

# Baltic Smart Water Hub

International platform sharing your solutions with experts in the Baltic Sea Region

Union of the Baltic Cities Sustainable Cities Commission

MARIIA ANDREEVA

BALTIC  
SMART  
WATER HUB

PLATFORM  
BSR WATER

 **Interreg**  
Baltic Sea Region

  
EUROPEAN UNION  
EUROPEAN  
REGIONAL  
DEVELOPMENT  
FUND

# BSR WATER platform aims

to enhance cross-sectoral cooperation in the water sector by providing a possibility for

- **transnational experience exchange,**
- **sharing of good practices and solutions,**
- developing regional policy recommendations for storm water management, nutrient recycling and hazardous substances

**Platform synthesizes results from seven projects:**  
IWAMA, BEST, iWater, RBR, Manure Standards,  
Village Waters, CliPLivE



## PRACTICE

# Collection and synthesis of good practices, solutions and expertise on water management

### Aim:

to gather and promote water projects' results as developed tools, tested good practices and technical solutions on the online portal **Baltic Smart Water Hub** for further uptake by the water experts in the region

### Main output:

**Baltic Smart Water Hub** with over 100 cases and innovations published

[balticwaterhub.net](https://balticwaterhub.net)

A close-up photograph of a sandy beach. In the foreground, a large question mark is drawn in the sand using a stick or finger. Below the main question mark, there is a smaller, circular mark. To the right, the ocean waves are breaking, creating white foam. The text "Are you familiar with the Baltic Smart Water Hub?" is overlaid in white, bold, sans-serif font across the center of the image.

**Are you familiar with the  
Baltic Smart Water Hub?**



**Baltic Smart Water Hub –  
online portal  
enabling exchange of  
practical experience and  
promotion of local  
achievements in the region**

International platform sharing your solutions with experts in the Baltic Sea Region



# BALTIC SMART WATER HUB

Fresh  
water  


Storm  
water  


Sea  
water  


Waste  
water  


As the majority of urban water management issues are cross-sectorial, in our city the Hub serves as an online knowledge portal to wide range of municipal specialists dealing with urban planning, environment, climate and urban infrastructure development issues.

— Nika Kotoviča, Urban Planning Expert, City of Riga, Latvia

**Explore practices, solutions, tools and innovations**

[WATER HUB](#) [BLOG](#) [RESOURCES](#) [CONTACT](#)

International platform sharing your solutions with experts in the Baltic Sea Region



## BALTIC SMART WATER HUB

Fresh  
water  


Storm  
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We hope the Smart Water Hub can be a large "neighbourhood", where we can share practices and information useful for many different actors in the field.

— Markus Raudkivi, University of Tartu

**Explore practices, solutions, tools and innovations**

Showcasing  
good practices,  
technical solutions,  
tools and  
innovations  
in four water areas

