ENVRI-Hub NEXT

D4.2
Report on the Training Activities

Status: Under EC Review

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Abstract	
Keywords	Capacity-building, Impact, Knowledge-exchange, Training Activities, Training Content, Sustainability
This deliverable looks back at the training activities provided by ENVRI-Hub NEXT up to November 2025, outlines the future training activities planned for 2026, and provides recommendations for training development through the rest of the project and sustainability even beyond the project's end. The training activities are presented in a chronological order, grouped by format, and assessed against training needs and related learning objectives.	

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Terminology / Acronyms	
Term/Acronym	**Definition**
AAI	Authentication and Authorisation Infrastructure
API	Application Programming Interface
CI/CD	Continuous Integration / Continuous Deployment
ECV	Essential Climate Variable
ENVRI	Environmental Research Infrastructures
ENVRINNOV	ENVironment Research infrastructures INNOVation Roadmap
EOSC	European Open Science Cloud
EPOS-DCAT-AP	European Plate Observing System - Data Catalogue Vocabulary - Application Profile
EV	Essential Variable
EVERSE	European Virtual Institute for Research Software Excellence
FAIR	Findable, Accessible, Interoperable, Reusable
FDP	Fair Data Points
GDPR	General Data Protection Regulation
I-ADOPT	InteroperAble Descriptions of Observable Property Terminology
IRISCC	Integrated Research Infrastructure Services for Climate Change Risks
KB	Knowledge Base
KER	Key Exploitable Result
LLM	Large Language Model
SP	Strategic priority
TN	Training need: the gap between the current level and type of knowledge, skills, mindset, and practices, and the desired one.

UI/UX	User Interface / User Experience
VRE	Virtual Research Environment
WP	Work Package

Useful Reference: **ENVRI Glossary**

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Executive Summary

This deliverable outlines and assesses the training provision coordinated under Tasks 3.5/4.5, "*User Training and Skills*," of the ENVRI-Hub NEXT project. The scope of this task covers not only the support to ENVRI-Hub service owners and developers in achieving the planned milestones and deliverables, but also the onboarding and training of ENVRI-Hub end-users.

The report recapitulates the outcomes of the training needs analysis conducted in 2024, summarised in seven strategic priorities and their related training needs. These needs pertain to elicitation of UX/UI requirements; user interface design; capacity-building for AAI, licenses and common policies; semantic harmonisation; services, documentation, and training integration; data management, access, and analysis capabilities; networking and advocacy for ENVRI at the EOSC level. Each past and future training activity presented in this report addresses at least one of the identified training needs. The training impact is assessed against realistic and measurable learning objectives.

The training activities organised so far were designed as internal capacity-building sessions or online public events, spanning from user persona definition, digital project management and software quality assurance best practices, to ethics in open science and GDPR compliance. Additional internal working sessions and public events allowed for a re-evaluation of training needs and enabled project partners' capabilities.

Finally, the report presents a brief list of recommendations about how to design hands-on training sessions, ensure the value of asynchronous training content, and plan for the sustainability of the ENVRI training infrastructure.

1. Introduction

1.1. Scope and Purpose of the Training Report

This report about training activities is delivered halfway through the ENVRI-Hub NEXT project by Task 4.5, "User training and skills". T4.5, being the continuation of Task 3.5, is responsible for supporting ENVRI-Hub developers, ENVRI-Hub service owners, and ENVRI-Hub end-users with training actions and guidance towards the optimal exploitation of the ENVRI-Hub potential. At month 10, Task 3.5 devised a Training Plan (D3.2) [**R1**], which was informed by a training needs analysis. The scope of deliverable 4.2 is now to recap the training activities organised up to November 2025, and describe the next steps foreseen in the pipeline to meet the identified training priorities.

The purpose of this report is therefore twofold: 1) sharing an overview of the training supply provided thus far to project participants and external stakeholders; 2) planning a follow-up for training activities, based on lessons learnt and available feedback, also including usability input from ENVRI-Hub beta testers. The training provision consists of organising training events and producing training content and supporting materials, with the collaboration of project partners, other ENVRI-related projects, and external subject matter experts.

