ANAEE-ERIC

NEWSLETTER :: WINTER 2024

ABOUT ANAEE-ERIC

Keeping ecosystems healthy is vital for our planet's future, and AnaEE-ERIC (Analysis and Experimentation on Ecosystems) is at the forefront of research to understand and protect them. By experimenting with real ecosystems under conditions like pollution and climate change, we provide crucial insights to help predict and mitigate environmental challenges.

Our work supports researchers, policymakers, industry, and agriculture in developing sustainable strategies to address global environmental issues.

AnaEE-ERIC is a distributed research infrastructure that offers a network of experimental facilities across Europe, equipped with advanced tools for conducting experiments and collecting data on how ecosystems respond to changes like climate change.

We will help society to better understand how it can adapt and which actions are the most impactful in reducing the climate change impact and mitigating changes in ecosystem functioning.

CONTENTS

PICTURE OF THE MONTH:

The IRISCC project side event at ICRI 2024 focused on climate risks, showcasing how environmental RIs are directly contributing to climate change mitigation and adaptation, here presented by Janne Rinne, project co-coordinator (Luke/AnaEE-ERIC). IRISCC also highlighted the importance of international collaboration among RIs, with the aim of building resilience through data sharing and integrated climate services.

ANAEE NEWS AND UPDATES

ANAEE 6TH ASSEMBLY OF MEMBERS

AnaEE-ERIC's 6th Assembly of Members (AoM)was held in Rome, Italy November 28-29th. The budget and preparation of the Workplan was presented, as well as the new Communication Strategy and Stakeholder Engagement Strategy. The Workplan was well received and AnaEE is not only opening calls for direct applications, but also engaging in multiple project applications in 2025.

HOST AGREEMENT WITH CREA SIGNED

CREA and AnaEE-ERIC has officially signed the host agreement for the Data and Modelling Centre in Rome! The data and modelling centre will help the climate-change researcher to harmonize, exploit, search for and organize research data. CREA have also started the process of finding a Data and Modelling Scientist to lead the work at this new centre.

AGROSERV CALL OPEN - PROLONGED DEADLINE FOR APPLICATIONS

You now have until March 26th, 2025 to apply for free access to advanced research services across Europe through our Transnational Access / Virtual Access programme. AgroServ offers: access to 140+ cutting-edge research services, support for transdisciplinary collaborations and funding for transnational projects with a focus on advancing the agroecological transition

ELTER CALL FOR ABSTRACT FOR THE 1ST SCIENCE CONFERENCE, JUNE 2025

The first eLTER Science Conference will take place 23-27 June 2025. The Scientific Programme is published, and the Call for Abstracts is open! More on this on our website under events. ***Call for abstract DL January 17th!***

ANAEE AT EGU 2025 - CALL FOR ABSTRACT

We're thrilled to announce our participation with a booth alongside the ENVRI community! People from our network are also hosting numerous sessions, grab your chance to participate in the conversation on ecosystem research at one of the biggest scientific gatherings of the year. All relevant session are gathered on our website. **Call for abstract DL January 15th!**

ENVRI COMMUNITY AT ICRI 2024

The ENVRI Community made a powerful impact at the International Conference on Research Infrastructures (ICRI) 2024 in Brisbane, Dec 3-5. IRISCC side event spotlighting RIs' role in climate change mitigation and adaptation. The side event featured talks from ICOS - Integrated Carbon Observation System (*Werner Leo Kutsch*), eLTER (*Michael Mirtl*), and IRISCC (*Janne Rinne*, AnaEE-ERIC).

FHERITALE WEBINAR - 16/01/2025, 11:00 CET

The webinar invites 3 experts detailing the latest in micro and nano plastics in the context of food, health, and environmental research. This first webinar sees speakers in food, health, and environmental research, providing their insight on the latest developments:

- Silvia Orlandini (ICAR)
- Alba Hernandez (Plasticheal)
- Plus one more speaker (TBC)

Register on their website.

AQUASERV CALL OPEN!

AquaServ opened its call on November 15th. This project provides researchers with funded access to over 60 of EU's cutting edge facilities from over 30 institutions in 16 European countries. More on

The participants of the AnaEE Assembly of Members, Rome. Nov 2024.

