AnaEE ERIC

ANNUAL
Report

2023

Approved by: The fifth Assembly of Members
Date: 12th of June 2024
Place: Brussels, Belgium

AnaEE-ERIC
1 avenue de la Terrasse
91190 Gif-sur-Yvette
France

anaee.eu
contact@anaee.eu

Design: Amanda Ölander

A word from our Director General

Dear reader,

It is with great pleasure that we present to you the second annual report of AnaEE-ERIC, covering the entirety of the eventful year of 2023. This report marks a significant milestone in our journey, providing a comprehensive overview of our achievements and progress.

Over the past year, AnaEE-ERIC has witnessed significant growth and development. We have successfully transitioned to our permanent headquarters and expanded our team to a total of 6 people working in Gif-sur-Yvette, including the DG. This expansion will improve our ability to serve the needs of the research community and reflects our commitment to excellence and our dedication to advancing the field of ecological research.

The activity of the research infrastructure at large was important, with a meeting of the facilities in Copenhagen, organized by the Technology Centre, which was well attended: the reports from the national nodes, in this document, reflect the active life of AnaEE.

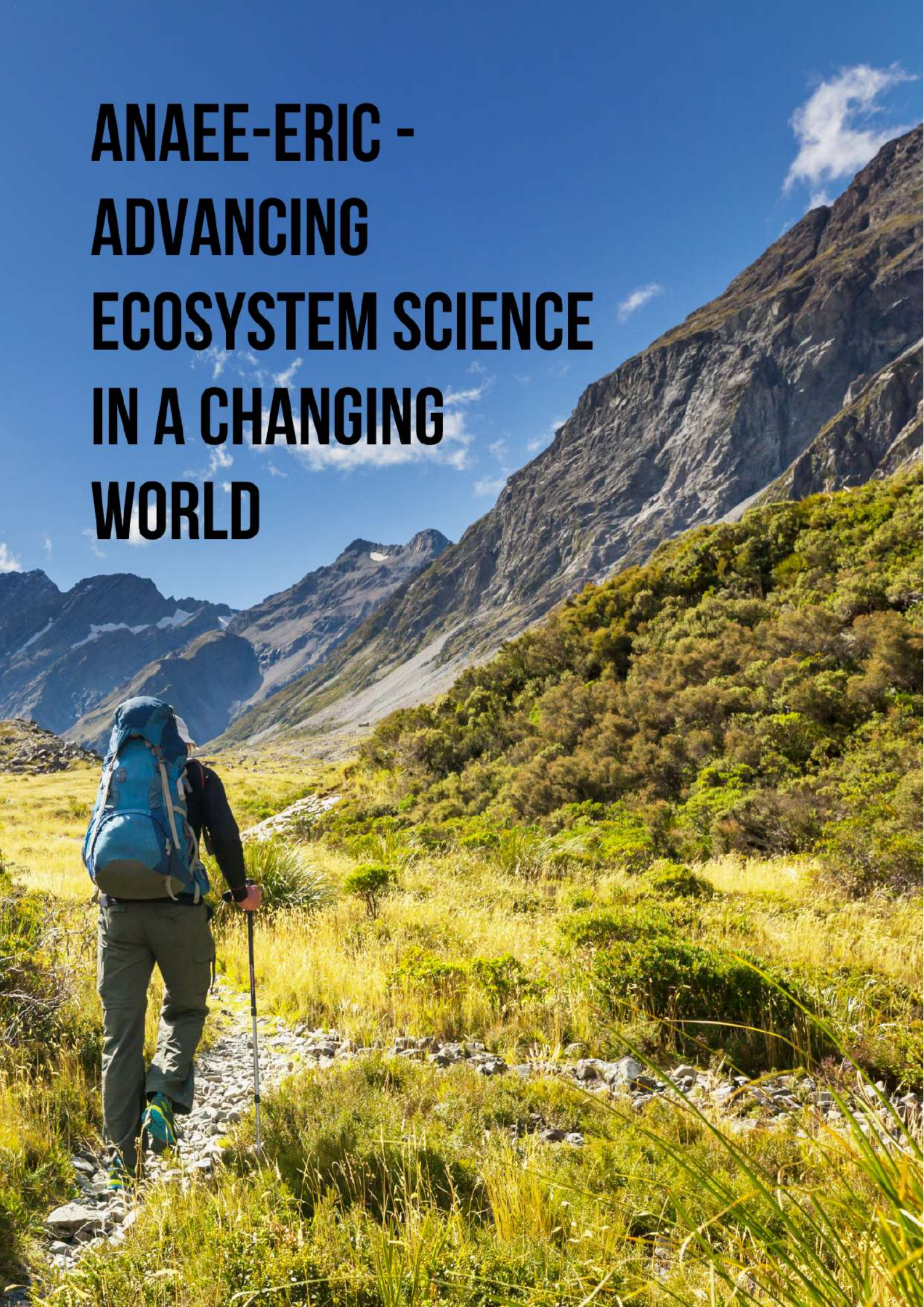
For the projects you can read about the great success of AgroServ which was positively evaluated by the Research Executive Agency, and got more than hundred expressions of interest for its first call. There is also a special report on PHENET, a Horizon Europe project which started in 2023. Five Horizon Europe projects, with AnaEE-ERIC participation, have been accepted this year, showing the central place of our organisation in the ERIC landscape.

A significant achievement on the institutional front is the formalization of the host agreement with CzechGlobe, which has led to the establishment of the Interface and Synthesis Centre in Brno. Founded in 2022, AnaEE-ERIC and its staff is fully committed in providing the best tools and support to the research community in ecology, and in contributing to the efforts to reach the sustainable development goals, and to the European policies.

Yours sincerely,

Michel Boër

ANAEE-ERIC - ADVANCING ECOSYSTEM SCIENCE IN A CHANGING WORLD



AnaEE-ERIC – an introduction

ANALYSIS AND EXPERIMENTATION ON ECOSYSTEMS

Climate change impacts everyone on the planet. According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, it's estimated that species extinction rates are 1,000 times higher than natural background rates due to human activities, with around 1 million species facing extinction.

By 2050 IPCC has projected that climate change could reduce crop yields by up to 30%, exacerbating food insecurity for millions of people worldwide.

Addressing these challenges requires urgent and concerted efforts at local, national, and global levels. Society has to work together to mitigate greenhouse gas emissions, conserve biodiversity, promote sustainable land and resource management, and enhance resilience to climate impacts.

To increase our understanding and be better equipped for changes that are already occurring, we need more scientific research.

AnaEE-ERIC's mission is to operate a research infrastructure focused on studying and experimenting with ecosystems, their functions, and the services they provide. Its aim is to provide the necessary tools, research services, and knowledge to address the complex environmental and climate challenges affecting society.

We contributes to sustainable development, the Green Deal, and OneHealth by promoting sustainable land use, addressing climate action, biodiversity conservation, and ecosystem health.

Recognizing the gaps in knowledge highlighted by intergovernmental agencies and academics, we focus on complementing observational approaches with advanced experimental methods. These methods allow researchers to control various parameters and test hypotheses across different ecosystems.

AnaEE-ERIC stands out for the ability to provide diverse experimental settings across a wide range of ecosystems and climates, serving as a crucial piece in addressing scientific and societal challenges. It offers a single point of access in Europe for comprehensive ecosystem research, involving relevant infrastructure and engaging stakeholders.

The uniqueness and value of AnaEE-ERIC lie in the emphasis on experimental methods as the foundation of our infrastructure. By effectively integrating experimentation and modelling activities, we advance ecosystem science, particularly in expanding Earth system models. The approach revolves around manipulation, measurements, modelling, mitigation, and management of continental ecosystems.

The experimental approach will ultimately help to predict the impact of environmental and climate change drivers, unravel mechanisms and feedbacks involved in ecosystems' responses, and test mitigation and adaptation measures.

6
MEMBER COUNTRIES

1
INTERNATIONAL ORG

1
OBSERVER COUNTRY

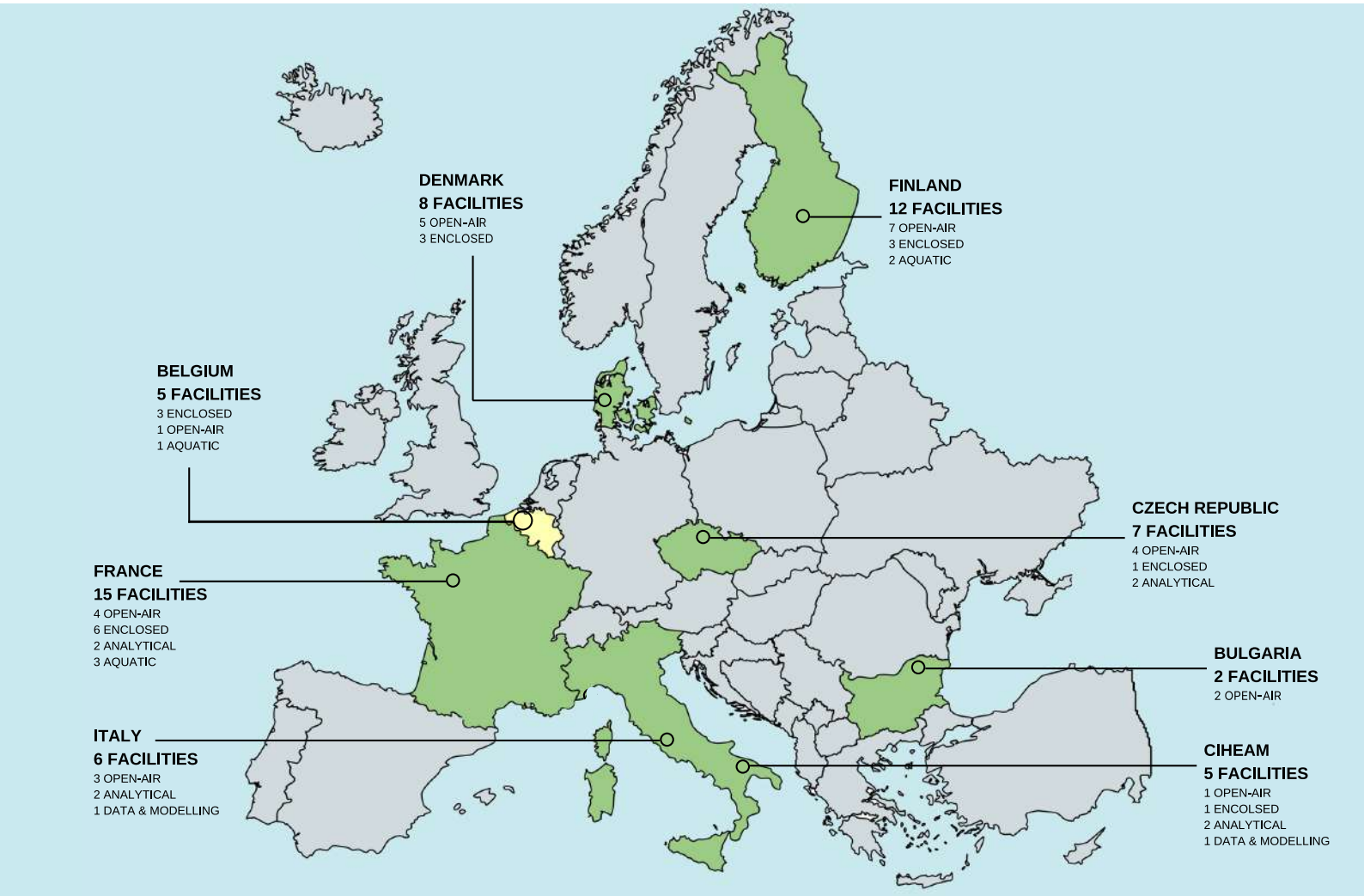
THE EXPERIMENTAL FACILITIES SIMULATE CHANGES IN THE ENVIRONMENT.

MODELLING

ANALYTICAL

ENCLOSED

OPEN-AIR



Highlights 2023

WINTER/SPRING

January: AnaEE-ERIC central hub moves into its permanent premises in the CNRS campus of Gif-sur-Yvette, located in the vibrant area of the "French Research Valley" of Paris-Saclay, South of Paris.

February: Kick-Off meeting of the PHENET project. (www.phenet.eu/en for details).

March: The AnaEE-ERIC Technology Centre organised the 2023 platform meeting and Technology Foresight Workshop in Copenhagen. IT was attended by 33 AnaEE representatives and installation managers. We learned about the newest technologies to measure greenhouse gases (GHG), discussed future collaborations and benefited from a fruitful exchange of information and ideas.

Figure 1: The present representatives of the AoM in Helsinki, November 2023.

SUMMER

June: The European Research Services in Agroecology Conference (ERSAC) took place in Prague. AgroServ is the first project coordinated by AnaEE-ERIC, more on this in the projects section.

- The third AnaEE-ERIC Assembly of Members took place in the headquarters of the Czech Academy of Sciences. The meeting commenced with a welcome presentation by representatives of the Czech Ministry for Science, and by the Vice-President of the Academy. The AnaEE-ERIC Assembly of Members approved our first Annual Report, including the financial report for 2022. This is an important milestone, which reflects all the activity and accomplishments of our ERIC in less than a year of existence.

July: Five new Horizon Europe projects have been approved with participation of AnaEE-ERIC. ERIC Forum 2, Aquaserv, IRISCC, MICROBES4CLIMATE, FHERITALE. See description in project section.

AUTUMN/WINTER

September: Kick-off event of the ERIC-Forum 2 project.

- AnaEE-ERIC participates to the Global Sustainability of Research Infrastructures conference in Tenerife, Spain.

October: Deadline for the expression of interest to propose for the AgroServ, AnaEE-ERIC coordinated project. More than 100 teams were interested in using services for the research in the agroecological transitions.

- Meeting of the Independent Scientific Advisory Committee of AnaEE-ERIC.

