



D 3.2 Report: Training Executive Working Plan for the second year



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1. INTRODUCTION

The deliverable 3.2 was planned to be released within the framework of the ITINERIS project and it is part of the activities of the Work Package (WP)3 concerning the mapping and planning of training activities for the second year; in detail, the actions would have involved all the OUs and covered the training activities for the scientific and technical personnel of the 22 Italian environmental Research Infrastructures (RIs), the PhD students and the RIs employees on science communication involved in the project.

This deliverable was expected to be released in Bimester 5 and to be included into the intermediate objective of bimester 6; it is produced under the responsibility of the Operative Unit (OU) of the National Research Council, Research Institute on Terrestrial Ecosystems (CNR-IRET).

The main aim of the deliverable 3.2 is to provide a general overview of details on the structure, organization and contents of the ITINERIS training program for the activities 3.6, 3.7 and 3.8. Instead, the aim of this document is to clarify the failure to release and deliver the activity plans regarding the training courses planned, as expected from the project, for the second year.

The document is structured into 3 chapters, including this one. Chapter 2 of this document presents the executive work plan for activities 3.6, 3.7, and 3.8 foreseen within WP3. In detail, the chapter includes also the training calendar developed by the OUs and the universities involved under the coordination of OU CNR-IRETLE. Chapter 3 includes the list of acronyms used in this report.

2. TRAINING EXECUTIVE WORKING PLAN

The OU CNR-IRETLE has been carried out the activity of planning and coordination of the training activities dedicated to technical and scientific personnel of RIs, students of XXXVIII and XXXIX PhD cycles, and RIs employees dedicated to science communication.

The temporary personnel with a level III Technologist profile hired in WP3 under all the OUs involved, in according with the referents of the universities (i.e. Universities of Naples Federico II, Naples Parthenope, Pisa, Salento and Tuscia) have worked during the first year of the project on the training plan of suitable training courses to be delivered taking into account the needs of the scientific community and of the personnel of the research infrastructures.

To facilitate communication and collaboration within WP 3, the CNR-IRETLE Operational Unit (OU) has created, within the LifeWatch Italy Community platform, a digital space dedicating a Working Group folder. This folder was used as a central hub for information sharing and discussion among key personnel of WP3, i.e. RTD and WP co-ordinators, the WP3 PhD programmes coordinators or University responsible for ITINERIS. The facilities included in the platform such as calendar, Repository area, Wiki, Forum a brainstorming area (Mural) are available to all the WG members.

The training courses that were scheduled starting from the first year of the project were not released and a new plan was designed to cope with the delays in the recruitment process of the fixed-term personnel responsible of the training activities in WP3 and the personnel that shall be subject to the training; besides the duration of the selections, in many cases the lack of candidates suitable for the specifications required by the calls led to the need to re-publish the procedures.

Therefore, the new working plan has been defined during all the WP meeting organized by OU-CNR IRETLE, with the participation of the OUs within WP3 and the universities involved, and the training programme proposed for activities 3.6, 3.7, and 3.8, taking into account the delays and the impossibility of the delivery for some courses, has been compressed in the second half of the project starting from October 2024 as listed in the following paragraphs.

The complete and updated list of courses, with precise details of dates, times, and delivery methods, it will be available in the dedicated sections of the ITINERIS training platform. Please note that the training program may be subject to changes in terms of the course itself or of training contents following possible reassessment of the training needs of the research infrastructures involved in the project and/or of the personnel concerned, i.e. participants and tutors.

An extension of the project will be needed to proceed with the new plan, enforcing a seamless implementation of all the planned course with no effect on their quantity and quality.

2.1 Training programme and actions in activity 3.6

Each advance training course included in the activity 3.6 has been designed to meet the specific needs of the target technical and scientific staff of the involved RIs in ITINERIS. To aim this goal, each, the units of personnel, with a level III Technologist profile, involved in the WP3 training, has been conducted, under coordination of OU CNR-IRET, an in-depth analysis of the needs per domain and per thematic subcategory of the Research Infrastructures of which the target course participants are a part. These courses have been structured to enhance the human capital of the RIs through specific training contents with extremely flexible delivery methods developed, including in-person, online, and hybrid modes, in order to meet the needs of the RIs.