1.2. Structure of the Document

This report is composed of 4 main chapters. Chapter 1 introduces the scope and purpose of the deliverable, namely, looking back at the training activities organised, looking forward to future training activities, and providing recommendations. Chapter 2 summarises the training needs identified in D3.2, which are the backbone of the training plan of the project. Chapter 3 lists the training activities organised so far and those in the pipeline, including public events and internal capacity-building sessions. Finally, Chapter 4 recommends the steps forward, based on lessons learnt and a long-term outlook on training activities.

2. Summary of the Training Needs Analysis

This chapter provides an overview of the seven strategic priorities (**SPs**) and their corresponding training needs (**TNs**) identified in D3.2, Training Plan, to support the cross-disciplinary and transversal development of the ENVRI-Hub components and their full exploitation.

2.1. Strategic Priorities and Training Needs

The overarching objective of the ENVRI-Hub NEXT project is to build an interdisciplinary Hub that gathers and harmonises interoperable data and services across the ENVRI Community environmental subdomains. The ambition to develop a single Hub poses technological, scientific, and policy challenges that the ENVRI-Hub NEXT project partners are tackling through a modular approach and intermediate steps, towards an optimised solution that integrates the different ENVRI-Hub components.

The components being developed, deployed and maintained by ENVRI-Hub NEXT include:

1. Catalogue of Services and FAIR Data Points;
2. Analytical Framework for Virtual Research Environments (VREs) and workflows;
3. Harmonised vocabulary of Essential Variables (EVs);
4. Integrated identity and authorisation management solution (ENVRI-ID);
5. Knowledge Base and LLM-based AI agent;
6. Training Gateway (content discovery) and Training Platform (content production).

The list below recaps the SPs and TNs that inform the ENVRI-Hub NEXT training plan:

- **SP1** | Understanding and translating user needs into user stories for functional user interfaces:
  - TN1.1 Evaluating and generating UX/UI requirements.
- **SP2** | Providing seamless access to data from EOSC or RI services or other Virtual Labs:
  - TN2.1 Explaining why AAI matters;
  - TN2.2 Choose licences, adopt policies;
  - TN2.3 Defining relations between EVs, I-ADOPT, metadata, and vocabularies.
- **SP3** | Providing a framework for sharing consolidated research workflows:
  - TN3.1 Integrating AAI, the KB, training, and VREs.
- **SP4** | Demonstrating the added value of improved FAIR metadata for discovery and integration of data:
  - TN4.1 Converging towards common metadata strategies and standards;
  - TN4.2 Managing dataset.

- **SP5** | Demonstrating added value of ENVRI data-oriented services for VREs users:
  - TN5.1 Improving reproducibility of research;
  - TN5.2 Equipping researchers with new data access and analysis capacities.
- **SP6** | Ensuring user-friendly, autonomous and full-fledged access to ENVRI-Hub functionalities:
  - TN6.1 Using ENVRI-Hub backend settings and functions;
  - TN6.2 Accessing ENVRI-Hub service endpoints.
- **SP7** | Ensuring ENVRI remains a key community in EOSC, in collaboration with other initiatives:
  - TN7.1 ENVRI, being aware of developments in EOSC and other projects, and vice versa.

3. Training Activities

This chapter outlines the internal capacity-building sessions and public events already organised in 2025 and those planned for 2026. The impact of each training activity is assessed against the established training needs and relevant learning objectives. Other enabling activities are included, as they complement the training provision.

3.1. Internal Capacity-building Sessions

Throughout the ENVRI-Hub NEXT project, internal capacity-building sessions are regularly organised to support project partners on the most relevant methodological, scientific, technical, ethical, and legal aspects in the development of such a complex ecosystem as the ENVRI-Hub. So far, the following topics have been tackled:

1. Onboarding to the SCRUM framework and the Jira ticketing system;
2. Introduction to user research principles and methods;
3. Overview of ethical aspects in scientific data and user data management;
4. Overview of GDPR compliance requirements.

