LATVIJAS UNIVERSITĀTE

CREATE

Water4All - CREATE project:

Latvian case study on exploring nature-bases solutions for addressing eutrophication in the Lielupe river basin and the Gulf of Riga

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Water4All Water security for the planet
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Latvijas Zinātnes padome

Content

- Briefly about the CREATE project and activities of the Latvian case study
- First results of public and stakeholder surveys about eutrophication and nature-based solutions (NBS)
- Modelling of ecosystem services and NBS to support water management

About the CREATE project

- **Title: C**ross-**RE**alm modelling and assessment of **A**quatic ecosystem services: **T**owards a science-based design of nature-based solutions to tackle **E**utrophication
- **Project duration:** 01.03.2025–29.02.2028
- **Partners:**
  - Lead: University of Eastern Finland
  - University of Tartu, Estonia
  - Mykolas Romeris University, Lithuania
  - Warsaw University of Life Sciences, Poland
  - University of Latvia
- **EE/LV/LT cross-border case study area**:
  - Lielupe river basin & Gulf of Riga

Project activities

WP1 – Revision, integration, and harmonization across realms and scales of knowledge and data towards the integrative modelling of ES, *Lead: UT*

- Assessing the knowledge and data availability for assessing ES in the Eastern Baltic Sea region
- Integrating dataflows to map and assess ES across marine, coastal and freshwater realms

WP2 – Interlinkages between Ecosystem Services and Eutrophication, *Lead: MRU*

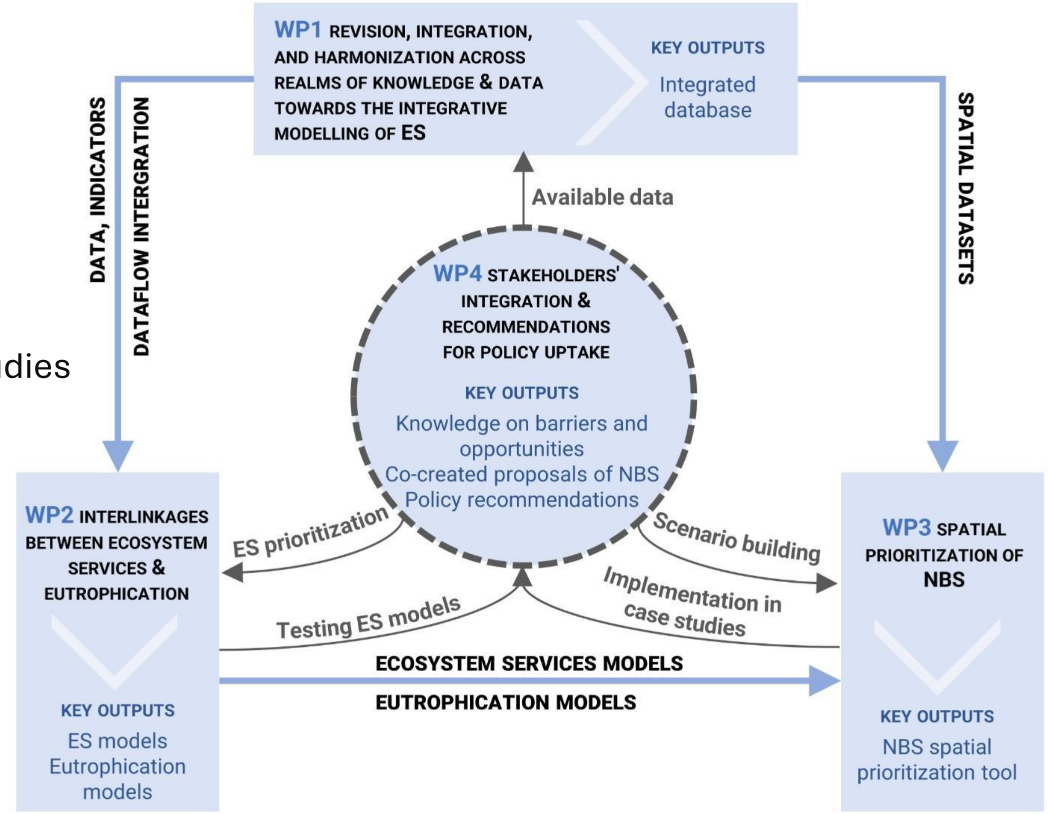
- Modeling of eutrophication using the Soil & Water Assessment Tool Plus (SWAT+)
- Development of cross-realm, process-based ecosystem service models