## Explore practices, solutions, tools and innovations

### Resource

- ☐ GOOD PRACTICE
- ☐ INNOVATION
- ☐ TECHNICAL SOLUTION
- ☐ TOOL

Reset options

### Sector

- ☐ WASTE WATER
- ☐ STORM WATER
- ☐ SEA WATER
- ☐ FRESH WATER

### Country

- ☐ RUSSIAN FEDERATION
- ☐ FINLAND
- ☐ GERMANY
- ☐ LATVIA
- ☐ POLAND

### Tags

- ☐ ENERGY
- ☐ SLUDGE
- ☐ PHOSPHORUS
- ☐ BIOGAS
- ☐ DRINKING WATER

Search by keyword

Apply


Reset





### Aquacare BioPhree® – Capturing phosphate through absorption

WASTE WATER INNOVATION




### Sludge recycling by hydrothermal carbonization with TerraNova® Ultra technology

WASTE WATER INNOVATION




### Rūjiņa Culture House – Dry River and Rain Gardens

STORM WATER GOOD PRACTICE



### Piloting phosphorus recovery by RAVITA process

WASTE WATER INNOVATION



### Turning wastewater into green energy at Marselisborg WWTP, Denmark

WASTE WATER GOOD PRACTICE



### Extreme Weather Layer (EWL)

STORM WATER TOOL



### Removal of microplastics and nutrients causing eutrophication

SEA WATER GOOD PRACTICE



### Modification of marine engine to DME fuel for less emission from diesel engine

SEA WATER TECHNICAL SOLUTION





## Natural treatment of storm water on a large-scale in Lahti

### Solution to which problem

Previously all storm water from the downtown area of the city of Lahti was discharged untreated to Lake Vesijärvi where it worsened the quality of water with nutrient and heavy metal loads. Suspended solids, hydrocarbons, microplastics and PAHs were also detected from the stormwater. Especially phosphorus was a problem in Vesijärvi. It was estimated that around 35 % of the external phosphorus load coming to the Enonselkä basin, adjacent to the city, originated from storm water discharge.

### Technical conditions

In order to improve the quality of water in Vesijärvi, it was decided that part of the storm water from downtown would be conveyed to another part of the city, Hennala, which is located about 3 km away. This transfer of storm water was possible due to the already existing backup/emergency sewer line. During autumn 2018 a dedicated pumping station was built for downtown storm water in another project (Hulevesien hallintaa kustannustehokkailla hybridiratkaisuilla / Storm water management via cost-effective hybrid solutions). The Hennala area, which was chosen to house the treatment system for the storm water conveyed from the city's center, is part of a recently decommissioned army garrison, slated for city planning and development in the coming years. The storm water system is located at the center of this developing area. In addition to cleaning the storm water the system will serve as a recreational area for the future residents.

The storm water treatment system consists of a sedimentation basin, biofiltration field, wetland basin and a channel, which connects them (see attached overview picture).

The core of the treatment system is the biofiltration field. It is divided into three different sections, each using a different filtration material. To prevent the cross-section movement of water, partition walls made of clay are used to separate the sections. In addition, the sections have their own under drains so that water samples



## Good Practice

### STORM WATER

### Contact information

Mr. Juhani Järveläinen

City of Lahti

[City website](#)

### Country



Finland

### Cost

122 000 EUR

- Construction and basic materials: 92 000 EUR
- Filtration materials: 30 000 EUR

### Funding

The pilot was implemented in a project "Uudet hulevesien hallinnan Smart & Clean ratkaisut (Hule S&C)", financed by the Helsinki-Uusimaa Regional Council



can be taken from the sections in order to be able to compare the treatment efficiency of the filtration materials. Filtration materials are basic filter sand (grain size 0,2 – 2 mm, used as a benchmark), expanded clay aggregate (Lecatm) and Filtralite P (a special clay aggregate, developed for phosphorus removal).

The treatment system is designed to receive runoff from a three-year, 10-minute design rainfall (intensity 160 l / s \* ha, impact of climate change is taken into account) on the Lahti city center where the storm water is directed to the treatment system.

Due to permit reasons, at least during the first years, the volume of storm water arriving to the treatment system is limited to 3 000 m<sup>3</sup> per day.

Before any storm water is directed through the treatment system, vegetation planted there needs to grow for about a year. Vegetation prevents erosion, improves the permeability of the filtration structure and makes it more efficient by absorbing nutrients.

The filtration materials for the biofiltration field were chosen based on preliminary laboratory tests carried out during the planning phase of the stormwater treatment system by the University of Helsinki as a part of the project. In the laboratory tests, the University of Helsinki tested five different filtration materials without and with plant cover on their ability to retain suspended solids, phosphorus, nitrogen and heavy metals.

Tested materials were basic filter sand, Filtralite P (a special clay aggregate, developed for phosphorus removal), expanded clay aggregate, spruce based biochar and concrete aggregate. Plant used was ribbon grass (*Phalaris arundinacea*). Storm water used in the tests was snow collected from heavy trafficked road in Lahti. It contained a lot of suspended solids (5g/l), which all tested materials retained effectively, 96-100 %. Storm water used in the test contained also a lot of phosphorus and metals, which were mainly absorbed in solid particles. 75-100 % of these were retained. Filtralite P and concrete aggregate were best in retaining liquid phosphorus. Filtering through these materials increased the pH to 12 while other materials kept the pH between 7-8. Seep water contained as much or more nitrogen than the incoming storm water thus the materials of the structure increased the amount. Plants helped retaining the nitrogen. Biochar retained nitrogen but phosphorus was leached through it.

