

- Desk research (including active web search, LinkedIn search, etc).
- Establish contacts with potential suppliers.
- Event participation as a way to get leads and find potentially useful information for potential partnerships.

Future state, facilitated by the CopHub.AC pipeline

For start-up managers

- Provide open access to a repository of affiliations working on specific sectors and thematic areas.
- Provide guidance to access to other EO initiatives that might be of interest for a start-up, for example link to DIAS, EO4GEO, EO-mall, OCRE, etc.

- Offer an open line of communication in order to guide them to the best possible matches to foster potential partnerships.

For Copernicus Academy members

- Maintain a database of successful use cases and research highlights in the various thematic areas.
- Connect with other EO initiatives such as DIAS, EO4GEO, EO-mall, OCRE, etc.
- Training and best practices exchange in order to improve communication skills with potential users.
- Guidance on potential market opportunities for their solutions.
- Disseminate requests for new services from the demand side.

Input needed from the Copernicus Academy members

- Provide latest research results - i.e. latest scientific publications, cutting-edge methods, etc, and successful use cases.
- Identify nodes of excellence among the Copernicus Academy members.
- Validate research highlights and use cases before making them openly available.
- Provide information about their links to other Copernicus related platforms and initiatives.
- Exchange best practices and success stories with the community and be available to communicate the know how to others.

Cross sectoral professional/student

Jorge is a candidate doctorate researcher at the department of Economics in Madrid. His study focuses on macroeconomics. At this point of his research he seeks to find agile statistical tools to help him analyse big data. His desk research mostly revolves around relevant scientific papers applied in Economics. He is mostly interested to explore disruptive methodological approaches, and therefore he also examines scientific publications and methods from different disciplines. One day, during a discussion with a friend who is a post-doctoral researcher at the Marine Laboratory at the Environmental department, he talks about the challenges he is currently facing. His friend explains to him how they solve complex problems with EO and have developed statistical tools to process the data, and suggests some online resources. To his disappointment, desk research takes more time than he had initially envisaged and the information he finds is scattered and unclear. Finally, he contacts his friend again to guide him with his search. He decides to send requests to various stakeholders hoping to get some clear answers and material.

Current situation

What is at stake (challenges):

- Limited access or (more commonly) complete lack of awareness regarding available research and tools developed in other disciplines.

Current process (blocking factors):

- Search is done through desk research.
- It is not clear what to search for in order to get the best results.

- Time restrictions and limited knowledge on how to assess research information coming from different disciplines.

Future state, facilitated by the CopHub.AC pipeline

For cross-sectoral professionals

- Open access to a searchable database with latest validated research highlights from different thematic areas and technology used.
- An easily activated open communication channel to seek reliable and timely guidance for different requests.

For the Copernicus Academy members

- Redirect the query to the most suitable person or institute to provide the answer. Provide information based on the CopHub.AC knowledge landscape.
- Foster a community to directly interact with the beneficiaries.

Input needed from the Copernicus Academy members

- Provide latest research results - i.e. latest scientific publications, cutting-edge methods, etc, and successful use cases.
- Identify nodes of excellence among the Copernicus Academy members.
- Validate research highlights and use cases before making them openly available.
- Provide information about their links to other Copernicus related platforms and initiatives.
- Exchange best practices and success stories with the community and be available to communicate the know-how to others.

The set of scenarios is indicative rather than exhaustive; it serves as a basis to carve the path forward in building sustainable capacity of the CopHub.AC pipeline. After testing and evaluating the CopHub.AC pipeline, we expect to enhance the scenarios and potentially extend the list.

Expected outputs

Considering that the CopHub.AC project has a lifetime of two years (24 months) only certain seed activities can be reasonably performed. Overall, however, the process should be designed to be sustainable and ready to be taken up after the end of the project. Currently, two tangible outputs are envisaged: (1) the **CopHub.AC interaction mechanism** and (2) the **Copernicus Academy Database (CAD) and its interlinkage with the knowledge landscape**.

