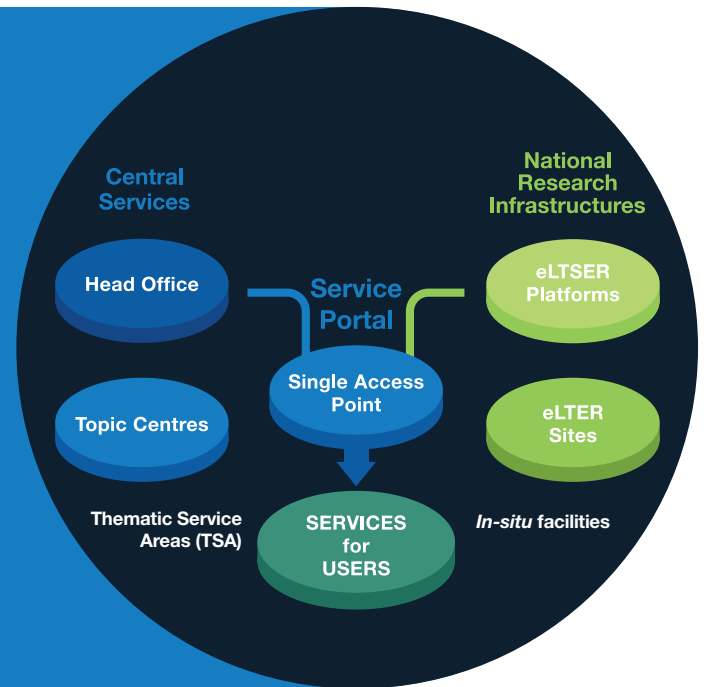


# eLTER RI: THE DESIGN

The eLTER design comprises (1) Distributed *in-situ* facilities: The eLTER Sites and eLTSER Platforms support excellent place-based ecosystem and socio-ecological research in participating European countries; (2) Central Services which integrate the distributed network and provide services to a wide range of external and internal user groups.



## National Research Infrastructures (NRIs)

These national building blocks of the eLTER RI consist of eLTER Sites and eLTSER Platforms in the participating countries (See Fig. 1). All sites and platforms are fully documented in the eLTER site registry (DEIMS-SDR). These eLTER *in-situ* facilities provide virtual, remote or physical access and implement the long-term, habitat-specific Standard Observations.

A formal labelling process secures their compliance with agreed criteria for three categories. The common characteristic consists in applying the unique Whole Systems Approach. However, the categories differ in intensity, scale and thematic focus of observation and research.

### eLTER Sites Category 1

Highly instrumented sites with a focus on at least two spheres (atmosphere, hydrosphere, biosphere, geosphere, or sociosphere) observing them with high intensity and accuracy

(prime methods). eLTER Sites Category 1 are ideally suited for co-location with specialised monitoring programmes or other RIs, and for hosting complementary experiments.

### eLTER Sites Category 2

Sites using less intensive or simpler methods (basic methods), complementing eLTER Sites Category 1 to achieve appropriate spatial and geopolitical coverage in continental scale research.

### eLTSER Platforms

Platforms are spatially explicit living laboratories for conducting transdisciplinary, long-term, socio-ecological research. They are designed and operated with the specific goal of harnessing scientific research on human-environment interactions. They follow a transdisciplinary approach and may facilitate sustainability transitions through collaboration between research, management and decision-makers.

## Central Services to serve a variety of users

The eLTER Central Services operate the distributed RI and serve all user groups. They will comprise the Head Office and several Topic Centres, providing unique services in seven Thematic Service Areas (see Fig. 1). All eLTER services will be available through a single access point, the **Service Portal**. The **Head Office** coordinates the eLTER ERIC operations, and is responsible for representation, coordination, management and strategic development of the RI as well as internal and external communication.