## Implementation

The aim of the pilot in Hennala was to develop the expertise and knowledge in storm water quality management and improve the attractiveness, healthiness and safety of the urban environment. A storm water treatment system was implemented in the Hennala area in order to improve the quality of storm water created in Lahti downtown and thus prevent the storm water from polluting Lake Vesijärvi. As a solution, part of the storm water from Lahti downtown will be directed to the

## Published on

04.03.2020

## Gallery



## More Hub cases

Rüjlana Culture House – Dry River and Rain Gardens

Biofiltration in Maunulanpuisto Park in Helsinki, Finland

[Share your Good Practice](#)

## Space for networking with 24 experts providing support in the Hub

Exchange of practical experiences, promotion of local achievements and lifelong learning on the international level

### Stefan Rettig

Research fellow at the Chair of Urban Water Management, Technische Universität Berlin

Experience in implementation of research projects

- BSR WATER – Platform on Integrated Water Cooperation
- IWAMA – Interactive Water Management

Selected topics:

- Energy efficient wastewater treatment
- Online sensors for wastewater quality,
- Odour and corrosion in sewer networks,
- Optimization studies at WWTP and
- Treatment of wastewater from aquaculture

Experiences in project development in EU-Interreg and German national funding programmes.

Special focus on cooperation with partners from the Baltic Sea region incl. Belarus and Russia.

### Water Blog

#### Energy management in wastewater treatment

Energy consumption of the wastewater treatment process is an important aspect of the modern wastewater treatment plant (WWTP) management. IWAMA project developed comparative benchmark in energy management, launched self-audit tool and several investments in energy efficiency.

#### Related Hub cases

- Smart Energy Management Self Audit (SEMSA) concept and self audit tool
- Monitoring and evaluating the energy consumption of the treatment process at Daugavpils WWTP
- Energy optimized control of WWTP in Kaunas
- Decision-making tool for optimized process operation and mass flow management



#### Mr. Stefan Rettig

Technische Universität Berlin  
Chair of Urban Water Management  
Straße des 17. Juni 135  
10623 Berlin  
Germany

[Contact person by email](#)

#### Areas of expertise

Waste water



### Waste Water

Since many of the environmental problems of the Baltic Sea are connected to the inefficient treatment of sewage and sludge handling, wastewater management is a key field of interest to many actors in the region. Municipalities and their water companies are often forerunners in water protection by implementing voluntary actions in treatment of municipal wastewater and increased efficiency of nutrient removal. Leader cities will see the potential of the concept "from waste to resource" when dealing with for example sludge and manure. The Hub's section on wastewater treatment presents best practices and examples of such implemented actions.

[See all Waste water examples](#)

#### Good practices for Waste water

Good practice cases presented in the Hub illustrate processes of implementing investments, piloting or innovative solutions that certain actors have experienced and sharing of which is beneficial for Hub's target users. From a good practice description you would find who did what and why, over what period of time, what was the result, how much did it cost and where the funding came from. Additionally, good practice might elaborate on a specific setting and prerequisites of the process and influencing regulatory factors.

[See all Waste water good practices](#)

[Share a Good Practice](#)

#### Technical solutions for Waste water

Technical solutions describe specific technologies that can be used in order to improve certain process or solve a specific problem. Technical solution is usually offered by a supplier, and you can learn about how exactly it functions, what prerequisites are needed, approximate cost. Brief examples of where it has been implemented and with what results can be found from a solution's description, or elaborated in more details as a good practice.