The CopHub.AC interaction mechanism

The CopHub.AC interaction mechanism itself is expected to be one of the outputs of the CopHub.AC project. As described in the previous sections, the interaction mechanism will be the central node of the CopHub.AC pipeline. The goal is to develop a flexible interaction mechanism that will enable to effectively address scenarios as the ones described above. The interaction mechanism shall be a two-way channel to gather inputs, assess them and deliver the appropriate results. It is important that the interaction mechanism is easily activated, its internal processes are simple and provide timely and reliable responses according to the different needs. The term interaction mechanism is used to visualise two things: (1) manage the interfaces through which the two main communities

interact and (2) the internal processes to moderate the inputs and outputs from both nodes (see a more detailed description on moderation in section "*Moderation as a part of the CopHub.AC pipeline*"). The interaction mechanism is driven by the requests from the beneficiaries' side. It is the component of the pipeline where most decisions are taken on how to address different needs. The key tasks that are expected to be performed under the CopHub.AC interaction mechanism could be summarised here:

- Gather requirements from the beneficiaries.
- Collect and moderate inputs and outputs for the gateway demonstrator (Del. 2.1), the knowledge landscape (Del. 3.3) and the Innovation Monitor (Del. 3.4) and cluster them to meet the EARSC taxonomy.
- Define the specifications on the appropriate scope, size, visual format and content language of the outputs.
- Define the knowledge landscape functionalities.
- Consider exploring other dissemination channels - link with existing efforts.
- Coordinate and moderate the various communication interactions among the research community (i.e. Copernicus Academy members) and the beneficiaries, using the Thematic Working Groups as a central element of the interaction mechanism.
- Monitor the impact of activities and fine tune the methods to maximise impact if necessary.
- Define methodologies to raise awareness of the CopHub.AC to beneficiaries and the research community.

To have the interaction mechanism operating continuously, we need to define an operational framework. During the lifetime of the project these tasks will be mainly performed as part of the testing process. To ensure sustainability, more specific roles could be proposed to support the activities after the end of the project. The partners together with the Thematic Working Groups will regulate these processes during the lifetime of the project. Their role might be further assessed when the Copernicus Academy Secretariat will be established.
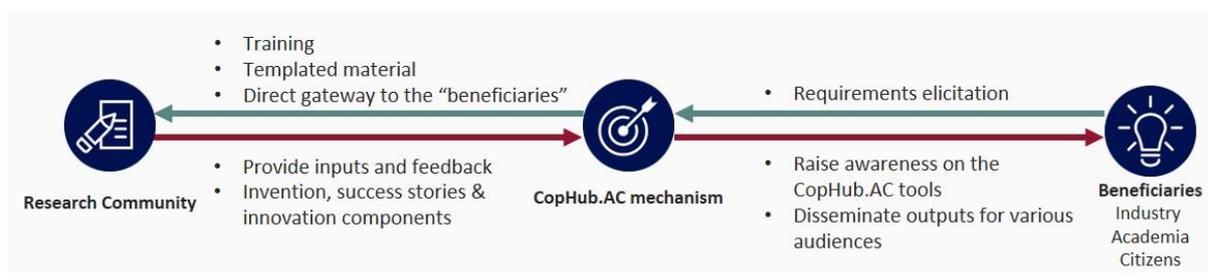

Figure 3: Presentation of the inputs and outputs of the CopHub.AC interaction mechanism at each step of the CopHub.AC pipeline.

Our conclusions after testing the CopHub.AC pipeline and proposals for the future will be reflected in Del. 6.3 *"Strategic Plan and Roadmap"* due for the end of the project.

Copernicus Academy database and knowledge landscape

The Copernicus Academy Database (CAD) is one of the main interaction tools of the CopHub.AC objectives. Overall, the CAD will have two main objectives:

- To serve as an **internal repository of information**. It will provide a preliminary data input related to all things discussed above.
- To **provide input to the Knowledge Landscape**. The information stored will serve as the input to implement the Knowledge Landscape which will display and disseminate information extracted by the database.

