



LifeWatch ERIC

e-Infrastructure for Biodiversity and Ecosystem Research



Website

<https://www.lifewatch.eu>

Headquarters

e-Science and Technology European Infrastructure for Biodiversity and Ecosystem Research — European Research Infrastructure Consortium 'LifeWatch ERIC' Sector II-III Plaza de España 41071, Seville, Spain

Legal Status

Established (ERIC, AISBL, GmbH, Others)

Type

distributed

Access

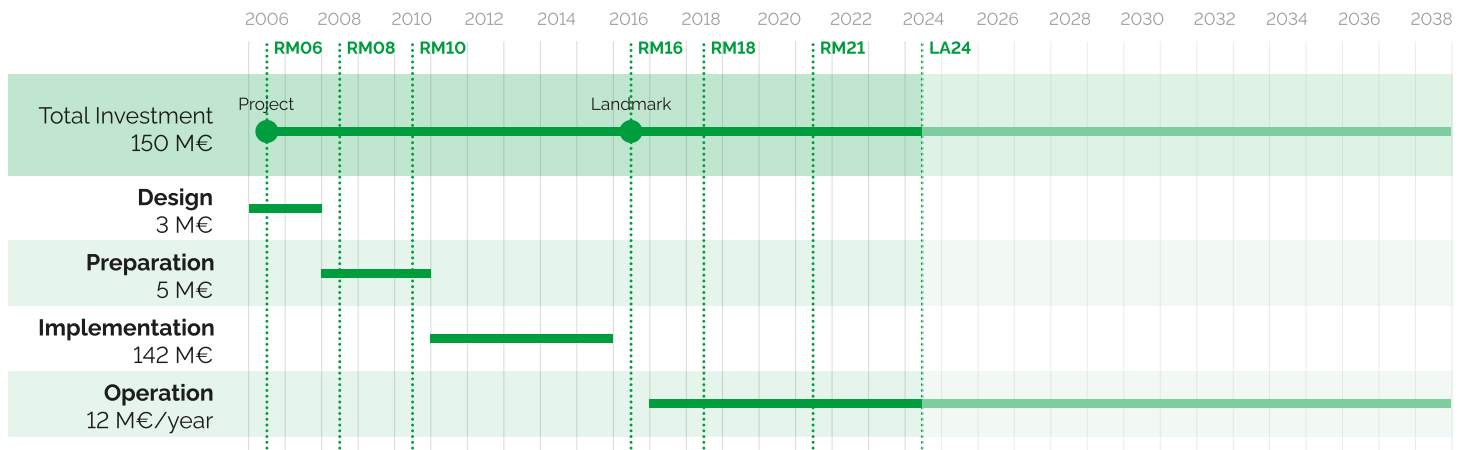
physical, virtual, remote

DESCRIPTION

LifeWatch ERIC (LW) provides e-Science research facilities and services to scientists investigating biodiversity and ecosystem functions. They benefit from LW to address key societal challenges linked to climate change and resource efficiency, food security and agriculture, sustainable development, energy and health. LW is a distributed research infrastructure consortium composed of eight European Union Member States (Belgium, Bulgaria, Greece, Italy, Netherlands, Portugal, Slovenia and Spain). LW's members operate

from national nodes, known as Distributed Centres, while its Common Facilities are located in three Member States: Spain (Statutory Seat Office/SSO & ICT Core), Italy (Service Centre/SC) and the Netherlands (Virtual Laboratories and Innovations Centre/VLIC). After a preparatory phase (2006 – 2010) and a transition phase (2010 – 2017), LW was established as a European Research Infrastructure Consortium (ERIC) by the European Commission, entering its operational phase (March, 2017). In 2022, LW entered its second five-year implementation period.

