Project idea form - small projects

Version 2.1

Registration no. (filled in by MA/JS only) _____

Project Idea Form

Date of submission 04/06/2025

1. Project idea identification

Project idea name	BalticScope - smart imaging for water ecosystem resilience and citizen engagement
Short name of the project	BalticScope
Previous calls	yes ◯ no ◉
Seed money support	yes ◯ no ◉

2. Programme priority

	2. Water-smart societies

3. Programme objective

	2.1. Sustainable waters

4. Potential lead applicant

Name of the organisation (original)	Latvijas Hidroekoloģijas institūts
Name of the organisation (English)	Latvian Institute of Aquatic Ecology
Website	https://lhei.lv/
Country	LV

Type of Partner	Higher education and research institution

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Which organisation(s) in the planned partnership take part in a project within the Interreg Baltic Sea Region Programme for the first time? Please list the respective partners.

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5.1 Specific challenge to be adressed

The Baltic Sea region faces significant challenges related to biodiversity loss and ecosystem disruption driven by pollution, eutrophication, and climate change. One critical challenge is the insufficient understanding of the present changes due to limited monitoring of aquatic environment. These are essential indicators of ecosystem health and water quality. Current monitoring methods often lack the required resolution, coverage, and timely data, limiting effective decision-making for water management and marine conservation. Our project addresses this challenge by utilizing advanced automated imaging technologies—ZooScan and Planktoscope—to facilitate real-time, high-resolution monitoring and comprehensive analysis of aquatic conditions.
These techniques, cover different sizes of organisms ZooScan is suitable for 200 um-5000 um size fraction, while Planktoscope works ideally with organisms between 20 µm and 250 µm, a combination of both is ideal because let us analyze full spectra plankton organisms: from phytoplankton and microzooplankton to mesozooplankton, benthos planktonic larvae, even juvenile fish.
Beyond plankton biodiversity, these methods will support regular observations that generate valuable data for applications such as wind park operations, paleolimnological reconstructions of historical water conditions, and microplastic detection. This multi-purpose approach will enable better

understanding of present ecological conditions, historical comparisons, and detection of emerging pollutants (i.e. microplastics), significantly advancing sustainable water management practices. Target groups directly benefiting include marine environmental agencies, local and regional authorities managing environmental and water quality issues, renewable energy operators (e.g., wind park service providers) requiring precise environmental assessments, fisheries and aquaculture sectors dependent on healthy aquatic ecosystems, and research institutions conducting detailed environmental studies. In the Baltic Sea, ZooScan system has not yet been applied to plankton research. The only zooplankton study conducted in the Gulf of Finland using another semi-automated image scanning and recognition system is with the Epson Perfection V750 scanner coupled with the ZooImage software.

5.2 Focus of the call

Small places, rural areas often depend heavily on local natural resources, including fisheries, aquaculture, tourism related to nature values, which are increasingly vulnerable due to environmental degradation, pollution, and climate impacts. By implementing advanced monitoring technologies such as ZooScan and Planktoscope, our project aims to provide these communities with high-quality, real-time environmental data. This data will enable sustainable decision-making for local environmental management, conservation efforts, and sustainable economic practices, e.g. close to real time zooplankton data will be useful for fish stock evaluations. For instance our project will aid renewable energy operators, such as wind park service providers, with essential ecological assessments to improve operational sustainability and community acceptance. Empower local and regional authorities to better manage and protect aquatic ecosystems, directly benefiting tourism and enhancing overall community resilience.

6. Transnational relevance

Our partnership includes diverse expertise from Finland, Latvia, Poland, and Lithuania, strategically representing key countries around the Baltic Sea. This multinational collaboration is particularly significant as the environmental challenges we face—such as pollution, biodiversity loss, and climate impacts—are transboundary and require coordinated regional efforts.
The partners bring complementary strengths to the project: some already possess hands-on experience with the instruments ZooScan and Planktoscope, providing essential practical knowledge and technical leadership. Others contribute robust expertise in areas such as water pollution surveys, environmental policy, community engagement, past climate conditions reconstruction, ensuring a holistic and multidisciplinary approach. More over, some of the partners represent potential stakeholders, authorities and end users as well. Project results will be of crucial importance for the whole Baltic Region through improved zooplankton and microlitter monitoring efficiency required through EU MSFD and HELCOM. We will also learn from experience outside consortium, e.g. during the EU Horizon Marbefes project, some of consortium partners built a collaboration with VLIZ (Flanders Marine Institute) regarding ZooScan activities. They have used ZooScan in North Sea plankton monitoring programs since 2014 what proves this device feasibility.