November: AnaEE-ERICs 4th Assembly of members took place in Helsinki where our Finnish node presented the latest news, and the atmosphere breathed optimism for the future, having expectations for the next

phase as AnaEE-ERIC will now begin delivering services to the users.

December: AnaEE-ERIC and CzechGlobe sign the agreement for the instalment of the Interface and Synthesis Centre.

The ISC will be accompanying the scientific community to promote their projects results and support them to strengthen their proposals and get fundings. The ISC will also be responsible for the training of stakeholders and public outreach.

"AnaEE-ERIC has been very successful in partnering with other RIs and gathering funding from projects at a European level. That demonstrates that the field we work in is very relevant, serving a wide community -from food and health to environmental clusters."

Sanna Sorvari Sundet, chairperson of the board.

Figure 2: The new office building in Gif-sur-Yvette is located on the CNRS campus site.

Our services for climate change resilience

AnaEE-ERIC is a key player when addressing the ecological sustainability challenge for Europe. Our extensive network of experimental facilities allows us to simulate environmental changes by making controlled adjustments. This helps us understand the impact of each change factor and how they interact. By combining this with modelling, we can predict how ecosystems will respond in the modern era, including identifying tipping points and understanding how ecosystems can adapt and continue to provide services to society.

These installations have been selected on several criteria, such as:

- State of the art instrumentation, following the AnaEE standards.
- Capacity to perform at least two environmental pressures.
- Quality of the data provided.
- Access to the international community using our research services.
- Open access to the data and agreement on the standards for data and metadata provided by AnaEE.
- Long term support

The services offered by the AnaEE-ERIC facilities fall into four categories:

Open-air ecosystem facilities

They comprise the predominant land use types of European continental ecosystems including managed and unmanaged ecosystems as well as terrestrial and aquatic ecosystems transecting Europe's climatic zones. Open-air installations have been designed to host long-term experiments lasting at least over one or two decades to decipher long-term trends and slow processes, especially in soils, but also on other terrestrial and freshwater systems. Long-term, open-air experiments constitute a major scientific approach in ecosystems with potential to unravel future patterns under realistic field conditions.

Enclosed ecosystem facilities

They complement the open-air installations by enabling a higher level of environmental control and process measurement on ecosystems. They can be used when highly controlled conditions are needed and are difficult or expensive to realize in open air, for example, the experimental simulation of elevated atmospheric CO_2, climate-warming, heatwaves, or shifting rainfall regimes. The AnaEE enclosed installations are unique in their whole-ecosystem level design and measurement technologies.

Analytical facilities

They offer advanced biological, physical and chemical analyses of different samples (soil, plant) for a deeper insight into processes. Featuring state-of-the-art large instrumentation, for advanced biological, physical, and chemical analyses (mostly belonging to the -omics science branches). Analytical installations extend the availability of advanced methods, otherwise inaccessible for most experimental installations, to provide comprehensive data that permits the understanding of the mechanisms of response and adaptation to different environmental factors.

Modelling and data facilities

Modelling installations give access to existing, state of the art, numerical models

and to advanced software facilities for model development that will improve data analysis and synthesis and allow predictions of the responses of ecosystems to global changes.

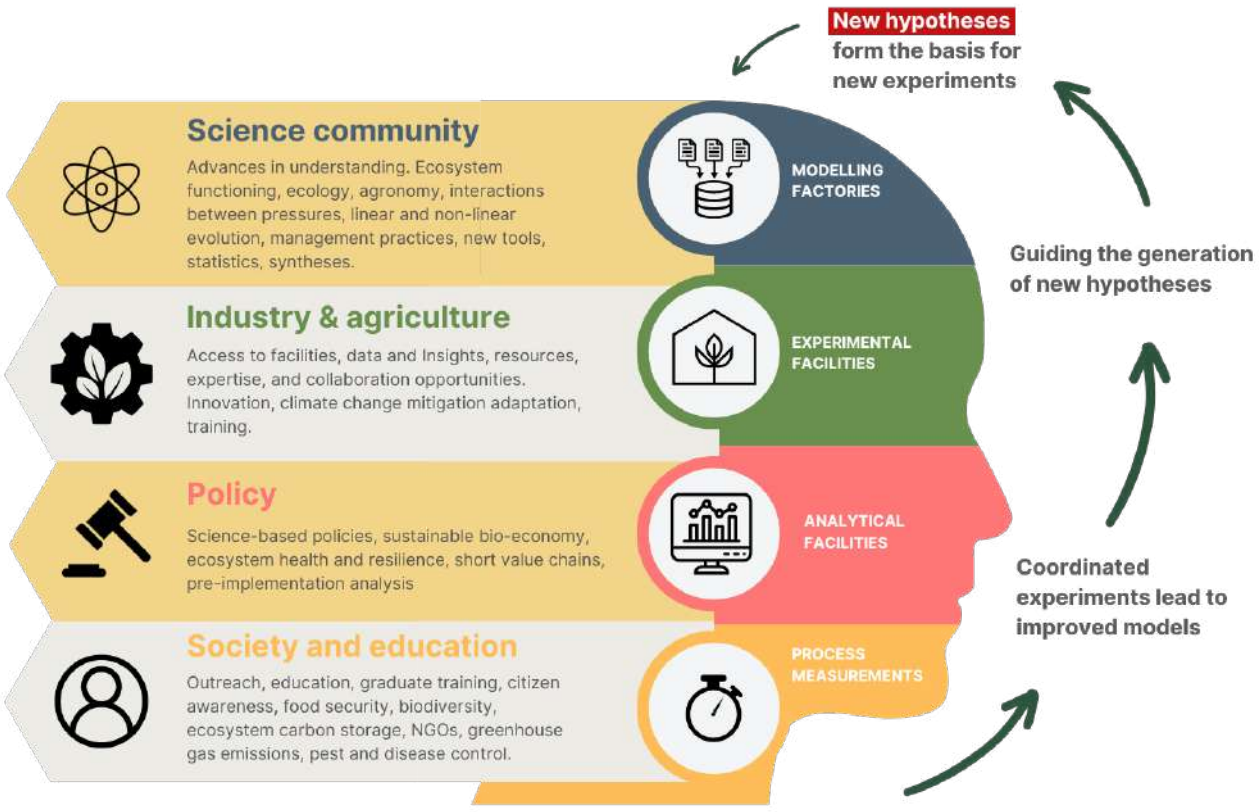
Modelling allows for effective forecasting of environmental trends and the impact of various factors like new management practices and climate change. It helps detect anomalies in field data and provides insights for better experimental design and planning. This information aids stakeholders and policymakers in making informed decisions.

DEVELOPMENTS IN 2023

In 2023, the AnaEE-ERIC Interface and Synthesis Centre (ISC) focused on establishing its presence at CzechGlobe in Brno, Czech Republic. Key highlights include signing the Host Agreement, participating in project preparations, and initiating accession communications with potential candidate countries.

The AnaEE-ERIC Data and Modelling Centre (DMC) prioritised enhancing digital capacities, drafting a new Data Management Plan, and supporting project proposals. Additionally, the DMC collaborated with the ENVRI and EOSC communities to strengthen AnaEE's positioning in the digital research landscape.

The AnaEE-ERIC Technology Centre (TC) played a pivotal role in developing the AnaEE web portal and ISIA system. Hosting the second Technology Foresight workshop in Copenhagen, the TC facilitated discussions on EU Horizon Europe calls and potential collaborations. Negotiations for finalising the host agreement between the University of Copenhagen and AnaEE-ERIC were also initiated during 2023.



AnaEE-ERIC's experimental approach advances scientific methods and our understanding of the climate change impact.

Governance

AnaEE-ERIC is founded by 6 member countries (France, Denmark, Italy, Czech Republic, Finland, Bulgaria), 1 Observer (Belgium) and 1 International Organization (CIHEAM).

The Central Hub is the headquarters and located in Gif sur Yvette, south of Paris, France. It is responsible for the coordination, administration and management of the AnaEE web portal and the three supra-national Service Centres.

The Director General
Michel Boër

Chairperson of the AoM
Sanna Sorvari Sundet

The Director General (DG) is the chief executive officer of AnaEE and its legal representative. The DG is appointed by the Assembly of Members and has authority on all services of the AnaEE-ERIC.

THE ASSEMBLY OF MEMBERS

The Assembly of Members (AoM) is the main governing body of the AnaEE-ERIC. It comprises two representatives per member, one with a scientific, and one with an administrative expertise. The AoM appoints the Director General and takes all decisions related to the AnaEE strategy, governance and scientific development.

CHAIRPERSON OF THE ASSEMBLY
Sanna Sorvari Sundet
(Since June 2022, FIN)

VICE CHAIRPERSON OF THE ASSEMBLY
Jean-Marie Flaud

BELGIUM
Laurent Ghys
Tom Vandenbogaerde

DENMARK
Mads Rugaard Christensen
Jørgen Eivind Olesen

BULGARIA
Martin Banov
Milena Glavcheva

FINLAND
Jaana Bäck
Mikko Peltonen

CIHEAM
Claudio Bogliotti

FRANCE
Eric Aubry
Jean-Marie Flaud

CZECH REPUBLIC
Jan Švehla
Kristina Trávníčková

ITALY
Marcello Donatelli
Giampiero Golisano

THE INDEPENDENT SCIENTIFIC ADVISORY COMMITTEE (ISAC)

The ISAC is composed of 5 to 10 scientists chosen for their expertise in the fields covered by AnaEE and is appointed by the AoM. It provides advice on the criteria for the acceptation of facilities, on the strategy, on the collaboration with other infrastructures and bodies, it analyses the activity reports and provides recommendations on the work programme and long-term strategy and gives foresight on ecosystem sciences and the links with food security and the bioeconomy.

Ioannis Athanasiadis
Professor of Artificial Intelligence and Data Science at Wageningen University and Research, Netherland

Alessandra de Marco
Director of research at ENEA, Italy, and coordinator of the IUFRO (International Union of Forest Research Organizations)

Stefan Bertilsson
Professor in Functional Ecology of Freshwaters, former Director of the SITES Research Infrastructure, Sweden

Violeta Bozhanova
Professor, Vice-President of the Agricultural Academy of Bulgaria

Michael Bahn
Professor at University of Innsbruck, Austria

Claudio Stöckle
Professor, Washington State University, United States of America

THE MANAGEMENT BOARD

The Management Board (MB) is a committee composed of the Director General and the heads of the service centres, and key personnel. The MB advises the Director General on all matters related to the day-to-day life of the ERIC, as well as in the preparation of the work programme and budget, strategy, communication and outreach.

In its "extended" form (Extended Management Board), the management boards meets with the representatives of the national nodes and of the four facility types. The management boards meets approximately once a month, the extended management board once every 2 months.

CHAIRMAN OF THE BOARD
Michel Boër
Director General

TECHNOLOGY CENTRE
Klaus Steenberg Larsen
Interrim

SENIOR PROGRAM MANAGER
Lavanya Premvardhan

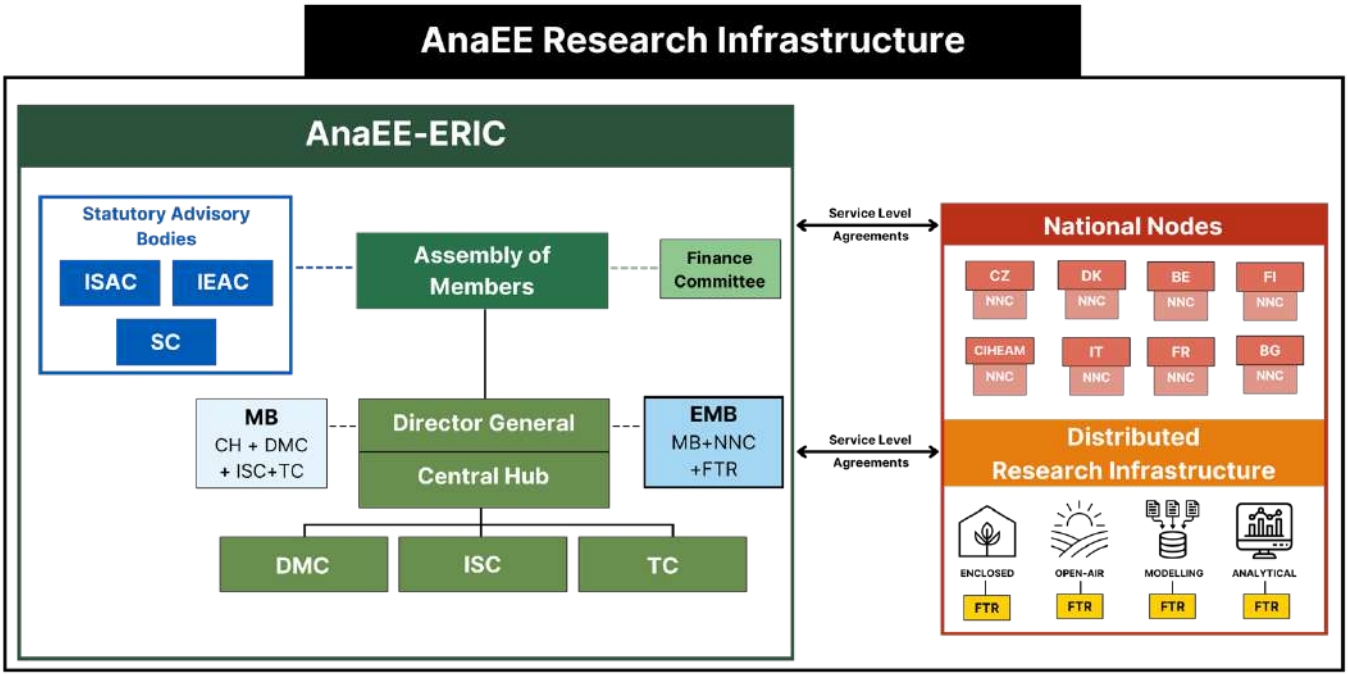
COMMUNICATIONS OFFICER
Amanda Ölander

DATA AND MODELLING CENTRE
Marcello Donatelli
Interrim

INTERFACE AND SYNTHESIS CENTRE
Karel Klem
Interrim

CHIEF ADMINISTRATIVE OFFICER
Mireille Kelly Matene Fah

OFFICE MANAGER AND EXECUTIVE ASSISTANT
Véronique Ozier-Lafontaine



Organisation chart
May 2024

ISAC: Independent Scientific Advisory Committee
IEAC: Independent Ethics Advisory Committee
SC: Stakeholder Committee

CH: Central Hub
DMC: Data and Modelling Centre
ISC: Interface and Synthesis Centre
TC: Technology Centre

MB: Management Board
EMB: Extended Management Board
NNC: National Node Contact
FTR: Facility Type Representative

AnaEE-ERIC Activities

THE CENTRAL HUB

The Central Hub (CH) is the heart of the strategy, coordination, communication and administration of AnaEE. It coordinates the overall infrastructure and manages the AnaEE web portal which gives access to all the resources and services of the infrastructure.

