Introduction

Living Labs represent a systemic approach to open innovation, defined by the European Network of Living Labs (ENoLL) as user-centered ecosystems based on co-creation and the integration of research within real-life communities and settings. This approach transforms end-users from passive subjects of observation into active partners in the innovation process, enabling solutions to be developed, tested, and refined in authentic environments.

The Living Lab approach is typically structured around the quadruple helix model, bringing together four key stakeholder groups:

- citizens and civil society,
- academia and research institutions,
- private sector actors, and
- public authorities.

Through this collaboration, Living Labs function as intermediaries that facilitate experimentation, rapid prototyping, and validation of new ideas in real-world conditions, enabling the joint creation of value and solutions to complex societal challenges .

In practice, Living Labs operate as open innovation platforms where users are actively involved throughout the entire innovation cycle. They are characterized by key principles such as real-life experimentation, multi-stakeholder participation, co-creation, openness, and continuous evaluation. Research within Living Labs typically follows iterative stages—exploration, co-creation, experimentation, and evaluation—allowing solutions to evolve dynamically based on feedback and real-world performance.

Currently, the Living Labs have evolved into a global methodology applied across multiple domains, including smart cities, healthcare, agriculture, environmental management, and digital innovation. Today, networks such as ENoLL support the development and certification of Living Labs worldwide, promoting shared methodologies, knowledge exchange, and collaborative innovation at international scale .

Overall, Living Labs represent a bridge between science, society, and policy, enabling more democratic, inclusive, and effective innovation processes that directly respond to real community needs and global sustainability challenges.

1. Meeting of the Dobrogea Blue Bay Living Lab Platform, 14 December 2023

On 14th of December 2023, *Ovidius University of Constanța* hosted the official launch and establishment meeting of the Dobrogea Blue Bay Living Lab Platform, the first local initiative dedicated to implementing climate-change adaptation measures within the framework of the DTEClimate – Act4D-Eutrophication Project, coordinated by Prof. Univ. Dr. Eng. Eden Mamut.

The event was organized in a hybrid format, enabling participation both in person and online, and brought together representatives of local authorities, academia, research institutions, and socio-economic stakeholders.

DTEclimate

Digital Twin Earth Intelligence for Climate Changes
Active Measures for Restoring Sweet-Water Lakes and Coastal Areas affected by Eutrophication addressing the Enhancement of Resilience to Climate Change and Biodiversity

Proiect	Acronim	Parteneri
Măsuri Active pentru Restaurarea Lacurilor de Apă Dulce și a Zonelor Costiere afectate de Eutrofizare în vederea Creșterii Rezilienței la Efectele Schimbărilor Climatice	DTE- Act4D-Eutrophication	UPB, UOC, ROSA, INCDFP, USV, EDW, EUROPLASTIC

Dobrogea Blue Bay Living Lab – Agendă

Locul de desfășurare – Sala Umberto Eco, Universitatea Ovidius din Constanta (Aleea Universității nr.1, Campus-corp A, etaj 2)
Data: 14. 12.2023

Orar	Activitate	Prezentare
10:00 –10:05	Deschidere	Conf. Dr. Dan-Marcel ILIESCU, Rector
10:05 – 10:30	Prezentare Proiect DTE- Act4D-Eutrophication	Prof. Dr. Eden MAMUT, Director Proiect Act4D-Eutrophication
10:30 – 11:00	Cuvânt din partea reprezentanților UAT-urilor	Mihai LUPU, Președinte CJC Vergil CHIȚAC, Primar George SCUPRA, Primar Florin CHELARU, Primar Dumitru CHIRU, Primar Ani Viorica MERLĂ, Administrator Delegat ZMC
11:00 – 11:15	Partenerii la Proiectul DTE- Act4D-Eutrophication	Prof. Dr. Mihai DATCU, UPB Dr. Ion NEDELCU, ROSA Dr. Constantin IONESCU,INCDFP Prof. Dr. Liviu MIRON, USV Cornel-Marius NIȚU, EDW Dr. Marcel IONESCU, EUROPLASTIC
11:15 – 11:45	Identificare Priorități (efecte vs cauze) în vederea adaptării la schimbările climatice	Moderatori: ȘL. Dr. Enache TUȘA Conf. Dr. Marius SKOLKA
11:45 – 12:00	Declarația de la Constanța de angajament pentru sprijinirea inițiativelor de adaptare la schimbările climatice	