WP3 – Spatial prioritization of NBS, *Lead: SGGW*

- Selection and compilation of conservation and eutrophication-relevant NBS
- Model-based assessment of the effect of NBS on mitigating eutrophication
- Development and implementation of the NBS spatial prioritization tool in case studies

WP4 – Stakeholders integration & Recommendations for Policy uptake, *Lead: UL*

- Analysis of stakeholder perception, knowledge, and acceptance of NBS (surveys, interviews)
- Scenario building and co-creation of suitable NBS
- Development of policy recommendations



Stakeholder integration process in LV

Establishment of stakeholder network:

- A contact list of potential stakeholders developed, including from national, regional and local authorities, academia, business and civil society (36 institutions and 119 individuals)
- Stakeholders approached by e-mail, informing about the CREATE project and asking to fill **two questionnaires**:
    - perceived necessity and feasibility of NBS in Lielupe river basin (33 responses so far)
    - willingness to take part in the project activities (18 responses so far)

Public survey on ecological knowledge and acceptance of NBS:

- ➢ *Aim: to assess the current perception and ecological knowledge of eutrophication-related problems*

- ongoing, so far 244 responses in LV

Semi-structured interviews with relevant stakeholder groups:

- ➢ *Aim: to assess enabling factors and constraints for implementing specific NBS in case territories*

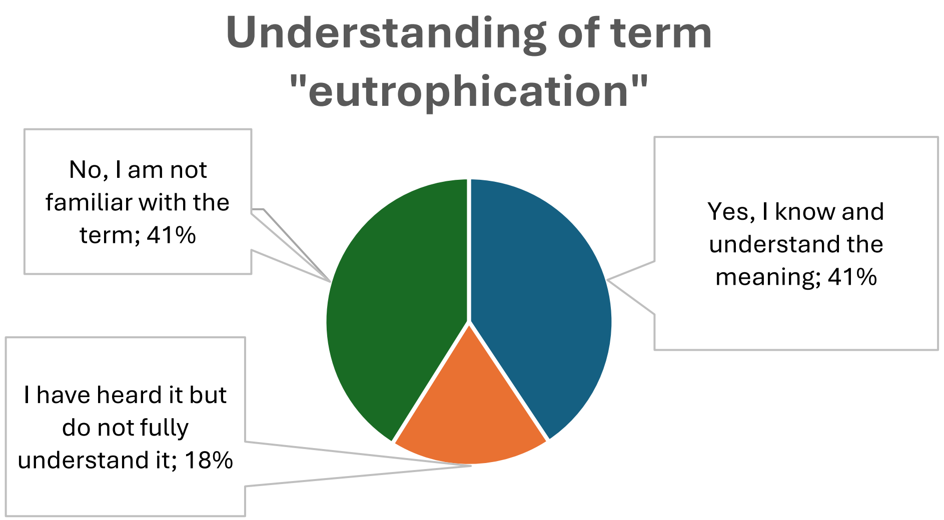
- ~15 interviews per country (municipalities, farmers, researchers, ministries/authorities, NGOs) to be launched in February-March 2026

