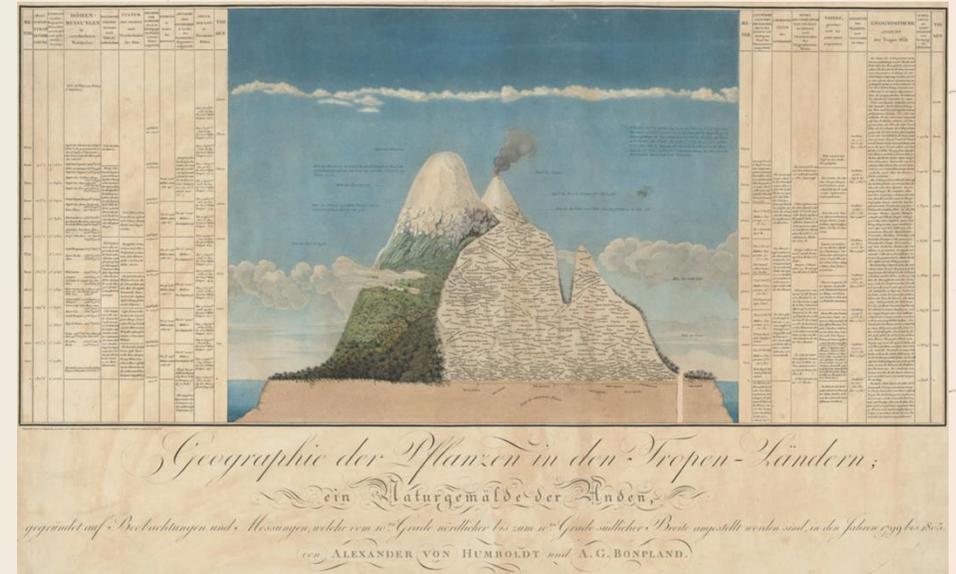


The Italian Integrated Environmental Research Infrastructures System - ITINERIS

- Eugenio Trumpy



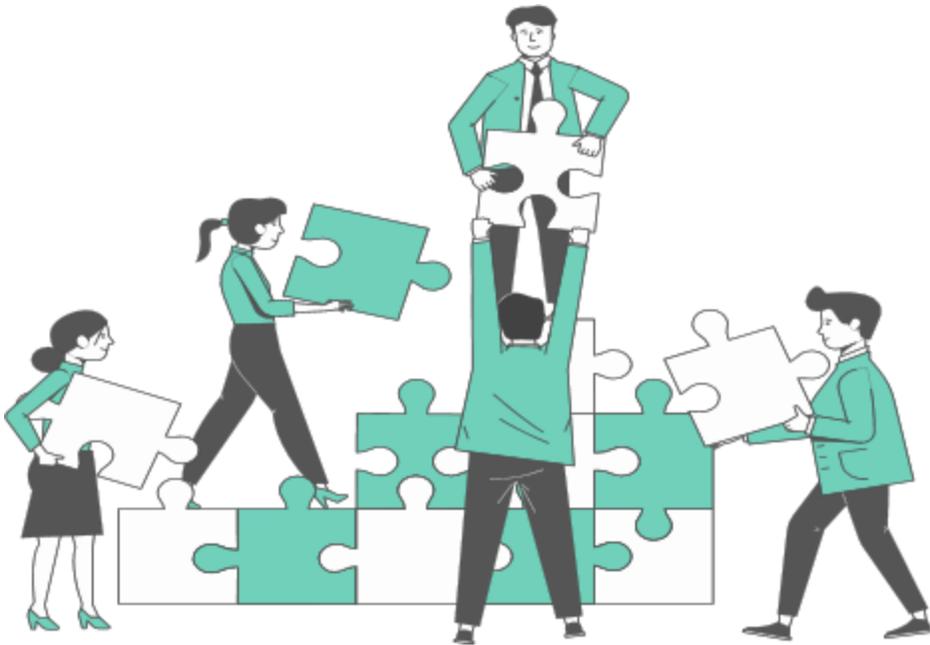
von Humboldt and Bonpland,
Naturgemälde

IR0000032 – ITINERIS, Italian Integrated Environmental Research Infrastructures System
(D.D. n. 130/2022 - CUP B53C22002150006) Funded by EU - Next Generation EU PNRR-
Mission 4 “Education and Research” - Component 2: “From research to business” - Investment
3.1: “Fund for the realisation of an integrated system of research and innovation infrastructures”



The Earth's system approach to environmental challenges

Most critical issues currently faced by our society involve key environmental challenges: pollution, land use and climate change, and their impacts on biodiversity and ecosystem integrity.