OTHER NEWS

The Fifth edition of the report on the Assessment of Biodiversity Measurement Approaches for Businesses and Financial Institutions.

The fifth edition of the report on the “Assessment of Biodiversity Measurement Approaches for Businesses and Financial Institutions” series was launched at COP16 this October. This iteration covers a total of 37 biodiversity measurement approaches, with seven new approaches added this year as well as an update to the Biodiversity Measurement Navigation Wheel. Download the report to find out more.

The Truth About Online Shopping and Its Environmental Impact

Global e-commerce has grown steadily over the past decade. The Covid-19 pandemic has pushed the sector even more, triggering changes in consumer behaviour and leading to staggering records in sales. Big companies such as Amazon, Alibaba, and Walmart have monopolised online shopping and increased consumers’ expectations by offering same-day delivery and free returns. Earth.Org takes a look at the growing trends in online shopping and its environmental impact.

“I strongly regret that there is no agreement on a new global plastics treaty. If business as usual continues, plastic production will triple by 2060.

Jessika Roswall, Commissioner for the Environment, Water Resilience and a Competitive Circular Economy

EU regrets lack of conclusion on global plastics agreement

After two years of negotiations, UN member states failed to reach an agreement on curbing the use of plastic worldwide, much to the disappointment of the EU. Read full article here.

UK to finish with coal power after 142 years

The UK is about to stop producing any electricity from burning coal - ending its 142-year reliance on the fossil fuel. The country's last coal power station, at Ratcliffe-on-Soar, finishes operations on Monday after running since 1967. This marks a major milestone in the country's ambitions to reduce its contribution to climate change. Coal is the dirtiest fossil fuel producing the most greenhouse gases when burnt. Read full article on BBC.

IPBES report calls for urgent action

The IPBES Transformative Change Report, prepared by over 100 experts from 42 countries over three years, addresses the urgent need to halt and reverse biodiversity loss to prevent irreversible ecosystem collapse, including threats to coral reefs, the Amazon rainforest, and polar ice sheets.

It outlines five key strategies for transformative change: conserving biocultural diversity, mainstreaming biodiversity in key sectors, transforming economic systems, reforming governance, and shifting societal values to recognize human-nature interconnectedness.

The report emphasizes that immediate action could generate $10 trillion in business opportunities and 395 million jobs by 2030, while delaying action by a decade would double the costs, highlighting that the current annual spending of $135 billion on biodiversity conservation falls far short of the needed $722-967 billion. Read summary for policy makers on their website.

Can U.N. summits save the planet? A faltering year of talks brings up questions about the process

The world’s nations keep faltering in their efforts to join together to save the planet from several environmental crises. In the past few months United Nations-sponsored negotiations to tackle climate change, plastic pollution, loss of global species and a growing number of deserts have either outright failed or come out with limited outcomes that didn’t address the scale of the problems. It’s been three years since activist Greta Thunberg dismissed global talks as “blah-blah-blah,” which became a rallying cry for young environmentalists. Read full Associated Press article here.

NEWSBYTES FROM NATIONAL NODES

In every issue we give some updates from a selection of our National Nodes.

Measurements of emissions of CO2 from soil and plants at Tsalapitsa Open-Air Field were carried out in four phases of the vegetation of barley grown in 2024 with a portable device "ALMEMO”.

BULGARIA

On December 5, in honour of World Soil Day, a scientific conference with international participation was opened on the topic: "Ecology and Agrotechnology - Fundamental Science and Practical Implementation - Business Models for Improving Soil Health".

The conference is organized by the Institute of Soil Science, Agrotechnology and Plant Protection "Nikola Poushkarov" at the Agricultural Academy and the New Bulgarian University and is under the patronage of the President of the Agricultural Academy, Prof. Dr. Violeta Bozhanova.

This conference, in addition to World Soil Day, also marks some important anniversaries such as the 150th Anniversary of the birth of the patron of ISSAPPNP Nikola Poushkarov, the 100th Anniversary of the teaching of soil sciences in Bulgarian universities and the 75th Anniversary of the science of agricultural mechanization in Bulgaria.