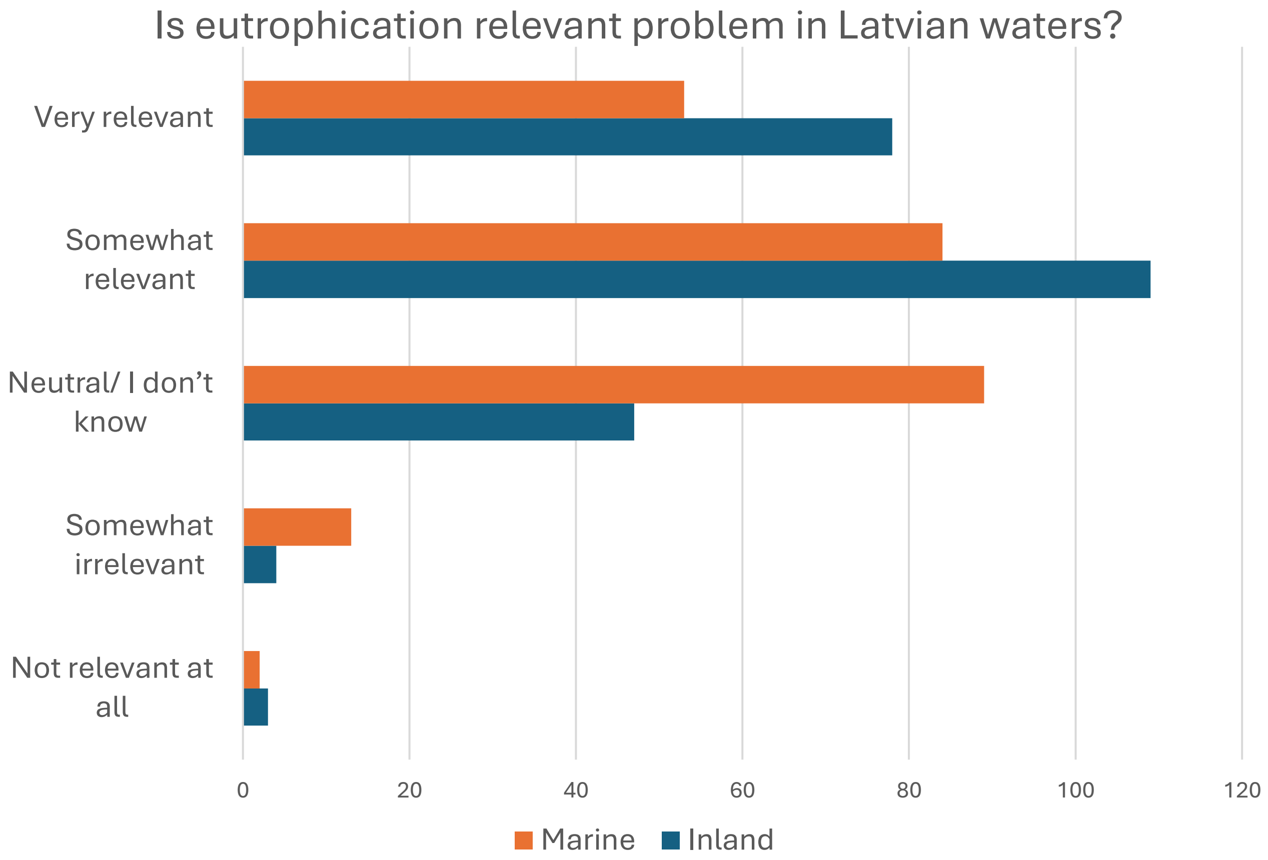
Scenario building and co-creation of suitable NBS (focus group meetings, stakeholder workshops)

- ➢ *Aim: to identify the suitable NBS in the case study area and integration of the ES approach in land and water management*

- First stakeholder workshop (beginning 2026) to discuss the proposed NBS and conditions for their implementations, and to define the targets for the scenarios