While the capacity-building sessions are designed for, and open to consortium partners only, any explanatory content delivered during the sessions is recorded and published on the ENVRI Training Platform (including slides, templates and useful resources). These training objects are then indexed and made findable on the ENVRI-Hub by the open-access Training Gateway, which retrieves training metadata through APIs from the ENVRI Training Catalogue.

In the tables below, details about four internal capacity-building sessions are reported. The sessions were organised between October 2024 and November 2025, upon request of project partners, and involved both specialists belonging to the consortium, as well as guest subject matter experts.

Table 1: Internal Capacity-building Session #1

INTERNAL CAPACITY-BUILDING SESSION #1	
Title	Jira for Cross-team Sprints in Research Projects
Date	16 October 2024
Format	Online tutorial and guided practice - 1 hour and 30 minutes
Scope and purpose	The heterogeneity of the research community involved in the ENVRI-Hub development is reflected in the geographical distribution of ENVRI-Hub developers and in the diverse expertise across the consortium. The coordination of such different development workgroups requires continuous feedback and the support of collaborative work tools. The

INTERNAL CAPACITY-BUILDING SESSION #1	
	ENVRI-Hub NEXT consortium has therefore adopted several practices from the Agile methodology, such as SCRUM, namely: 1) the usage of Jira, a ticketing system to track activities, issues, and requests; 2) the adoption Git, a distributed code versioning system; 3) the implementation of continuous integration, delivery, and deployment practices; and 4) the general adoption of brief and informal communication practices among workgroups. To support such collaboration practices, this training session introduced project partners to the use of Jira: https://jira.egi.eu
Trainer panel	Nadia de Nardi, App development manager and research technologist at CREA
Learning objectives	• Explain Jira ticket types and their hierarchy; • Describe Jira ticket anatomy, including ticket attributes, description, and relations; • Plan a Jira ticket according to the Agile methodology and the SCRUM framework adopted by the project.
Strategic priorities and Training needs	SP1: TN1.1 SP6: TN6.1
Impact	The correct and timely onboarding of project partners to the chosen ticketing system was essential to establish a common development framework across WPs, with clear operational guidelines up to the reference standard. The training session was followed by a walkthrough of the SCRUM system's dashboards, projects, and examples of Jira request management. The ticketing system was regularly used for issues monitoring and planning of sprints, component updates and new releases.
Public link / ID	Jira for Cross-team Sprints in Research Projects

Table 2: Internal Capacity-building Session #2

INTERNAL CAPACITY-BUILDING SESSION #12	
Title	Do the right thing, do the thing right – How to generate UI/UX requirements
Date	9 December 2024
Format	Online tutorial and guided practice - 2 hours
Scope and purpose	The ENVRI-Hub development managed by the ENVRI-Hub NEXT consortium entails both evaluating and consolidating existing ENVRI-Hub demonstrators, while also generating user needs and establishing requirements for new ENVRI-Hub use cases. This training session introduced ENVRI-Hub developers and ENVRI-Hub service owners to the concept of user personas, the definition of generative and evaluative user research, and their different scopes. In the second part of the training session, a hands-on exercise provided participants with practical tips on how to run a user interview and collect actionable insights.
Learning objectives	• Defining realistic personas for the ENVRI-Hub service user groups; • Listing expected outcomes from interaction with user groups; • Choosing the most effective formats of interaction with user groups.
Trainer panel	Katie Berns, Postdoctoral Researcher at Aalto University, specialised in service design for climate change policy.
Strategic priorities and Training needs	SP1: TN1.1.
Impact	ENVRI-Hub service owners actively participated in the training session, which provided an opportunity to acknowledge gaps, challenge design assumptions, and reinforce a user-oriented approach. The guidelines proposed during the training were adopted and adapted to the project needs, creating a user persona template and service factsheet for each ENVRI-Hub component, including a user persona service overview and details about required interaction with relevant end-users.