Given the complexity of such challenges, a comprehensive and integrated approach at the Earth's system is essential to provide quantitative knowledge to be transformed into actionable strategies

ITINERIS will build the Italian Hub of Research Infrastructures in the environmental scientific domain for the observation and study of environmental processes in the atmosphere, marine domain, terrestrial biosphere, and geosphere.

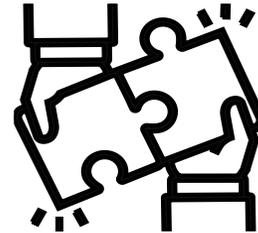
The main goal is to develop a whole-system, cross-disciplinary and integrated approach for understanding and predicting the Earth's system and developing effective action strategies to address the most pressing environmental challenges.

The ITINERIS Mission



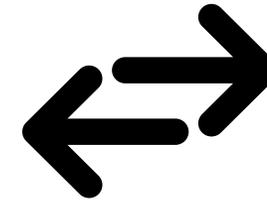
Integrate the environmental RIs

Harmonize developments and integration to ensure full interoperability, and provide the highest accessibility to data, knowledge and services produced by the RIs through the ITINERIS HUB.



Develop cross-disciplinary research

Develop cross-disciplinary actions, services and tools, such as Virtual Research Environments, that empower researchers to tackle complex environmental challenges.



Strengthen the national RIs landscape

Promote internal exchange of expertise facilitating transfer of best practices from the most mature to the new and developing RIs.

The ITINERIS HUB



A single access point providing seamless access to the wide range of data, cutting-edge facilities, analytical tools, and services provided by the Italian environmental Research Infrastructures to support scientific inquiry, policy-making, and innovation.

A catalyst for Environmental Science and Innovation



- ✓ A **platform enabling groundbreaking research** and discoveries in environmental science
- ✓ **Enhancing the availability and access to data and services** produced by the integrated system of RIs
- ✓ **Fostering international collaborarion** with European and international global communities and organizations
- ✓ Supporting the **development of skills and expertise** among researchers
- ✓ Develop new products and services, **fostering innovation** and increasing competitiveness in the market
- ✓ Increase awareness and **promote adoption of sustainable practices** and technologies
- ✓ Providing evidence-based insights to **support and inform policy-making**
- ✓ Contribution to global effort to **adapt to and mitigate the impacts of pressing environmental challenges**

ITINERIS aims to position Italy as a global leader in environmental research.

By harnessing the power of interdisciplinary research and leveraging cutting-edge technologies and innovative solutions, ITINERIS is poised to become an international benchmark and shape the framework of environmental science and policy for the next decades.



The Ministry of University notice 3264/2021 provided a budget of €1,080 million divided according to the 6 thematic areas of ESFRI and based on the priorities identified in the National Plan for Research Infrastructures 2021-2027 (PNIR).

- i. RI enhancement – for high priority RIs;
- ii. New RIs – for medium- high priority RIs;
- iii. Thematic or multidisciplinary RI networks related to one of the ESFRI area - for medium- high priority RIs



Opportunities...with conditionalities!

- 40% of the investment to be located in the Southern Italy regions
- Gender equal opportunities;
- Do Not Significantly Harm
- Environmental and digital tagging objectives
- Open science and fair data
- Long-term sustainability: at least for the 10 years period after the completion of the project

The project at a glance



ITINERIS -Italian Integrated Environmental Research Infrastructures System is a project funded by EU – Next Generation EU PNRR- Mission 4 “Education and Research” – Component 2: “From research to business” – Investment 3.1: “Fund for the realisation of an integrated system of research and innovation infrastructures”.

The project is coordinated by the CNR (National Research Council). It started in November 2022, and will continue for 36 months.