7. Specific aims to be adressed

Building trust that could lead to further cooperation initiatives
Our project specifically aims to build trust among partners from Finland, Latvia, Poland, and Lithuania, who have not previously collaborated together in this particular consortium configuration. Through joint activities such as training sessions, creating coherent methodology collaborative research, and data sharing initiatives, partners will develop strong professional relationships and trust. This newly established network, strengthened by shared project experiences and collective involvement, will create the way for further cooperative initiatives beyond the scope of this project. Potential future collaborations could include expanded regional environmental projects, joint policy development efforts etc. addressing shared challenges in the Baltic Sea region.
Initiating and keeping networks that are important for the BSR
With this project we will create a network on particular subject and extend it by actively involving key end users and stakeholders from each participating country, including scientific institutions, environmental agencies, private companies, and authorities at various administrative levels.

Bringing the Programme closer to the citizens
This project will include outreach and engagement activities targeting children, students, and the broader public (specially industry which may have particular interest of the results, i.e. wind parks developers, maritime spatial planning authorities). These activities may include educational workshops, citizen science initiatives involving simple water sampling, and school visits with mobile demonstrations of the ZooScan and Planktoscope devices. It is important for citizens to understand the role of zooplankton as a vital part of the aquatic food web, basis for fish stock production and ecosystem functioning. By using innovative equipment and methodologies, we bring science closer to the community and increase awareness of water ecology and life beneath the water surface. These efforts will inspire a deeper appreciation for environmental protection and encourage public participation in maintaining the health of the Baltic Sea.
Allowing a swift response to unpredictable and urgent challenges
Zooplankton, as a crucial component of aquatic ecosystems, i.e. energy transfer in the food webs, rapid response to environmental changes such as temperature shifts, pollution events, eutrophication, and harmful algal blooms. These rapid biological responses make zooplankton communities valuable early indicators of ecological stress and shifting water quality. By implementing real-time and high-resolution monitoring technologies such as automated imaging with new techniques; ZooScan and Planktoscope, our project will enable the timely detection of these changes in zooplankton communities and simultaneously gather data on microlitter prevalence and abundance hopefully leading to pollution sources. This capability provides decision-makers and environmental agencies with essential data to act swiftly in mitigating emerging issues before they escalate.

8. Target groups

Education/training centre and schools - we will reach out to organizations paying special attention to water habitats, ecosystems education to promote tools of this project to be included in education process, i.e. Nature house of Liepaja ZIIC in Latvia, Harakka nature centre (City of Helsinki, Finland), Maretarium public Baltic aquarium, Kotka Finland; Lithuanian Sea museum, Klaipėda, Lithuania

Higher education and research institution - we will promote including those project tools in regular teaching process, in courses teaching students zooplankton, paleolimnology and environmental pollution, i.e. University of Latvia (LV), Daugavpils University (LV), University of Helsinki (FI), Klaipėda University (LT), The Environmental Protection Agency of Lithuania, University of Gdańsk (PL).
International governmental organisation - HELCOM as the coordinating body of national monitoring programs and efforts including zooplankton and microlitter will be invited as a strategic stakeholder and external advisor. Their involvement will ensure alignment of the project's methodologies with ongoing regional frameworks and will help validate monitoring protocols for broader adoption within BSR national programs and will facilitate dissemination of results through HELCOM expert groups and policy platforms.
Consultant Companies conducting monitoring campaigns such as Ramboll and Eurofins in Finland and Poland. Both mentioned above will be involved through questionaires and partcipation in practical seminars to givr feedback.
Large enterprises - pilot testing, feedback workshops, and consultations.
Local public authorities - are central to the project as they oversee environmental health at the municipal level. They will be directly involved in pilot testing, co-development of protocols, and citizen engagement. Through their participation, the project ensures that stakeholder needs are integrated into the outcomes.

	Please use the drop-down list to define up to five target groups that you will involve through your project's activities.	Please define a field of responsibility or an economic sector of the selected target group	Specify the countries and regions that the representatives of this target group come from.
1.	Education/training centre and school	Raising society awareness and developing societal responsibility about water habitats and its sustainability	Finland, Lithuania, Latvia
2.	Higher education and research institution	Creating future experts in field of oceanography and limnology, existing methods are laborous and require expensive equipment, those devices would increase quality of education process	All consortium countries

3. International governmental organisation	HELCOM operates in the environmental protection sector, focusing specifically on the Baltic Sea region. Its main responsibility is coordinating actions among member states.	All consortium countries
4. Large enterprise	Companies developing their business with risks to impact water ecosystems and therefore having need for fast and precise evaluation of present water ecosystem state, i.e. wind park developers	Wind mils „Curorian Nord“ in Lithuanian the Baltic Sea and AB Ignitis Group AS Latvenergo in Latvia.
5. Local public authority	Municipalities environmental specialists to collect regular samples and obtain information about zooplankton and phytoplankton, also to monitor for instance cyanobacteria and microplastics	Municipalities in Latvia in areas with high representativeness of lakes in their areas, i. e. Riga, Augšdaugava, Cesis. Local environment centres in Finland, larger cities e.g. Helsinki.