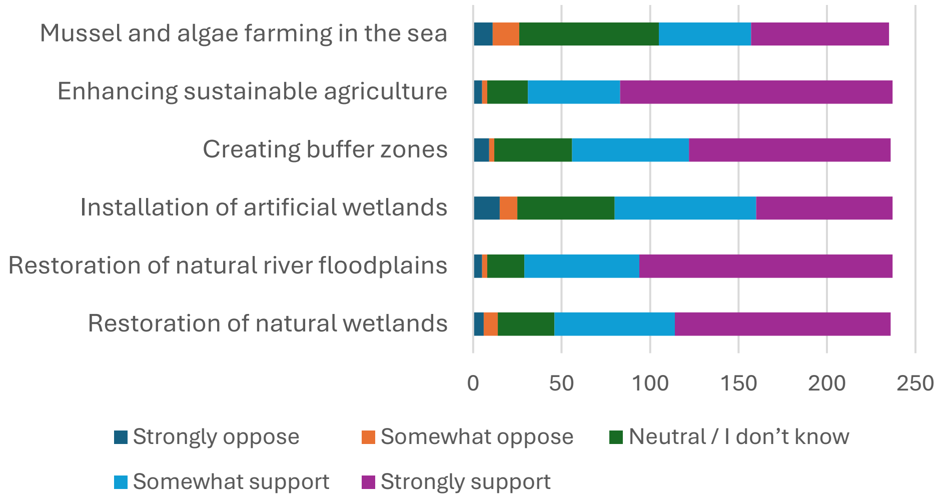
Insight into current results of LV survey (n=243; 25.09.25): Ecological knowledge





Term not that well known, but the processes and impacts are

Insight into current results of LV survey (n=243; 25.09.25): Acceptance of NBS for reducing eutrophication



Most accepted:

Sustainable agriculture, natural river floodplains

→Preference of «natural»?

Least accepted:

Artificial wetlands, mussel and algae farming

→Least accepted – least understood?

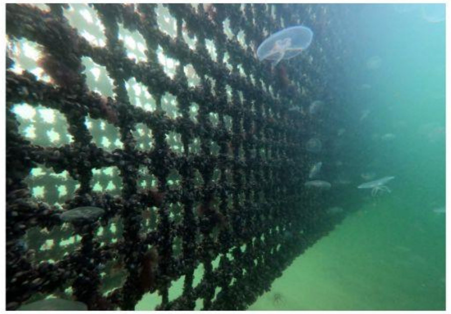
Restoration of natural wetlands – promotes the purification of agriculturally polluted water and reduces flood risks.

Restoration of natural river floodplains – provides space for floodwaters, helping to purify them and reduce flood risks.

Installation of artificial wetlands – functions as a natural barrier/filter that reduces the entry of nutrients into the waters.

Creating buffer zones along rivers and lakes – involves forming strips of grass, trees, or shrubs that trap nutrients before it reaches the water (for example, near agricultural lands).

Enhancing sustainable agriculture – by using environmentally friendly farming practices (e.g., crop rotation, creating field margins), pollution and soil erosion are reduced.



Mussel and algae farming in the sea - they naturally clean the water by filtering it and absorbing excess nutrients, helping to reduce pollution.

Preliminary stakeholder survey on NBS in the Lielupe River basin (n=33)

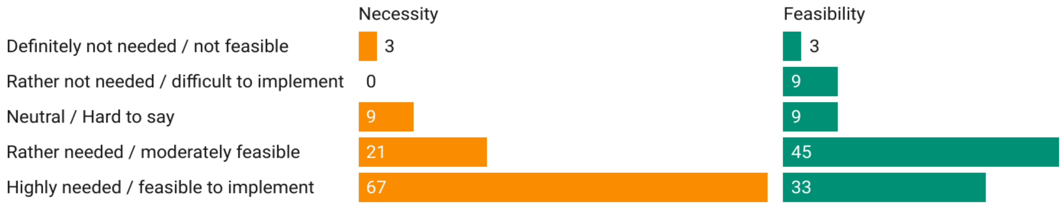
- Perceived necessity and practical feasibility of 10 nature-based solutions
- Further questions:
  - What explains the high ratings of certain NBS?
  - Which of these NBS could serve as “entry points” for scenario-building workshops?

