Klaipeda University

LITHUANIAN CASE: RESEARCH FOR HEALTHY WATERS 2030

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RESTORE OUR OCEAN AND WATERS BY 2030:

how the **Lithuanian research** can be involved in the implementation of this mission:

- facilities
- competences
- experience

KLAIPĖDA UNIVERSITY

- Founded in 1991, only marine-oriented science & education institution in Lithuania
- 2008-2018 – intensive development of marine/maritime competencies and infrastructure
- Since 2017 – among the **top 200** universities in the world in the field of **oceanographic research** (Shanghai Ranking)
- Since 2019 – member of the **EU-CONEXUS alliance** – transnational European higher education and research institution for smart urban coastal sustainability

FACULTIES AND INSTITUTES

- Faculty of Health Sciences

public health, nursing, radiology, recreation and tourism, social work, leisure sports...

- Faculty of Marine Technology and Natural Sciences

computer science, marine engineering (maritime transport, shipping and ports, port facilities) and classical engineering (electrical, chemical, mechanical, construction)...

- Faculty of Social Sciences and Humanities

educology, public administration and political science, social geography and regionalism, continuing studies...

- Institute of Baltic Region History and Archeology

Cultural and social landscapes of prehistoric and historical times in the Eastern Baltic region, changes in societies and cultures in the Eastern Baltic region in the Middle Ages, early modern and recent times

- Marine Research Institute

Marine and coastal environment and biodiversity, marine protected areas, fisheries and aquaculture, blue biotechnology, water transport and air pollution, mechanics and marine engineering...

STRATEGIC RESEARCH DIRECTIONS:

- towards sustainable technologies, blue and green growth and **a healthy sea**;

- towards sustainable health and well-being;

- society and culture on the Baltic coast.

MARINE RESEARCH INSTITUTE – OVER 20 YEARS OF EXPERIENCE IN AQUATIC ENVIRONMENTAL RESEARCH

Fundamental and applied research in natural sciences and technology; R&D, degree studies.

Labs:

- Coastal Environment and Biogeochemistry
- Fisheries and Aquaculture
- Waterborne Transport and Air Pollution
- Mechanical and Marine Engineering

Facts:

- State-of-art infrastructure since 2018
- ~ 150 research/technical staff
- ~ 30 ongoing research projects
- Field research geography – from the Arctic to Antarctic

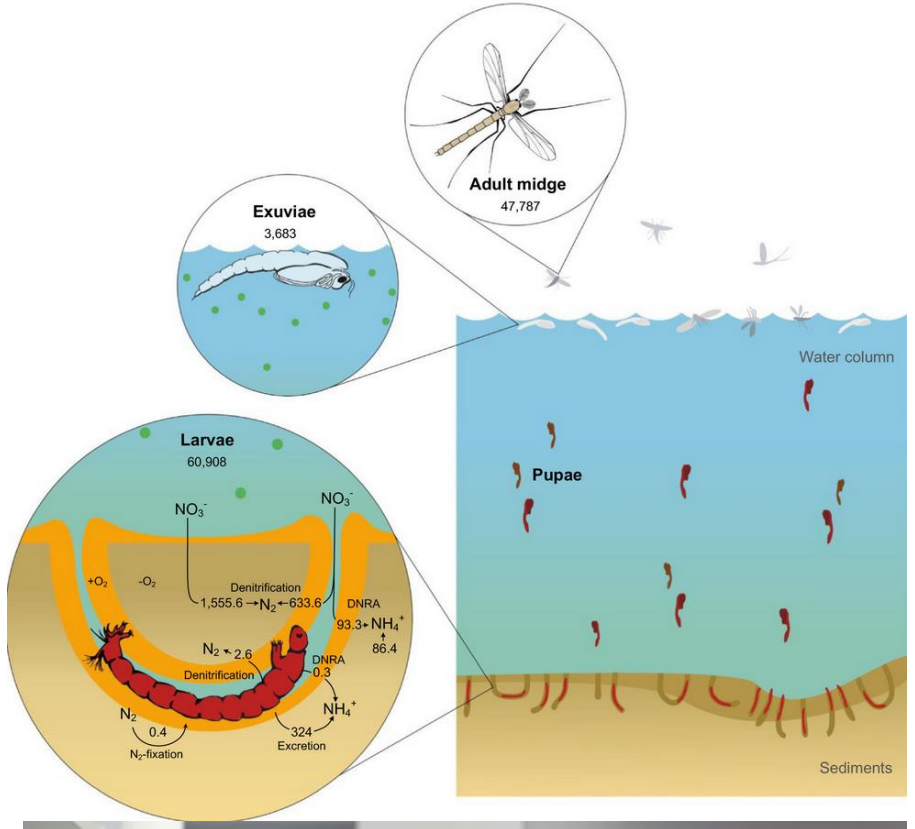
COMPETENCES IN MARINE ENVIRONMENTAL RESEARCH