STAFFING

AnaEE-ERIC has expanded during 2023 with our headquarters in Gif-sur-Yvette consisting of six team members by the end of the year. The AgroServ Project Manager has also officially joined as staff of AnaEE-ERIC in September, hence the four recruitments in 2023 consist of the following four:

CHIEF ADMINISTRATIVE OFFICER
Mireille Matene

OFFICE MANAGER AND EXECUTIVE ASSISTANT
Véronique Ozier-Lafontaine

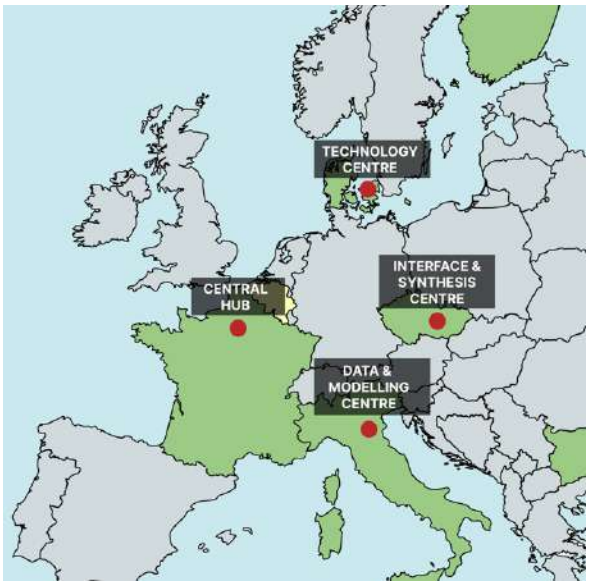
COMMUNICATION OFFICER
Amanda Ölander

PROJECT MANAGER, AGROSERV (Project EU-funded)
Sarah Dramé

PREPARATION OF LEGAL AND STRATEGIC DOCUMENTS

Host agreement preparation

In 2023 CH has been busy preparing the host agreements for CH, DMC, ISC, TC. While negotiations are still underway for DMC and TC, the hosting agreements with the CNRS (France) and CzechGlobe (Czech Republic) have been approved by the AoM#4. A nice ceremony of signature between the Directors General of CzechGlobe and AnaEE-ERIC for



the hosting of ISC took place in Brno on the 13th of December 2023, attended by representatives of the Ministry for Youth, Higher Education and Science, of the City of Brno, and the press.

Service Level Agreement Status

The service level agreements (SLA) link AnaEE-ERIC and the distributed network. Two types of SLAs have been prepared: the SLAs with the national nodes organise the collaboration with the national consortiums; the SLAs with the operational facility owners detail how the international users experiments are accommodated on the facility, the percentage of external users that the facilities will accept, and various aspects of the collaboration.

AS THE RESEARCH INFRASTRUCTURE IN EXPERIMENTAL ECOSYSTEM ECOLOGY, ANAEE'S GOALS ARE IN LINE WITH THE SUSTAINABLE DEVELOPMENT GOALS ADOPTED BY ALL THE UNITED NATIONS MEMBER STATES IN 2015.

WE CONTRIBUTE THROUGH SCIENCE-BASED POLICIES, ECONOMIC DEVELOPMENT, SUPPORT TO BETTER MANAGEMENT PRACTICES, AND BY RAISING CITIZEN AWARENESS.

OFFICES

Beginning 2023, AnaEE-ERIC moved to its new offices located in the CNRS Campus of Gif-sur-Yvette, in the vibrant area, yet nature protected, of the Chevreuse Valley. This has implied purchases of furniture and equipment, as well as works to fit-up office space

PARTNERSHIP AND ENLARGEMENT

AnaEE-ERIC seeks to extend its membership base with the objective to strengthen its consortium with an expanded reach and better address vulnerabilities, and fill gaps, in the European ecosystem landscape. To this end, discussions with different countries have been opened, and have reached a more advanced stage with Portugal and Spain following the sustained interactions in 2022.

Portugal: continued discussion with partners in Portugal are ongoing. Four institutions in Portugal have passed an agreement for the constitution of a national node. The AoM#2 took place in Porto, December 2022, and was an opportunity for our delegates to meet in person the Portuguese community. The University of Tras os Montes and Alto Duro (UTAD) is a beneficiary of AgroServ, where it provides socio-economic services and contributes to one of the living-labs under the umbrella of AnaEE RI.

Spain: After a successful meeting in November 2022, technical discussions are ongoing. 5 institutes of the CSIC have successfully applied for the constitution of a national node and preparation of an application to the authorities for possible membership of Spain to AnaEE-ERIC.

Both Spain and Portugal are associated to the works of the EMB, in order to consolidate the links between the communities, and to prepare there arrival as full member.

Figure 7: Signature of Host agreement between AneEE – ERIC and CzechGlobe on the establishment of AnaEE – ISC

Belgium

The AoM#4 (Helsinki, November 2023) has renewed the status of Belgium as observer until 2025, and the national community is preparing an application for full membership towards their authorities for 2024.

AnaEE-ERIC continues discussions with several partners based on the specificity and added-value of their infrastructure, and interest in AnaEE.

COORDINATION OF THE NETWORK

Regular meetings between the management of AnaEE-ERIC and the national node representatives within the framework of the Extended Management Board (EMB). CH has also been involved in the writing of proposals on behalf of the AnaEE Research Infrastructure, including the scientific, administrative, and financial parts. Most of these proposals were successful (cf. project section).

THE ANAEE INTERFACE AND SYNTHESIS CENTRE (CZECH REPUBLIC)

The AnaEE Interface and Synthesis Centre (ISC) is responsible for the overall integration of the results obtained thanks to AnaEE RI. It prepares synthesis and opinion papers on

behalf of AnaEE, watch for emerging societal needs, answer to demands from the society, economy, and policy makers. It is also responsible for the training and outreach.

In 2023, the AnaEE-ISC focused on carrying out all the administrative steps to establish the ISC at CzechGlobe (Global Change Research Institute, Czech Academy of Sciences) in Brno, Czech Republic. In the framework of these activities, several meetings were held between the Director General and the CzechGlobe management to clarify all legal financial and organizational conditions of the host agreement between AnaEE - ERIC and CzechGlobe, so that a smooth start of AnaEE - ISC activities could take place in the first half of 2024.

On December 13th, the signing ceremony of the Host Agreement was held with the presentation of AnaEE - ERIC, Czech national node AnaEE (CzeCOS) and planned activities of AnaEE - ISC in the presence of journalists, representatives of the Ministry of Education, Youth and Sports, of the city of Brno, and representatives of the Czech Republic in ESFRI.

In 2023, the AnaEE–ISC was actively involved in the preparation of the HORIZON INFRA-DEV project (GRASSI), where AnaEE - ISC was mainly responsible for the communication and promotion of AnaEE-ERIC in potential candidate and collaborating countries, capacity building and partly also for the integration of experimental, analytical and modelling installations and facilitation of multidisciplinary research. Although the project was not finally approved for support, the preparation process has produced, through intensive discussions, the essential elements of a strategy for developing AnaEE-ERIC.

AnaEE-ISC has initiated or been part of the continuation of accession communications with potential candidate countries or countries with potential for intensive scientific cooperation in the field of ecosystem research: Poland, Romania, Estonia, Spain, Portugal, Germany and also with some non-EU countries (Ghana).

In 2023, AnaEE-ISC participated in the preparation of one meta-analysis focusing on the impact of UV radiation on vents and possible implications for modelling climate-ecosystem interactions (Ac et al. 2024 Plant, Cell & Environment).

In 2023, the preparation of several synthesis studies and opinion papers continued, focusing on the potential of soil carbon sequestration in agriculture, its evaluation and economic analysis, identifying gaps in the upscaling of experimental data to a higher spatial level and proposing possible solutions facilitating the scaling process, and a study on the importance of ecometabolomics in understanding and exploiting molecular mechanisms of adaptation to climate change.

THE ANAEE TECHNOLOGY CENTRE (DENMARK)

The role of the AnaEE Technology Centre (TC) is to watch and develop new emerging technologies and ensure that instrumentation and methods are coordinated among the installations. The AnaEE-TC is also responsible for the spin-off of new technologies developed within AnaEE, as well as for coordinating the training of users and installation operators.

The AnaEE-TC was highly involved in the continued development of the AnaEE web portal and the ISIA - CNRS system during 2023. Multiple online meetings involving facility managers and representatives have been organised to teach facilities how to use the system and how to update their facility information.

16-17 March 2023, the AnaEE-TC hosted the second official Technology Foresight

workshop in Copenhagen. More on this in the section “Training”

THE ANAEE DATA AND MODELLING CENTRE (ITALY)

The AnaEE Data and Modelling Centre (DMC) is responsible for the processing of the data and metadata, the provision of data to the users (either the direct users or the community), the access to the models and model factory. It also organises workshops and training for users and AnaEE staff.

In 2023 the AnaEE-DMC has pursued a threefold goal: (I) developing its digital capacities building on the infrastructure developed during 2022 and the pre-operational phase, (II) contributing to the overall development of AnaEE-ERIC, and (III) improving the cooperation and digital transformation within AnaEE-ERIC by engaging research installations and facility managers.

The first objective resulted in the overhaul of services such as the data catalogue (data.anaee.eu) and the API catalogue (developer.anaee.eu) which now feature more content and allow for cross-RI access. The DMC has also guided the construction of the Crops and Pests Virtual Research Environment (VRE), funded by the Italian National Node’s ITINERIS project, which is now entering its pre-operational phase and is undergoing internal testing.

The second objective was pursued by leading the drafting process of the new Data Management Plan for AnaEE-ERIC, which is scheduled to be endorsed by 2024, and in general by providing assistance to AnaEE-ERIC whenever decisions on IT technologies have to be made. Finally, the DMC interim personnel took active part in the Central Hub’s initiatives for research installations and their managers, contributing to the dissemination of AnaEE ERIC’s methods and tools and listening to installation managers’ feedback and requests.

In addition to its core mission related activities, the DMC has participated in the drafting of new project proposals and supported AnaEE-ERIC’s Agro-Serv project by contributing to developing the project’s data and management plan and contributing to the authoring of further project proposals. The DMC personnel, to further reinforce the connections between AnaEE-ERIC, the ENVRI community, and the EOSC community, has also engaged in a continuous collaboration with the EGI community and fellow ENVRI RIs such as EPOS, EMSO and Lifewatch ERIC to further strengthen the positioning of AnaEE in the emerging digital research landscape and to provide AnaEE-ERIC users with state of the art data FAIRness guidelines, services, and tools.

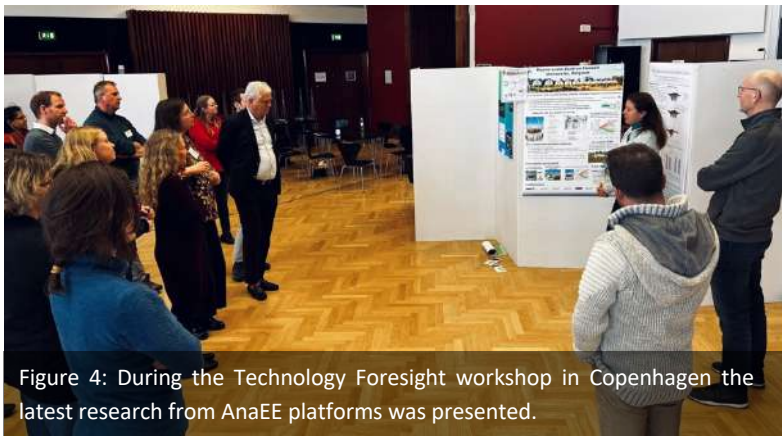


Figure 4: During the Technology Foresight workshop in Copenhagen the latest research from AnaEE platforms was presented.

The 2023 DMC activities outlined, in the context of achieving data FAIRness, the importance of a shared vision concerning data manipulation tools management among research installations and stakeholders, therefore, the overarching goal of the DMC for 2024 is to contribute to the formalisation of such a vision by means of contributing to research installations requirements engineering and the specification of technological guidelines and non-functional requirements for software tools within AnaEE ERIC.