In detail, the training courses of Activity 3.6 will globally offer theoretical training modules, which will provide a conceptual background and specific knowledge based on the thematic categories of RIs, hands-on sessions to enforce the knowledge of RIs scientific instrumentation and services, and case studies to offer the opportunity to analyse real cases and discussing with other participants using the experiences of other professional figures coming from the same disciplinary sector or from parallel sectors, in order to increase the synergy between the RIs.

Table 1 lists the 25 of the 36 planned training courses of activity 3.6 that can be delivered even if an extension of the available time is not granted, the courses in this table are considered priority courses and will be delivered in any case. Table 2 lists the remaining 11 training courses that can only be delivered if an extension of the available time is granted. Table 3 presents the proposed calendar on the training programme for activity 3.6.

Table 1 – Updated training programme planned in activity 3.6

WP2 Access and Management	WP2 eScience Domain	WP4 Atmospheric Domain	WP5 Marine Domain	WP6 Terrestrial Domain	WP7 Solid Earth Domain	WP8 Trans Domain
Access process and modalities	Open FAIR Science	Atmospheric Standardized observations: methods and maintenance in the labs - In- Situ	Introduction to Marine Research Infrastructures: managing complexity	Eddy Covariance theory and practice: from sensor setup to preliminary data processing	Digital collection and archiving of drilling data with mDIS	Safety in the field work related to RIs (fire risk and sea activities)
	FAIR Awareness	Atmospheric Data acquisition, processing and submission - Remote Sensing	Marine data management and data quality control	Datalogger programming and sensors connection - basic course	Distributed Acoustic Sensing (DAS) for high- resolution and large-scale geophysical imaging	How to write a successful proposal
	FAIR Assessment via FAIR Implementation Profiles	Atmospheric composition data exploitation	Ship-based training initiatives in marine-related sciences	Use of Isotopes in environmental investigations	Data mining and machine learning for Geophysics	Safety in the field work related to RIs (towers climbing and hiking principles)
	Enabling Open Science on Cloud using Jupyter Notebooks	Atmospheric Standardized observations: methods and maintenance in the labs – Remote Sensing	Structure of the Marine Data access at the European Level	Datalogger programming and sensors connection - advanced course	Geophysical instruments and data processing	Use open scientific infrastructure facilities and VRE - Advanced

Table 2 – Training program that could be delivered in activity 3.6 if we have the six month extension

WP2 Access and Management	WP2 eScience Domain	WP4 Atmosphere Domain	WP5 Marine Domain	WP6 Terrestrial Domain	WP7 Solid Earth Domain	WP8 Trans Domain
Access process and modalities	Harmonization of remote sensing data and geospatial modelling	Climate change and urban pollution: challenges and objectives for the atmospheric research	Introduction to Marine Research Infrastructures: managing complexity	Containers creation and use in HPC environment	Advanced technologies for landslides	VRE operating mode - basic
	Artificial Intelligence applied to environmental monitoring	Atmospheric Data acquisition, processing and submission - In Situ	Marine data management and data quality control	Programming in Python		

Table 3 – Calendar for training courses of activity 3.6

	Autumn 2024	Winter 2024	Spring 2025	Summer 2025
WP2 Access and Management	Access process and modalities			Access process and modalities
WP2 eScience	FAIR Awareness	FAIR Assessment via FAIR Implementation Profiles	# Open FAIR Science; # Enabling Open Science on Cloud using Jupyter Notebooks; # Harmonization of remote sensing data and geospatial modelling	Artificial Intelligence applied to environmental monitoring
WP4 Atmosphere Domain	Atmospheric Data acquisition, processing and submission - Remote Sensing	# Atmospheric Standardized observations: methods and maintenance in observatories - In- Situ; # Atmospheric Standardized observations: methods and maintenance in the labs – Remote Sensing	# Atmospheric composition data exploitation; # Climate change and urban pollution: challenges and objectives for the atmospheric research	Atmospheric Data acquisition, processing and submission - In Situ
WP5 Marine Domain	Introduction to Marine Research Infrastructures: managing complexity.	Marine data management and data quality control	# Ship-based training initiatives in marine- related sciences; # Structure of the Marine Data access at the European Level; # Introduction to Marine Research Infrastructures: managing complexity	Marine data management and data quality control
WP6 Terrestrial Domain	Eddy Covariance theory and practice: from sensor setup to preliminary data processing	Datalogger programming and sensors connection - basic course	# Use of Isotopes in environmental investigations; # Datalogger programming and sensors connection - advanced course	# Containers creation and use in HPC environment # Programming in Python