Greetings on the occasion of World Soil Day and wishes for successful work at the conference were presented by the official guests, including virtually from France by Prof. Michel Boër, DG of AnaEE-ERIC.

Prof. Dr. Violeta Bozhanova, President of the Agricultural Academy, in Bulgaria during the World Soil day. This year it went under the topic "Ecology and Agrotechnology - Fundamental Science and Practical Implementation - Business Models for Improving Soil Health".

A successfully completed project was reported and a closing conference was held under Project "BG06RDNP001-16.001-0023 to the Rural Development Program for the period 2014-2020" under sub-measure 16.1. "Support for the formation and functioning of operational groups within the framework of the EPI", as part of measure 16 "Cooperation" under the Rural Development Program for the period 2014 - 2020, on the topic "Introduction of remote methods for planning activities in agriculture", led by the Agricultural Development and Planning Agency "LAND OF THE FUTURE".

We also announce that Prof. Dr. Irena Atanasova and Prof. Svetla Ruseva from ISSAPPNP will be guest editors of the special edition Ecological Restoration of Degraded Soils in Sustainable Agriculture in the journal Agriculture – MDPI and, if possible, we invite you to submit an article for publication.

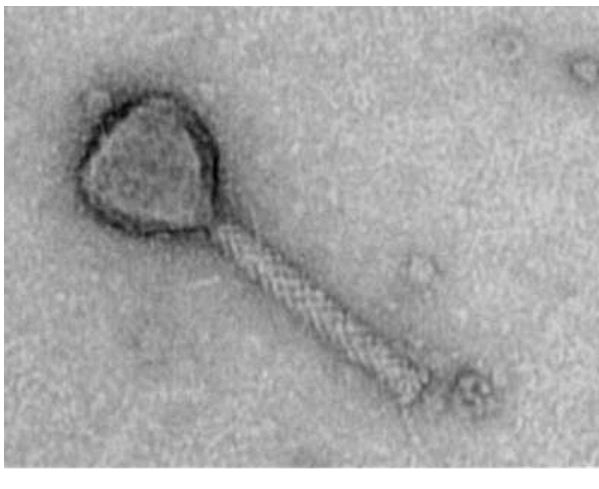
CIHEAM

The absence of direct and effective therapies for plants affected by certain bacterial diseases has prompted researchers to explore novel approaches and compounds to combat these emerging pathogens.

At the AgroServ, AnaEE-ERIC Analyst platform of CIHEAM Bari, advanced techniques in transcriptomics, metagenomics, and proteomics are being now empowered and employed to offer next-generation sequencing and in-depth data analysis based on host-pathogen-environment interactions.

These cutting-edge methods assist in understanding the mechanisms of bacterial and viral infections, including the identification and sequencing of complete genomes of bacteria, bacteriophages, viruses, etc. In particular, the study of antimicrobial peptides (AMPs), bacteriophages, and lactic acid bacteria as biocontrol agents are considered promising eco-friendly alternatives for sustainable agricultural treatments and provide nowadays new opportunities to address plant bacterial diseases in an environmentally responsible manner.

A series of publications, highlight the latest advancements in this field at Analyst platform of CIHEAM Bari, underscoring their effectiveness as natural solutions for combating plant pathogens while minimizing environmental impact.



Transmission electron microscopy image of MATE 2 showing a particle with an isometric capsid head and a long contractile tail, scale bar = 25 nm

Measurement of greenhouse gas emissions using manual chambers and a mobile platform for variations of repeated disturbance and fertilisation in a grassland ecosystem

