

POSTER EXHIBITION

This exhibition presents the results and highlights of different transnational projects that have contributed to the development of the smart water sector in the Baltic Sea Region.

BSR WATER platform throughout its duration has cooperated with a variety of water-related projects developing innovative and efficient solutions and producing recommendations. The most active cooperation partners have kindly contributed with their posters – get to know them in this gallery!



CWPharma

Clear Waters from Pharmaceuticals

CWPharma aims

Our aim was to produce tools, training and recommendations on feasible and sustainable ways to decrease the emissions of active pharmaceutical ingredients (API) to the environment.

Key findings:

- APIs were screened in six river basin districts in the Baltic Sea region. Twelve out of 75 studied pharmaceuticals were identified as a risk to the environment.
- Wastewater treatment and collection and disposal of pharmaceutical waste should be improved to decrease the API emissions.
- Both technical and upstream measures are needed to avoid the environmental risks. CWPharma recommended several actions to decrease the emissions.

Baltic Pharma Load Model

Instead of expensive monitoring campaigns, simulating the API emissions could be a cost-efficient approach to identify the areas where potential screening and monitoring campaigns should be focused.

To estimate where the highest API loads originate from and where are the potential concentration hotspots, CWPharma developed a new calculation model, Baltic Pharma Load Model.

The driving parameter in the model is API sales as suggested e.g. by the European Medicines Agency. The model also takes into account several dissipation processes, such as metabolism, removal at wastewater treatment plants, and degradation in the environment.

Guideline for Advanced API Removal

Advanced wastewater treatment technologies, like ozonation and activated carbon, are needed to decrease the emissions of more persistent and ecotoxic chemical compounds such as active pharmaceutical ingredients. CWPharma produced a guideline on how to plan, start and operate advanced wastewater treatment technologies. The guideline is used in the CWPharma 2 extension stage project.

CWPharma website: www.cwpharma.fi/en-US



MORPHEUS



Model Areas for Removal of Pharmaceutical Substances in the South Baltic

Reducing and removing pharmaceuticals in the environment

The background to MORPHEUS project is the constant release of pharmaceuticals and other micropollutants via wastewater treatment plants (WWTPs).

The project combines information on upstream pharmaceuticals consumption patterns with estimates of the downstream pharmaceuticals discharge from a selected WWTPs located in the 4 model coastal regions:

- Skåne (Sweden)
- Mecklenburg (Germany)
- Klaipėda (Lithuania)
- Pomerania (Poland).

During the project, the pharmaceutical burden in these regions was assessed and combine with an inventory of existing WWTPs' technologies.

Obtained data allowed MORPHEUS to map the quality of the wastewater treatment in the different WWTPs and the left-over pharmaceutical substances flushed into the Baltic Sea.

Road maps for upgrading existing technologies to advanced wastewater treatment technologies were established as well as training courses on pharmaceutical analysis and advanced treatment technologies for target groups.

As basic understanding of the need of treatment of pharmaceuticals at certain selected sites in the regions was outlined, MORPHEUS provides not only the recommendations for future investments in wastewater technology, but also raises awareness among citizens.

Website: www.morpheus-project.eu

Contact: Prof. Erland Björklund, Kristianstad University, Sweden (erland.bjorklund@hkr.se)

Funding: Interreg South Baltic Programme

Budget: EUR 1.6 mln

Duration: January 2017 – December 2019



FanpLESStic-sea

Initiatives to remove microplastic before they enter the sea

Microplastic have been found in the most remote areas of the Baltic Sea as well as in drinking water, but the real extent and consequences of the problem is unknown. There are several challenges the FanpLESStic-sea project addresses:

- Lack of common understanding of the extent and characteristics of microplastic pollution;
- Lack of effective up-stream technologies to remove microplastic from different sources;
- Lack of incentive among the stakeholders in the water chain to implement removal technologies that would have a true effect on microplastic pollution.

Report on existing research and policies

Is a comprehensive report based on the inputs from each partner on existing and ongoing microplastic related research reports, initiatives and policies in each partner country, on the EU level and globally. The document prepared in 2 versions: full and brief and was translated into several languages.

Mapping flows and pathways

The collecting the data on microplastic sources and releases. An important feature is the methodic used ensure the comparable data obtaining. More than 45 samples was taken from different sources and processed.

Microplastic removal technologies

Review and evaluation of exciting technologies to remove microplastic. Studying efficiency of different pilot solutions by microplastic removal from waste, storm and melt waters.



Website:

www.swedenwaterresearch.se/en/projekt/fanplesstic-2

Funding: Interreg. Baltic Sea region

Budget: EUR 2.97 million

Duration: January 2019 – December 2021

Lead partner: Sweden Water Research (SWR)



NonHazCity

Innovative management solutions for minimizing emissions of hazardous substances from urban areas in the Baltic Sea Region

The NonHazCity project's phase 1 (2016 – 2019) and phase 2 (2019 – 2021) aimed to demonstrate possibilities to reduce emissions of hazardous substances to the Baltic Sea at the source.