Rather feasible and needed NBS

5 Sedimentation basins (%, n=33)

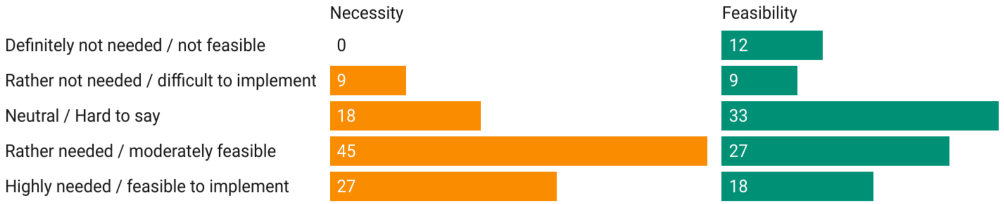
1 Artificial wetlands for wastewater treatment (%, n=33)

7 Creation of river buffer strips (%, n=33)



4 Controlled drainage (%, n=33)

10 Environmentally friendly (conservation) agriculture (%, n=33)

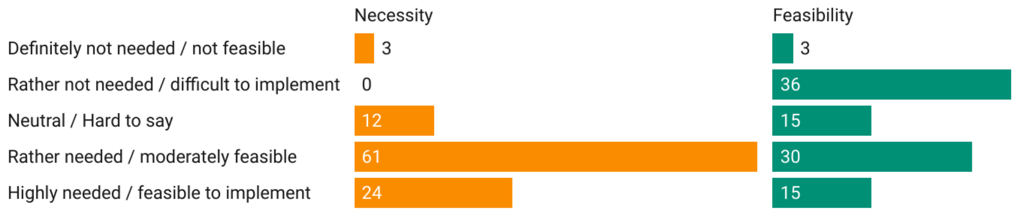


Preliminary stakeholder survey on NBS in the Lielupe River basin (n=33)

- perceived necessity and practical feasibility of 10 nature-based solutions
- further questions:
  - Why NBS considered "needed but not feasible" → implementation challenges, costs, lack of examples?
  - Where are knowledge gaps or conflicting views among stakeholder groups?

Rather not feasible and / or not needed

2 Restoration and maintenance of natural wetlands (%, n=33)



3 Restoration and maintenance of floodplains (%, n=33)

6 Restoration of natural river flow (%, n=33)

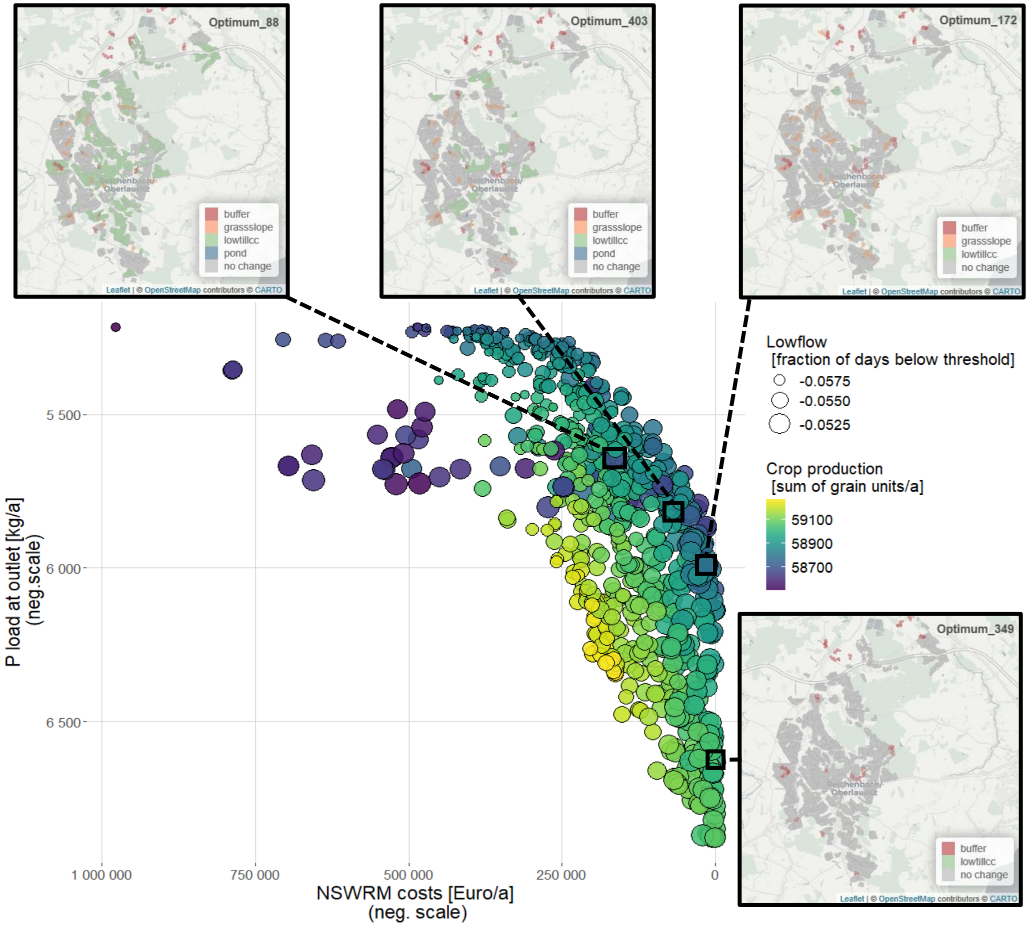
8 Installation of instream structures (natural barriers) (%, n=33)