[See all Waste water technical solutions](#)

[Share a Technical solution](#)

#### Tools for Waste water



### Expert of the WASTE WATER



#### Marzena Smol

Mineral and Energy Economy  
Research Institute, Polish Academy  
of Sciences

Poland

[Profile of the expert](#)

#### Related Good practices

Construction of Molodezhnoye WWTP with modern membrane wastewater treatment technologies

Upgrade and extension of Warsaw WWTP, Poland

#### Related Tools

Training Materials Package for wastewater treatment

Smart Sludge Management Audit (SSMA)



## Blog

Topical regional challenges, questions and comments from experts in the water sector. Share your thoughts through the Water Blog!

**Send us your articles via [info\(at\)balticwaterhub.net](mailto:info(at)balticwaterhub.net):** posts are free-form and relatively short (max. 400 words), they can include links and pictures. If you are writing to our Blog for the first time, please add a bit of info about you so that our readers can get to know you better!

### Water issues: involvement and conscious attitude

If you only notice the quality of water when it flows from your tap, then you definitely do not deal with the management of water resources. However, everyone is involved in this process, and awareness in water issues should be part of the culture for the efforts of experts to gain success and effectiveness, and for consumers to receive high-quality drinking water and a favorable environment.

[Read more: Water issues: involvement and conscious attitude »](#)

## The Baltic Sea region as a forerunner in innovative water solutions

The long-term regional cooperation of the Baltic Sea countries is one of the best examples of coordinated environmental work in the world, and actions to prevent and remediate negative impacts are on the forefront of our cooperation. This has enabled our region to also become a forefront of scientific innovation, especially in the water and wastewater sector.

[Read more: The Baltic Sea region as a forerunner in innovative water solutions »](#)

### Cooperation with water users in the industrial wastewater treatment

It is a common challenge in the whole Baltic Sea Region that municipal wastewater treatment plants, constructed for processing wastewater from households, take a huge load from industries. How to solve it? Through cooperation!

[Read more: Cooperation with water users in the industrial wastewater treatment »](#)

Topical regional challenges, questions and comments from the experts in the water sector

## HUB

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## RESOURCES

## Networks

Familiarize yourself with various networks, organisations and initiatives functioning in the Baltic Sea Region, as well as Europe- and world-wide with the aim to improve the water sector. Listed entities actively work on improving the state of the water and engage in transnational cooperation.

[Browse Networks](#)

## Funding

Consult on different funding programmes operating in the countries of the Baltic Sea Region. Most of the funding sources, which are provided as examples on this page, have been applied in the good practices showcased in the Hub. The funding overview can give an idea on the funding sources existing in the region, availability of funding for specific project scopes.

[Browse Funding](#)

## Policy Framework

Find regional recommendations, as well as relevant EU- level directives and legislative acts that regulate and influence the water management sector in the Baltic Sea Region.

[Browse Policy Frameworks](#)

Informing about the existing funding instruments, regional policy framework and potential networking associates

## Events

[Suggest your own event](#)

September 2021

[◀ Prev](#)   [Next ▶](#)

	Mo	Tu	We	Th	Fr	Sa	Su
	30	31	1	2	3	4	5
	6	7	8	9	10	11	12
13	14	15	16	17	18	19	
	20	21	22	23	24	25	26
	27	28	29	30	1	2	3
12th ELUSOR Annual Forum 27.09.2021 - 01.10.2021 - 01.10.2021 - 01.10.							

# Water Hub development through the BSR WATER



# Improved layout and usability



SHARE   

## Reducing P-discharge to the Gulf of Riga from local WWTP

### Good practice (name)

Reducing P-discharge to the Gulf of Riga from local WWTP

### Solution to which problem

Eutrophication caused by intensive P-discharge and sludge washouts

### Implementation period

2010-2012

### Funding source

EU Interreg Baltic Sea Region Programme 2007-2013 (ERDF + own co-funding), in the framework of PURE project

### Technical conditions of the site where implemented

WWTP of 1 000 000 PE, using mechanical and biological treatment, and generating about 7 000 tonnes of sewage sludge produced annually

The treatment process of mechanical filtration through screens, sand sedimentation, mechanical treatment in radial sedimentation pools that have a volume of 14 000 m<sup>3</sup>. Biological treatment based on an anaerobic-aerobic treatment chain, afterwards directed into secondary sedimentation ponds.

### Summary

Purchasing and installing the equipment.