Participants and Institutional Representation

The meeting gathered a wide range of high-level participants, including:

- Petre Enciu, Vice President, Constanța County Council
- Florin Chelaru, Mayor of Năvodari
- Conf. Dr. Alexandru Bobe, Vice-Rector, Ovidius University of Constanța
- Dr. Ing. Constantin Ionescu, General Director, National Institute for Earth Physics, Bucharest
- Prof. Dr. Liviu Miron, Vice-Rector, University of Life Sciences "Ion Ionescu de la Brad", Iași

Representatives also attended from: Constanța Metropolitan Area Association, Constanța City Hall, Lumina Commune, Ovidiu Town Hall, National Institute for Marine Research and Development "Grigore Antipa", Dobrogea-Litoral Water Basin Administration, Romanian Space Agency (ROSA), National University of Science and Technology Politehnica Bucharest, and SC Europlastic SRL.

Presentation of the DTEClimate – Act4D-Eutrophication Project

Prof. Univ. Dr. Eden Mamut, Project Director, presented the objectives, activities, and current implementation status of the DTEClimate initiative. The project aims to:

- Develop procedures for identifying environmental problems
- Strengthen the scientific basis for decision-making
- Facilitate collaboration with local authorities and socio-economic communities
- Co-design innovative climate-change adaptation solutions
- Implement measures that enhance community resilience

During 2024–2025, project activities will focus on Lake Siutghiol, followed by replication and scaling to the Black Sea coastal zone and freshwater lakes across Romania. At the end of the implementation period, the National Competence Center for Climate Change Adaptation – DTEClimate will become operational and integrated into the European Mission on Climate Adaptation.

Scientific Contributions and Technical Insights

Several experts presented ongoing research and monitoring activities:

- Dr. Ing. Laura Alexandrov provided a synthesis of monitoring results and identified issues affecting coastal lakes, with emphasis on Lake Siutghiol.
- Conf. Dr. Marius Skolka and Dr. Enache Tușa presented current work on climate-related risk assessment and the socio-economic impacts on communities surrounding Lake Siutghiol.

Participants—researchers, specialists, and academics—shared observations, challenges, and proposals for future activities.

5. Establishment of the Dobrogea Blue Bay Living Lab Platform

To formally mark the creation of the platform, a Declaration of Commitment supporting climate-change adaptation initiatives was drafted and endorsed by participants. This declaration accompanies the present report.

The Dobrogea Blue Bay Living Lab Platform will serve as the main collaborative framework for local partnership activities under the DTEClimate – Act4D-Eutrophication Project, enabling continuous dialogue, co-creation, and coordinated action among stakeholders.