9 Floodplain forests (%, n=33)

Modeling tasks to assess effectiveness of different NBS distribution scenarios

Adapting the workflow of the OPTAIN project (www.optain.eu)

- **SWAT+ Model:** Simulates hydrological processes (runoff, sediment, nutrient fluxes) under current and scenario conditions
- **CoMOLA Tool:** Uses multi-objective land-use optimization to allocate NBS based on SWAT+ outputs



Integration Workflow:

- Export SWAT+ sub-basin and HRU-level results (e.g., water yield, sediment load).
- Translate to spatial indicators for CoMOLA suitability and objective layers.
- Run optimization to identify optimal NBS placement balancing hydrological, ecological, and socio-economic goals.

SWAT+ and CoMOLA results will be further analysed using Pareto optimisation.

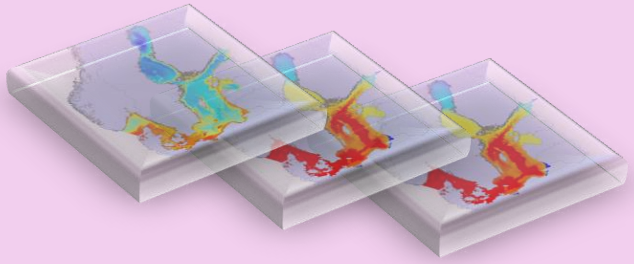
Ecosystem functioning and services mapping and NbS prioritization in the Gulf of Riga and the related Baltic Proper

1

Compilation of models and maps for ecosystem functioning and services in the Baltic Sea

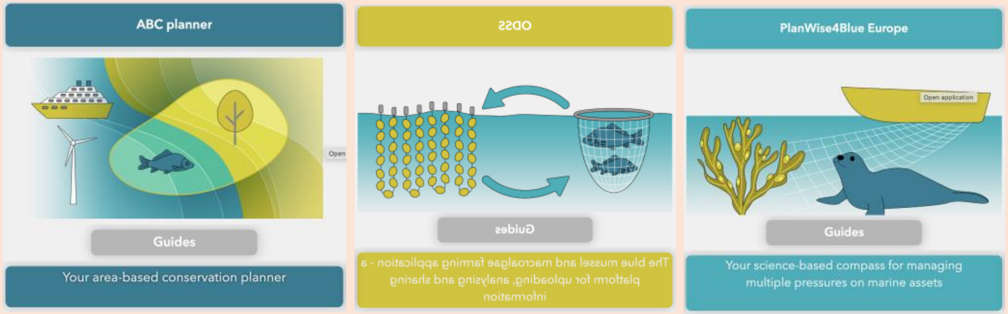
2

Integration of improved distribution models and maps for key habitat formers



3

Repurpose tools (ABC planner, ODSS, and PlanWise4Blue) for the prioritization of NbS (habitat suitability, environmental relevance, costs, and trade-offs)



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You are invited to take part in the CREATE public survey and share it in your networks!

for Latvia:

for Lithuania:

for Estonia:

for Finland:

More about the project:

https://www.water4all-partnership.eu/project/create

https://sisu.ut.ee/create-project/

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