TIMELINE & ESTIMATED COSTS



POLITICAL SUPPORT

Lead

ES

Member

BE, BG, GR, IT, NL, PT, SI



The new implementation period converts the current LW Infrastructure into an innovative hub for biodiversity and ecosystem research. All resources developed by the National Nodes and Common Facilities have been consolidated through an industrialisation process. The TRL of LW is moving from 6 to 9. Cutting-edge technology (e.g. BlockChain, AI) is applied to enhance research in silico. The number of the research resources (>1,700), services and other research products (>190) and their combination into workflows and VREs address many of the needs of the different types of research communities. Technologies currently deployed by LW offer for example a single-click access point to multiple data and service resources, such as simultaneous access to biological and environmental data (e.g., Metadata Catalogue, Ecoportal, Tesseract, LifeBlock); workflows dedicated to specific lines of research with customised data sources and services; on-the-fly workflow(s) created by users; multiple workflows that can test the same hypothesis in parallel and then compare the results, serving researchers from multiple disciplines or domains; and Cloud resources to operate the above technologies. These technologies impact on all stages in the life cycle of the scientific research practice, from hypothesis formation to publication of new knowledge, which are all encompassed by LW's holistic approach stretching from measurement to manuscript. They also have impact on the cornerstone features of the science practice, namely transparency, repeatability and efficiency. Finally, they support collaboration between disciplines and domains, by lowering existing barriers and allowing different communities to work in a shared collaborative environment. The possibility to test the same hypothesis with content and services from a plethora of disciplines or domains and to compare results to a knowledge basis much broader than it is today, along with the collaboration with EOSC next-generation e-Infrastructure, all promote the creation of synthetic knowledge. These innovations inevitably bring new challenges and innovative ways by which LW is used by the communities. LW has created many Thematic Services and VREs, focused on various aspects of the study of biodiversity and ecosystem functioning. All of the components are converted into FAIR-compliant resources and services, which allows comparison of results derived from multiple scientific disciplines or even domains. Therefore, LW contributes to the development of better public policies. This is enhanced by its participation in many projects, organisations, initiatives and networks involved in policy making such as the UN, IUCN, Biodiversa+ and EuropaBON. LW supports with its resources the UN Sustainable Development Goals #14 (Life Below Water) and #15 (Life On Land). Through its participation in EU-funded projects, LW significantly contributes to the technology transfer to third countries, such as those from Africa and Latin America. This further strengthens the Infrastructure and increases the engagement of the scientific community, globally. The main challenge faced by LW is a cultural one: to turn scientists' attitudes from working in isolation in a single-core brain fashion ("brain-etics"), using a single PC with licensed software, into participating in high-performance brain network synthesis ("brain-omics"), using an ecosystem of web services via the Metadata Catalogue of LW, with data management drive and support, storage capacity and computational power. LW has already engaged young scientists into its core project and provided them with both content and services to test their hypotheses in a secure, supportive, safe and collaborative environment. Also, it has expanded its contribution to training and education activities at all levels. Since its first implementation period, LW supports a MSc curriculum to further engage the younger members of the scientific community. The implementation of the gender equality plan has already had an impact on LW by improving the quality and relevance of the research and innovation process, as well as by attracting and retaining more talent, and ensuring that everyone can maximise their potential. Finally, LW has created a number of direct and indirect jobs. All of the above activities have increased the use of LW resources by 1,450 registered users, and thousands of individuals participating in the events and being trained by LW. The activities have also attracted the interest of the community, which is evidenced by the fact that LW's social media accounts attracted more than half a million of views and achieved more than a million of reach or impressions. More on LW's impact and how it is measured is presented in the Sections B.3 and B.4 of this Questionnaire.

LW consists of four basic layers: Core (vertical) services (e.g., AAI, HPC, cloud services); Integration (horizontal) services (e.g., Metadata Catalogue, Ecoportal, Tesseract, Naa VRE); an ecosystem of analytics, composed of hundreds of web services; and finally services for converting research results into knowledge. Detailed information about these layers and services can be found in Section B1.2 of this Questionnaire.

INTERCONNECTIONS



COOPERATION WITH OTHER RIS

LW currently collaborates with or develops synergies among multiple ERICs and RIS: eLTER (Integrated European Long-Term Ecosystem, critical zone and socio-ecological Research); DiSSCo (Distributed System of Scientific Collections, set up by natural history museums, botanic gardens and university collections in the natural sciences); ELIXIR (European life science data infrastructure); EMBRC (European Marine Biological Resource Centre); ANAEE (Research Infrastructure for the Analysis and Experimentation on Ecosystems); EMSO (European Multidisciplinary Seafloor and water column Observatory); and MIRRI (Microbial Resource Research Infrastructure). This collaboration takes the form of LW offering access to the RIS' datasets, co-developing VREs and/or maintaining active dialogues, in some cases formalised in MoUs. In addition, LW actively collaborates with other types of RIS, such as global aggregators GBIF (Global Biodiversity Information Facility) and OBIS (Ocean Biodiversity Information System), and private organisations and enterprises (e.g. PLAZI, Species 2000, Advance Services). Detailed information on these collaborations can be found in the Section B2.2 of this Questionnaire.