The main focus of the project was on emissions from small scale emitters in urban areas e.g. private households, municipal entities, and businesses. The activities of the project included contributing to the development of Chemicals Action Plans for cities, information campaigns and trainings for different stakeholders including raising awareness of the inhabitants of the partner cities.

NonHazCity has reached more than 15 000 inhabitants face-to-face in its events and almost 1 000 000 persons by its social media campaigns.

Reducing hazardous substances

- GPP & chemicals smart procurement and integrating chemicals risk management into environmental management standards and systems
- Systematizing training of staff in public sector: e-learning course for municipality procurement specialists- training.nonhazcity.eu
- Covering the topic of plastics as vector for hazardous substances, which has recently gained new impetus through the EU plastics strategy and work on the circular economy
- Empowering a larger amounts of private consumers & businesses to reduce their consumption of products containing HS

You can detox your household with help of this guide

[DIY GUIDEBOOK: DETOX YOUR HOME](#)

Website: thinkbefore.eu/en

Contact: Heidrun Fammler, Baltic Environmental Forum

Funding: Interreg Baltic Sea Region Programme

Total budget: EUR 4.6 million

Duration: 2016 – 2021



Extreme Weather Layer

BSR NOAH tool for holistic urban planning

What is it?

As climate change increases extreme weather events, effective stormwater management plays a key role especially in densely populated areas. In the BSR NOAH project, a tool, the Extreme Weather Layer (EWL), has been created for spatial planning and flood risk mitigation in urban areas.

The tool is built based on the model of an existing stormwater system and is a combination of hydraulic modeling, different climate scenarios and other urban planning datasets.

The EWL can be used to simulate a stormwater system's response to extreme weather events based on different climate change scenarios.

Benefits of the tool

The EWL tool allows users such as urban planners to apply an additional layer to an existing map and identify the areas with the highest flood risks in the present and future. The flood risks are displayed on the map (either 2D or 3D) in traffic light colors from low risk to high risk.

The EWL helps experts to prepare for future challenges in the field of water management and to develop the climate-resilience in urban areas. With the assistance of the new planning layer, the most suitable solutions for flood mitigation can be implemented in the areas with the highest flood risk. Further, the effects of the solutions can be analyzed – how the new developments change the flooding risks in the selected area.

BSR NOAH

Protecting the Baltic Sea from untreated wastewater spillages during flood events in urban areas

Duration: 1/2019 – 12/2021

Financier: Interreg Baltic Sea Region

Partnership: 6 countries, 18 institutions

 sub.samk.fi/noah

   @bsrnoah



RAINMAN

Towards higher adaptive capacity in urban water management

Towards higher adaptive capacity in urban water management

The international project within the South-East Finland – Russia Cross-border Cooperation Programme 2014-2020 was launched on January 1st, 2019 and will last 3 years.

The Project aims to derive detailed information on the current and future climatic status of St.Petersburg, Helsinki, Mikkeli and Lahti up to 2050 and on climate changes that may negatively affect the freshwater resources quality. Thus, experts will develop general recommendations for adaptive stormwater runoff management to mitigate negative impact on the environment.

The Russian Federation is represented in the project by SUE “Vodokanal of St.Petersburg”, Voeikov Main Geophysical Observatory and GBU “State Hydrological Institute”

Outputs

Over the past 2 years, measurements of the wastewater flows parameters in sewer networks in locations subject to flooding during the period of intense atmospheric precipitation have been carried out. Hydraulic modeling was performed, and scientific conclusions were prepared based on the obtained data.

For example, for a historically built-up areas, where conditions for the large-diameter pipes reconstruction are very cramped, a number of measures will be recommended to prevent flooding, such as replacing the asphalt pavement with paving stones, so that stormwater would effectively permeate into the soil, preventing overflow of sewer systems and surface.

Expected outcome

The RAINMAN KS - 1038 Project participants’ research results will be included in the list of measures for elaboration of sectoral, regional and corporate Plans of the Ministry of Economic Development of the Russian Federation for the adaptation of engineering networks and structures to climate change, including an increase in the amount of off-nominal atmospheric precipitation.

Website: projects.gtk.fi/rainman/index.html





PLATFORM
BSR WATER

Interreg
Baltic Sea Region



WISA Water Innovation System Amplifier

In the 3-year project WISA, the aim is to develop and test new technologies to reduce pollution by stormwater from ports and other large hard surfaces. The handling of pollutants in stormwater is a challenge for ports. Active environmental work is in progress, and there is an increasing demand to reduce pollutants that end up in the stormwater.

In the innovation work in the project, collaboration with various companies and researchers is key to solving the stormwater challenges. Krinova plays a coordinating role in the project linked to e.g. the WISA testbed. This project will use the water testbed WISA, where the concept is to use the existing infrastructure of e.g. the Port of Åhus as a “real life” test environment. The port in Gdynia, Poland is also taking part in the project together with the respective port’s local university.