INTERNAL CAPACITY-BUILDING SESSION #12	
	The concept of user persona was embedded in the design of four ENVRI-Hub user journeys: curiosity-driven researcher, senior environmental scientist, data provider, and data analyst. Some of the given examples of user research methods are being put into practice with a user group of beta testers.
Public link / ID	How to generate UI/UX requirements

Table 3: Internal Capacity-building Session #3

INTERNAL CAPACITY-BUILDING SESSION #3	
Title	Ethical Challenges in the ENVRI-Hub design: AI, Data Stewardship and User Rights
Date	23 June 2025
Format	Online webinar with questions and answers session - 1 hour and 30 minutes
Scope and purpose	This ENVRI-Hub NEXT webinar was organised to deepen the understanding of the ethical responsibilities that come with developing, maintaining, and using an environmental research hub. In this training session, external ethics experts guided project partners on how to manage data responsibly, apply ethical research practices, engage with stakeholders meaningfully, and develop trustworthy AI tools.
Learning objectives	• Define the ethical expectations for a Horizon Europe project in environmental research; • Identify the ethical challenges related to data collection, integration and reuse for environmental research infrastructures; • Discuss the concepts of Ethics by Design and Ethics of Use; • Develop a project governance framework covering both legal rules and broader bio-ethical principles.
Trainer panel	• Dr. Louise Bezuidenhout, Senior Researcher in Open Science at CWTS - Centre for Science and Technology Studies, Leiden University

INTERNAL CAPACITY-BUILDING SESSION #3	
	• Dr. Heikki Lihavainen, Managing Director at SIOS - Svalbard Integrated Arctic Earth Observing System; • Professor Stavroula Tsinorema, Director of the Joint Postgraduate Programme in Bioethics and Director of the Centre for Bioethics, University of Crete.
Strategic priorities and Training needs	SP2: TN2.1, TN2.2; SP3: TN3.1; SP4: TN4.1.
Impact	This capacity-building session was part of a larger review process of the ethics assessment plan in ENVRI-Hub NEXT. Three areas of potential risks were addressed by external advisors: AI and software tools; research data management; and personal data management in stakeholder consultations. The training supported project partners in submitting the deliverable 15.2 OEI – Requirements No.2.
Public link / ID	Ethical Challenges in the ENVRI-Hub design: AI, Data Stewardship and User Rights

Table 4: Internal Capacity-building Session #4

INTERNAL CAPACITY-BUILDING SESSION #4	
Title	GDPR Compliance in ENVRI-Hub NEXT: A Practical Guide
Date	23 September 2025
Format	Online webinar with questions and answers session - 1 hour
Scope and purpose	As the ENVRI-Hub NEXT continues to evolve as a central access point for environmental data and services provided by federated research infrastructures, ensuring the protection of such data and maintaining transparency is essential. This training webinar walked project partners through the principles, structure, and practical implications of the ENVRI-Hub privacy policy, and showed them how it should support both legal compliance and user trust.
Learning objectives	• Define overall scope and foundational principles of the EU's General Data Protection Regulation (GDPR);

INTERNAL CAPACITY-BUILDING SESSION #4	
	• Identify GDPR requirements for a Horizon Europe research project; • Review the GDPR compliance checklist in the context of ENVRI-Hub NEXT, including roles, responsibilities, and processes for privacy policy and agreements management.
Trainer panel	Yin Chen, Senior Community Support Officer at EGI Foundation
Strategic priorities and Training needs	SP2: TN2.1, TN2.2.
Impact	This webinar supported project partners in defining key legal components of the ENVRI-Hub privacy policy, including a governance structure for data protection and security. The overall challenge being tackled consists of developing an ENVRI-Hub comprehensive privacy policy, harmonising the profiles of several legal entities, ensuring GDPR compliance, and defining privacy roles, e.g., Data Controller, Data Protection Officer at RIs level, and Security Officer. Moreover, clarifying GDPR requirements was essential to better evaluate a unified legal framework for the cross-domain AAI system across services.
Public link / ID	GDPR Compliance in ENVRI-Hub NEXT: A Practical Guide

3.2. Public Training Events

In May 2025, an online training workshop was organised as a joint effort by the ENVRI-Hub NEXT and the EVERSE projects. The training event was titled: "*Research Software Quality Assessment: from local development to production environments*". This public event was announced and disseminated across the ENVRI Community internal and external communication channels, as well as the EVERSE project's social media, project website, and EVERSE Network mailing list. The registration for the training event was open to application developers and research software engineers across all scientific domains. During the second hour of the event, 20 seats were made available for a guided hands-on exercise.