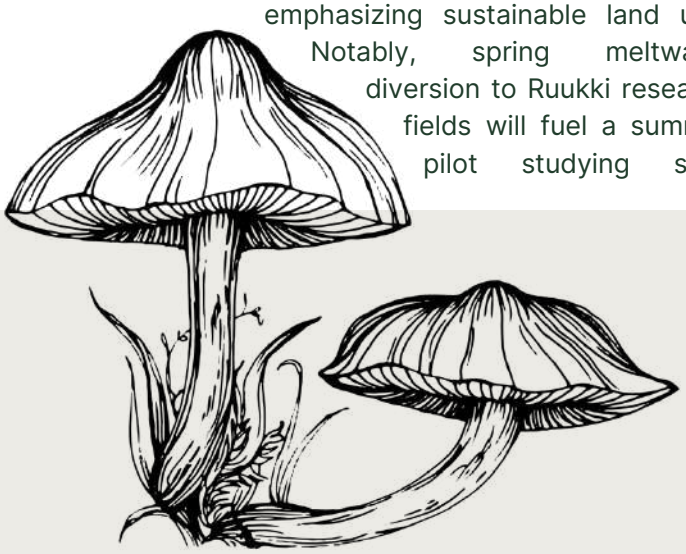
TRAINING

16-17 March 2023, the AnaEE-TC hosted the second official Technology Foresight workshop in Copenhagen.

The workshop had representation by several technology companies. LI-COR presented their latest instruments for measurements of CO_2, CH_4 and N_2O in combination with their SMART Chamber. DMR presented the new version of their ECOFluX chamber and The Dutch Scientist presented latest technologies from a range of companies including PICARRO, Eosense, Airyx, Ionicon and UGT. In addition, a poster session was organised where facility representatives presented latest results and/or technologies that will be used for research at their facilities in future.

In total, the workshop had 39 participants from eight countries, representing 22 different AnaEE experimental installations. During the workshop, one activity included going through EU Horizon Europe calls in 2024 that are relevant for AnaEE and discussing the potentials for participating or potentially leading a consortium on specific calls. One important outcome of these discussions was that none of the cluster 5 and cluster 6 calls were obvious for AnaEE to lead and that the AnaEE community as well as AnaE-ERIC should focus on lobbying for calls where the experimental approaches of AnaEE are in focus.

Finland: On May 3rd, the NorPeat research field hosted a session on water management for agriculture resilience to extreme weather, emphasizing sustainable land use. Notably, spring meltwater diversion to Ruukki research fields will fuel a summer pilot studying sub-irrigation's feasibility from a farmer's standpoint. A Science Day at SMEAR II, University of Helsinki on August 11th showcased Hyytiälä's research, underscoring forests' role as carbon sinks across seasons. SMEAR forests are exceptional in carbon sequestration, shedding light on ecosystem cycling via various measurement tools like chambers for precise analysis.



COMMUNICATION

Coordinated communication plays a pivotal role in advancing the goals, reputation, and impact of AnaEE-ERIC as a pan-European research infrastructure organisation, ensuring that it effectively serves the needs of the research community and society at large.

Increased visibility can attract potential collaborators, funding opportunities, and stakeholders, thereby expanding the organization's reach and impact.

The communication efforts are coordinated by the Communications Officer at the Central Hub together with the Technology Centre, the Data and Modelling Centre and the Interface and Synthesis Centre.

DEVELOPMENTS

2023 marked the first full year of AnaEE-ERIC and the need for coordinated communication efforts has increased. Therefore, Amanda Ölander joined us as our new Communications Officer in the Central Hub in Gif sur Yvette in October. Just as the year before, AnaEE-ERIC was strongly invested in various communication, dissemination and outreach activities in 2023.

Our representatives visited conferences and seminars. Internal communications were complemented by external activities where the presence of AnaEE-ERIC was evident to its scientific base and external stakeholders.

As the organization is still relying on the communication plan of AnaEE dated 2020, there is an urgent need to develop one adapted to the current needs. This will identify target groups, stakeholders, communication activities and include visual guidelines. This will make the “brand” AnaEE-ERIC more recognizable, give clarity and a more professional look to the organisation, reflecting its position as a member of the European ERIC family.

INTERNAL COMMUNICATION

Monthly internal updates were sent by email in April, May and June.

This year we also started online information sessions as an open forum for dialogue with AnaEE-ERIC facilities: It can take the form of a presentation, open discussion, or a Q&A session and was realized in collaboration with the Central Hub. In September, we opened with the theme "Communications and Collaborations with Platforms”, together with the Technology Centre. The second: “Data Management Plan Survey and Feedback” together with the Data and Modelling Centre.

WEBSITE

The AnaEE-ERIC website provided information about the activities, news and updates on the new projects that AnaEE-ERIC is invested in. Various legal and operational documents that are available on the website, made it a reliable reference resource for the AnaEE community of installations.

The website is currently hosted by Université Grenoble, who also assists with maintenance, GDPR and technical advice.

The website traffic has been monitored by Google Analytics but migrated to Matamo in 2023. As Matamo has been using a consent manager since October 17th 2023, only the statistics of visitors who have given their consent are recorded after this point.

Because of these changes, the statistics are not directly compatible. Combining the logs from Google Analytics (January - May 2023) and Matomo (June - December 2023) some general conclusions can still be drawn.

- Most of the visitors are European (around 80%).
- Total unique visits on the page 4256 in the year.
- Most of the visitors are French and German.
- Total unique downloads 160 (data only since July 2023).
- The average visit duration is roughly two minutes per visit.

“With a journalistic background I will focus on storytelling to create a stronger identity and increase the awareness of AnaEE-ERIC as the crucial member of the European Research Infrastructure family.

Amanda Ölander,
Communication officer, AnaEE-ERIC

SOCIAL MEDIA

During 2023, AnaEE-ERIC has succeeded in increasing the activities and followers on the social media accounts LinkedIn and X (previously Twitter), created in 2022. Social media is useful for promoting AnaEE-ERIC events, results and to interact with a wider community while receiving feedback and interacting with followers and partners.

Followers in December 2023

LinkedIn: 616 (+30 % since last year).
X: 383 (+12 % since last year).

The decreasing activities and marginal outreach on Facebook led us to leave the platform and the focus will rest on the two remaining platforms.

The videos on the AnaEE-ERIC YouTube channel are good but are starting to get outdated and the channel needs new content.

NEWSLETTER

During 2023 two AnaEE-ERIC newsletters were disseminated in May and November, highlighting the latest updates from the organisation as a whole and including updates from our National Nodes. The December issue was published on the platform Issuu, as a flipbook. It also included the section "In the journals" where we presented our facilities that have been used in key peer-reviewed publications.

PARTICIPATION TO EVENTS & CONFERENCES

The DG and CH participated in several events representing AnaEE-ERIC, as well as engaging in networking.

The annual meeting of the ISIDORE Horizon Europe project on infectious diseases, presenting the point of view of AnaEE-ERIC and AgroServ on opportunities and challenges in EU RI actions 6 April, Michel Boër.

The AgroServ project, coordinated by AnaEE-ERIC, was presented in the "Service-provision Projects" in the Panel on "Uptake EOSC-Life results". Presented by Lavanya Premvardhan, 9 June.

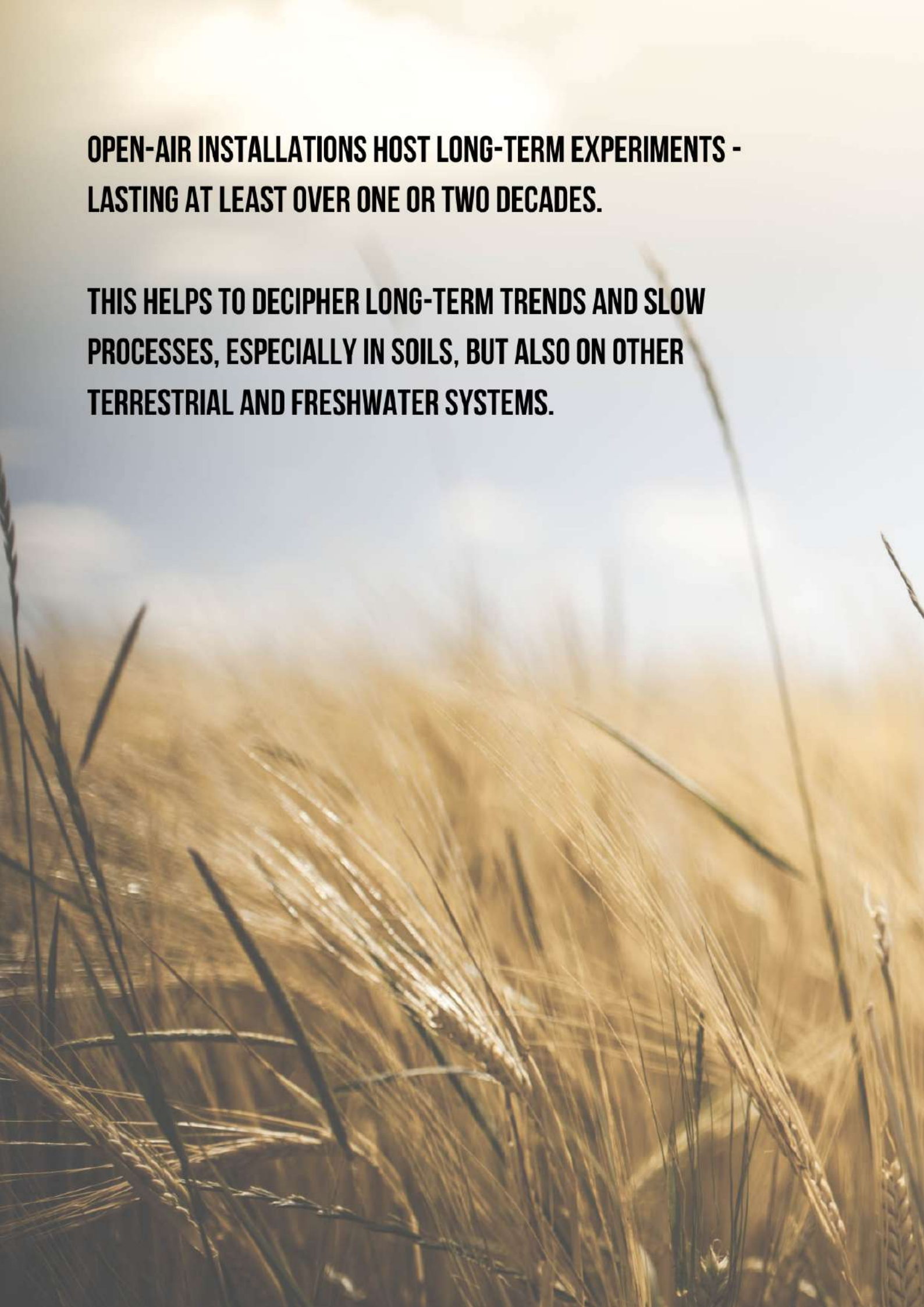
"Knowledge valorisation: the role of research and technology infrastructures", organised in partnership with the Horizon Europe project RITIFI – Research Infrastructures and Technology Infrastructures for Impact, 15 June.

Global Sustainability of Research Infrastructure Conference, Tenerife, Spain, 25-26 Sept.

ESFRI Stakeholder forum, Tenerife Spain, 27 Sept.

Agroecology Living Labs and Research Infrastructures in Europe – experiences from ALL-Ready & AE4EU", organized by the two Horizon 2020 funded projects ALL-Ready and AE4EU. AnaEE-ERIC was invited to the panel discussion on "How can Living Labs and Research Infrastructures support the agroecology transition?". Presented by Lavanya Premvardhan. 27 Sept.

EuroGeo workshop, presentation of activities of AnaEE-ERIC at session on biodiversity, ecosystems and geodiversity. Bolzano, Italy, 2-4 October.



OPEN-AIR INSTALLATIONS HOST LONG-TERM EXPERIMENTS - LASTING AT LEAST OVER ONE OR TWO DECADES.

THIS HELPS TO DECIPHER LONG-TERM TRENDS AND SLOW PROCESSES, ESPECIALLY IN SOILS, BUT ALSO ON OTHER TERRESTRIAL AND FRESHWATER SYSTEMS.

Projects

At the end of 2023 AnaEE-ERIC was involved in three projects, demonstrating the organisation's central place within the landscape of European Research Infrastructures. AnaEE-was also involved in 6 more proposals, of which 4 were accepted for a start in 2024.

Completed projects (pre ERIC-phase)

ENVRI-FAIR (2019 – 2023)

Ongoing or starting in 2023

AgroServ, AnaEE-ERIC as coordinator. (1/09/2022 - 31/08/2027)
PHENET (1/01/2023 - 31/12/2027)
ERIC Forum 2 (1/09/2023, 31/08/2026)

Accepted in 2023 and starting in 2024

FHERITALE (1/01/2024, 31/12/2026)
Microbes-4-Climate (1/02/2024, 31/01/2029)
AquaServ (1/04/2024 - 31/03/2029)
IRISCC (1/04/2024 - 30/09/2028)

COMPLETED PROJECTS

ENVRI-FAIR

Understanding the Earth needs an interdisciplinary approach based on harmonised and easy-to-use data and services from the contributing environmental research infrastructures. The overarching goal of EU-funded ENVRI-FAIR is to advance the findability, accessibility, interoperability and reusability (FAIRness) of these digital assets and connect them to the emerging European Open Science Cloud.

The ENVRI-FAIR project was completed with success, strengthening the positioning of AnaEE-ERIC as a provider of digital services for Research Installations and a key enabler in the landscape of data FAIRification. During the project AnaEE-ERIC personnel worked together with data managers form EPOS, Lifewatch, ICOS, eLTER, and other RIs, exchanging best practices and implementing FAIR-enabling protocols in the AnaEE services such as the data and the developer portals.

The AnaEE's contributions to the consortium work have been cemented by the development of ENVRI-FAIR's deliverable 11.5 which provides a detailed

description of the FAIRness implementation situation in the biodiversity subdomain.

AnaEE-ERIC personnel also contributed to the discussion on the ENVRI-Hub platform and moved on to participate into the follow up project ENVRI-Hub-Next aimed at providing the scientific community with a single-entry point to the ENVRI data and services infrastructure.