Storage and dosing tanks for phosphorus precipitation chemical to improve the phosphorus removal efficiency; additional precipitation tank was purchased and installed by funding from John Nurminen Foundation in 2012-2013 to allow both pre- and simultaneous precipitation of P;

Magnetic flow meters to provide exact waste water flow measurements needed in steering of the process;

### Related materials

-  Other similar investments
-  Other solutions in P reduction
-  Other practices done by the company
-  Technical solution for this good practice

### Contact information

-  UBC SCC  
Lead Partner of the project
-  Riga Water Company
-  SIA Inducent (energy meters)

← 2017  
→ 2021

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Fresh  
water  


Storm  
water  

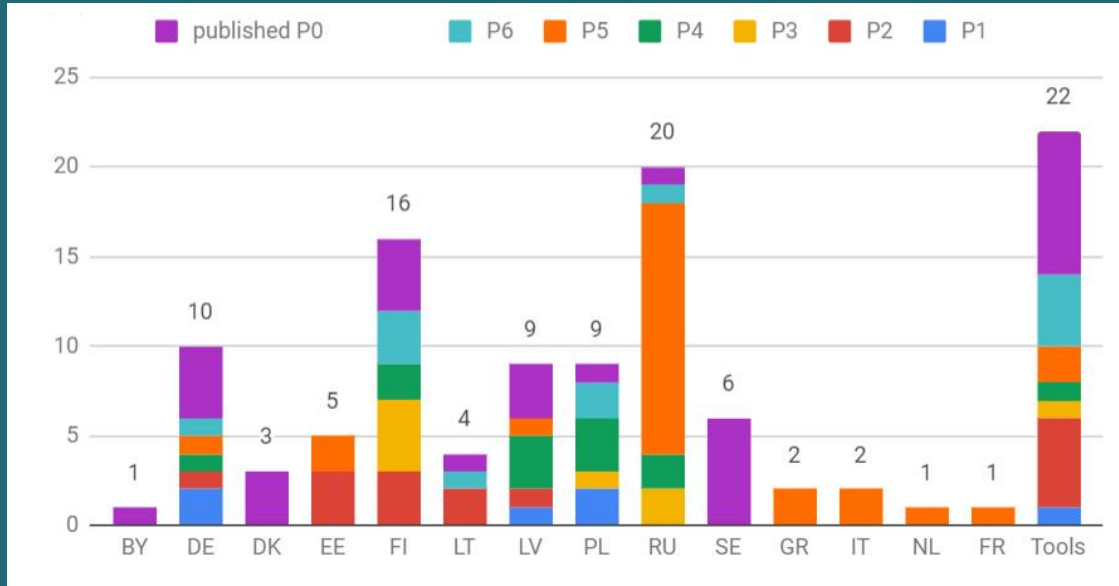

Sea  
water  


Waste  
water  


We hope the Smart Water Hub can be a large "neighbourhood", where we can share practices and information useful for many different actors in the field.

