eLTER
Integrated European
Long-term Ecosystem, critical zone and socio-ecological Research

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Priorities and tasks for the next 5 years set! Now off to action!

COVID-19 might have altered our lives in the last few months, but at eLTER we have proved our resilience and determination for success through the extremely fruitful and inspiring kick off meetings of our two projects - eLTER PPP and eLTER PLUS (30 March - 03 April 2020). In the space of just a few weeks we've moved the two events fully online, with no cuts to the initially planned programme.

We missed on a traditional group photo but we kept our spirits high through improvising several online group photos to keep a memory of everyone's smiling faces in front of their laptops. Moreover, the team stayed inspired during the long hours in front of a screen by sharing some stunning photos of the nature surrounding home office setups of participants across Europe!

With the Preparatory Phase Project for the eLTER Research Infrastructure (eLTER PPP) we plan to create a legally, financially and technically mature e eLTER RI.

To help our RI graduate we have intensively used the kick off meeting to identify our plans and discuss important milestones in releasing the eLTER RI, including working with our stakeholders and shareholders and strengthening the network and the community spirit.

Highlights eLTER PLUS

Through its scientific cases defined within four research challenges - Biodiversity loss; Biogeochemical controls of ecosystem functions; Climate-water-food nexus; and Socio-ecological systems, the Advanced Community Project for the eLTER Research Infrastructure (eLTER PLUS) aims to execute a performance test of the emerging eLTER RI and challenging, assessing and strengthening its operations in real time.

At the kick off meeting we tackled important issues, including data needs and pathways for provision and use, as well as successful execution of one of the central tasks of this project - providing access to data and sites related to the European LTER network. We have also set up the path for our "service scouting" to build the portfolio of the future services offered by the eLTER RI.

eLTER COVID-19 statement

As an additional and unexpected result form our online meeting we have come up with our statement on COVID-19 and the role of environmental RIs in such situations of crisis, emphasizing their importance in providing crucial data and guidance for social and environmental recovery and well being.

Find our statement here: https://www.lter-europe.net/covid-19-statement

Latest research

Replacements of small- by large-ranged species – among the suspects for diversity loss in Europe's temperate forests

A new research, published this month in Nature Ecology & Evolution, seeks to give insights on the curious trend in biodiversity dynamics, whereby no net loss in local species richness is reported, while at the same time worrying trends such as global loss in biodiversity and accelerated redistribution of species are constantly reported.

The team of scientists around the forestREplot initiative, led by Dr Donald M. Waller, University of Wisconsin–Madison site data from 68 vegetation resurvey studies of semi-natural forests in Europe, to quantify how individual species trajectories scale up to diversity changes. Some of these sites are part of the LTER network. Results suggest that small-range species seem to be replaced by more widely distributed ones due to the specificities of species nitrogen niches.

Source:

Plant responses to warming driven by the dynamics of forest microclimate

Among the many reported negative effects of climate change, global warming is reported to cause a shift in biological communities in favour of warm-affinity species (thermophilization), while driving the extinction of others.

A recent report in Science analyses understory microclimate dynamics in European forests across several decades to show that thermophilization and the climatic lag in forest plant communities are primarily controlled by microclimate. The study was carried out within the forestREplot initiative (www.forestreplot.ugent.be/) with a number of LTER sites involved.

For example, increasing tree canopy cover reduces warming rates inside forests, but loss of canopy cover leads to increased local heat that exacerbates the disequilibrium between community responses and climate change, thereby accelerating the so-called "extinction debt" of species.

et al. Replacements of small- by large-ranged species scale up to diversity loss in Europe's temperate forest biome. Nat Ecol Evol 4, 802–808 (2020). https://doi.org/10.1038/s41559-020-1176-8

Zellweger, F., De Frenne, P., Lenoir, J. Forest microclimate dynamics drive plant responses to warming. Science, 368: 6492 (2020). https://doi.org/10.1126/science.aba6880

Network news

LTER in Bulgaria approved for the national RI roadmap

We are happy to share that LTER in Bulgaria has received official notification that its application for a funding project is approved as part of the national RI roadmap and is in a pre-commencement phase. The project combines:

- site upgrade plans - equipment procurement and capacity building; developing of new and potential sites, including a LTSER Platform for socio-ecological research;
- central network activities, including a component on data integration, management and processing, unification of national policies and procedures, such as standard observation procedures, research agenda and scientific product development;
- interaction with stakeholders with emphasis on joint development of scientific cases, as well as products and citizen science, publicity and dissemination.

The Bulgarian team expresses its gratitude for the ongoing support for LTER! Thanks to it, our application was successful as we were able to demonstrate the strength of the European and global networks that LTER BG belongs to.

Photo: A view from the Srebarna eLTER site in Bulgaria, located at the Srebarna Lake, a breeding site of the globally-famous Dalmatian Pelican species.

