

# A DISTRIBUTED RESEARCH INFRASTRUCTURE WITH CENTRAL SERVICES

eLTER RI will comprise National Research Infrastructures (NRIs) and European level Central Services.

## National Research Infrastructures (NRI)

Partner countries provide the national in-situ building blocks (eLTER Sites and eLTER Platforms). Distributed site-operations will be concerted (instrumentation, observation variables) and follow standards (protocols, data flows). Sites and platforms will be open for research and education via a common access scheme.

## Central Services

A range of services will make eLTER RI much more than the sum of its national networks. Service providers will comprise the Head Office (coordination, outreach, strategic development & collaborations, operation of central Service Portal) and Topic Centres. Collectively, the Topic Centres will cover Thematic Service Areas like data management, interoperability, data analysis & modelling, technological innovation, and synthesis of actionable knowledge.

## SUPPORTING PROJECTS

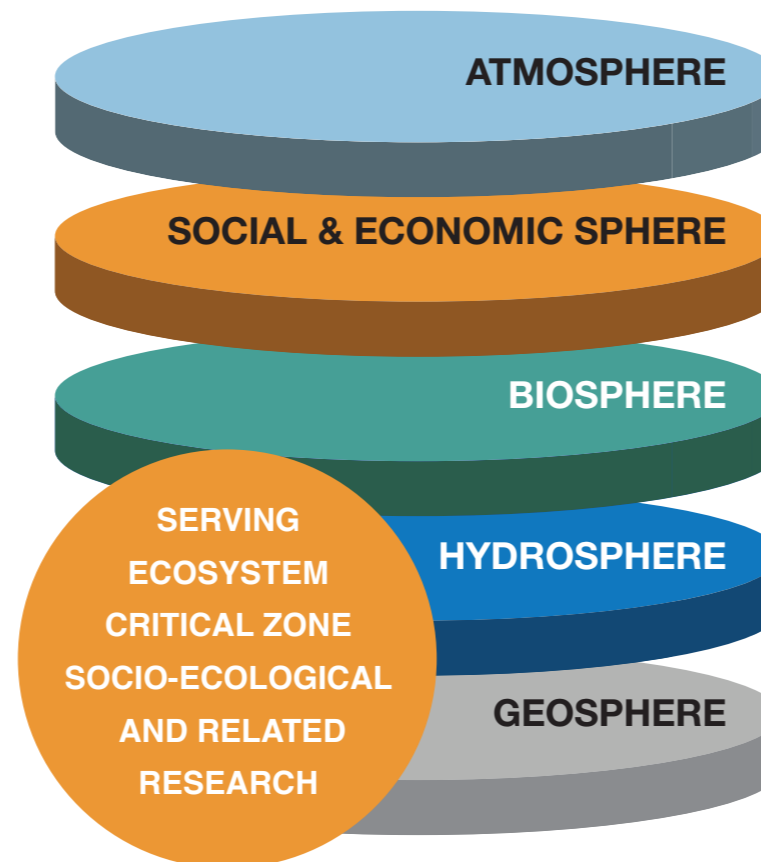
Since 2020, the provision, testing and development of the eLTER RI has been supported by two EU-funded 5-year projects involving 27 countries: **eLTER PLUS** is testing the performance of existing components through scientific case studies and is identifying the needs of a wide range of scientific and other user groups (Coordinator: Jaana Bäck, UHEL/Finland). **eLTER PPP**, the eLTER RI Preparatory Phase Project is facilitating the formalisation of eLTER RI as an ERIC (Coordinator: Michael Mirtl, UFZ/Germany).



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Images courtesy of LTER-Europe members

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## CONTACT US

Michael Mirtl, eLTER ESFRI Coordinator, Chair of LTER-Europe  
[office@elter-ri.eu](mailto:office@elter-ri.eu)

Jaana Bäck, eLTER PLUS Coordinator  
[office@elter-ri.eu](mailto:office@elter-ri.eu)