9. Contribution to the EU Strategy for the Baltic Sea Region

Please indicate if your project idea has the potential to contribute to the implementation of the Action Plan of the EU Strategy for the Baltic Sea Region (https://eusbsr.eu/implementation/).

yes ◉ no ◯

Please select which policy area(s) of the EUSBSR your project idea contributes to most.

PA Nutri
PA Hazards
PA Health

The MA/JS may share your project idea form with the respective policy area coordinator(s) of the EUSBSR. You can find contacts of PACs at the EUSBSR website (https://eusbsr.eu/contact-us/).

☐ If you disagree, please tick here.

10. Partnership

Latvian Institute of Aquatic Ecology (LHEI), Latvia - research institute dedicated to research on ecology and environmental problems in the Baltic Sea and freshwaters, responsible for monitoring both plankton and microplastics, has taxonomy expertise to share with other partner and broad network of local stakeholders.

University of Gdansk (UG)- one of the largest educational institutions in Poland and a leading center for marine environmental education. This partner has some experience is testing the capabilities of the PlanktoScope for both phytoplankton and zooplankton research, as well as its potential use in environmental monitoring. This partner will share existing experience and will lead devices adaptation and improvement for speed up and increase of available data for regular monitoring in marine systems.

The Marine Research Institute (MRI) at Klaipėda University is a leading center for marine and coastal research in Lithuania, with strong expertise in plankton ecology, environmental monitoring, and maritime technologies. MRI has significant experience with advanced automated imaging tools such as ZooScan and FlowCam. These systems are included in partnership with AB Ignitis Group to monitor plankton at the offshore wind farm “Curonian Nord”. The Environmental Protection Agency of Lithuania is evaluating the use of ZooScan for zooplankton monitoring programs. This partner will share its experience in building trust among stakeholders.

Finnish Environment Institute, Finland – Governmental research institute conducting environmental research and monitoring in terrestrial, freshwater and Baltic environments. Syke has long experience in both automated plankton imaging (IFCB, FlowCytobot, FlowCam, LisstHolo2, ZooScan, Planktoscope) and sampling and identification of microplastics in various matrices. As Syke conducts research and serves as a public authority responsible for Baltic Sea and freshwater monitoring (e.g. phyto- and zooplankton and microplastics) it has a vantage point on present monitoring requirements and technological developments. As a national environmental authority Syke has a wide stakeholder network covering both ministries and environmental authorities of the municipalities, and may therefore have active dialogue with them during the project to get feedback for the project developments and to raise awareness of the potential of the instruments in future monitoring.

11. Workplan

Activities:
1. Review and compilation of existing information – report on review and alignment with existing EU rules and guidelines regarding plankton and microplastics, present practice for paleolimnology.

Output – region based analysis report and baseline reference document;

2. Cross-border capacity building and knowledge exchange – organize series of joint workshops and training sessions involving project partners and stakeholders. Output – trained participants and a shared knowledge base across countries, created network;

3. Pilot testing and method validation – use of existing practice as a benchmark and test technical feasibility in different settings. Output - Validated and field-tested monitoring protocols for ZooScan and Planktoscope ready for stakeholder use;

4. Stakeholder and public engagement – involvement of stakeholders throughout the project in discussions, sampling, and feedback activities, organizing school and student workshops and citizen science sampling events to raise awareness and gather feedback. Output - increased public awareness and stakeholder input incorporated into pilot development, increased trust in offered solutions;

5. Final guidelines development and policy integration - co-develop practical recommendations and protocols for HELCOM and different stakeholder groups to implement developed tools regular use. Output - guideline document, policy brief, and cost-estimate toolkit for stakeholders.

The project will test 2 automated imaging devices for further implementation into regular use (Zooscan and Planktoscope) to facilitate environmental monitoring, past ecological conditions reconstruction and pollution monitoring. The aim is to identify approaches that are both scientifically robust and operationally feasible for authorities and stakeholders. The pilots will also explore cost, staff training needs, and time for integrating developed solutions into routine use.
Involvement of target groups – participation in workshops and training, hosting pilot testing sites, providing feedback, co-developing guideline document.

12. Planned budget

ERDF budget (planned expenditure of partners from the EU)	EUR 500,000.00
Norwegian budget (planned expenditure of partners from Norway)	*EUR XXX*
Total budget (including preparatory costs)	**EUR 500,000.00**

13. Project consultation

Please indicate if you wish to have a consultation (online meeting) with the MA/JS to discuss your project idea

yes ◉ no ◯

14. Questions to the MA/JS

Questions related to the content of the planned	Would like kindly to ask feedback on proposed consortium composition, we are mostly research organizaiton right now, same time representing

project	stakeholders - monitoring implementers
Questions related to budgeting and expenditure	-
Any other questions	-

15. Additional information

-

Your account in BAMOS+

Please remember that to officially submit your application you need to access our electronic data exchange system BAMOS+. More information about the process of applying for your account in BAMOS+ you will find here:
https://interreg-baltic.eu/gateway/bamos-account