To date the Bulgarian LTER network features 7 sites representing different biomes typical for the country and the Bulgarian Antarctic base, including freshwater lakes and rivers, marine biomes, tundra landscapes and different forest types.

Explore Bulgarian sites directly from the DEIMS-SDR interface or our site catalogue.

Reporting back

eLTER at the EGU 2020: ecosystem studies and the whole systems approach

Like most events this spring, the EGU 2020 General Assembly had to rearrange forces to adjust to the limitations imposed

in 701 scientific sessions.

Among these, on 08 May 2020, eLTER, in the face of Michael Mirtl, Jaana Bäck, Daniel Orenstein and Giorgio Matteucci, co-chaired a session focused on "Whole system approaches in addressing long-term changes in ecosystems" with 33 submitted abstracts.

The session uncovered exciting insights on the response of terrestrial and aquatic ecosystems to various environmental drivers, coming directly from long-term ecosystem, critical zone and socio-ecological research networks and experimental research sites and platforms.

Photo: Measuring platform on lake Valkea-Kotinen, Lammi LTER site in Finland

Among the various topics, presentations featured results from benthic investigations at the Arctic long-term deep-sea observatory HAUSGARTEN, as well insights on the interactions of hydrology, carbon cycle, and greenhouse gas fluxes in the climate-sensitive ecosystem of Arctic watersheds. The Mediterranean was represented by a report on the interactions between cork oak woodlands and global changes. From Finland, the Lammi LTER site reported on the brownification process of surface waters due to increased terrestrial loading of organic carbon, while for the area of Kokemäenjoki river basin a method for collating regional GHG balances including natural ecosystem processes was presented. The presentations also touched on hot new methodologies and topics such as new frameworks for identifying components and interactions of the whole system approach though a web of interactions (WoI) model, as well as routes to improved earth and environmental data quality assurance.

The EGU GA 2021 will hopefully continue along the same lines, with a face-to-face session on exciting, long-term eLTER research.

Find all abstracts, presentations and related studies here:
https://meetingorganizer.copernicus.org/EGU2020/displays/35273

Upcoming events

GEO BON Open Science Conference & All Hands Meeting 2020

📆 06-10 July 2020
📍 100% online
🔑 https://conf2020.geobon.org/

This year's event will focus on the development of Biodiversity Observation Networks and Essential Biodiversity Variables, as well as their potential to support global biodiversity monitoring and conservation.

Registrations possible until 3 July!

Feature article

H2020 project “e-shape” contributes to eLTER

by Ulf Mallast

e-shape

EuroGEO Showcases: Applications Powered by Europe

The H2020 project e-shape (www.e-shape.eu) is a “unique initiative that brings together decades of public investment in Earth Observation and in cloud capabilities into services for the decision-makers, the citizens, the industry and the researchers”. Services are no longer defined in a data-centric approach but directly by the users.

The project envisions to foster the development of valuable Earth Observation services with and for the users and to streamline the access to key resources (knowledge, technology, markets and capital). Both of these objectives have the purpose to allow researchers, developers and industrial actors to deliver services that bring concrete benefits to a number of key societal sectors.

Within e-shape seven showcases aim to address societal challenges, foster entrepreneurship and support sustainable development, in alignment to the three main priorities of GEO (SDGs, the Paris Agreement and the Sendaï Framework).

One of them, the showcase myECOSYSTEM will serve focal user groups such as research, environmental assessment, reporting and management by offering seamless access to consistently scaled environmental information from various sources at benchmark sites across major European environmental and land use & management gradients. To this end, myECOSYSTEM consists of three highly complementary pilots, developed to maximize services to user groups both in their specific topical areas, but specifically through integrating and jointly using information from remote sensing (mySPACE; led by ECOPOTENTIAL), in-situ observation (mySITE; led by eLTER) and high-level indicators verification and testing with an exemplary focus on biodiversity (myVARIABLE, led by GEOBON).

How does e-shape link to eLTER?

During a first stage, data from 12 eLTER sites and further sites in Europe

will be the important basis for service development. In an extensive validation/testing procedure the same services will be tested for further eLTER sites during the second phase of the project to achieve European coverage. In general, these services will help to increase the informational value of eLTER Sites. In an European context, participating sites will also elevate their visibility and are likely to be included in future EU projects. The information from the service development work will be connected to eLTER projects (https://www.lter-europe.net/projects) making the process highly synergistic and beneficial also in developing the eLTER RI services.

Besides the site advantages, developed services will likewise help to restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and biodiversity loss (SDG 11, 14 15).

e-shape is looking for a fruitful collaboration with eLTER and other projects.
https://e-shape.eu/

In this issue's header we feature views from the LTER Ria de Aveiro site in Portugal

More about the site

Stay tuned for more beautiful landscapes from sites across Europe in our next issues!