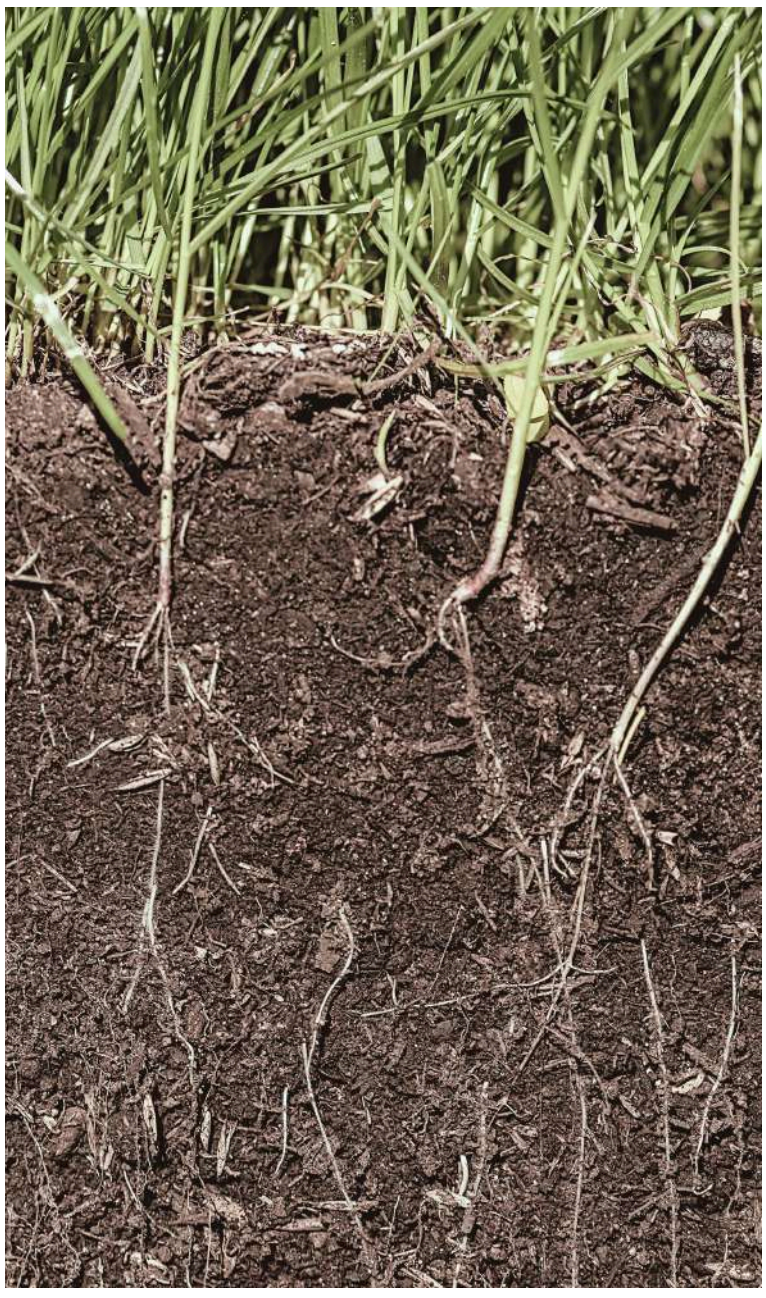
CZECH REPUBLIC

In the summer of 2024, a mobile platform for chamber measurements of greenhouse gas emissions of CO_2, N_2O, CH_4 and NH_4 was put into operation within the Czech AnaEE-ERIC national node - CzeCOS.

This provides simultaneous measurement of emissions from up to 8 separate variants or replication using manual chambers. The mobile platform is based on a small trailer with a Picarro G2508 analyser installed, a multiplexer and a PLC-based programmable control unit.

The platform has been used and tested in 2024 within an experiment in an agroecosystem with different variants of nitrogen and organic fertilisation in combination with tillage technology and cover crops, then in an experiment focused on disturbance and fertilisation within a grassland ecosystem and finally in a manipulation experiment with a young forest ecosystem including variants of elevated CO_2 concentration, nitrogen and water availability.

All measurements demonstrated the feasibility of using similar mobile platforms for ambulatory measurements of ecosystem processes in different open-air manipulation experiments within a short period while achieving high utilisation of expensive equipment.



FROM COSMIC RAYS TO THE SOIL BENEATH: A SCIENTIFIC JOURNEY

“Too much land on the premises" led AnaEE's Director General Michel Boër into ecology.