WP7 Solid Earth Domain	Distributed Acoustic Sensing (DAS) for high-resolution and large-scale geophysical imaging	# Advanced technologies for landslides; # Digital collection and archiving of drilling data with mDIS	Data mining and machine learning for Geophysics	Geophysical instruments and data processing
WP8 Trans Domain	How to write a successful proposal	# Safety in the field work related to RIs (towers climbing and hiking principles); # Use open scientific infrastructure facilities and VRE - Advanced	# Safety in the field work related to RIs (fire risk and sea activities) # VRE operating mode - basic	

2.2 Training programme and actions in activity 3.7

The advanced training courses, included in Activity 3.7, have been designed to meet the specific needs of RIs, providing high-level training to early career environmental scientists in PhD programs focused on the main research areas of RIs, with the main aim to supply them the skills and to actively contribute to the development of scientific research.

The units of personnel involved for training activities in WP3 for OU CNR-IRET, have been fully involved with the Universities of Naples Federico II, Naples Parthenope, Pisa, Salento and Tuscia, to finalize all the protocol of agreement and administrative procedure within the expected time to allow the publication of the PhD fellowships supported by ITINERIS for the XXXVIII and XXXIX PhD Cycles.

Moreover, all the OUs and the personnel involved in the training activities of WP3, under the coordination of OU CNR-IRETLE, have been conducted an in-depth analysis of the needs and training requirements of the early career environmental scientists planning an adequate training program. This was made possible through the collaboration between each OU and the reference university for thematic domains, i.e. OU of Atmospheric Domain involves the Universities of Naples Federico II, OU of Marine Domain involves Naples Parthenope, OU of Solid Earth Domain involves Pisa, OU of eScience involves University of Salento and OU of Terrestrial Domain involves University of Tuscia, with the trans-Domain organizing transdisciplinary practical courses. The training programme of the courses for the revised plan is presented in Tables 3 and 4, in particular Table 4 lists 21 training courses of activity 3.7 that can be delivered even if an extension of the available time is not granted, the courses in this table are considered priority courses and will be delivered in any case. Table 5 lists the remaining 8 training courses that can only be delivered if an extension of the available time is granted. Table 6 presents the proposed calendar on the training programme for activity 3.7.

Table 4 – Updated training programme planned in activity 3.7

WP2 eScience Domain	WP4 Atmosphere Domain	WP5 Marine Domain	WP6 Terrestrial Domain	WP7 Solid Earth Domain	WP8 Trans Domain
Research life cycle management	Anthropogenic activities and effects on the living environment and human health.	Oceanographic observational and modelling products available for marine research	Eddy covariance: processing and data use	Geophysical methods in geoscience and near surface geophysics	Use open scientific infrastructure facilities and VRE - Basic
Introduction to Python language	Can Science Save the Earth? (Optical advanced instruments for atmospheric	Autonomous instruments in oceanography	Programming in R	Geophysics and natural risks: instruments and principles of data analysis	Use open scientific infrastructure facilities and VRE - Advanced

	monitoring design and operation).				
Data mining and machine learning		Advanced data analysis and processing techniques	Containers creation and use in HPC environment	Advanced technologies for monitoring and prediction of ground instabilities	Safety in lab and field work related to RIs (UNIPisa)
Data harmonization and integration		Applications of dynamic systems theory in oceanography	Programming in Python advanced course		Safety in lab and field work related to RIs (UNISalento)

Table 5 – Training program that could be delivered in activity 3.7 if we have the six month extension

