

PROJECT ACRONYM AND TITLE: *ITINERIS - Italian Integrated Environmental Research Infrastructures System*

FUNDING PROGRAMME: *PNRR M4C2 Inv.3.1 IR - infrastrutture ricerca*

HOST DEPARTMENT or CENTER: Dipartimento di Scienze Ambientali, Informatica e Statistica

SCIENTIFIC RESPONSIBLE: Dott. Marco Roman - DAIS

FINANCIAL DATA:

Project total costs	Overall funding assigned to UNIVE
€ 6.551.160,60	€ 1.900.000

ABSTRACT:

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 need to be urgently addressed, providing quantitative knowledge to be transformed into actionable strategies. Given the complexity of such challenges, a multi-disciplinary approach at Earth System level integrating atmosphere, hydrosphere, biosphere and geosphere subdomains, is paramount. Field and laboratory measurements, analyses and experiments, data analysis and modelling tools in all four subdomains need to be combined within a federated approach to IT resources and e-science facilities – including liable data policies according to the FAIR principle. Environmental Research Infrastructures (RIs) are essential for providing the systematic and coherent information needed for high-level research addressing societal needs such as climate mitigation and adaptation, natural resource conservation, health, food security, biodiversity and sustainable use of the sea, freshwater and land. Italy participates in all main environmental RIs of pan-European interest, and hosts other environmentally-relevant national RIs, as reported in the PNIR 2021-2027. This large number of RIs, their heterogeneity and complementarity and the urgent need for harmonization require a coordinated action to integrate and interlink the different environmental RIs, rather than independently enhancing individual RIs. The importance of inter-RIs coordination has been highlighted by the EU and ESFRI, through research projects explicitly aimed at organizing the EU RIs landscape. To design, develop and implement a national contribution to this need, the participating RIs agreed to jointly prepare the large proposal ITINERIS under the "thematic network" action of the call, instead of proposing single-RI strengthening projects. The harmonized RI activities of ITINERIS will create the integrated system of the Italian Environmental RIs to be proposed as a reference at European level. In order to build this integrated approach, ITINERIS builds a network of 22 Research Infrastructures, all relevant for environmental studies and actionable knowledge, with the main goal to establish the Italian Hub in the environmental scientific domain for the observation and study of processes in all subdomains of interest. ITINERIS will sustainably develop cross-disciplinary research through the use and re-use of existing (or pre-operational) data and services, providing access to data and services, supporting our Country to face the critical environmental challenges expected to worsen in coming years. The national IR CeTRA, led by Ca' Foscari University, participates to the project in cooperation with the Italian nodes of the ESFRI Landmarks ACTRIS, EMSO, Euro-Argo, ICOS and LIFEWATCH, from the ENV domain and ANAEE from the H&F domain and closely linked to the ENV domain; the Italian nodes of the ESFRI projects DANUBIUS, DISSCO, e-LTER, from the ENV domain, and EMPHASIS and EUIBISBA from the H&F domain and also relevant for ENV; the EU RIs ECORD, EUFAR, Eurofleets, JERICO and SIOS, all from the ENV domain; and the national RIs ATLAS, Laura Bassi, and SMINO, from the ENV domain, and Geosciences and LNS, both from the PSE domain, that in ITINERIS support services in the marine domain.

OBJECTIVES and EXPECTED RESULTS:

The objective of the ITINERIS project is to establish the Italian Hub of Research Infrastructures in the environmental scientific domain. ITINERIS will support observation and study of environmental processes in the atmosphere, marine domain, terrestrial biosphere, and geosphere, providing access to data and services and supporting the Country to address current and expected environmental challenges. In order to reach this objective, ITINERIS is building a coordinated system of the national nodes from 22 RIs, mostly from the environmental domain, and including two RIs related to agri-food with strong link with the environment and 2 RIs from the PSE domain, which support the services for the marine domain. The project is articulated in eight WPs. Four vertical WPs are related to the four main environmental subdomains: atmosphere (WP4), marine domain (WP5), terrestrial biosphere (WP6) and geosphere (WP7). In each of these WPs, the participating RIs work together towards a harmonized development and ensure full interoperability, promoting inter-RI data use and, whenever possible, colocation and standardization of methods and tools. This will be achieved through the development of common services with high level of competences and avoiding duplications. These WPs promote internal exchange of expertise facilitating transfer of best practices from the most mature RIs (ESFRI Landmarks) to the new and developing RIs contributing to strengthen the national RIs landscape in the environmental domain. In the whole RIs system built by ITINERIS, RIs data and services will be harmonized and integrated, data gaps in observations will be filled, and data and products will be made available to the research community and to stakeholders.

The project is expected to:

- Promote scientific excellence, create knowledge and innovation, measured as more than 1000 of scientific paper/conference participation/abstract in scientific conferences and workshops explicitly referring to ITINERIS;
- enhance the creation and development of human capital, with about 100 Ph.D. trainees;
- attract new researchers from other territories. More than 1000 EU and extra-EU researchers are estimated to become users of ITINERIS facilities after the end of the project;
- attract capital and investments in the territory of more than 10ML/year, thanks to the competitiveness of the national scientific communities in participating in EU and international call for proposals;
- impact on the competitiveness of enterprises by contributing to technological development, prototyping activities up to licences and more generally in terms of spin-off effect on the territory;
- increase the employment within the ITINERIS network at over 140 people per year during the project duration.

PARTNERSHIP:

CNR - Consiglio Nazionale delle Ricerche	Coordinator
INFN - Istituto Nazionale di Fisica Nucleare	Partner
INGV - Istituto nazionale Geofisica e Vulcanologia	Partner
ISPRA - Istituto Superiore per la Protezione e la Ricerca Ambientale	Partner
OGS - Istituto Nazionale di Oceanografia e Geofisica sperimentale	Partner
Università di Firenze	Partner
Università Ca' Foscari di Venezia	Partner