Key Data

Project duration: 2019-2023 (completed during pre ERIC-phase)
Coordinator: Jülich Forschung Zentrum
Maximum grant amount for the project: 18,997,878 €

https://envri.eu/

ONGOING PROJECTS

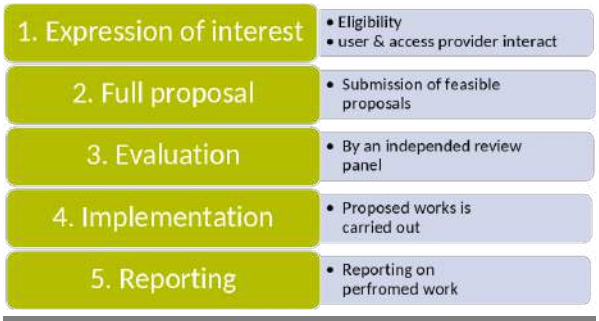
AGROSERV

AgroServ, the flagship project coordinated by AnaEE-ERIC is funded by the EU under Horizon Europe, supports agricultural research and innovation to tackle complex challenges like feeding a growing population sustainably, combating climate change, and preserving biodiversity.

With 73 partners offering 143 Research Services, they facilitate collaboration between stakeholders like farmers, industry, and policymakers, providing accessible research from molecular to societal levels. The inclusive approach aims to inform evidence-based decisions for addressing environmental threats, promoting cross-fertilization of knowledge across disciplines.

Updates 2023

In 2023 the AgroServ catalogue of services was prepared and released publicly. The first announcement of opportunity has been released, with more than 100 expressions of interest received. The design of 5 living-labs (Mediterranean, Central European and North European) has been drafted. The knowledge base system has been designed. In fall 2023, AgroServ successfully passed the first review of the project by the EU Research Executive Agency (REA). As foreseen, the coordination of the project



Implementation and management of TNA process

was handed over to AnaEE-ERIC by the CNRS.

Advancements

The ISIA system developed by the CNRS is used as a platform hosting the catalogue of services and the application process. The latest catalogue marks a

significant advancement in terms of integration and interdisciplinarity, and user friendliness setting a new standard for upcoming projects. The catalogue is improved from the user demand, work on integrated pipelines of services.

The June 2023 call for expressions of interest attracted significant attention (101 applications from 35 countries, 10% from industry, 38 fully submitted), identifying challenges like addressing long-term project needs. Services are set for delivery in June 2024, with a new proposal call anticipated. The data knowledge hub, leveraging existing expertise, is expected to thrive post-AgroServ, managed ethically and qualitatively with interdisciplinary oversight, involving diverse stakeholders and establishing initial collaborations. Co-creation activities and living labs are prepared for the next project cycle, with sustainability pathways identified, emphasizing training and community engagement, including internal sessions fostering interdisciplinary collaboration, like the ongoing workshop in Bari.

The first meeting with the Scientific and Stakeholder Advisory Board (SSAB) took

place in December 2023. The SSAB have concluded that the project is advancing well across its nine work packages (WPs), but there are questions about how different activities connect. They stated that the first call for Expressions of Interest (EoI) was a success, helping to improve open access to research infrastructures.

The lessons from this call should guide future ones, aiming to refine and enhance the approach. They also pointed out the synergies with the Horizon Europe Agroecology Partnership that are worth exploring to foster more interdisciplinary research. They highlighted living-lab users and how they should have a more central role through a co-creation or demand-driven approach, with a focus on real-life applications and considering social and ecological factors.

AnaEE-ERIC role

The coordinating body has been changed from CNRS to AnaEE-ERIC as foreseen in the GA, starting 1st September 2023. This change of coordination was made through an amendment. The coordinator remains Michel Boër.

Key Data

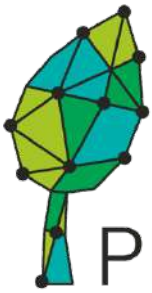
Project start: 1/09/2022
Project duration: 60 months
Coordinator: AnaEE-ERIC (as of 1/09/2023)
Maximum grant amount for the project: 14,252,873€ (not including UK partners).

Maximum grant amount for AnaEE-ERIC: 720,863€
Maximum grant amount for AnaEE RI partners, transverse work packages (1-9): 2,099,370€.
Maximum grant amount for AnaEE RI service delivery: 1,719,089€

www.agroserv.eu

AGROSERV HOSTED ITS FIRST EUROPEAN RESEARCH SERVICES IN AGROECOLOGY CONFERENCE ERSAC IN PRAGUE IN THE SUMMER OF 2023.

PHENET



The project PHENET, responding to call INFRA-2022-TECH-01-01, addresses Europe's need for agroecological transition for food security, climate resilience, biodiversity, and soil carbon restoration. Collaborating with EMPHASIS, AnaEE-ERIC, eLTER, and ELIXIR, PHENET develops tools for future-proofed farming practices across Europe's climate-change scenarios, offering wider access to phenotypic and environmental data, AI-based sensors, Earth Observation data, FAIR data support, and predictive modelling.

Eight Use Cases demonstrate solutions' portability, including on-farm data mobilization, while training and outreach activities enhance RI staff skills and broaden user base, benefiting innovative companies and climate-smart agriculture.

Updates 2023

See article on PHENET page 27-30.

Key Data

Project start: 1/01/2023
Project duration: 60 months
Coordinator: INRAE, France
AnaEE-ERIC role: Beneficiary, WP lead
Maximum grant amount for the project: 9,993,469€.
Maximum grant amount for AnaEE-ERIC: 198,750€.
AnaEE RI partners involved: Aix-Marseille Université (Beneficiary, 292,000€), CNRS (affiliated AMU, 67,375€), U. Hasselt (Beneficiary, 344,223€)

www.phenet.eu

ERIC FORUM 2

The Second Implementation Project for the ERIC Forum (from now on ERIC Forum 2 or EF2) is born to further structure the cooperation between the ERICs and to support the implementation of the ERICs' policy, shaping their community identity and consolidating their integration within the European Research Area (ERA).

The Project's main objectives are to provide updated data and information on the ERICs to demonstrate their outcomes, impacts, and importance in the ERA.

It will develop shared practices, regulations, and services to improve ERICs' sustainability and ensure compatibility with European political priorities. Strengthen coordination and networking between the ERICs, supporting ERICs-in-preparation.

Ensure that ERICs have an adequate representation on the European stage, a unified voice to speak with, and strong links with society, economy, and competitiveness.

AnaEE-ERIC co-leads the Pillar II on "reinforcing the internal communication", and leads in Work Package WP10: Strategy on building shared services between ERICs.

Key Data

Project start: 1/09/2023
Project duration: 48 months
Coordinator: BBMRI-ERIC
AnaEE-ERIC role: Beneficiary, WP lead
Maximum grant amount for the project: 2,999,463€.
Maximum grant amount for AnaEE-ERIC: 64,875€.

www.eric-forum.eu

PROJECTS GRANTED IN 2023 AND STARTING IN 2024

FHERITALE

Growing concerns about artificial materials like plastics and biotech chemicals highlight their potential impact on health and the environment. From their intended use in food packaging to their lifecycle, these materials raise questions. The EU-funded FHERITALE project seeks to revolutionize how European research facilities tackle these challenges. By systematically developing, providing, and integrating services across Europe's research infrastructure, the project empowers scientists to study synthetic materials' effects. It will compile a comprehensive list of available research services across various domains.

Duration time: 1/01/2024, 31/12/2026
Coordinator: ERM/CIRMMP

MICROBES4CLIMATE

Microbial services addressing climate change risks for biodiversity and for agricultural and forestry ecosystems. The project, funded by Horizon Europe, aims at providing an efficient access to a cluster of complementary world-class Research Infrastructures and their integrated, advanced services, enabling them to conduct curiosity-driven, cross-disciplinary research addressing terrestrial biodiversity and ecosystems, including agricultural and (agro)forestry ecosystems, in light of the still poorly understood microbiomes-plants-soil-environment interactions, and its roles in climate change responses, resilience, and mitigation.

Duration time: 1/02/2024, 31/01/2029
Coordinator: MIRRI

AQUASERV

The objectives are to bring together, enhance, integrate and customise RI capacities to significantly further scientific advance and promote and facilitate the implementation of European Common Fisheries Policy, the Farm to Fork Strategy, the Sustainable Blue Economy and the European Green Deal. It will be achieved by offering remote and on-site transnational (TA) and virtual (VA) access to European research infrastructures and its nodes related to research and management of marine and freshwater biological resources, food and biotechnology.

Duration time: 1/04/2024 - 31/03/2029
Coordinator: CCMAR

IRISCC

Integrated Research Infrastructure Services for Climate Change Risks (IRISCC) covers disciplines from natural to social sciences, across different domains and sectors. IRISCC provides scientific and knowledge services to foster cutting-edge research and evidence-based policymaking to improve Europe's resilience to climate change. IRISCC ensures a "one-stop-shop" for various user communities on climate change risk related RI services by setting up a dedicated Catalogue of services and related access management system both for granting transnational (onsite and remote) and offering virtual access.

Duration time: 1/04/2024 - 30/09/2028
Coordinator: LUKE

PRECIOUS PEATLAND

COVERS 3%
OF EATH'S LAND SURFACE

CONTAINS AROUND
550 GIGANTONS
OF CARBON

Peatland is a terrestrial wetland ecosystem in which the production of organic matter exceeds its decomposition and a net accumulation of peat results.

Despite the important role that peatlands play in sequestering carbon, the scientific community is not currently able to factor them into future climate models and projections, largely because of gaps in data and research. To address these data gaps, additional research is needed to better understand.

The AnaEE-Finland open-air facility Lakkasuo-Siikaneva peatland experiment Installation, is located in Southern Finland. It is a fen belonging to an oligotrophic peatland massif of 1300 ha with few isolated ombrotrophic bogs. Vegetation is characterized by sedges and continuous Sphagnum moss cover.

Both in Lakkasuo and Siikaneva biodiversity, biogeochemical cycles and vegetation–soil–atmosphere interactions are studied both experimentally and with long-term observations. Siikaneva 1 has also ongoing ecosystem-level measurements of greenhouse gases and meteorology and belongs to ICOS.

A PROJECT IN THE SPOTLIGHT - PHENET

UHasselt

Vera Claessens, a PhD student, has been selected and hired at UHasselt to conduct experimental studies on climate change impact on soil phenology in UHasselt Ecotron. Vera has started to develop a plan of her PhD project. At the moment this plan entails 4 sub-projects:

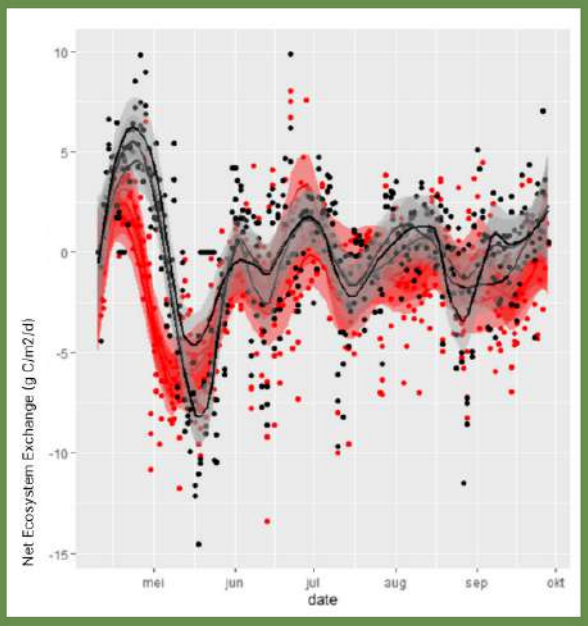
1. Assessment of climate change impact on mycorrhizal fungal communities in pear orchards;
2. Assessment of climate impacts of carbon transfer into mycorrhizal and saprotrophic fungi;
3. Assessment of climate change impact on root phenology and developing AI methods to support such assessment;
4. Assessment of climate change impact of time dynamics of emission of volatile organic compounds in soil.

In regard to the sub-projects 1 and 2, we have detected a climate-induced effects in aboveground phenology of pear trees. Subjected to climatic regime of the year 2040, pear trees start developing foliage and blossoming 2 weeks earlier than pear trees growing in the ambient climate regime (photo on the right). Analysis of Ecotron data has revealed that this leads to overall increase in carbon sequestration within the ecosystem of pear orchard (data being prepared for publication). The task of Vera will be to examine how this increased C flux affects time and space dynamics of soil mycorrhizal fungi.

Regarding the subproject 3 Vera benefits from the expertise of AnaEE colleagues in root studies. A visit to LUKE Rhizotron (part of AnaEE network of enclosed climate experimentation facilities) has been conducted to learn from Luke's colleagues' expertise on root analyses. We have developed a plan to run the sub-project of root phenology in collaboration with LUKE.

25 APRIL 2018

25 APRIL 2040



Regarding the subproject 4 we have had extensive discussions with CNRS and have developed a step-by-step plan of running this project together, utilizing the expertise of CNRS on measuring volatile organic compounds and on using AI method of VOC analyses. The samples will be collected at the Ecotron and will be analysed at CNRS. Vera will receive training on this analysis.

o UHasselt has finalized establishment of a Mycotron field experiment aimed to assess time dynamics impacts of mycorrhizal fungi on soil cycling. In the Mycotron experiment 3 types of mycorrhizal fungal environment (AMF-, EcMF-, and ErMF-dominated environments) are created on initially the same soil. The distinct mycorrhizal environments are enabled through planting on the experimental plots the plants of exactly the same growth form (small evergreen shrubs) featuring AM, EcM, and ErM mycorrhizal types. The experiment features 60 experimental plots. A scientific manuscript presenting the experimental concept has been prepared and submitted to FEMS Microbial Ecology journal.