In October 2025, the IRISCC project, together with the ENVRINNOV and ENVRI-Hub NEXT projects, hosted a public webinar dedicated to helping research infrastructures identify, manage, and exploit Key Exploitable Results (KERs). Joint community building and training efforts between the two ENVRI flagship projects and IRISCC will continue in 2026.

Table 5: Public Training Event #1

PUBLIC TRAINING EVENT #1	
Title	Research Software Quality Assessment: from local development to production environments
Date	21 May 2025
Format	Online workshop - 2 hours
Scope and purpose	This joint training webinar was organised as part of the training activities of the EVERSE Network and the ENVRI-Hub NEXT project. The EVERSE Network is an initiative by EVERSE - European Virtual Institute for Research Software Excellence, a EOSC project committed to improving the quality of software in European research in an international and transdisciplinary context. The ENVRI Community is part of the Science Clusters represented in EVERSE by scientific use cases, which include the ENVRI-Hub. This hands-on training session provided developers with a practical approach to code quality assurance (QA), including research software FAIRness and sustainability, containerisation, and security assessment of their applications, all integrated within GitLab CI pipelines. The main goal was to equip developers with the tools and procedures needed to maintain code quality, build secure container images, and automate deployments efficiently from local development to production environments.
Learning objectives	• Compare good practices for code deployment, management, and monitoring; • Use a preconfigured pipeline to assess your code; • Run a quality pipeline in your own environment.
Trainer panel	• Miguel Viana, DevSecOps Engineer, LIP – Laboratory of Instrumentation and Experimental Particle Physics; • João Machado, Research Assistant, LIP – Laboratory of Instrumentation and Experimental Particle Physics; • Zhiming Zhao, Associate Professor, Informatics Institute, UvA – University of Amsterdam.
Targeted participants	Application developers and research software engineers across all scientific domains.

PUBLIC TRAINING EVENT #1	
Strategic priorities and Training needs	SP6: TN6.1; SP7: TN7.1
Impact	Out of 50 registrants, 39 joined the event for the introductory theoretical session, while 17 also took an active part in the hands-on exercise during the second half of the event. A well-balanced ratio of 2 trainers for max 20 trainees was therefore achieved, as planned. This public online workshop provided an opportunity for knowledge exchange over modern DevOps best practices not only with the ENVRI Community, but also with the other scientific communities involved in the EVERSE project, such as life sciences, social sciences, humanities, photon and neutron sciences, astrophysics, and particle physics. The use case presented by LIP during the event was the customised Continuous Integration and Continuous Deployment (CI/CD) pipeline that was successfully implemented for the ENVRI-HUB Next Core service. A pre- and post-event survey was administered to attendees to evaluate their overall satisfaction against their expectations, and their self-assessment against the proposed learning objectives. The ten replies received showed an improvement in the participants' capacity of: • Identifying software quality criteria; • Choosing at least one relevant software assessment tool, and; • Using the GitLab CI/CD solution for software quality assessment, a goal for which more preparatory steps and guided practice time were deemed necessary by the participants.
Public link / ID	ENVRI-Hub NEXT and EVERSE Training Webinar: Research Software Quality Assessment

Table 6: Public Training Event #2

PUBLIC TRAINING EVENT #2	
Title	Key Exploitable Results Management | Turning Research Services into Impact
Date	29 October 2025