Aquatic biogeochemistry and ecosystem functioning:

- material cycles in inland, transitional and coastal waters, pelagic and benthic zones, along geographical and eutrophication gradients
- ecosystem services – evaluation and nature-based management solutions
- environmental modelling – spatial and temporal forecasting and "what-if" predictions

New generation pollutants (microplastics, pharmaceuticals, phthalates, etc.):

- identification, effects on ecosystems and risks for human health
- development and testing new technologies to reduce pollution

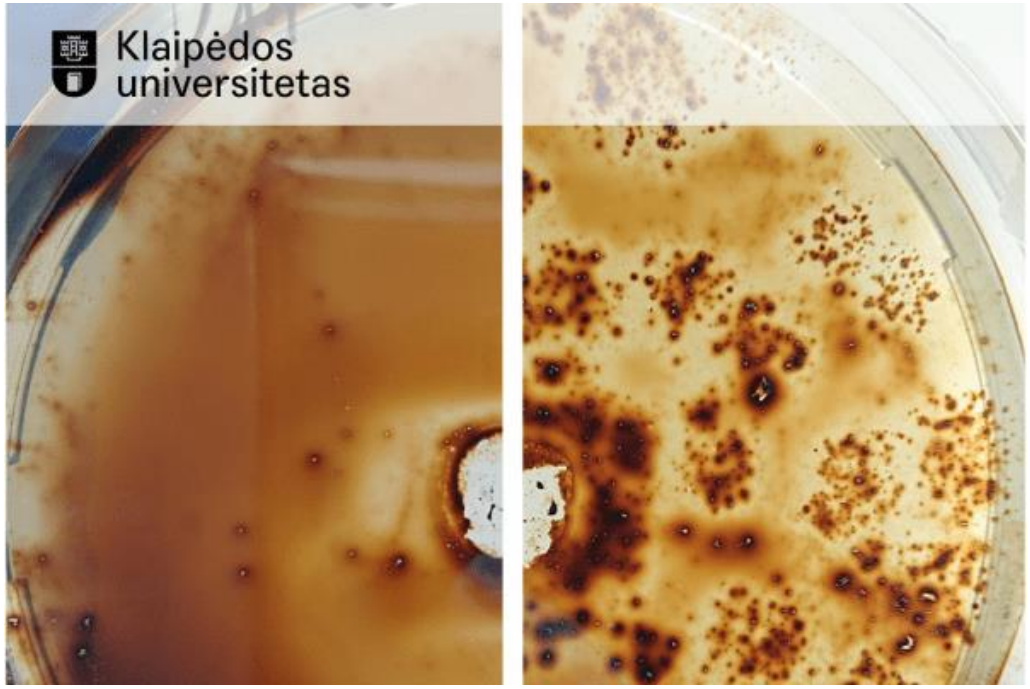


MORPHEUS
Model Areas for Removal of Pharmaceutical Substances in the South Baltic

Interreg South Baltic

EUROPEAN UNION

WISA
Water Innovation System Amplifier



EXAMPLES OF INNOVATIVE TECHNOLOGIES AND ENVIRONMENTALLY FRIENDLY SOLUTIONS

Biological treatment technologies (patented in European Patent Office):

- decomposition of oil pollutants in the marine environment using mushroom cultures extracted from water and sand of the Baltic coast
- InnoAerogel – a waste paper-based oil spill sorbent – highly efficient, biodegradable and reusable material, integrated with microorganisms for better biodegradation

Floating islands:

- for restoration of the transformed coastline, removal of nutrients and increasing of biodiversity