Partners:

Krinova Incubator & Science Park, Sweden
The Port of Åhus, Sweden
Klaipeda University, Lithuania
Gdansk University of Technology, Poland
Port of Gdynia Authority S.A, Poland

Website:

www.krinova.se/en/project/wisa

Contact: Project manager Jan Persson,
Krinova Incubator & Science Park, Sweden
(jan@krinova.se)

Funding: Interreg South Baltic Programme

Budget: EUR 1.8 million

Duration: June 2019 – May 2022



WATERCHAIN

Recovering the Baltic Sea by reducing harmful inflows of nutrients and hazardous substances

The WaterChain project aimed to reduce the inflows of nutrients and hazardous substances ending up in the Baltic Sea by two approaches:

- Raising awareness of the effects of everyday actions on the Baltics Sea and introducing various means to reduce the chemical and nutrient load.
- Reducing the inflow of nutrients and hazardous substances by utilizing environmental technology.

During WaterChain project various methods were jointly piloted with different partners in the Central Baltic area, including 4 pilots in Finland and 2 in Latvia. Activities to reduce the inflows into the watershed were initiated with a pilot in Swedish and Estonian pilot watersheds. The last pilot was carried out in a laboratory.

Recovering the Baltic Sea by reducing harmful inflows

The technological methods used to reduce the inflow of nutrients and hazardous substances from inland waters were implemented during the project in participating countries as pilot investments. Crucial hotspot areas for nutrient loading were identified in pilot watersheds.

The project compiled best practices for the common regional challenge of the nutrient and hazardous substances load in the Baltic Sea. Both technological measures and the approaches for awareness raising are presented for both practitioners and policy makers.

Website: waterchain.eu

Contact: Merja Ahonen, Satakunta University of Applied Sciences, Finland

Funding: Interreg Central Baltic Programme

Budget: EUR 2.5 million

Duration: October 2015 – September 2018



Beach Wrack Management

Conversion of a Nuisance to a Resource and Asset (CONTRA)

Addressing the challenges

Beach wrack is often seen as waste, but it is a nutrient rich biomass that can be utilised. The sustainable removal and treatment of beach wrack can bring about a win-win-win situation, combining improvements in coastal water quality, clean & healthy beaches and blue growth opportunities.

CONTRA addressed the beach wrack valorization challenge with the knowledge that all viable beach wrack treatment options have to be able to cope with pollutants incl. litter, heavy metal contamination and a varying level of sand content.

The CONTRA initiative brought together experts from around the BSR to demonstrate treatment methods, address management obstacles and put forward [policy change recommendations](#).

Beach Wrack 'Toolkit'

The outcomes and practical findings of CONTRA have been compiled as a set of beach wrack management guidelines aimed at local authorities and policy makers. This 'Toolkit' offers practical information about beach wrack treatment options, environmental & ecological assessments, legal frameworks, value chains / markets and socio-economic impacts.

The CONTRA output reports support and strengthen both local and regional environmental policy with respect to marine resource management, nutrient cycling, pollution reduction, biodiversity and coastal protection.

All reports, including the 'Toolkit' can be found at www.beachwrack-contra.eu/publications

What next?

An international and multi-disciplinary Beach Wrack Network has now been established for further collaboration and exchange on the topic of sustainable beach wrack management. It consists of local authority representatives, coastal engineers, nature conservationists, scientists, and private companies.

More information about the Network and how to join can be found at www.eucc-d.de/beach-wrack-network.html



BONUS Return

Reducing Emissions by Turning Nutrients and Carbon into Benefits Project

Turning waste into circular solutions for the Baltic Sea

The BONUS RETURN project set out to explore the reduction of emissions to the Baltic Sea from agriculture and wastewater by turning nutrients and carbon into benefits - closing the nutrient loops and promoting circularity.

The overall aim was to improve the adaptation and adoption of agriculture and municipal wastewater ecotechnologies for capture and reuse of nutrients and carbon in the Baltic Sea Region for maximum efficiency and increased co-benefits.

The project was piloted in three case studies sites in Finland, Poland and Sweden.

BONUS RETURN reduced knowledge gaps through systematic reviews as well as modelled impacts on catchments with the SWAT tool, highlighting potential impacts on nutrient reduction from the application of ecotechnologies.

It assessed effectiveness of ecotechnologies through sustainability assessment as well as a bottom-up approach to cost-benefit analyses and supported circular innovations, uptaking pre-commercialization plans, test beds and supporting a toolbox to guide municipalities.

BONUS RETURN connected science and practice by identifying barriers and opportunities and developed tools for stakeholders that enabled knowledge co-production, cross-sectoral learning and regional collaboration.

Website: www.bonusreturn.eu

Contact: [Karina Barquet](#), Stockholm Environment Institute, Sweden

Funding: BONUS Programme

Budget: 3 million EU

Duration: May 2017 – October 2020