On the one hand, the CAD will serve as the virtual "library" of the CopHub.AC pipeline. The database will be used as a directory storing information of each Copernicus Academy member. Each Copernicus Academy member will have their own unique identity (expressed by an ID number). All the information about each member will be stored in a structured and predefined way under the member's ID. The idea is to have as much as possible encoded information for each affiliation and their research highlights. This information will come from different sources, such as the Copernicus Academy application form (http://www.cophub-ac.eu/application, see Del. 2.1) or the form for the Thematic Working groups (http://www.cophub-ac.eu/twg/, see Del. 2.4). EARSC's Copernicus Market/Application taxonomy will be included as a classification index to identify innovation potential or skills gaps. All data should be accessible to the CopHub.AC interaction mechanism as an operational tool.

On the other hand, the CAD will be the database on which the knowledge landscape will be built. The knowledge landscape should be easily searchable and thus all the connections between the data will have to be defined already while developing the database. The inputs provided for the database and the dynamic visualisation of database content can be seen as a new "format" of the Researcher Briefs as it will be used to communicate in different ways and through different channels, information to trigger innovation. As one of the tangible outputs of the project, the knowledge landscape is intended to be co-created with the beneficiaries' feedback and linked with similar existing efforts. Later in the project, we will also implement visualisations of the innovation dimensions of the knowledge landscape (Del. 3.4).

The table below includes the information that is intended to be primarily collected from the Copernicus Academy members and stored in the CAD. It also shows an initial categorisation of information based on where it is expected to be used.

Table 1: Copernicus Academy database input map. The CAD will take inputs from the Copernicus Academy membership application form (Del. 2.1) and later on from the registered Copernicus Academy member. From the application predefined entries will also be used as input data for the dynamic knowledge landscape.

Copernicus Academy member input	Knowledge landscape
Name of organisation	x
Department	x
Type of organisation	x

Number of staff	
Website	x
Address	
Social Media	
Membership type	
Network	
Methodological competence - knowledge areas	x
Application field (EARSC taxonomy)	x
Educational programmes	x
Contact point (organisational)	
Contact point (academic)	x
Methodology	x
Persons organisation Member	
Relevant publications	x
Copernicus core domain	x
Data used	x
Area of Interest	x
Key words	x

Status of application	
Readiness level	x
Key results	x
Innovative impact	x
Status of the application (application to become a Copernicus Academy member)	

The database will be revised during the lifetime of the project and enhanced with new inputs if necessary. In the future, the database can also be used to generate new forms of research dissemination material.

What can be done during the lifetime of the project?

Changing from updating the Research Briefs to initiating the CopHub.AC pipeline approach, it is necessary to reflect what is feasible to be done during the lifetime of the project. Under the framework of the project and more specifically, WP3, we will attempt to put some blocks of real impact in action. We aim to test and assess the ideas based on the scenarios elaborated above, mobilise and give a mission to the Copernicus Academy members and the Relays, develop the knowledge landscape and propose guidelines for the CopHub.AC interaction mechanism. Shaping the CopHub.AC pipeline will be strongly linked to the other activities initiated by the CopHub.AC project such as the Del. 2.1 "*Gateway demonstrator*" (m6/9), Del. 3.4 "*Innovation Monitor*" (m21/24), Del. 4.3 "*Assessment of Copernicus uptake by selected groups*" (m21), Del. 5.3 "*Catalogue of success stories*" (m21), Del. 6.3 "*Strategic Plan and Roadmap*" (m21/24), Del. 6.1 "*Health and sustainability report to the General Assembly of Copernicus Relays and Copernicus Academy including policy briefs*" (m9/21). All these activities will be integrated into the pipeline in different ways, to extract or provide useful input to boost the capacity building developed under the CopHub.AC pipeline.

What could be done beyond the lifetime of the project?