Oak Observatory at the OHP (O3HP)

o The O3HP is an in natura platform running a rain exclusion experiment since 2012 in an old-growth Downy oak forest in Mediterranean France. At the O3HP the main focus for PHENET is on climate change impact on forest regeneration through seedlings and development and on soil biota. It is intended to develop methods with the help of AI to facilitate the interpretation of plant and soil biota traits in relation to experimental climate change treatments. In 2023 three approaches have been identified which are at the stage of investigating their feasibility:

o The O3HP is making use of a series of drought experiments on oak seedlings in the ONF research platform PNRGF de Cadarache, in terms of large-scale pot experiments exposed to drying and distinct regimes of soil water content and are performed in greenhouse conditions. This is a collaboration with the BIAM/ CEA Cadarache.

Natural regeneration from acorns is heavily compromised, and seedling mortality after field transplanting from nurseries is very high. It is attempted to improve survivability by inducing plant behavioural and developmental changes through inoculation with specific microbiota or phytohormone treatments in the soil. Aboveground non-destructive analyses of hyperspectral reflectance, stomatal conductance, Chl a fluorescence, leaf phenology, growth are seeked to be linked to belowground bacterial and fungal communities. Destructive leaf metabolomic analyses are prone to provide further insights. Above are, however, complex datasets to conclude from. A first approach to get this going with the help of AI has been defined with WP2, and the exchange and preparation of dedicated recently elaborated datasets has begun.

o Mesofauna in the litter on the forest floor play an important role in the foodweb that allow nutrients cycling from dead biomass. These invertebrates are hard to follow-up on, as they are small, around 500 µm in size, and avoid light and heat. Classic observational approaches are destructive, time and human resource-demanding and lethal to the organisms.

The O3HP seeks to test an optical probing in the field notably during night-time/in darkness. Infrared imagers with microscopic optics manufactured by INFRATEC/ Germany could provide such a solution and test trials are being negotiated. The institute IMBE can provide collembola from breeding for the trials and has expertise in collembola observations. WP2 has the expertise to treat image and video sequences using AI for object identification and characterization. First trials to test the imaging device on soil biota are planned for the end on 2024.

o Root development and positioning in the soil volume are considered key traits in adaption to the environment and show a wide range of phenotypes. It is hypothesized that interaction with microbial strains or communities are able to alter root traits. Candidate strains have been recovered from the O3HP from microbial communities exposed in situ to ambient and reduced rainfall (RCP 8.5 for 2050, RCP 4.5 2100).

During the ‘affordable plant phenotyping workshop’ in Angers organized by the leader of WP2, a fully automated monitoring platform (multioplex-lab.com) has been identified that would allow to study the impact of above strains on root development in controlled laboratory condition, through imaging. The bacterial candidate strains of the O3HP are under analyses for selection. Contact to the developer of the system has been made, and the possibility of a collaboration is under preparation. WP2 has experience in AI aided root analyses and developed dedicated tools that could be implemented.

o A biologist has been identified that has the competence in the treatment of ecological datasets, specifically of microbiomes, and that is motivated to collaborate on the development of AI-methods with WP2. The student is planning to defend his PhD in Sep 2024, and we anticipate employing him as a post-doc in PHENET thereafter.

Mycotron March 2024.

Reports from the national nodes

BELGIUM

The Belgian National Node brings together the universities of Antwerp and Hasselt in Flanders, and the University of Liège (campus Gembloux Agro-Bio Tech) in Wallonia. Covering the temperate oceanic climate zone of Europe, the BE National Node primarily focuses on enclosed installations (terrestrial and aquatic). Joint research areas include the agroecological transition and the water crisis.

Existing facilities like the ecotrons at UHasselt and UAntwerp, FATI system at UAntwerp, Mesodrome at UAntwerp, and ecotron at Gembloux Agro-Bio Tech, are now complemented by three new developments:

Water System Maps: A GIS-based system at UAntwerp, integrating land cover, geography, and hydrology data. It facilitates field-scale assessment of ecosystem responses to parameters like precipitation change, aiding in scenario planning.

Mycotron - soil microbiology light house: At UHasselt, this experimental garden cultivates various mycorrhizal fungi to study their impacts on soil carbon and nutrient budgets. It enables testing of carbon farming techniques and soil health responses to global change.

Mobile Ecotron Rapid Assessment Units (ME-RAU): UHasselt's system features ecotrons with exchangeable lysimeters, offering full atmospheric and soil climate control. It facilitates testing of ecosystem samples under various conditions.

These developments will integrate into existing installations or become new additions to AnaEE ERIC's catalogue by 2024-2025. AnaEE-Wallonia is expanding with the construction of climate-conditioned rooms in the TERRA-Ecotron of Gembloux.

In 2024, prof. Nadia Soudzilovskaia (UHasselt) will take over from prof. Ivan Nijs (UAntwerp), who coordinated AnaEE Belgium since the beginning.

Figure 5: In 2024. Prof. Nadia Soudzilovskaia takes over from Prof. Ivan Nijs as National Node coordinator.

DENMARK

2023 was a good year for the AnaEE Denmark consortium in terms of attracting new, national funding for research activities across installations. In 2023, AnaEE Denmark facility research activities formed the basis for 12 new scientific manuscripts (2022: 13, 2021: 11) and managed to attract three new projects with a total budget of 4.4 mill. Euro.

Two of these projects have more than one AnaEE Denmark partner, and they both have participation of external partners. The three projects started in 2023 focus on how to increase the uptake of applied fertilisers as well as how to minimise the N_2O emissions from agriculture, to minimise the climate impact of agriculture. In addition to the new projects that were started in 2023, another five projects were funded with planned start during 2024.

These projects have a combined funding of 17.4 mill. Euro and focus on how to minimise greenhouse gas emissions from lowland soils, how to store carbon in soils using biochar, and continued efforts to provide data for better emission factors and more efficient fertiliser uptake in agricultural plants.

During the year, there have been several physical meetings among the AnaEE Denmark partners. Especially the working group on using automatic chambers for greenhouse gas measurements collaborates closely on how to optimise the use of the chambers and on how to ensure highest quality control of the final flux calculations. AnaEE Denmark further continues to develop common protocols across the Danish facilities for creating FAIR data products, in close collaboration with AnaEE ERIC.

Figure 6: New technologies have recently been acquired at several facilities of AnaEE Denmark, including LI-COR eddy covariance towers and EcoFlux chambers from DMR as seen here at the Foulum facility.

FINLAND

AnaEE Finland will have made significant progress in its second year of operation. National research facilities have been actively involved in conducting research and providing access to state-of-the-art facilities in EU projects promoting ecosystem research as well as received national funding to develop research facilities. A national umbrella infrastructure, the Integrated Atmospheric and Earth System Research Infrastructure (INAR RI) coordinates Finland's participation in the four European environmental research infrastructures (ICOS, ACTRIS, eLTER and AnaEE). INAR RI comprises 30 measurement stations, several laboratories and mobile units, and 2 data infrastructures.

The Research Council of Finland has allocated funding to enhance INAR RI facilities, particularly focusing on urban and agricultural environments to address challenges related to air quality and climate change, aligning with the national goal of achieving carbon neutrality. Projects include upgrading infrastructure for enhanced data quality control, such as the AgriLeach facilitiy, and refurbishing facilities like the open chambers at Lakkasuo and water load measurement systems at NorPeat.

New collaborative projects have also been implemented. The EcoClimate facility and national research organisation the Geological Survey of Finland have resulted in the development of detailed information on bedrock and soil geology, groundwater properties and peat chemical properties. This collaboration has provided research-relevant background data for the use of the research facility that could not previously have been produced.

Also, social interaction has been visibly increased and diversified in 2023 with the opening of new accommodation and dining facilities at the Hyytälä research station in the summer, providing modern facilities with high quality audiovisual equipment for a wide range of activities. Hyytiälä's Station Manager Antti Uotila retired at the end of 2023, and Juho Aalto will start as the new Station Manager in 2024. Overall, 2023 was a significant year of development, both in terms of equipment renewal and new cooperation, which points the way to exciting developments in AnaEE FI in the coming years.

Figure 7: Lakkasuo peatland, AnaEE-Finland. Experimentation on the site shows that carbon dioxide exchange is more strongly influenced by drying than by warming alone, with experimental water level draw-down significantly increasing ecosystem respiration.

ITALY

The major efforts of AnaEE-Italy are dedicated to the participation into the Italian project titled 'Italian Integrated Environmental Research Infrastructures' (ITINERIS https://itineris.cnr.it/).

New temporary-contract personnel for the Italian facilities were recruited and purchase of new equipment for upgrading of the facilities is in progress. ITINERIS aims at creating a system of Virtual Research Environments (VREs) that will provide services for harmonizing the work of different research infrastructures working in different domains, especially through the sharing of information and data.

AnaEE-Italy leads the Crops, plants and pests (CPP) VRE, and contributes to the national access policy of ITINERIS in compliance with the guidelines produced by the ENVRI FAIR project, first concrete step towards the creation of a distributed common authentication system between the Italian and European Research Infrastructures.

On 6-7 June 2023, AnaEE-Italy participated to an ICOS workshop in Lampedusa Island (Italy) together with other Research Infrastructures (LifeWatch ACTRIS EMSO LTER), with the aim of discussing interactions and perspectives. Half a day was dedicated to visit the three ICOS observatories (ecosystem, ocean, atmosphere) located on the island.

A study on *Pica pica* found that increased O3 levels affect the bird's feeding patterns on grape berries, with those in ambient O3 conditions consumed more rapidly than in elevated O3 treatment. Additionally, critical O3 levels for biomass reduction in poplars were established, and insights into the interaction between O3 exposure and cypress canker disease were gained. Lastly, research on *Moringa oleifera* underscored ecotype-specific vulnerabilities to O3, emphasizing the need for further investigation into O3's impact on ecosystems to develop resilience strategies.

Figure 8: FO3X is an ecosystem-level manipulative research facility that ensures long-term operability, fully replicated treatment plots connected with state-of-the-art ecophysiology and genomics labs and is available for undertaking new collaborative projects.

FRANCE

AnaEE-France offers a coordinated network of facilities for exploring living organisms and ecosystems, along with tools for data management and analysis. With 13 experimental installations, 2 analytical facilities, and centralized tools, it provides physical or remote access to equipment, sample supply, and data access.

In 2023, it hosted 344 projects involving 1,000 users, with international and private sector participation. AnaEE France also processed 453 data and sample requests and produced 188 articles. Training initiatives engaged around 2,000 people, with 400 receiving technical training. The infrastructure's equipment had an average occupancy rate of 70% in 2023. A comprehensive list of services is available on its new website.

Since 2020, AnaEE France has undertaken a project to enhance its capabilities in four key areas: modifying installations, improving collaborations, enhancing digital services, and contributing to research. Investments were made to boost climate change manipulation and analytical capacity, with internal audits assessing installations and sponsoring technological development projects. Pricing strategies were implemented, and the ISIA application was developed with AgroServ support. Collaborative projects on environmental DNA and spatial remote sensing data integration were initiated, alongside organized training workshops, including an international Summer School.

Efforts to improve data dissemination and quality management continued in 2023. Tools like OpenAdom were developed to manage data from long-term experimental facilities securely. Data annotation tools based on OBOE ontology were developed, and AnaEE France participated in the implementation of a national biodiversity portal.

Highlights included the launch of a new website, implementation of harmonized pricing policies, and integration into the EQUIPEX+ GAIA Data project. Development of environmental genomics capabilities and climate manipulation devices also progressed, alongside contributions to national research programs on soil carbon, water, forest management, and nature-based solutions.

Figure 9: A new experimental set-up to manipulate soil temperature and rainfall in the forest understory at CNRS, Puéchabon open-air installation. The equipment was installed in 2023 and will be operational in 2024.

CZECH REPUBLIC

AnaEE-Czech integrates AnaEE-ERIC's experimental and analytical infrastructure with ICOS-ERIC's observational infrastructure, DANUBIUS-RI, eLTER, and EUFAR infrastructure (AISBSL). This collaboration fosters multidisciplinary ecosystem research, combining experimental, observational, and analytical approaches with modelling techniques.

CzeCOS enables a deeper understanding of ecosystem processes, especially in the context of climate change, and facilitates the creation of tools like web portals and applications (InterSucho, AgroRisk, FireRisk) for broader user access. In 2023, a follow-up project supporting CzeCOS until 2026 was launched, alongside a modernization project (CzeCOS-BOOST) to upgrade remote sensing, metabolomic laboratories, and experimental infrastructure.

Key achievements include the reconstruction and modernization of the automatic OTC chambers facility Domanínek, simulating the impact of elevated CO_2 concentration, drought, UV radiation, and increased temperature on agricultural ecosystems.

Additionally, successful airborne measurement campaigns were conducted.

The project "AdAgriF" launched in 2023 aims to enhance agriculture and forestry's capacity for carbon storage, reduce emissions of trace greenhouse gases (N_2O and CH_4), establish a network of monitoring stations, and promote best practices implementation.

The outputs from the "Cultivation domes/Bílý Kříž" research infrastructure, published in Tree Physiology, demonstrate that while drought and decreased nitrogen availability diminish the stimulatory effect of elevated CO_2 concentration on Norway spruce photosynthesis, elevated CO_2 concentration enhances water use efficiency only in the presence of increased nitrogen availability.

Results from the experimental station Domanínek -rain-out shelter facility, published in Agriculture, indicate that summer drought significantly impacts spring crops (spring barley, corn) compared to winter rye.

Figure 10: Experimental facility OTC Domanínek in 2023 after finished reconstruction. It is a fully automated facility, allowing manipulation of CO2, water and UV-radiation among other things, - allowing the evaluation of complex interactions of multiple factors.

BULGARIA

AnaEE-Bulgaria offers two Open-Air facilities which host long-term experiments to define trends in the “soil-crop-atmosphere” relationships and to understand the influence of different fertilizers on soil properties, crop yield and the environment.