Project at a glance



€ 155M INVESTMENT



7 PARTNERS

39 OPERATING UNITS



75 INTERMEDIATE OBJECTIVES

208 DELIVERABLE

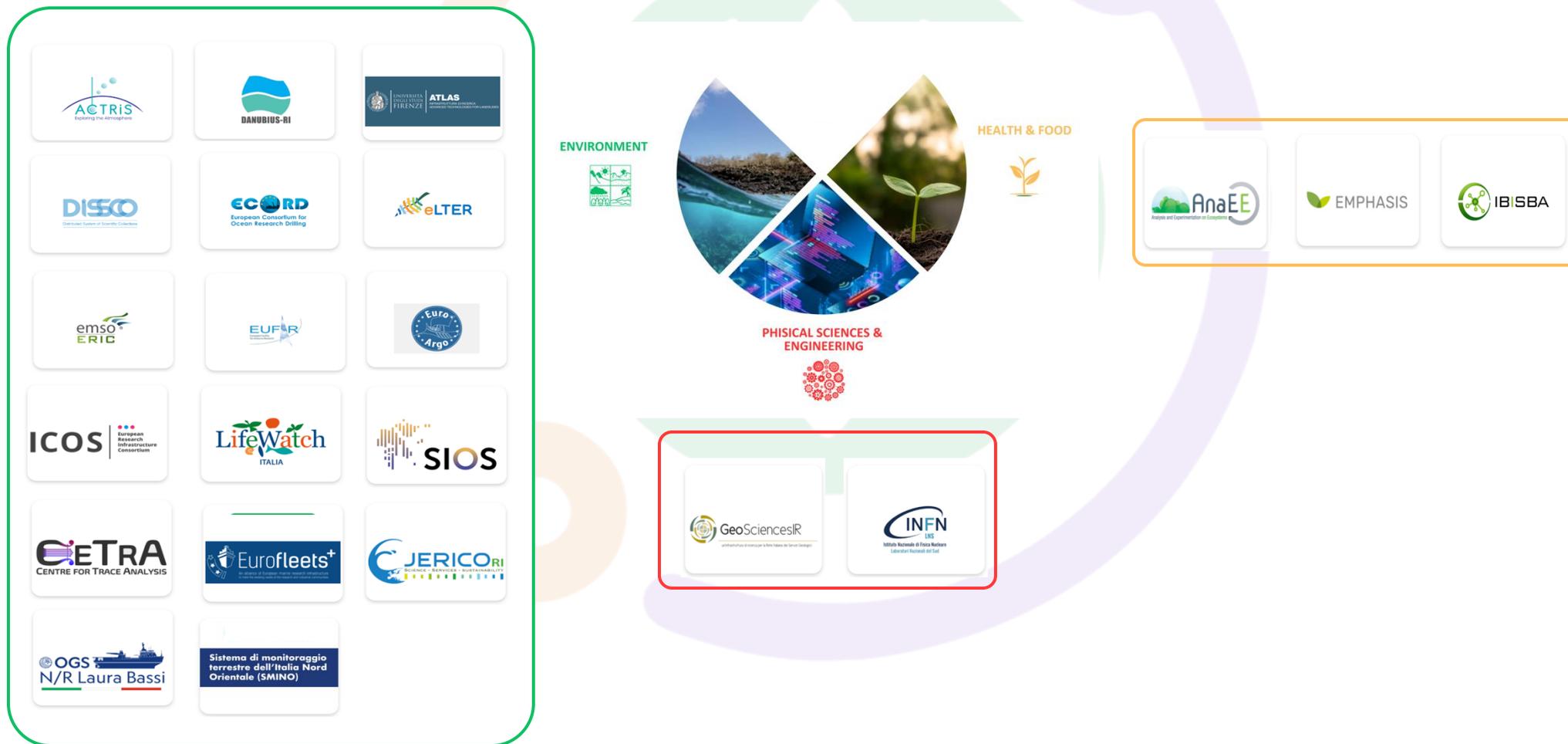


8 WORK PACKAGES

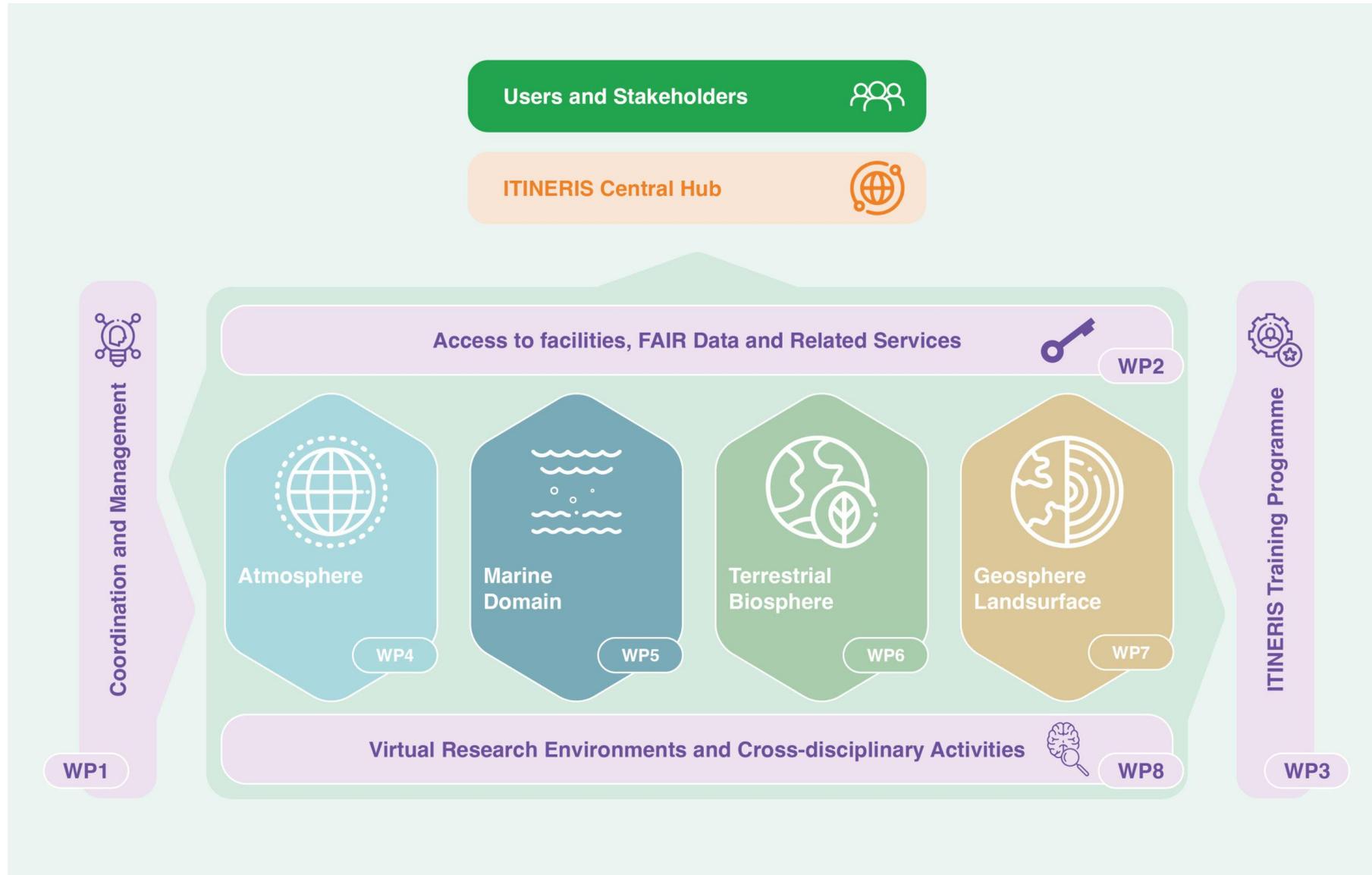
89 ACTIVITIES