Reinforcing the Research and Innovation capacities of the Copernicus Academy members is an ongoing process and CopHub.AC aims to create momentum for establishing outputs and processes to achieve it. However, as already mentioned previously in this document, the holistic approach will need more time and resources in order to be sustainably implemented. After a period of testing, assessing various scenarios and requirement elicitation, decisions on how to actually implement the CopHub.AC pipeline should be made. Viability and sustainability of the CopHub.AC outcomes should be ensured after the end of the project. Continuous flux of information from the Copernicus Academy members, collection, moderation and dissemination through the established tools (knowledge landscape and innovation monitor) are the key elements in this respect. As the CopHub.AC pipeline implements a bidirectional approach, monitoring of the service providers' needs

and adjusting methods and/or developing new ones should be considered. It is expected as a natural step after CopHub.AC that the Copernicus Academy members, the Copernicus Academy Secretariat, the Copernicus Support Office (CSO) and the Thematic Working Groups will continue to work closely to assess lessons learned from this project and decide how to best implement other aspects of the CopHub.AC pipeline in order to maximise impact.

Moderation as a part of the CopHub.AC pipeline

According to Task 3.2 the Copernicus Academy network will have been requested to contribute internally (e.g. departments) and externally (e.g. research institutes, Universities, not already in the network) with input for the Research Briefs. In addition to that, the Thematic Working Group members will have been allocated to evaluate the Research Briefs and act as reviewers. To this end, CopHub.AC's DoA had foreseen the establishment of an editorial board to manage the finalisation and dissemination of the Research Briefs. Nevertheless, as presented in this document, Task 3.1 will support the concept of the CopHub.AC pipeline. Consequently, the purpose of the moderation needs to be adapted accordingly. Therefore, In this section we will describe how we envisage moderation as a part of the CopHub.AC pipeline.

Firstly, we will urge the Copernicus Academy members to contribute inputs for the CAD and play a key role in testing the idea of the pipeline based on the different scenarios. Alongside to the Copernicus Academy network, the Copernicus Relays will also be leveraged through the collaboration established in Task 5.1. The Copernicus Relays will be invited to also provide their inputs and become part of the pipeline in the long run. The Copernicus Relays are expected to present success stories and help us shape the scenarios and the needs of each part of the pipeline through real examples. All inputs, collected from both by the Copernicus Academy network and the Copernicus Relays will be filtered and evaluated by the Thematic Working Group members while they will be classified against EARSC's taxonomy. In general, the Thematic Working Groups (TWGs) play a key role in the moderation process, as they are expected to facilitate the evolution of the Copernicus Academy members towards an effective element of the Copernicus User Uptake. Each TWG will be responsible for filtering all the input and requests related to their thematic area. For the input coming from the beneficiaries, they will work closely with the consortium members in order to collect all their needs and decide how it would be best to address them. The TWG members will also lead the assessment impact for innovation in parallel with the requirements collected by the beneficiaries.

During the project we will test and validate different scenarios before moving towards a final implementation. Under this scope, the TWGs will work closely with the project partners to run this process. This is being ensured since the TWGs are chaired by CopHub.AC partner organisations. They could be responsible to regulate and operate the tasks under the CopHub.AC interaction mechanism (see "*CopHub.AC interaction mechanism*" section). At the same time, working closely with the consortium members, they are expected to also guide and supervise the activities of the Copernicus Academy members. Finally, TWGs will help us ensure that both inputs and results coming from this task will be linked to the other initiatives which are complementary or in support to the CopHub.AC activities (such as the EO4GEO further elaborated in Del. 4.1 *"Report on the link and harvest on EO4GEO activities and outcomes"*.

Way forward

The way forward will see the testing and validation of the various ideas described in this document. During the next months we will work towards proposing a first draft of the necessary inputs for the CAD as well as their correlations. This task will be heavily based on the outcomes of the Del. 2.1 *Gateway demonstrator*. The immediate next steps include the development of the knowledge landscape (m12). We aim to identify which would be impactful ways to present research highlights to facilitate service providers absorb them and potentially adopt them in developing innovative solutions. Having some first inputs will help us shape the first instance of the knowledge landscape. We aim to communicate the CopHub.AC vision to the Copernicus Academy members and the Copernicus Relays through our internal channels and engage them to contribute to this effort. Continuous flux of information about the CopHub.AC pipeline is expected to help shape the Innovation Monitor as well, which is also expected to be developed during the second year of the project. Key outputs, findings and proposals will be reflected in the Del. 6.3 "*Strategic Plan and Roadmap*" (m21/24).