The Thematic Service Areas besides the Head Office are:

- **Data Management and Integration**, which includes a range of FAIR data services to enable acquisition, integration and dissemination of eLTER RI Standard Observations and other data, including registration and description of the in-situ facilities and their capabilities.
- **Optimised design and RI interoperability**, covering the further specification of the RI *in-situ* facilities, design development, interoperability with other RIs creating potential for cross-RI research support, specifying requirements for emerging measurements and protocols.
- **Technological Innovation and Development**, a range of services that will coordinate technology development and testing and foster the link between the eLTER and industry.
- **Analysis Tools and Modelling** these services and capabilities will foster and strengthen the knowledge and analysis of the state and evolution of ecosystem functioning and ecosystem services in the context of global change, through the provision of harmonised, gap-filled data, scenarios, customised indicators and diagnostics. An essential aspect is the integration of atmosphere, hydrosphere, biosphere, geosphere, and sociosphere observations towards a Whole Systems Approach.
- **Synthesis towards actionable knowledge**, a group of services that will integrate, synthesise and transform the cross-disciplinary expertise and data (spanning the natural and social sciences) gathered in eLTER *in-situ* facilities to create actionable knowledge; communicate this actionable knowledge to relevant stakeholder groups using a wide range of tools, materials and activities; and facilitate exchange between local-to-continental scale, stakeholder-defined problems and agendas with researchers, policy makers and businesses.
- **Central Analytics and Observation**, including services that will complement eLTER's Standard Observations and the Whole System Approach implemented by the *in-situ* facilities. These could be through central laboratories providing analysis services (eDNA, Hydrochemistry etc) or centrally organised campaigns (Geophysics, Aircraft-/Drone campaigns) and/or sensor loan system to bridge a sudden malfunction of sensors or for cross-calibration at eLTER in-situ facilities.

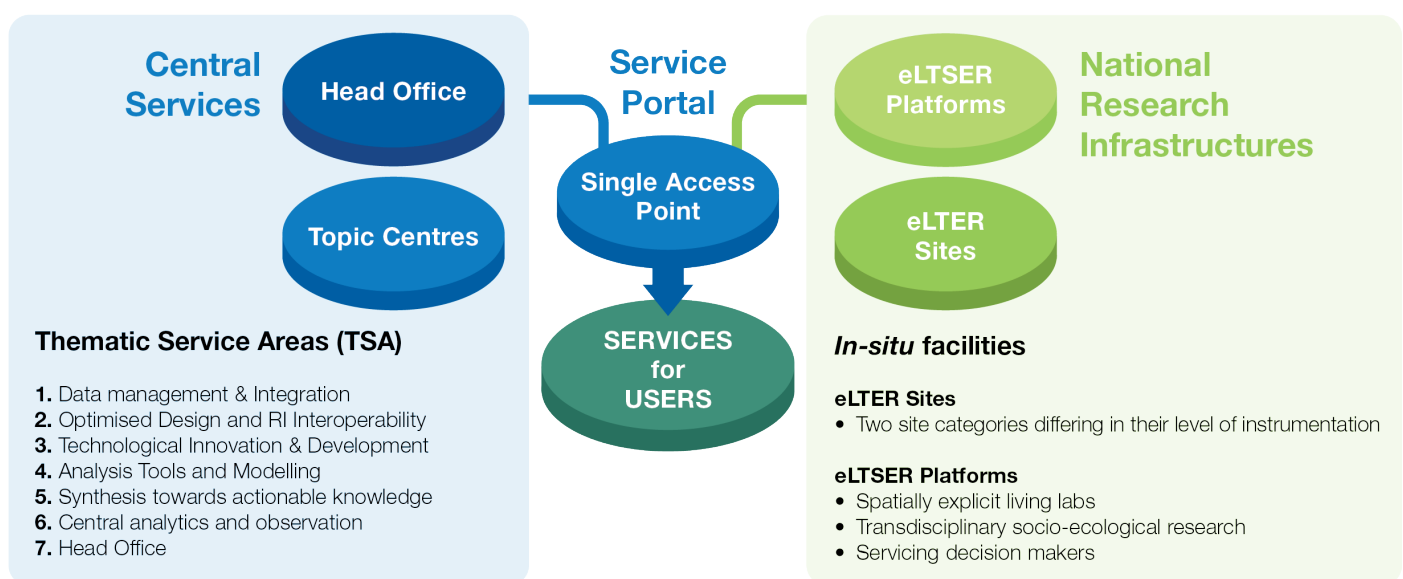


Fig. 1: The eLTER design, including the Central Services (left) and National Research Infrastructures (right).