The RIs landscape: a network of excellence

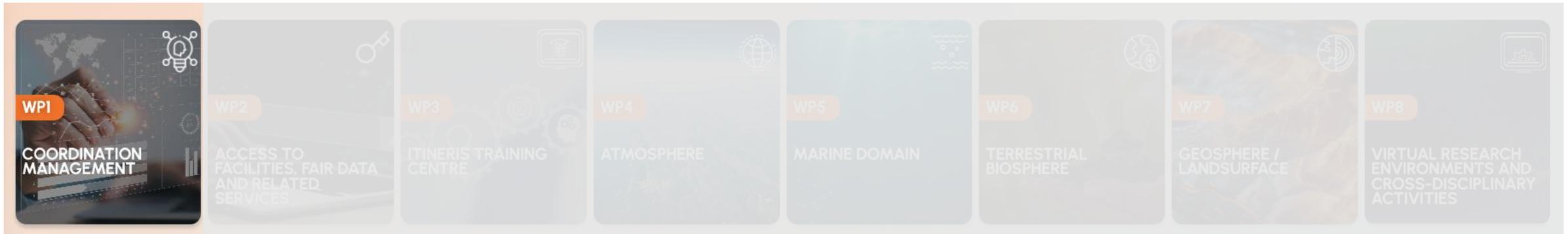
A network of national nodes of 22 ESFRI/European/National Research Infrastructures in the Environment, Physical science, Health & Food domains.