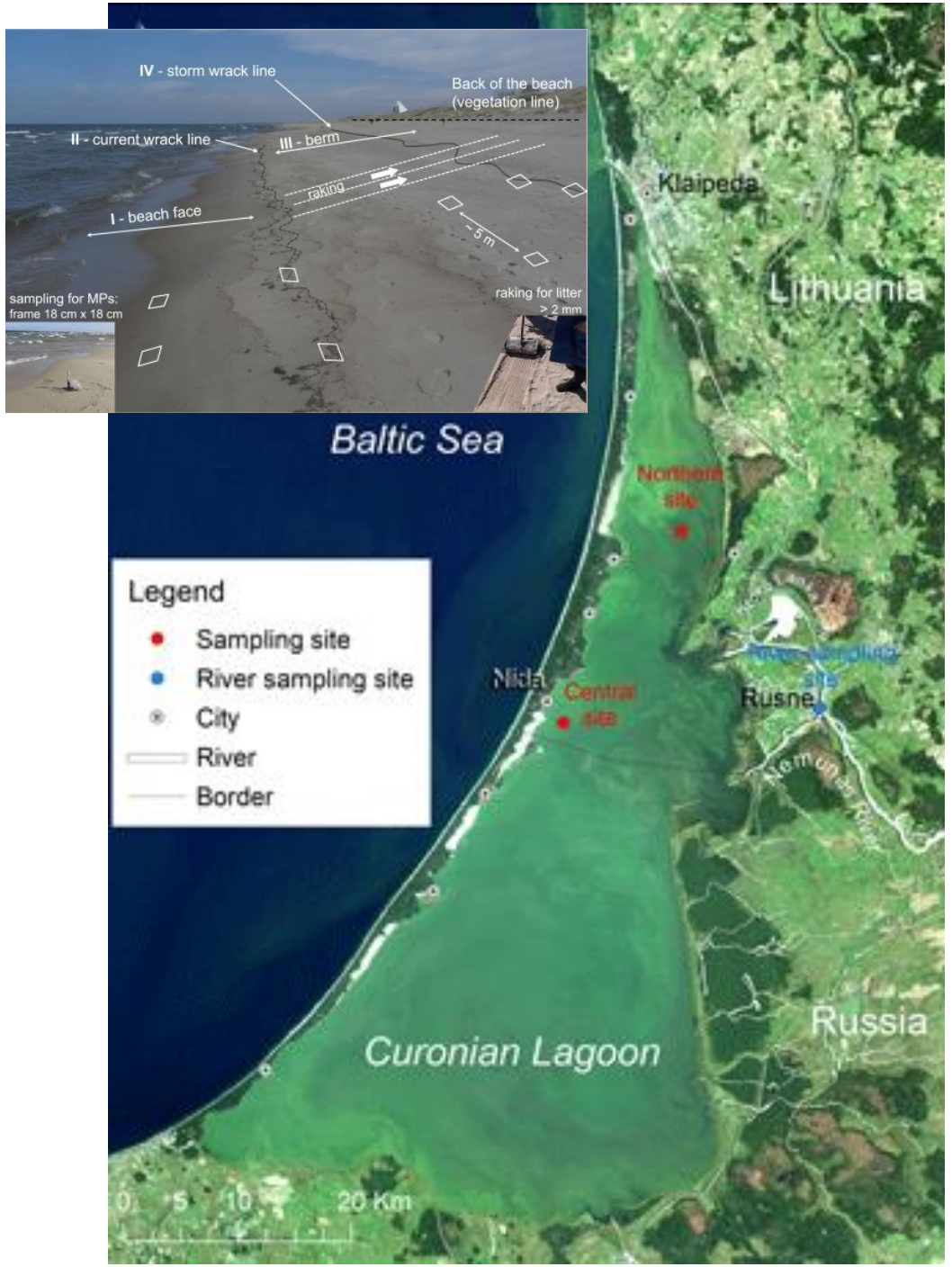
LiveLagoons

inobiostar

InnoAerogel
Oil spill sorbent

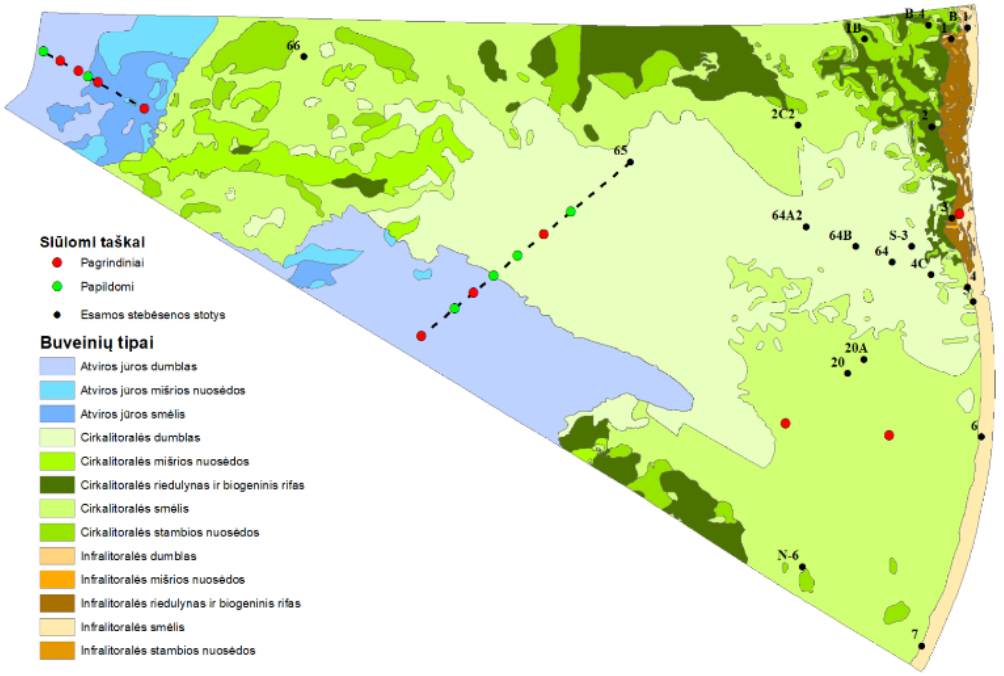
MODERN METHODS FOR ENVIRONMENTAL MONITORING