PUBLIC TRAINING EVENT #2	
Format	Online presentation – 1 hour
Scope and purpose	This IRISCC webinar was organised in collaboration with ENVRI-Hub NEXT and ENVRINNOV to help RIs identify, manage, and exploit Key Exploitable Results (KERs) within EU-funded research projects. Tracking KERs ensures that valuable project outputs are protected, shared, and reused, enhancing both visibility and long-term impact. Robust exploitation strategies create lasting value for science, innovation, and society.
Learning objectives	• Define Key Exploitable Results (KERs) and their value for RIs; • List the intellectual property (IP) types that are relevant in EU projects: background, sideground, third-party, and foreground IP; • Describe KERs' managing roles and reporting process on the EU portal; • Identify innovation training opportunities and community tools for RIs offered by ENVRINNOV.
Trainer panel	Elia Bellussi, EGI, Innovation manager in ENVRI-Hub NEXT and IRISCC
Targeted participants	ENVRI-Hub service owners and service developers; PIs, WP leaders and task leaders in ENVRI-related projects; KER champions.
Strategic priorities and Training needs	SP5: TN5.1; SP7: TN7.1.
Impact	This training session gathered 29 participants from across 16 organisations and 7 countries, representing the broader ENVRI and research infrastructure community. Participants explored how to handle project results strategically, from mapping intellectual property (IP) to developing effective exploitation plans. This webinar also set the stage for internal hands-on KER workshops for designated ENVRI-Hub NEXT, ENVRINNOV and IRISCC KER Champions.
Public link / ID	https://www.iriscc.eu/article/turning-research-services-into-impact-managing-key-exploitable-results-in-iriscc

3.3. Other Enabling Activities

Between 2024 and 2025, other public and upon invitation events, and internal working sessions were organised by the ENVRI-Hub NEXT partners. Even though they do not count as training activities, these initiatives were nevertheless essential to elicit common challenges and solutions, re-evaluate training needs and actions, and bring forward transversal work across the project.

Listed below are enabling activities that provided input to the ongoing ENVRI-Hub NEXT training provision:

- **Public event:**
    - **03/09/2024** | Webinar on "**Lessons Learned from ENVRI-Hub NEXT Landscape Analysis**". During this two-hour, public online event, ENVRI-Hub NEXT partners shared insights from key findings of an ENVRI landscape analysis that surveyed practices and policies in metadata, vocabularies, AAI, and licenses across environmental research infrastructures. The following discussion among participants helped clarify the baseline for the ENVRI-Hub AAI system and identified training needs for semantic mapping and adoption of harmonised vocabularies.
- **Event upon invitation:**
    - **25/09/2025** | The **first user group online meeting** was organised to preview the 2025 ENVRI-Hub deployment and embed early user feedback in its evolution. All members of the ENVRI-Hub user group were invited to join a two-and-a-half-hour call where leading partners introduced the ENVRI-Hub NEXT project's mission and showed the in-development version of the ENVRI-Hub. After exploring the ENVRI-Hub homepage, each participant ran an individual user test, trying to achieve a specific objective through one or more ENVRI-Hub components. User feedback was shared live, in the chat, and tracked via a survey. Insights were used to plan future user research, onboarding and support efforts.
- **Internal working sessions:**
    - **13 and 20/06/2024** | A series of two online hackathons to present and discuss crucial aspects of the **ENVRI-Hub architecture framework**, the Agile methodology adopted for software development management, and DevOps solutions for software quality monitoring and assurance.
    - **18 and 25/11/2024** | A series of two online hackathons to present the **I-ADOPT framework** and its relations with **EVs and metadata schemas**. During the first day, project partners were guided on how to use EPOS-DCAT-AP and populate the ENVRI Catalogue of Services. On the second day, the FAIR Data Points and their APIs were explored.
    - **09/12/2024** | The **ENVRI-ID** cross-RI **AAI** Workshop onboarded project partners onto the identity management solution developed for the ENVRI-Hub.

The features of the Service Management Portal for the integration of services were also explored, including strategies for access control, membership management and group collaboration. Finally, potential services requiring AAI integration were identified.

- **08-10/04/2025** | During this 3-day onsite hackathon in Amsterdam **all in-development components of the ENVRI-Hub** were discussed through presentations and hands-on sessions, including: creation of Jupyter Notebooks for accessing EVs, based on existing RI services; metadata harmonisation and API access from the Analytical Framework; CI/CD & software quality control overview; search scenarios validation; user interface validation of the Catalogues of Services and FAIR Data Points; AAI integration status.
- **10 and 17/06/2025** | During this two-day online "All Hands meeting", partners presented **ethics** requirements, validated successful **user journeys**, and defined the necessary **steps toward deployment** (version 1.0). The final checklist included: asset status, missing documentation, indexing and retrieval protocols for the KB and LLM-based research, and feeding between the FDP and the CoS. Parametrisation of the Notebooks and other aspects of AAI and CI/CD were also discussed.