Work Packages and interconnections



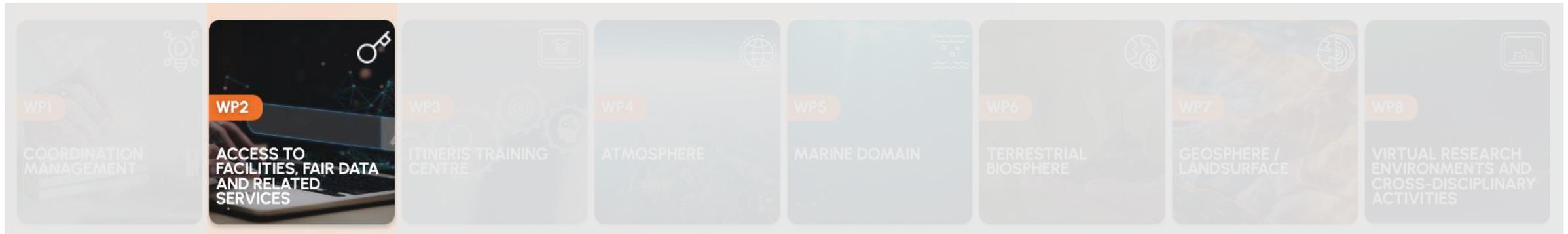
Work Packages and interconnections



Major Objectives

- Ensure adequate coordination and management of all the project work packages in all scientific, technical, administrative and financial matters and the day-to-day management tasks and the liaison with its Consortium partners, and implement appropriate quality control measures for monitoring the progress of the project activities;
- Ensure efficient the information flow within the project partners and with the partners, scientific community, and end-users /stakeholders through regular project meetings and project web portal.

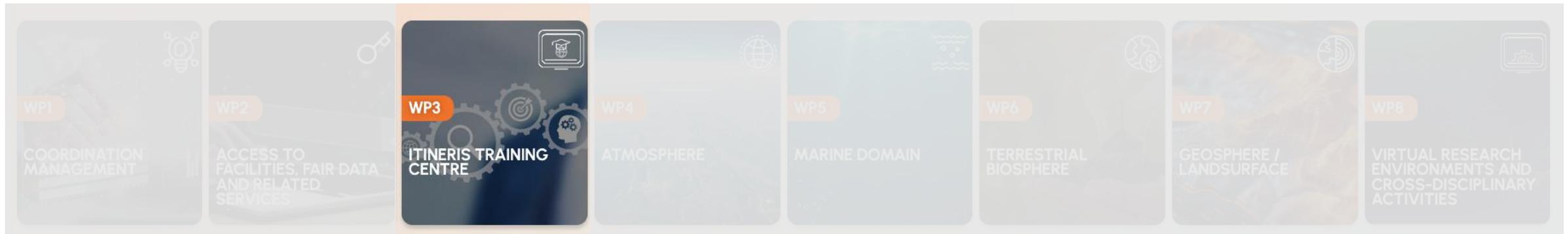
Work Packages and interconnections



Major Objectives

- Networking and harmonisation of National Environmental RIs to build a community around a central HUB enabling access to the environmental data of distributed national RIs;
- Definition of a common framework for Access Provision and implementation of a single entry point to the whole national network of environmental RIs and to their facilities, resources and knowledge to reinforce the national contribution to scientific excellence in Europe;
- Encourage the application of FAIR principle to support the advancing cross-disciplinary research through environmental domains.