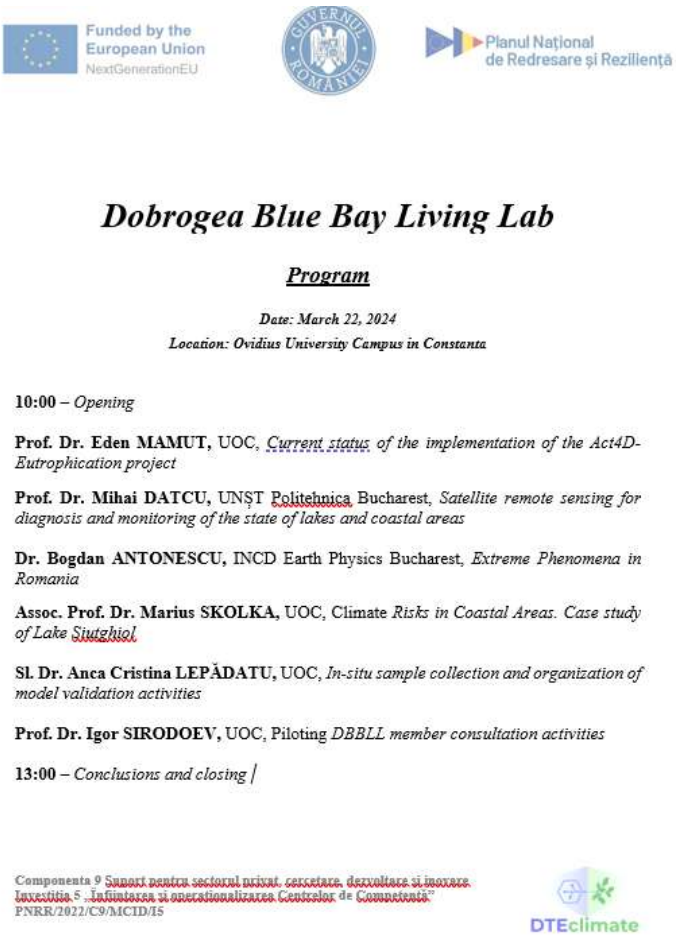
Conclusions

The constitution meeting successfully launched a long-term collaborative structure dedicated to climate-change adaptation and environmental resilience in the Dobrogea region. The strong participation of local authorities, academic institutions, research organizations, and community stakeholders demonstrates a shared commitment to protecting Lake Siutghiol and the wider coastal ecosystem.

The Dobrogea Blue Bay Living Lab is now positioned as a strategic platform for innovation, knowledge exchange, and coordinated action, supporting Romania's contribution to European climate-adaptation objectives.

2. Doborgea Blue Bay Living Lab (DBBLL), 22 March, 2024

The Dobrogea Blue Bay Living Lab (DBBLL) meeting, was held on 22 March 2024 at the Ovidius University Campus in Constanța, and brought together researchers, experts, and institutional partners to review progress within the Act4D-Eutrophication project and to consolidate the scientific and operational framework for climate-change adaptation in coastal and lacustrine environments.



Dobrogea Blue Bay Living Lab

Program

Date: March 22, 2024
Location: Ovidius University Campus in Constanta

10:00 – *Opening*

Prof. Dr. Eden MAMUT, UOC, *Current status of the implementation of the Act4D-Eutrophication project*

Prof. Dr. Mihai DATCU, UNȘT Politehnica Bucharest, *Satellite remote sensing for diagnosis and monitoring of the state of lakes and coastal areas*

Dr. Bogdan ANTONESCU, INCD Earth Physics Bucharest, *Extreme Phenomena in Romania*

Assoc. Prof. Dr. Marius SKOLKA, UOC, Climate *Risks in Coastal Areas. Case study of Lake Siutghiol*

Sl. Dr. Anca Cristina LEPĂDATU, UOC, *In-situ sample collection and organization of model validation activities*

Prof. Dr. Igor SIRODOEV, UOC, Piloting *DBBLL member consultation activities*

13:00 – *Conclusions and closing*

Componenta 9 Suport pentru sectorul privat, cercetare, dezvoltare și inovare Investiția 5 „Înființarea și operaționalizarea Centrelor de Competență" PNRR/2022/C9/MCID/I5

DTEclimate

Key Scientific Contributions

The program included a series of presentations that provided an integrated perspective on environmental monitoring, climate risks, and stakeholder engagement:

- Prof. Dr. Eden Mamut presented the current status of the Act4D-Eutrophication project, highlighting progress in data collection, modelling, and Living Lab activities.

- Prof. Dr. Mihai Datcu introduced advanced methods of satellite remote sensing for diagnosing and monitoring lakes and coastal zones.
- Dr. Bogdan Antonescu presented the extreme weather phenomena in Romania, emphasizing their increasing frequency and relevance for local resilience planning.
- Assoc. Prof. Dr. Marius Skolka presented a climate-risk assessment for coastal areas, with a detailed case study on Lake Siutghiol.
- Sl. Dr. Anca Cristina Lepădatu outlined the procedures for in-situ sampling and model validation, essential for ensuring scientific accuracy.
- Prof. Dr. Igor Sirodoev reported on the piloting of DBBLL consultation activities, focusing on stakeholder engagement and participatory processes.

Integration of Science, Technology, and Stakeholder Engagement

The event demonstrated the Living Lab's capacity to integrate:

- Earth observation technologies
- Field-based ecological monitoring
- Climate-risk modelling
- Community and institutional consultation mechanisms

This multidisciplinary approach strengthens the Living Lab's role as a regional hub for co-creation and evidence-based decision-making.

Contribution to the DTEClimate – Act4D-Eutrophication Project

The meeting provided:

- Updated insights into the scientific progress of the project
- Validation of methodologies for data acquisition, modelling, and scenario analysis
- Reinforcement of the Living Lab as the primary platform for stakeholder collaboration
- A shared understanding of the climate-related vulnerabilities affecting Lake Siutghiol and the coastal zone

Key Outcomes

- Consolidation of the DBBLL operational framework for 2024.
- Strengthened collaboration between academic institutions, research centers, and local authorities.
- Alignment of scientific activities with community-level adaptation needs.
- Identification of priority areas for future monitoring, modelling, and stakeholder engagement.
- Agreement on next steps for Living Lab-based co-creation activities.