3.4. Future Training Activities

ENVRI-Hub NEXT will continue coordinating, co-organising and supporting training activities in 2026, with a focus on the full exploitation of the ENVRI-Hub by end users, training of (new) data and service providers, and further engagement with the ENVRI Community and other ENVRI-related projects.

Two upcoming training activities are currently being planned, as follows: 1) an internal capacity-building session on Key Exploitable Results (KERs); 2) a short course at the European Geosciences Union (EGU) general assembly 2026. Below, we provide the available details as of November 2025.

3.4.1. Capacity-building Session on KERs

Table 7: Internal Capacity-building Session #5

INTERNAL CAPACITY-BUILDING SESSION #5	
Title	To be defined
Date	Early 2026
Format	Online workshop

INTERNAL CAPACITY-BUILDING SESSION #5	
Scope and purpose	The exploitation management strategy of ENVRI-Hub NEXT includes the concept of Key Exploitable Results. A Key Exploitable Result (KER) is a project result or a group of similar project results with particularly high exploitation potential, i.e. use and benefits from something often for commercial purposes, public policymaking, or further research. The groups of KERs identified in ENVRI-Hub NEXT are: • KER01: ENVRI-Hub Framework • KER02: ENVRI-Hub Service Management System • KER03: ENVRI-Hub Technical Architecture • KER04: ENVRI-Hub EOSC Integration • KER05: ECV Scientific and Technical Framework • KER06: ENVRI-Hub Training Materials Each KER's group is coordinated by an appointed KERs Champion, who is responsible for collecting relevant data and communicating it to the Innovation Manager. This online workshop will support ENVRI-Hub NEXT project partners in the KERs reporting process, clarifying scope, roles, and responsibilities. Participants will be guided with a writing session, analysing transversal components of the ENVRI-Hub through the lens of measurable, exploitable results.
Learning objectives	• Define the value proposition of each KERs' group in ENVRI-Hub NEXT, including needs, risks and mitigation measures; • Identify ownership and other responsibilities across ENVRI-Hub NEXT project partners and other ENVRI-Hub stakeholders; • Adopt a KERs standardised reporting process for ENVRI-Hub NEXT, including scope, templates, and timelines.
Suggested trainer panel	• Elia Bellussi, EGI
Targeted participants	KER Champions, KER-related WP leaders, KER-related Task leaders, and Deliverable contributors.
Strategic priorities and Training needs	SP5: TN5.1 SP7: TN7.1

INTERNAL CAPACITY-BUILDING SESSION #5	
Expected Impact	This capacity-building session will support project partners in satisfying EC reporting needs while also planning for dissemination and exploitation actions to connect KERs to pilots and early adopters.
Public link / ID	To be created

3.4.2. Introducing the ENVRI-Hub Potential at EGU26

Table 8: Short Course at EGU26

SHORT COURSE AT EGU26	
Title	Harnessing the ENVRI-Hub: data, tools, and services for interdisciplinary research
Date	Between 3 and 8 May 2026
Suggested format	Hybrid workshop - 1 hour 45 minutes
Scope and purpose	Earth and environmental sciences thrive on data diversity: from ocean temperatures to biodiversity records, from climate indicators to geological observations. Yet, this very diversity can also be a barrier: different datasets are described with different standards, stored in different formats, and are difficult to connect across research infrastructures. The ENVRI-Hub provides a set of tools to overcome these challenges. It offers researchers a unified framework to discover, access, and reuse complex and multidisciplinary data. This short course will give researchers a practical introduction to how ENVRI-Hub workflows can directly support their own projects, to build more reproducible and impactful science. This public course will also be informed by the outcomes of a one-week internal hackathon, planned for December 2025, about the rationalisation of the ECVs in the ENVRI-Hub.
Learning objectives	• Define the value of Essential Variables' harmonisation for scientific collaboration and research reproducibility across Earth and environmental sub-domains; • Access datasets through different pathways, including LLM-based search;