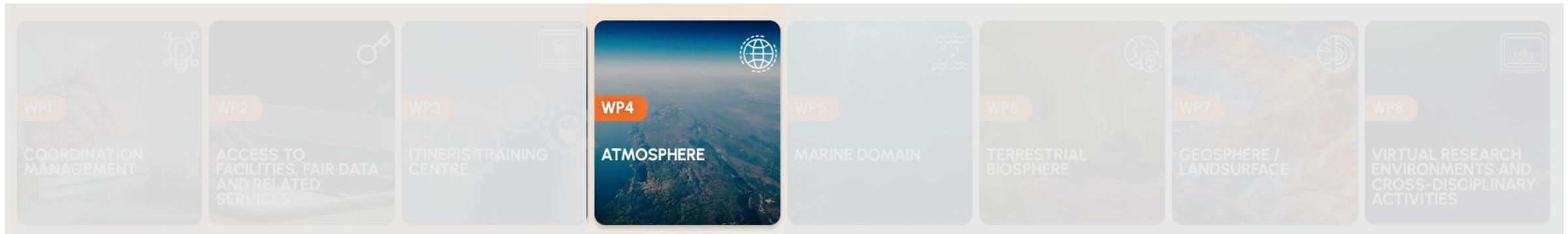
Work Packages and interconnections



Major Objectives

- Develop a single, unified Training Centre for the Italian RIs with major interest in the Environmental domain;
- Maximize the efficiency of the research infrastructures' operation;
- Ensure excellence of future generations of RIs employees and users;
- Ensure knowledge transfer to all components of civil societies and to citizens

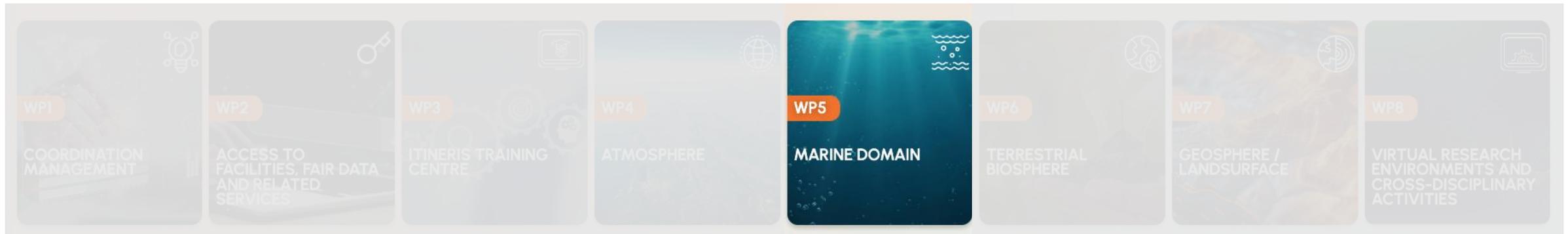
Work Packages and interconnections



Major Objectives

- Integration and harmonization within the Italian Network of Environment RIs;
- Pilot service on Aerosol types and sources;
- Pilot service on Planetary Boundary Layer height and its impact on aerosol and trace gases concentration at ground;
- Pilot service on impact of natural and anthropic fires on atmospheric composition.

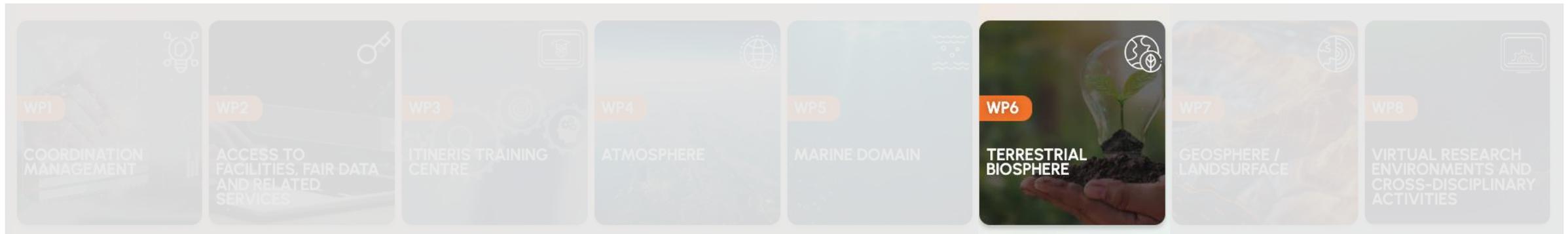
Work Packages and interconnections



Major Objectives

- Integration and harmonization of Marine Domain RIs towards an Italian Integrated Ocean Observing System (IOOS)
- Fill the gaps in biological and ecosystem observations;
- Expand capability of NRT ship-based ocean observations;
- Develop Pilot services to tackle overarching marine issues.