**INTEGRATED EUROPEAN  
LONG-TERM ECOSYSTEM,  
CRITICAL ZONE AND SOCIO-ECOLOGICAL  
RESEARCH INFRASTRUCTURE**



## THE CHALLENGE

### An innovative research environment for the next generation of scientists

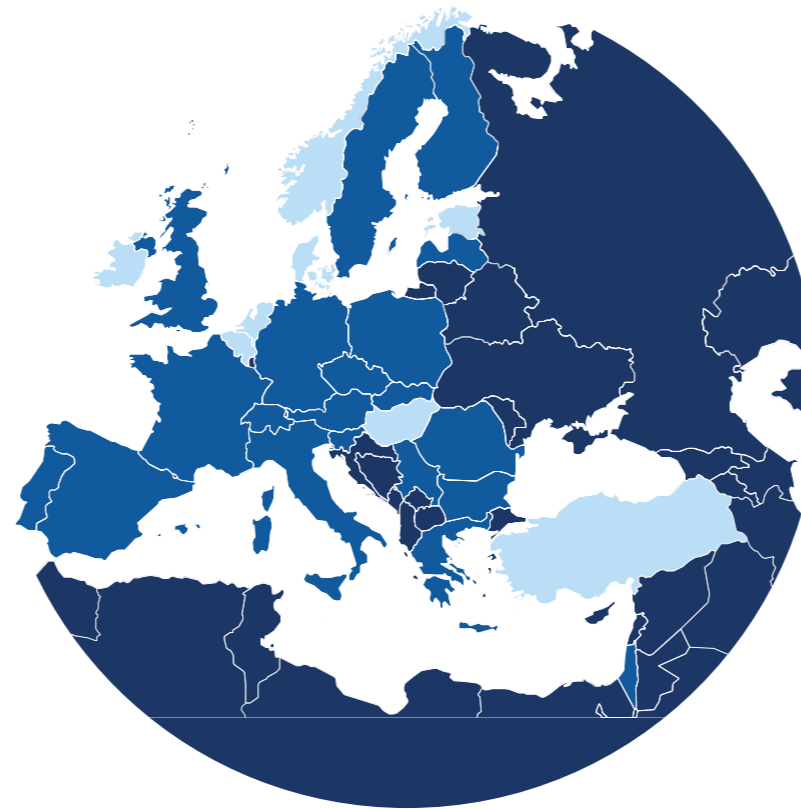
We live in a world of rapid social, economic and ecosystem change, facing major challenges such as global warming, biodiversity loss and pressures on natural resources. Addressing these topics requires world-class ecosystem, critical zone and socio-ecological research by communities of experts well-connected across various disciplines.

eLTER RI will catalyse scientific discovery through its state-of-the-art in-situ facilities and tools, open and accessible data, collaborative working culture, transdisciplinary expertise and its demand-driven service portfolio, comprising analytical tools and capacity building activities.

## HOLISTIC SCIENCE

eLTER RI will adopt a fundamentally systemic approach to observe and analyse the human-environmental system, encompassing biological, geological, hydrological and socio-ecological perspectives. eLTER RI will be the first research infrastructure capturing and analysing holistically the integrated impacts of climate change alongside other pressures on a wide variety of European ecosystems.

It comprises in-situ Standard Observations range from biophysico-chemical to biodiversity and socio-ecological variables. Ecosystem change caused by long-term pressures and short-term pulses are investigated in a nested design from the local to the continental scale.



### Support for eLTER RI

- Politically supported by 20 countries
- ~165 supporting institutions from 28 countries

## KEY FEATURES OF eLTER RI

- Wide scale and systematic coverage of major European terrestrial, freshwater and transitional water ecosystems – ca. 250 research sites, selected from a wider pool of ~600 LTER-Europe sites
- Investigation of interactions between abiotic and biotic ecosystem components at multiple scales, including human-environment interactions
- Research into ecosystem processes influenced by multiple drivers, as well as socio-ecological research relating to ecosystem services
- Integrated, long-term and high quality observations across the critical zone, supporting whole ecosystem science
- Central Services provided by: Head Office, Service Portal and thematic Topic Centres
- Strong links with other European environmental RIs (e.g., ICOS, AnaEE, LifeWatch) and international collaboration, e.g., global LTER (ILTER), Global Ecosystem Research Infrastructure (GERI).

## eLTER RI'S UPCOMING RESPONSE TO DECISION MAKERS' NEEDS

**Environmental policies need to consider the entire system beyond isolated phenomena:**

- eLTER uniquely **explores the compounded impacts** of climate change, biodiversity loss, soil degradation, pollution, and over-exploitation on major European ecosystems.
- eLTER catalyses **scientific discovery** and insights through its state-of-the-art in situ research infrastructure, collaborative working culture, and transdisciplinary expertise.

**Sustainable management of our natural resources depends on robust information:**

- eLTER observes and analyses human-environment interactions in the long term to inform, calibrate and improve **models and forecasting**.
- eLTER informs evidence-based decision making by providing **data** and information at local, regional and continental scales.

**Change management needs to be fair to be sustainable:**

- eLTER investigates social-ecological systems, their stakeholder interactions and resilience to explore **fair mitigation and adaptation options**.
- eLTER data can provide insights into how **environmental changes lead to social effects and responses**, and can help determine causation from correlation effects.

**Societal challenges require collaborative research across disciplines and organisational levels:**

- eLTER is embedded in **concerted continental and global efforts** in the context of the European environmental RIs, GEO, UNECE WGE, GERI, ILTER, etc.
- **eLTER's in-situ network of ~ 250 sites and platforms and its central service portfolio are well embedded** in the European and global landscape of research infrastructures and EOSC.
- The research and data by eLTER RI are relevant for policies regarding **the EU Green Deal and the UN SDGs**, including e.g. Zero Hunger, Sustainable Cities and Communities, Climate action, Life Below Water and Life on Land (SDG 2, 11, 13, 14, 15).

**Balancing cost efficiency with required investments for excellent science:**

- eLTER's service portfolio **supports** scientists, funding agencies, policy decision makers, peer RIs, industry, and the general public. eLTER **integrates the activities of many research communities** into a harmonised infrastructure to serve scientists and other stakeholders in a cost-efficient way.