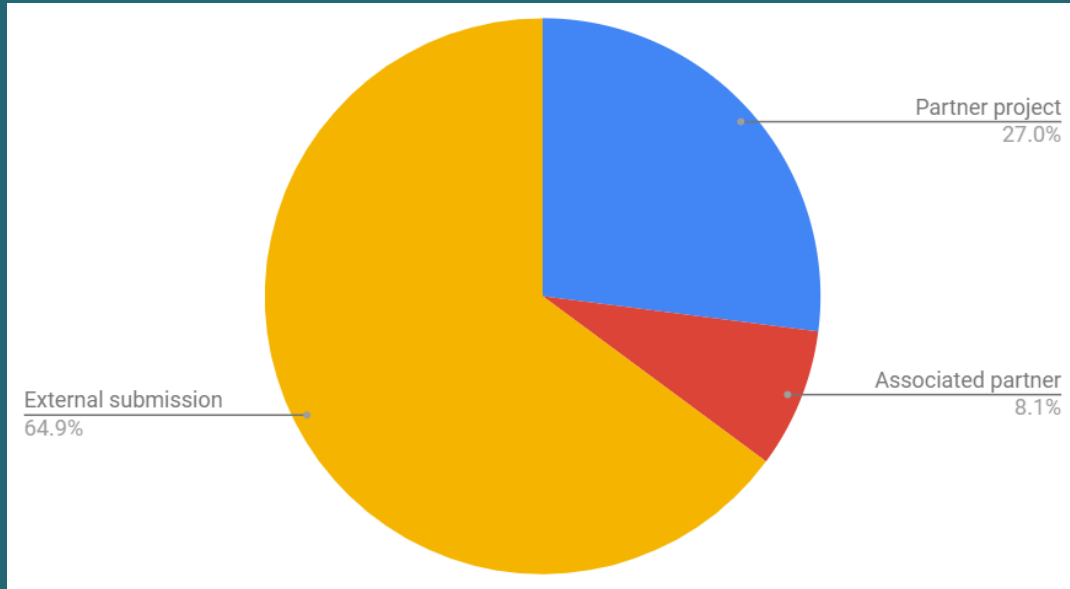
— Markus Raudkivi, University of Tartu

# Collected examples of smart operation

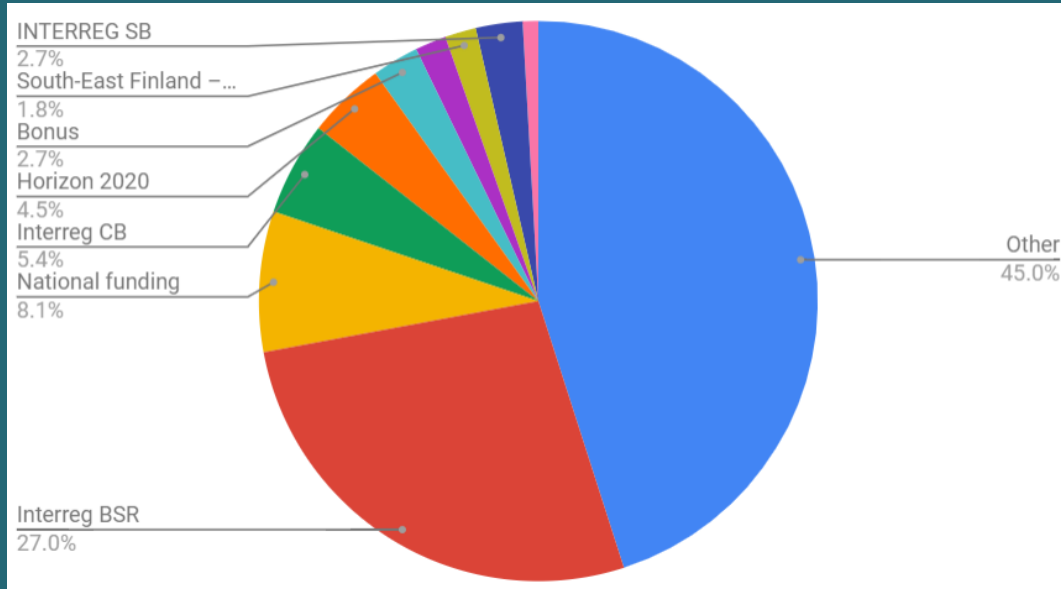




# Collected examples of smart operation



# Involving over 15 transnational projects and showcasing different funding sources



The platform integrates results of other projects funded through different EU funding instruments

# For you as a Hub user:

- Inspiration and knowledge from the Baltic Sea Region
- Both small- and large-scale investments; from infrastructure to stakeholder involvement
- Wider outreach and promotion of your organizations' qualifications and excellence
- Promotion of your solutions at international events and webinars (regional conferences and fora, webinars)
- International expert network – discuss, cooperate, co-create!

The cooperation doesn't stop here –

**We welcome you to  
submit cases to the Hub  
and promote your  
expertise in the region!**

**[www.balticwaterhub.net](http://www.balticwaterhub.net)**



# Thank you!

## CONTACT

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**Stefan Rettig**  
balticwaterhub.net/expert/stefan-rettig

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