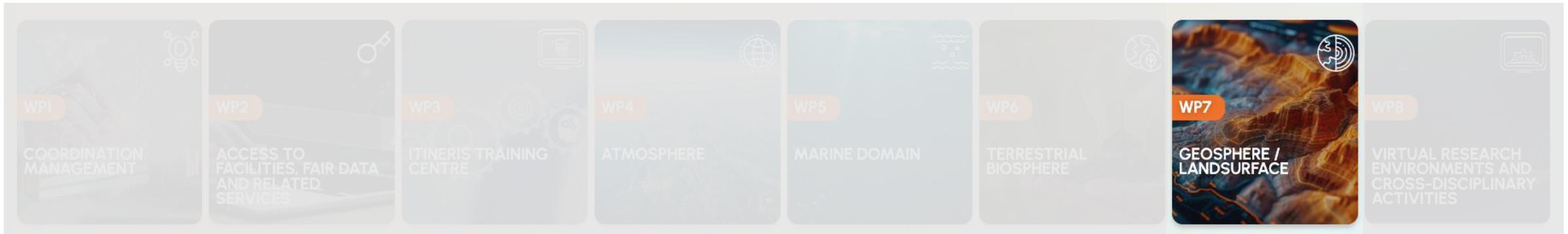
Work Packages and interconnections



Major Objectives

- Fill gaps in the key observations needed to ensure the provision of a complete and exhaustive view of the observed process/ecosystem/quantity;
- Build a service to support RIs data use for pollution control using Nature Based solutions from planning to verification
- Build a service to support RIs data use for ecological responses to global warming and their implications on biodiversity;
- Develop services and tools for sustainable agriculture and forestry to mitigate climate change and foster circular economy;

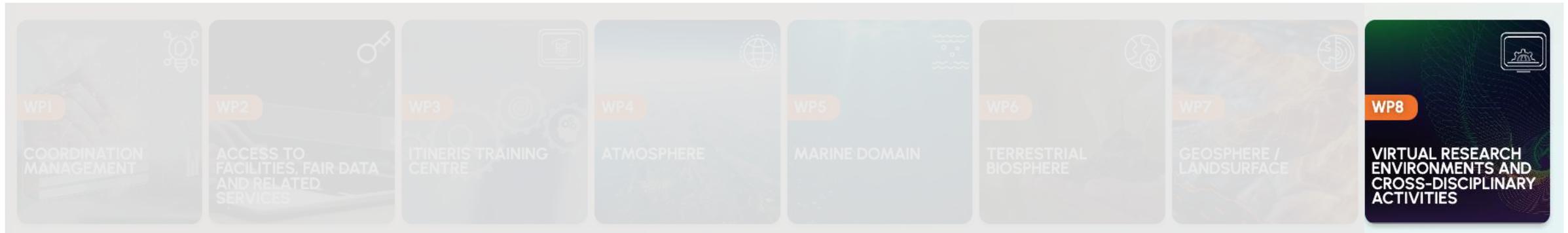
Work Packages and interconnections



Major Objectives

- Harmonise and integrate data generated by the different Ris, and improve data transfer capability;
- Collecting and distributing data from deep earth-drilling experiments and facilitating the RI access;
- Improving the collection of geochemical, geophysical, geological, geodetic, and seismological observational data of nearsurface processes in a more holistic framework;
- Improving the multi-parameter observation of the surface processes with spaceborne and airborne SAR infrastructures, and develop a facility for the digital data distribution.