WP2 eScience Domain	WP4 Atmosphere Domain	WP5 Marine Domain	WP6 Terrestrial Domain	WP7 Solid Earth Domain	WP8 Trans Domain
Knowledge graph. Fundamentals, techniques and applications		Software for processing meteorological and oceanographic data	Build a project proposal, a presentation or a public communication		How to present your activities and results (UNIPisa)
Developing research projects in Virtual Research Environments		Oceans and climate.	Artificial intelligence and data mining methods in ecology		How to present your activities and results (UNISalento)

Table 6 – Calendar for training courses of activity 3.7

	Autumn 2024	Winter 2024	Spring 2025	Summer 2025
WP2 eScience	Introduction to Python language	# Research life cycle management; # Data mining and machine learning	# Data harmonization and integration; # Knowledge graph. Fundamentals, techniques and applications	Developing research projects in Virtual Research Environments
WP4 Atmosphere Domain		Can Science Save the Earth? (Optical advanced instruments for atmospheric monitoring design and operation).	Anthropogenic activities and effects on the living environment and human health.	
WP5 Marine Domain	Oceanographic observational and modelling products available for marine research	# Autonomous instruments in oceanography; # Advanced data analysis and processing techniques	Applications of dynamic systems theory in oceanography	# Software for processing meteorological and oceanographic data; # Oceans and climate.
WP6 Terrestrial Domain	Eddy covariance: processing and data use	# Programming in R; # Programming in Python advanced course	# Containers creation and use in HPC environment; # Build a project proposal, a presentation or a public communication	Artificial intelligence and data mining methods in ecology
WP7 Solid Earth Domain	Geophysics and natural risks: instruments and principles of data analysis		# Geophysical methods in geoscience and near surface geophysics; # Advanced technologies for monitoring and	

			prediction of ground instabilities	
WP8 Trans Domain	How to present your activities and results (UNISalento)	# Use open scientific infrastructure facilities and VRE - Basic; # Safety in lab and field work related to RIs (UNIPisa)	# Safety in lab and field work related to RIs (UNISalento); # How to present your activities and results (UNIPisa)	Use open scientific infrastructure facilities and VRE - Advanced

2.3 Training programme and actions in activity 3.8

The training course included in the activity 3.8 has been dedicated to the RIs employees dedicated to science communication. The activity has been planned to offer six courses in the first year with a learning-by-doing approach, and two intensive practical courses, held by the RIs employees trained with the previous courses and dedicated to stakeholders. The OU CNR-IRETLE has been activated communication with the personnel of OUs involved in WP3 for a development of a first draft of the training courses based on the mapping activities of RIs needs and field of interested

Table 7 lists the 6 training courses of activity 3.8 that can be delivered even if an extension of the available time is not granted, the courses in this table are considered priority courses and will be delivered in any case meanwhile Table 8 lists the remaining 2 summer/winter schools that can only be delivered if an extension of the available time is granted. Table 9 present the proposed calendar on the training programme for activity 3.6.

Table 7 – Updated training programme planned in activity 3.8

<i>Advanced Training courses for RIs employees for science communication</i>
Communicating science in a fun way: principles and foundations
Multidisciplinary science communication: a bridge to bring science to people
Scientific journalism and narrative
The art of presentation design: A guide for creating effective communication and presentation events
Science communication in the Digital Era: Podcasting
Science communication in the Digital Era: Social Media

Table 8 – Training program that could be delivered in activity 3.8 if we have the six month extension

<i>Courses held by the RIs employees dedicated to Stakeholders</i>
Scientific communication toward stakeholders and public
Citizens in science for a healthier and more sustainable global Earth system

Table 9 – Calendar for training courses of activity 3.8

Autumn 2024	Winter 2024	Spring 2025	Summer 2025
	Communicating science in a fun way: principles and foundations	# The art of presentation design: A guide for creating effective; # Multidisciplinary science communication: a bridge to bring science to people; # Scientific journalism and narrative; # Science communication in the Digital Era: Podcasting; # Science communication in the Digital Era: Social Media;	# Scientific communication toward stakeholders and public; # Citizens in science for a healthier and more sustainable global Earth system

		communication and presentation events	
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3. LIST OF ACRONYMS

OU: Operative Unit

RI: Research Infrastructure

WP: Work Package