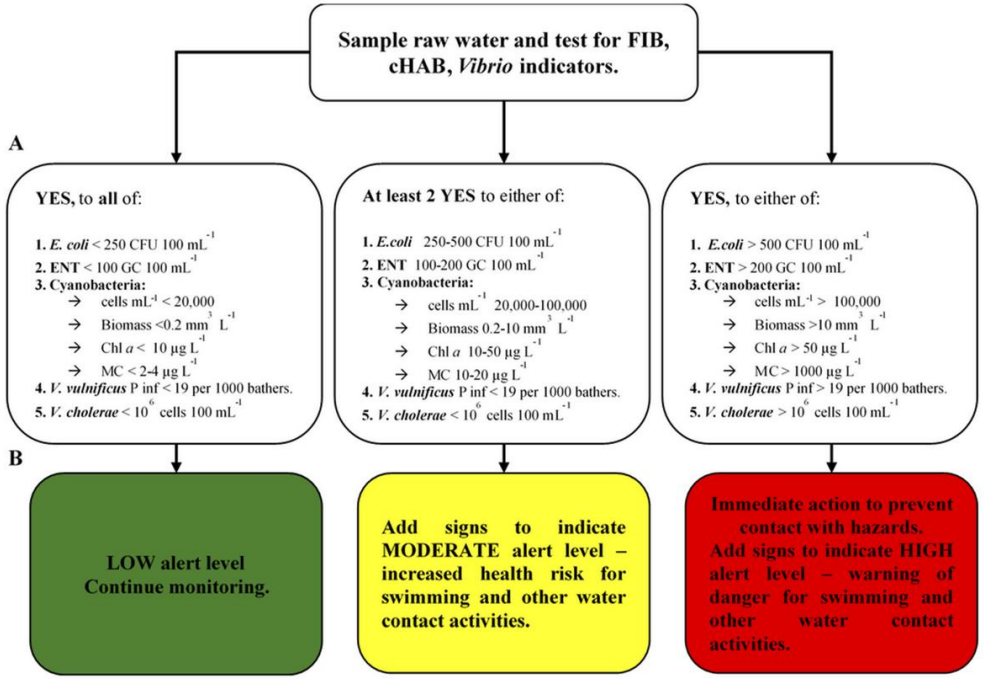
- **analysis of satellite data**, aerial vehicles, underwater video and acoustic technologies
- development of **operational and integrated water quality assessment** service combining in situ, space-borne and air-borne imagery
- assessment of environmental vulnerability, sensitivity and risk in the context of climate change or human activities using **multi-criteria decision-making methods**



COASTAL AND MARINE MANAGEMENT, MARINE POLICY

- scientific background for **spatial planning** of marine and coastal areas, selecting suitable places for human activities and protected areas
- **ecological status assessment** for implementation of the Marine Strategy Framework Directive
- **nature-based long-term management and planning solutions** for the sustainable coastal development
- **plastic litter** detection, monitoring and management in marine and coastal environment
- **bathing water quality** assessment, detection potential sources of pollution and human pathogens (e.g. *Vibrio*); algorithms for decision making





Interreg Latvija–Lietuva
European Regional Development Fund
EUROPEAN UNION
ESMIC
Climate Change Management Through Mitigation And Adaptation
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AdapTM
biodiversa
BALTVIB 2021-2024

SUSTAINABLE MANAGEMENT OF MARINE BIORESOURCES, AQUACULTURE AND BLUE BIOTECHNOLOGY

Recommendations for sustainable use and management of aquatic living resources, based on:

- monitoring of the fishery resources at the Lithuanian cost
- analysis and forecast of fish population dynamics

Innovative solutions for marine recirculated aquaculture systems: fish and shrimp aquaculture, aquaponics, use of geothermal water, probiotics etc. – to reduce human pressure on the marine ecosystems

RETROUT InnoAquaTech Interreg South Baltic EUROPEAN UNION aqua VIP

THANK YOU!