In 2023, experiments have been conducted on the Bozhurishte Open Air facility, applying new technology of biostimulants from algae in the cultivation of maize. Variants with mixed organic and chemical fertilization, as well as chemical fertilization, only, will be investigated. This will help farmers achieve recommendations for fertilization and preservation of the health of plants through biostimulants, as well as for the transition to organic farming, which will lead to stimulation of soil microflora and preservation of soil health.

In 2023, a project including biochar used on Tsalapitsa Open Air facility of the ISSAPPNP (N. Poushkarov Institute of Soill Science, Agrotechnology and Plant Protection) of the Agricultural Academy was funded by the National Science Fund of the Ministry of Education and Science, entitled "Effect of biochar application on immobilization and bioavailability of heavy metals and other pollutants in Technogenic soils" 2022-2025 , Contract KP-06-PN66/5.

The experimental facilities in Bozhurishte and Tsalapitsa were equipped with portable gas analysers ALMEMO “MA2590-4” for determination of CO_2 and GASTiger 2000 for determination of N_2O emissions. The devices will be used at both experimental facilities of “Nikola Poushkarov” ISSAPP to measure CO_2 and N_2O emissions during the growing period of crops with different rates of fertilization and biochar amendments. At the moment, users of the facilities are scientific and farmers organizations. New stakeholders from the industry sector and the general public are being explored. The facilities are included with new experiments in projects with grants of the National Science Fund of the Ministry of Education and Science and the Agricultural Academy. Several new publications from the conducted experiments in the AnaEE Bulgarian facilities have been produced.

Figure 11: Measuring greenhouse gas fluxes (CO_2 , N_2O.) at Bojhurishte Open-Air facility using portable gas analyzers ALMEMO “MA2590-4” for determination of CO_2 and GASTiger 2000 for determinatiion of N_2O.

CIHEAM

In 2023, the geomatics laboratory at CIHEAM Bari made significant progress in research by introducing new technologies and expanding their inventory of tools and equipment.

One of the most notable advancements was the development of an advanced algorithm for analysing satellite images from the Copernicus Sentinel program. This algorithm can monitor crop changes caused by diseases, classify cropping systems and soils, and analyze large-scale agroecosystems. Its functionalities also include estimating agronomic parameters and detecting abiotic and biotic stress conditions in crops, which are essential tools for optimising the management of agricultural resources.

The laboratory also developed a phytosanitary treatment system for vines, which can be managed remotely and is designed for the nebulization of hydrogen peroxide inside covered tents. This innovation aims to prevent plant diseases while reducing the use of plant protection products, a crucial step towards more sustainable agricultural practices.

In addition, the laboratory acquired new equipment that further strengthened its research capabilities. This includes the DJI Agras T10 Drone, an optimised system for aerial distribution of liquid products with a load capacity of 10 kg of liquids and can cover an area of 4,000-6,000 m² in just 10 minutes. It is dozens of times faster than manual distribution. The laboratory also acquired the DJI Mavic 3 Multispectral Drone, which with its advanced imaging capabilities combined between an RGB camera and multispectral sensors, allows detailed crop analysis essential for precision agriculture. With a flight time of 43 minutes, this drone can cover up to 2 km² per flight, making it an invaluable tool for agricultural mapping and monitoring.

Moreover, the laboratory has integrated a high-performance workstation into its equipment, which facilitates complex data processing and supports the computational needs of the most demanding research.

These acquisitions not only expand CIHEAM Bari's research capabilities but also significantly contribute to its commitment to technology applied to sustainable agriculture, promoting methods that are both effective and environmentally friendly.

Figure 12: DJI Agras T10 Drone.

Partnership

In 2023 AnaEE-ERIC, as well as the Research Infrastructure at large, have continued and reinforced their partnership activities with other infrastructures, networks and institutions. This is reflected in the project and in the enlargement sections of this document. AnaEE-ERIC is a member of the clusters on environment (BEERI, Board of the European Environmental Research Infrastructures) and life sciences (LS-RI).

Both bodies are essential in coordinating the RIs, expressing common views towards the Commission as well as member states, suggesting new topics for Horizon Europe and the next framework program, as well as promoting common proposals to HE calls. AnaEE-ERIC is also a strong contributor of the ERIC Forum 2 project, as it leads one of the pillars of this project and coordinates a work package (read more in section *Projects*).

The strong relationships that AnaEE is building can be shown in the common involvement in many projects with infrastructures, networks, and research institutions in both the health & food and environment domains.

The picture below shows the diversity of the interactions between AnaEE and partner RIs. With the exception of FHERITALE and the ERIC Forum, all projects include a substantial part of the AnaEE distributed infrastructure, either as beneficiaries or affiliated entities. The institutions and facilities involved in AnaEE RI can build strong links with other partners through the common involvement in projects. The highlight section on PHENET is a striking example of how working together in the framework of a project (here an INFRA-TECH) can lead to unexpected developments and ideas, new techniques and expertise, and new partnerships.

Common involvement of AnaEE-ERIC with other ESFRI Research Infrastructures. The size of the circle is proportional to the number of projects in association with AnaEE-ERIC

2023 FINANCIAL REPORT

AnaEE-ERIC is funded through annual membership and observer fees as well as the host premiums provided by its hosting countries. The source of external funding is mainly EU projects.

In summary, the year 2023 shows a strong increase in expenses which correlates to the effective establishment of the ERIC and more personnel. The result balance of 2023 is 230,045€, versus 468,564€ in 2022 which adds up to a total balance of 698,609€ by the end of 2023. However, this balance will likely decrease considerably in 2024, with the anticipated recruitments for the ISC in 2024, and for DMC and TC if host agreements are concluded.

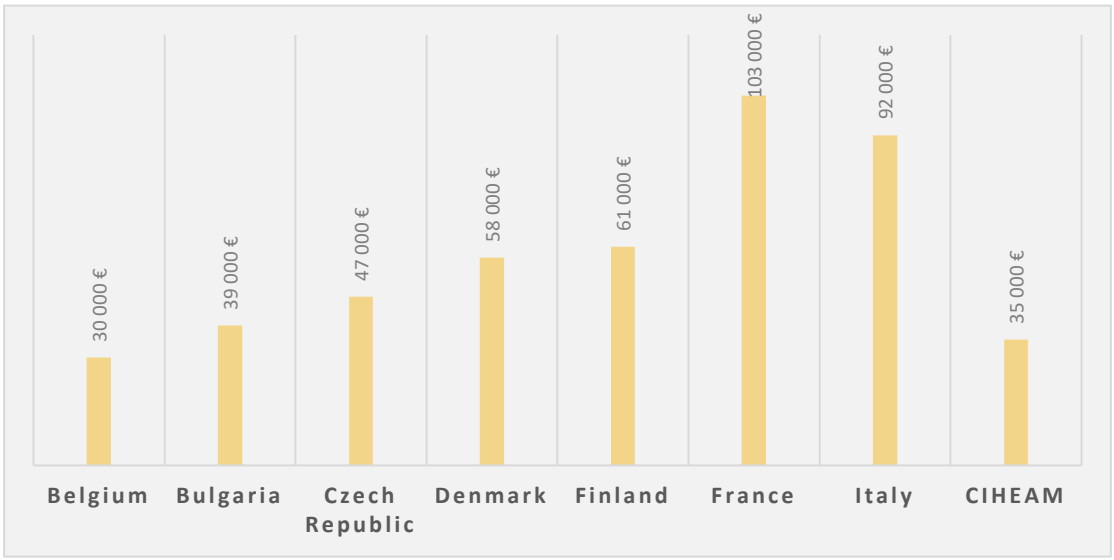
To ensure the financial sustainability of the AnaEE-ERIC and increase the core revenues there is a need to pursue discussions on additional fundings sources, primarily in the form of an enlargement of the consortium.

Mireille Matene,
Chief Finance and Admin. Officer

1. CORE BUDGET

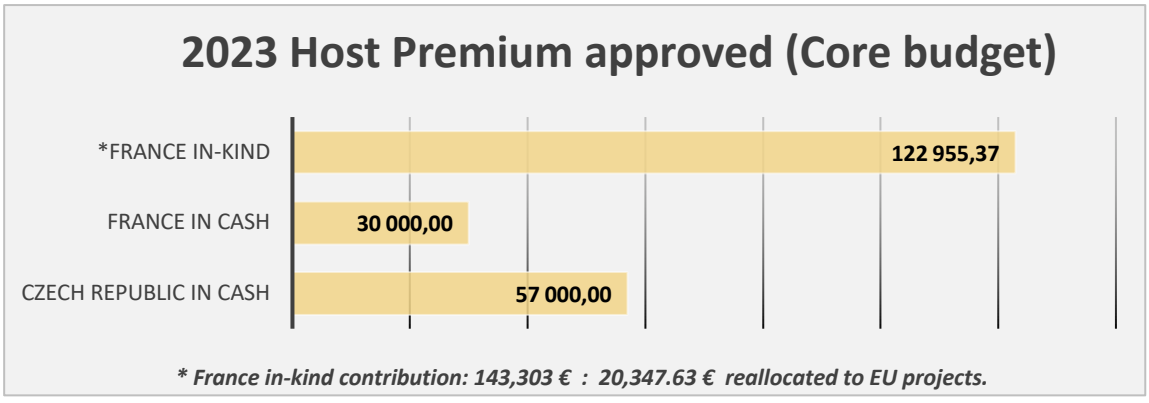
The AnaEE-ERIC core revenue includes membership and observer fees, and host premium contributions.

Membership and observer fees in 2023



Note: Italy has paid its membership fees for both 2022 and 2023. Therefore, there is no longer a gap neither in 2022 nor in 2023 as far as membership fees are concerned.

Host Premium Contribution 2023 (only core budget)



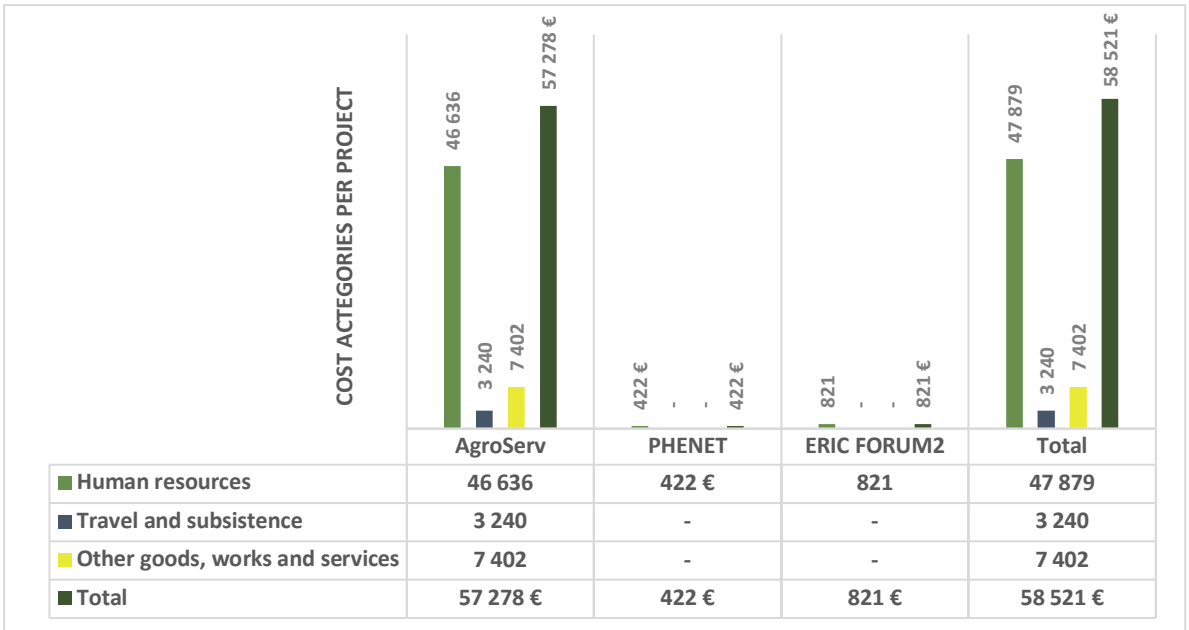
The host premium contribution estimates from Denmark and Italy are paid fully in kind and it was not possible to include these contributions in the accounts, as they are not yet approved by the AoM.

2023expenses CH and ISC (Core budget only, EU projects excluded).