The proceedings concluded with a synthesis of the main findings and a reaffirmation of the Living Lab's mission to support climate-change adaptation, ecosystem protection, and resilient community development in the Dobrogea region.

3. Living-Lab meeting organized on the occasion of the workshop on "Solutions for Strengthening the Resilience of Local Communities to the Consequences of Climate Change"

Organized on 20 March 2025 at the *Elena Roizen Cultural Center* in Ovidiu, the event marked a significant step forward in advancing climate-change adaptation efforts in the Siutghiol Lake area.

The event was organized jointly by the Institute for Nanotechnologies and Alternative Energy and the Ovidiu City Hall, and integrated into the Activity Plan of the DTEClimate – Act4D-Eutrophication.

Workshop: Solutions for Increasing the Resilience of Local Communities to Adapt to the Consequences of Climate Change

Competence Center for Climate Change Digital Twin for Earth forecasts and societal redressment – DTEClimate

AGENDA

March 20, 2025, Time: 14:00

Location: Cultural Center "Elena Roizen", Ovidiu, Constanța

14:00 – *Opening of the opening session - Mr. George SCUPRA, Mayor of Ovidiu Town*

Prof. Dr. Eden MAMUT, Ovidius University of Constanta, *"Operationalization of the National Competence Centre for Climate Change Adaptation - Constanta branch"*

Prof. Dr. Enrico SCIUBBA, Ovidius University of Constanta, *"A scientific approach for the estimation of remediation costs related to climate change"*

Dr. Corina VĂDUVA, National University of Science and Technology Politehnica Bucharest, *Specific RDI Project 1:"Artificial Intelligence in Earth Observation for Understanding and Predicting Climate Change" (AI4DTE)*

Dr. Silviu TOMESCU, Universitatea Witwatersrand, Johannesburg, Africa de Sud, *"Metagenomic Approaches to Study Phytoplankton Eutrophication, Climate Change Effects, and Salmon Impairment"*

Conf. Dr. Gabriel PRODAN, Ovidius University of Constanta, *"Analiza ecosistemului din lacul Siutghiol folosind date satelitare și date istorice"*

Conf. Dr. Daciana SAVA, Ş.L. Dr. Manuela SAMARGIU, Conf. Dr. Marius SKOLKA, Ovidius University of Constanta, *" The natural state of Lake Siutghiol"*

Conf. Dr. Marius SKOLKA, Ovidius University of Constanta, *"Interrelations between biotic and abiotic natural systems and the socio-economic system in the area of Lake Siutghiol""*

Prof. Dr. Igor SIRODOEV, Ovidius University of Constanta, *"Dobrogea Blu Bay Living Lab"*

Ş.L. Dr. Sibel OSMAN, Ovidius University of Constanta, *"Assessment of the water quality of Lake Siutghiol by analyzing physico-chemical parameters"*

16:00 – *Conclusions and closing session*

The workshop brought together representatives of the Ovidiu Local Council, specialists from the administrative units of Ovidiu, Năvodari, Lumina, and Constanța Municipality, as well as experts from key environmental and water-management institutions, including the Environmental Protection Agency, the Dobrogea-Litoral Water Basin Administration, the National Agency for Fisheries and Aquaculture, the Administration of Navigable Canals, the Constanța Metropolitan Area Intercommunity

Development Association, the County Directorate for Agriculture, and the Constanța Natural Sciences Museum Complex.

During the event, members of the project implementation team presented the procedures developed for data collection, processing, and analysis, alongside simulation and forecasting models designed to assess the evolution of aquatic ecosystems under climate-change conditions. The workshop also highlighted proposed mitigation measures, community-level adaptation strategies, and scenario-based action plans aimed at strengthening local resilience.

Presentations were delivered by the researchers from *Ovidius University of Constanța* and the *National University of Science and Technology Politehnica Bucharest*, together with invited experts from partner institutions in Italy and South Africa, ensuring a multidisciplinary and international perspective.

Overall, the event successfully facilitated knowledge exchange, stakeholder engagement, and the co-creation of actionable pathways for climate-change adaptation in the Siutghiol Lake region, reinforcing the collaborative foundation required for the next phases of the DTEClimate project.