SHORT COURSE AT EGU26	
	• Draft a mini workflow from data query to results visualisation, using curated Jupyter notebooks; • Discuss ENVRI-Hub use cases with peers.
Suggested trainer panel	• Kety Giuliacci, INGV / EPOS • Zhiming Zhao, UvA
Targeted participants	This short course is tailored for: • Researchers in Earth and environmental sciences, project coordinators, and data scientists looking to improve their data workflows; • Anyone interested in applying interoperable approaches to interdisciplinary research; • Anyone with basic familiarity with Python/Jupyter Notebooks.
Strategic priorities and Training needs	SP2: TN2.1; SP5: TN5.1, TN5.2; SP6: TN6.2.
Expected Impact	In 2025, EGU welcomed in Vienna 21.000 conveners across all Earth science sub-domains. 100 seats per short course are made available by the conference organisers. The short course was also designed to complement the EGU26 scientific session "Essential Variables for Global Cooperation and Interoperability": meetingorganizer.copernicus.org/EGU26/session/57662
Public link / ID	https://meetingorganizer.copernicus.org/EGU26/session/57896

4. Recommendations

This final chapter provides recommendations on key aspects to take into account when planning and producing training, what training needs will be further addressed by ENVRI-Hub NEXT in 2026 and how to prepare for the project's end.

4.1. Lessons learnt and Steps forward

- **Training activities planning** | In training activities embedding a practice component, it proved necessary to block longer time slots for the guided hands-on session, either on the same day or by splitting it over more days. For training activities with a high cognitive intensity and technical focus, the onsite format is preferable, as part of training workshops, summer schools, or conference side events, ideally in collaboration with other ENVRI-related projects. Sharing beforehand preparatory tutorials with participants is an option to carefully consider to maximise the in-presence time allocated for practical work.
- **Training content production** | For online capacity-building sessions, sharing the video recording with the trainer's presentation afterwards may not suffice to allow effective asynchronous access to information and knowledge building by those who missed the live session. Lack of time to retrace the video recording or extrapolate key insights from the slides emerged as a concern. First of all, cutting long video recordings into separate units by content, and/or adding detailed chapter titles, largely improves the successful re-use of training content. Accompanying the video and slides with a textual summary and a checklist of "must-knows" is another strategy to opt for.
- **Training needs** | During the first part of the ENVRI-Hub NEXT project, the training provision supported project partners in successfully concluding intermediate sprints and launching the planned deployments. During 2026, internal capacity-building sessions will continue, in parallel with external training actions catering for the needs of ENVRI-Hub end-users, focusing on defining the relations between EVs, I-ADOPT, metadata, and vocabularies (TN2.3); managing datasets (TN4.2); and equipping researchers with new data access and analysis capacities (TN5.2). Envisaged training actions include creating service user manuals, FAQs, tutorials, and organising periodic user onboarding sessions.

4.2. Sustainability of the ENVRI Training Infrastructure

D3.2, Training Plan, described the current structure and components of the ENVRI Training infrastructure, including the ENVRI Training Platform, the ENVRI Training Catalogue's metadata schema and APIs, and the ENVRI-Hub Training Gateway.

Even though the updating of such infrastructure is not an expected activity in the scope of ENVRI-Hub NEXT, Task 4.5 recommends planning for a sustainability strategy to ensure the maintenance, curation, and dissemination of the training content even beyond the end of the project. Such a strategy should be informed by validating the training content production and

search scenarios (TN3.1) through user research, for example, by interviewing and/or surveying participants of the ENVRI-Hub user group, which is coordinated by WP4.

5. References

Reference	
No	**Description/Link**
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R3	**ENVRI-Hub NEXT D7.1 Report on Metadata Catalogue Development (Under EC Review).** Turco, A., Bailo, D., Salvi, M., & Vinciarelli, V. 2025. DOI: https://doi.org/10.5281/zenodo.16566368
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R9	**Training needs assessment: Methods, tools, and techniques.** Barbazette, J. John Wiley & Sons. 2006.