Text & Photo: Amanda Ölander

Earlier this year, I had the privilege of visiting the Observatory of Haute Provence with Michel Boër, its former director and current Director General of AnaEE-ERIC. What makes this location extraordinary is how seamlessly astronomical research intertwines with ecological investigation—a convergence that is anything but accidental.

Boër is originally an astronomer specializing in gamma-ray sources, spending decades studying gamma-ray sources – explosive astronomical phenomena we observe across multiple wavelengths, from gamma and X-rays to optical and infrared light.

But science, like the universe, is rarely linear. As the director of the Observatory of Haute Provence, he primarily worked with space and ground-based telescopes, when his path suddenly took an unexpected turn.

-The observatory, established in the late 1930s, had extensive land – about 100 hectares. At one point there was a need to optimize this resource. And after discussions with colleagues, we decided to establish an ecological research station focused on experimental ecology.

JUST AS ASTRONOMERS USE CENTURY-OLD PHOTOGRAPHIC PLATES, ECOLOGISTS NEED DECADES TO UNDERSTAND COMPLEX SYSTEMS LIKE FORESTS.

Michel Boër
Director General, AnaEE-ERIC

In astronomy they were already used to working with large instrumentation. So, they applied that technical expertise to ecology, building sophisticated observation platforms in forest canopies and developing complex research infrastructure.

It was at this observatory that the first planet outside our solar system was discovered in 1995 by Michel Mayor and Didier Queloz. It was 51 Pegasi b, a gas giant orbiting a star similar to our Sun.

- And perhaps one day we might discover the first exoplanet that is harbouring life! So studying ecology in the same place where we expanded our understanding of potential extraterrestrial life feels like an interesting link to me.

Since 2019 Boer is involved with AnaEE-ERIC, a pan-European ecological research network, crucial parts of scientific innovation, advancement and European competitiveness.

Research infrastructures allow us to move beyond short-term project thinking. We create platforms that operate for decades, enabling transnational collaboration where European scientists share access to research facilities. This builds a genuine community of researchers committed to long-term ecological understanding.

- We're experiencing significant environmental disruption – climate change, biodiversity loss – primarily caused by human activities. Our infrastructure allows us to simulate future environmental conditions, test adaptation methods like carbon sequestration, and develop sustainable agricultural practices.

In the Mediterranean, for instance, drought conditions over multiple years can be simulated, to help understand forest evolution. This isn't just academic – it provides evidence-based insights for policymakers and practical solutions for industries like agriculture.

But better scientific work in itself won’t fix the challenges we face.

- Scientific organizations can't solve political problems directly, but we provide critical evidence. By working collaboratively – not just among scientists, but with farmers, engineers, and policymakers – we can develop comprehensive strategies.

IN THE JOURNALS

AnaEE-ERIC facilities for climate research

AN IN SITU 15N LABELING EXPERIMENT UNVEILS DISTINCT RESPONSES TO N APPLICATION APPROACHES IN A MOUNTAIN BEECH FOREST

Since the industrial revolution, atmospheric nitrogen (N) deposition has doubled in terrestrial ecosystems, potentially boosting forest productivity but also causing problems like soil acidification and biodiversity loss. Traditional studies often overlook the canopy's role in N fate, focusing on direct forest floor N addition. In our study, we applied labeled nitrogen above and below the canopy, revealing that above-canopy treatment led to significantly higher N recovery in foliage (43%) compared to below-canopy (9%). This highlights how N application methods impact nitrogen cycling, with canopy treatment showing distinct N recovery patterns without altering long-term tissue storage.

First published: Sep 2024. Luca Da Ros et al.
Tree Physiology: https://doi.org/10.1093/treephys/tpae104

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MACRONUTRIENT CONTENT AND EXPORT WITH BIOMASS AND LYSIMETRIC WATER FROM A FIELD EXPERIMENT WITH BARLEY (HORDEUM VULGARE L.) GROWN AS AFTER-EFFECT.