Expenses Categories	CH/Headquarters		ISC		Total		Approved budget *(AoM#2)**
	Cash	In-kind	Cash	In-kind			
Human Resources *(salaries, charges, job advertisement, insurance...)*	184,155.57	143,303.00	14,658	N/A	**342,116.55**		**507,403****
Travel and subsistence	35,364.62	N/A	831.73	N/A	**36,196.35**		**40,000**
Office management *(running costs, furniture, procurements, subscriptions…)*	42,397.72	N/A	3,925.11	N/A	**46,322.83**		**70,000**
Outsourcing & Services *(accounting, auditing, bank, legal…)*	17,764.27	N/A	-	N/A	**17,764.27**		**40,000**
Outreach and communication	1,925.27	N/A	585.18	N/A	**2,509.45**		**40,000**
Total expenses	281,607.45	**143,303.00**	**20,000.00**	**N/A**	**444,909.45**		**697,403*****
Total 2023 Expenses (cash & in-kind)	**424,910.45**		**20,000.00**		**444,910.45**		

**The 2023 forecast budget was approved by the AoM during its second session (12th-13th December 2022 in Porto, Portugal)*
***Total Human resources foreseen in 2022 for all the Centres = 758,824 €. DMC and TC not included in the table*
****2023 Budget approved = 948,824€*

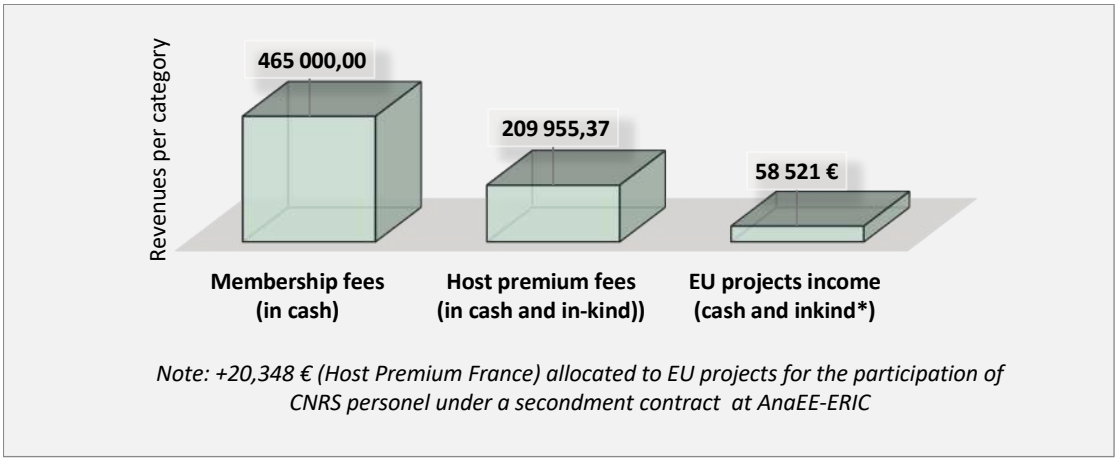
2. FUNDINGS RELATED TO EU-PROJECTS



	AgroServ	PHENET	ERIC FORUM2	Total
Human resources	46 636	422 €	821	47 879
Travel and subsistence	3 240	-	-	3 240
Other goods, works and services	7 402	-	-	7 402
Total	57 278 €	422 €	821 €	58 521 €

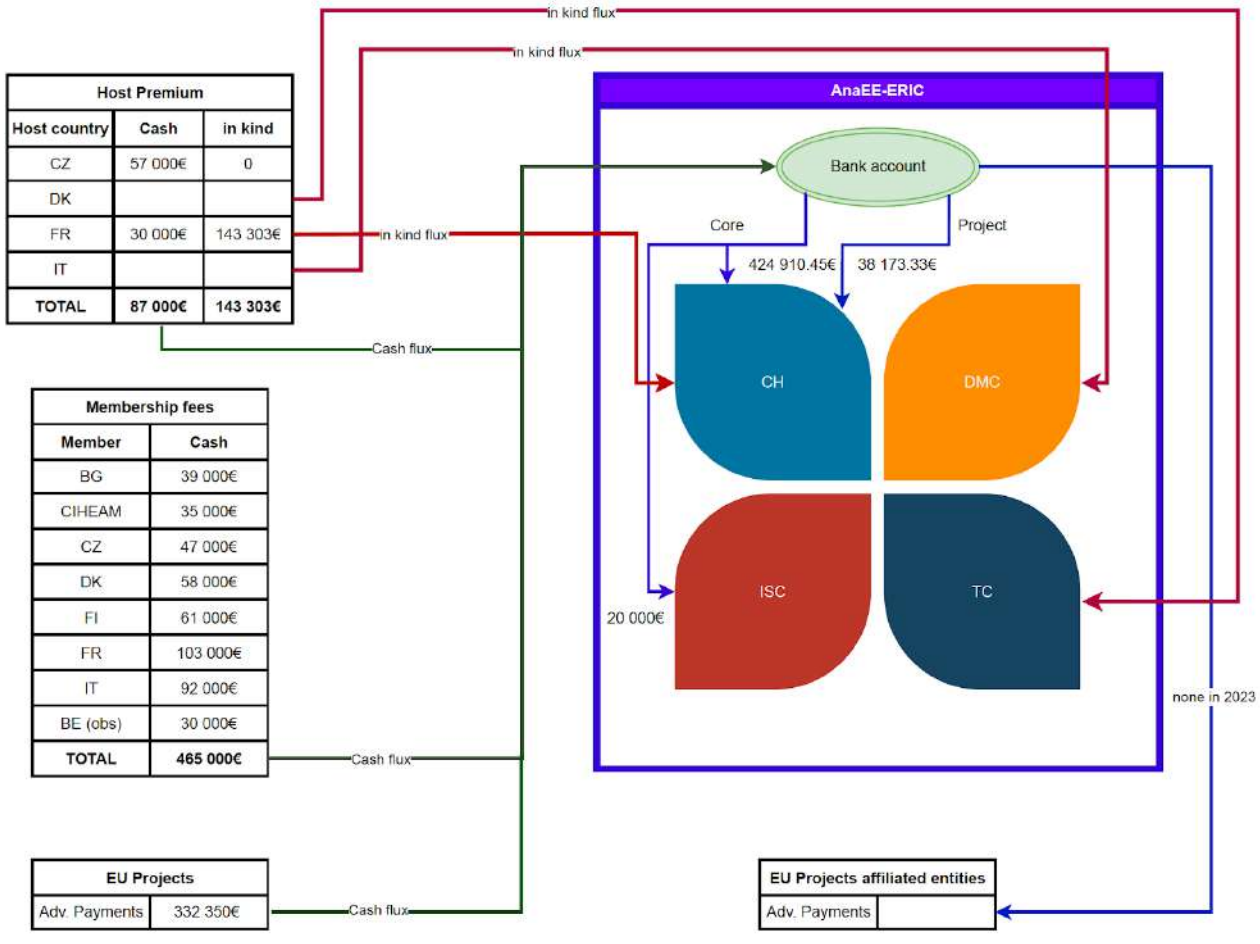
3. REDISTRIBUTION BETWEEN THE HEADQUARTERS AND SERVICES CENTRES

Figure 4: 2023 revenues (core budget + EU projects)



Note: +20,348 € (Host Premium France) allocated to EU projects for the participation of CNRS personel under a secondment contract at AnaEE-ERIC

Figure 5: Cash and in-kind flow for the 2023 financial year



Host Premium		
Host country	Cash	in kind
CZ	57 000€	0
DK		
FR	30 000€	143 303€
IT		
TOTAL	87 000€	143 303€

Membership fees	
Member	Cash
BG	39 000€
CIHEAM	35 000€
CZ	47 000€
DK	58 000€
FI	61 000€
FR	103 000€
IT	92 000€
BE (obs)	30 000€
TOTAL	465 000€

EU Projects	
Adv. Payments	332 350€

EU Projects affiliated entities	
Adv. Payments	

Acronyms

ACTRIS Aerosol, Clouds and Trace Gases Research Infrastructure
AKIS Agriculture Knowledge Information System
AKPI AnaEE KPI (cf. KPI)
AnaEE Analysis and Experimentation on Ecosystems
AoM Assembly of Members
APF Associated Platform
ARISE Atmospheric Dynamic Research in Europe

BEERI Board of the European Environmental Research Infrastructures

CERN Chinese Ecological Research Network
CH Central Hub
CIHEAM International Centre for Advanced Mediterranean Agronomic Studies (Intergovernmental)
CNR Consiglio Nazionale delle Ricerche (Italy)
CNRS Centre National de la Recherche Scientifique (France)
CORDEX Coordinated Regional Climate Downscaling Experiment
CREA Consiglio per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria (Italy)
CzechGlobe Global Change Research Institute of the Czech Academy of Sciences

DG Director General
DMC Data and Modelling Centre
DMP Data Management Plan

EC European Commission
EMB Extended Management Board
EMPHASIS European Infrastructure for Plant Phenotyping
ENRIITC European Network of Research Infrastructures and Industry for Collaboration
ENVRI Environmental Research Infrastructures cluster
ERA European Research Area
ERIC European Research Infrastructure Consortium
ESA European Space Agency
ESFRI European Science Forum for Research Infrastructures
EU European Union
EUPHORISC European Plant Health Open Research and Innovation Starting Community

FAIR Findable Accessible Interoperative Re-usable
FAO Food and Agriculture Organization of the United Nations
FP Framework Program (EU)

GHG GreenHouse Gas
GSL Growing Season Length

HE Horizon Europe framework program

ICOS International Carbon Observatory System
IEAC Independent Ethical Advisory Committee
IPBES Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC Intergovernmental Panel on Climate Change

ISAC Independent Scientific Advisory Committee
ISC Interface and Synthesis Centre
ISIA Information System for Infrastructure Administation, developed by CNRS and AnaEE-France

LTER Long-term Ecological Research
LS-RI Life Sciences Research Infrastructures cluster

MB Management Board

NEON National Ecological Observatory Network
NSF National Science Foundation (USA)

O3HP Oak Observatory at OHP: cf. OHP
OHP Observatoire de Haute Provence

PRC Proposal Review Committee

RCP Representative Concentration Pathway
RI Research Infrastructure

SDG Sustainable Development Goal
SHC Stakeholder Committee
SLA Service Level Agreement

TC Technology Centre

WG Working Group
WP Work Package

Glossary

Agro-ecosystem: Managed ecosystem with agriculture (cf. ecosystem).
Analytical facility: Facility that offers advanced biological, physical,chemical or socio-economic analyses for a deeper insight into processes.
Analytical installation: Equipment that offers advanced biological, physical and chemical analyses for a deeper insight into processes.
Analytical platform (historical) : Facility that offers advanced biological, physical and chemical analyses for a deeper insight into processes. Historical term - Analytical installation or facility to be used.
Aquacosm: aquatic mesocosm that allows manipulations (cf.mesocosm). In AnaEE, all aquacosms are in fresh waters.
Anthropic Stress: Pressure of human origin that reduces ecosystem state and/or ecosystem functioning below optimal.

Ecosystem: A system that includes all living organisms (biotic component) in an area as well as its physical environment (abiotic component)
Ecotron: A set of enclosed experimental units hosting replicas of a given ecosystem (from few dm3 to several m3) where environmental conditions are tightly controlled and multiple ecosystem processes are automatically monitored. Ecotrons allow ecologists to run for several months to years experiments with controlled environmental factors such as temperature, rainfall, greenhouse gases, pollutants, etc. Cf. ecosystem, experiment, enclosed platform.
Enclosed facility: Controlled environment facility where replicas of a given ecosystem (from few dm^3 to several m^3) can be experimentally exposed to tightly controlled environmental conditions in enclosed units.
Enclosed platform (historical): Controlled environment facility where replicas of a given ecosystem (from few dm^3 to several m^3) can be experimentally exposed to tightly controlled environmental conditions in enclosed units. Historical term - enlosed facility to be used.
Experimentation: The act, process, practice, or an instance of making experiments (CollinsEnglishDictionary). In AnaEE manipulation of the conditions or environment of the ecosystem under study (either open-air or enclosed) to explore its behaviour.
Experiment: A test, trial, or tentative procedure; an act or operation for the purpose of discovering something unknown or of testing a principle, supposition, etc. (CollinsEnglishDictionary). Cf. manipulation.

Facility: In AnaEE, a place or set of equipment that delivers one or more research services.

Installation: synonym of facility. This term is often used in the EU project context.

Manipulation: A manipulation of the environment or conditions of an ecosystem in order to simulate environmental pressures such as climate warming, changes in rainfall regime, elevated atmospheric CO2, different management practices, etc. Cf. experiment.
Macrocosm: Large experimental object physically representing an ecosystem in enclosed platforms, consisting offor example several m^3 of soil with vegetation or a water body with aquatic organisms. Macrocosms are simplified ecosystems used to simulate and predict the behaviour of real ecosystems under controlled conditions.
Mesocosm: Medium-sized experimental object physically representing an ecosystem in enclosed platforms, consisting of for example several dm^3 of soil with vegetation or a water body with aquatic organisms. Mesocosms are simplified ecosystems used to simulate and predict the behaviour of real ecosystems under controlled conditions.

Microcosm: Microscale experimental object physically representing an ecosystem in enclosed platforms, consisting of for example at est tube with microorganisms in soil or water. Microcosms are simplified ecosystems used to simulate and predict the behaviour of real ecosystems under controlled conditions.
Modelling installation: A user interface allowing to run numerical models in ecology to compute the behaviour of a simulated ecosystem under several initial conditions and measured (or simulated) experimental parameters. A modelling platform can host the models on its own computers or elsewhere.
Modelling platform (historical): A user interface allowing to run numerical models in ecology to compute the behaviour of a simulated ecosystem under several initial conditions and measured (or simulated) experimental parameters. Historical term - modelling installation to be used instead.

Observation: It is the action or process of carefully watching someone or something (CollinsEnglishDictionary). In the context of AnaEE and more generally environmental sciences, the process of monitoring or surveying objects or phenomenaon Earth or in the Universe without direct intervention on them (e.g. measuring the greenhouse gases over time).
Open-air facility: An experimental facility in open-air conditions (in natura) allowing the manipulation of several environmental pressures (e.g. rainfall, heating, management practices). The facilities can be installed in several ecosystem types (forest, grassland, peatland, fields, unmanagedland, etc.), as well as several climate types (mediterranean, sub-arctic, alpine, etc.).
Open-air platform (historical): An experimental platform in open-air conditions (in natura) allowing the manipulation of several environmental pressures (e.g.rainfall, heating, management practices, etc.). Historical term - open-air facility to be used instead.

Platform (historical): In the AnaEE context the unit where the activity (experimental, analytic or modelling) is performed; platforms are not belonging to AnaEE, but linked to it thanks to a Service Legal Agreement. Cf. facility, enclosed platform and open-air platform.

Service Centre: one of the AnaEE centres where additional services are provided to the users, stakeholders or to the facilities.
Service Legal Agreement: A legal agreement binding AnaEE and a (group of) facility. Services, such as experiment accommodation, data and metadata production and open access, are provided by the facility to AnaEE and the users. In turn, AnaEE provides services to the facility such as visibility, open and FAIR access to the data, technological expertise, modelling, transnational access, link with other facilities and RIs, etc.

User: The external commissioner of services from AnaEE.

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ANAEEE-ERIC ANNUAL REPORT

2023