Work Packages and interconnections

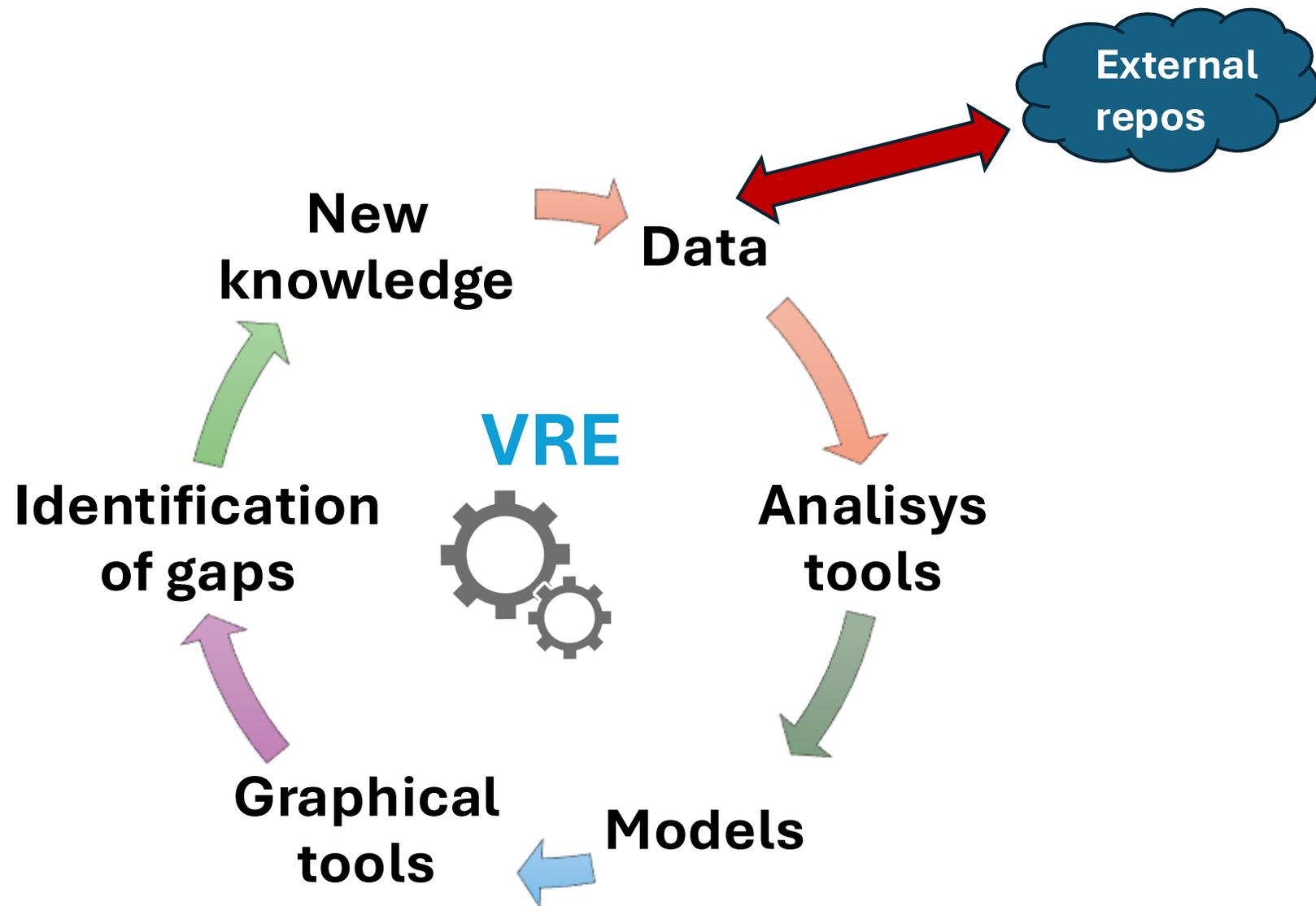


Major Objectives

- Implement a network of CZ observatories and their VRE to study the dynamics of the Critical Zone (CZ) linking biosphere, geosphere and atmosphere;
- Implement an Essential Variables VRE (EV VRE) based on the ECV and EBV variables produced by the Italian observatories and field campaigns;
- Implement the AERO VRE for visualizing climatological charts of the aerosol types occurred at the different sites; indicators of the occurrence of the desert dust; statistical plots of the atmospheric boundary layer properties
- Implement the CARBON VRE with the main carbon reservoirs and the direct anthropogenic emissions;
- Implement the VRE CLIMAVRE to gather climatic variables and provide indicators for quantifying climate change and its impacts
- Implement the VRE on downstream effects of environmental change (DOWNSTREAM VRE) to focus on the nexus of climate and environmental change effects, carbon, and Earth System response, particularly in marine and terrestrial domains
- Implement the national ISOTOPE VRE to allow researchers and environmental managers to retrieve coordinated information and analysis tools, supporting the implementation of new laboratory facilities to fill the gaps in the current ability to analyze isotopes from different matrices.

VRE and Data workflow

- Collaborations and shared solutions **to answer specific scientific and/or management questions** that require an ensemble of data, analysis tools, modelling solutions and graphical tools, in the spirit of the open science principles.
- Researchers can upload/download and share knowledge, contributing to the construction of the VRE
- **Users** can access to a simplified version of the VRE to tackle specific issues





THANKS!

IR0000032 – ITINERIS, Italian Integrated Environmental Research Infrastructures System
(D.D. n. 130/2022 - CUP B53C22002150006) Funded by EU - Next Generation EU PNRR-
Mission 4 “Education and Research” - Component 2: “From research to business” - Investment
3.1: “Fund for the realisation of an integrated system of research and innovation infrastructures”