The study examines how mineral fertilization of a previous tomato crop affects barley (Hordeum vulgare L.) yield, macronutrient content, and soil water composition. Barley yields doubled in fertilized plots, reaching 4247.6–4360.7 kg/ha, due to residual nutrients in the soil. While nitrogen content in barley biomass increased, phosphorus, potassium, calcium, and magnesium levels were largely unaffected. Higher fertilization rates led to increased calcium, magnesium, nitrates, and sulphates in soil water, alongside lower pH and bicarbonate levels. Nutrient export with barley biomass and soil water was directly influenced by fertilization intensity. The findings emphasize both the productivity benefits and environmental impacts of residual fertilization.

First published: Aug 2023, Nenova, L., et al.
Bulgarian Journal of Agric. Sci.: Reed article on website.

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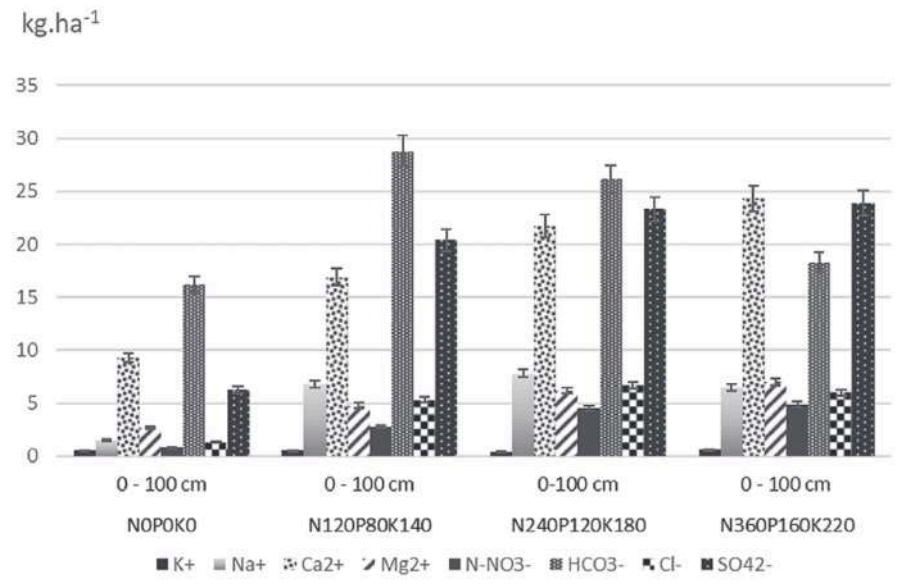
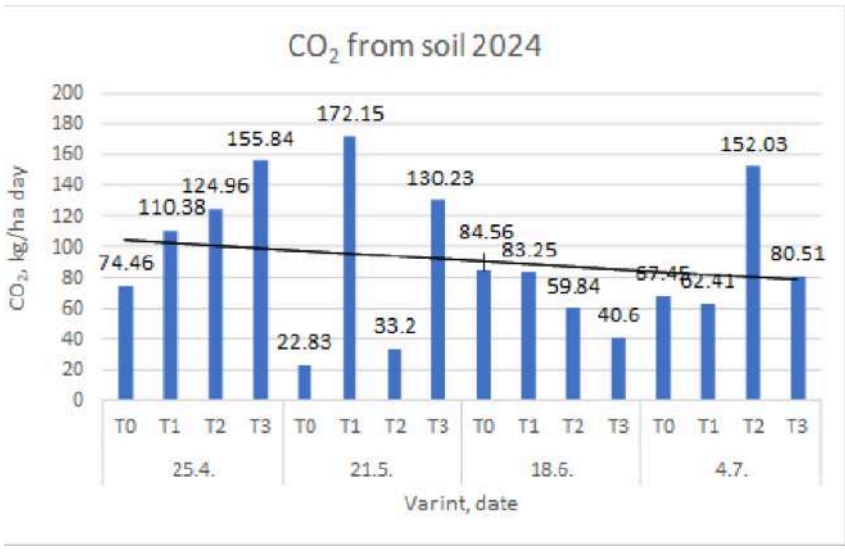


Fig. 2. Export of the elements (kg.ha^{-1}) by the lysimetric waters



AnaEE-ERIC is a distributed European-wide research infrastructure for experimental research on managed and unmanaged terrestrial and continental aquatic ecosystems.

NATIONAL NODE CONTACTS

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