

Visualization of the results

Output 4.2 of Interreg Baltic Sea Region project NOAH

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





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Introduction

The NOAH project aims to protect the Baltic Sea from untreated wastewater spillages during flood events in urban areas. For this purpose, actions such as holistic urban planning and real-time control of urban drainage systems are carried out. The project focuses on developing tools that can be widely shared and used in the Baltic Sea region. To reach the experts of the field, the general public and other stakeholders, the project puts special effort on raising stakeholder awareness in various ways.

The aim of the work package 4 (WP4) is to

- 1) increase the capacity of the project partners with the results gained in the NOAH pilot areas,
- 2) validate and generalize the project results from the measures carried out within WP2 and WP3 for reducing urban runoff-driven water quality impairments,
- 3) deliver the results outside the project partnership.

The activity and output 4.2 *Visualization of the results* focuses on delivering clear-cut material of the project pilot activities, which can be used to share the information on the project outcomes to stakeholders. By visualizing the project results in an easy-to-comprehend manner, sharing information among groups of interest is fluent and effective.

This report describes the planning, data collection, processing and material creation of the visualization activity. The output supports not only the project work and aims of WP4 but also the project communication activities in WP5.

At the end of the project, the report will be included in the NOAH handbook (A4.3), which describes the NOAH concept and is used to strengthen the capacity building and transnational value of the project.

This report was compiled in project period 5, in June 2021 (the activity was extended due to the project prolongation resulting from the COVID-19 pandemic).

1 Overview of the activity

Pollution events related to urban drainage system overflows are commonly hard to perceive, they happen as a series of reactions starting from an extreme weather event (intense rainfall or water level rise) and ending as untreated wastewater spillages to receiving waters. The measures applied in the NOAH project, enhanced spatial planning and monitoring of stormwaters, aim to mitigate the impact of extreme weather events in urban areas.

The activity *4.2 Visualization of the results* was created to produce illustrative, attractive material of the measures taken in NOAH pilot areas in selected pilot sites in five countries of the Baltic Sea region. The activity was led by the Satakunta University of Applied Sciences (SAMK), responsible partner for project communication. However, the entire partnership was widely involved in the activity:

- 1) project municipalities and water utilities ensured to provide information, images and videos of the pilot sites and installations,
- 2) academies provided the technical images, such as stormwater management models and NOAH Extreme Weather Layer images,
- 3) lead partner and umbrella organizations revised the process and the results.

The output 4.2 focuses on presenting the achieved results and to communicate the positive effect of NOAH to the stakeholders inside and outside the project community. The output was designed to complement the detailed technical documents produced during the project lifespan, e.g. reports on stormwater management installations, climate scenarios, modeling, water quality sampling, implementation of the NOAH planning tool etc. As a comparison to these reports, the target audience of the visualization of the results is the general public – for this reason the aim was to present the project results in a distinct and comprehensible manner.

The output consists of altogether eight 5-minute videos presenting the activities in each NOAH pilot site, and a set of one-page leaflets summarizing the relevant information of the sites. The output strongly supports the general project communication activities and the aims of capacity building in the Baltic Sea region.

2 Planning and material collection

The first written plan for the activity was created in May 2020, corresponding the description of the activity and the output 4.2 as given in the project application. However, the plan, aiming to depict e.g. “extensive run-off in urban drainage system with high water levels colored on the bases of different contamination levels before and after applying solutions created in NOAH” or “presentation of excessive rainwater flowing on the ground into the pipeline of combined sewer system and causing untreated wastewater spillages to the BS” was soon found problematic – the water quality data collected in the project was not sufficient for an encompassing presentation to be made from this perspective.

After careful considerations and negotiations, the plan was modified and improved and the focus was shifted towards depicting the flood risks of the pilot areas, the improvements planned and executed by the project as well as the new planning tools created for estimating flood volume, duration etc. in urban areas that suffer from flooding.

Regarding the material to be produced, it was decided that each NOAH pilot site, with site characteristics, water management installations, modeling and planning tools, would be presented in video format. SAMK as the partner leading the activity made preparatory arrangements and data collection to travel to the pilot sites for filming and photographing. However, due to the COVID-19 pandemic, the trips had to be postponed and eventually cancelled.

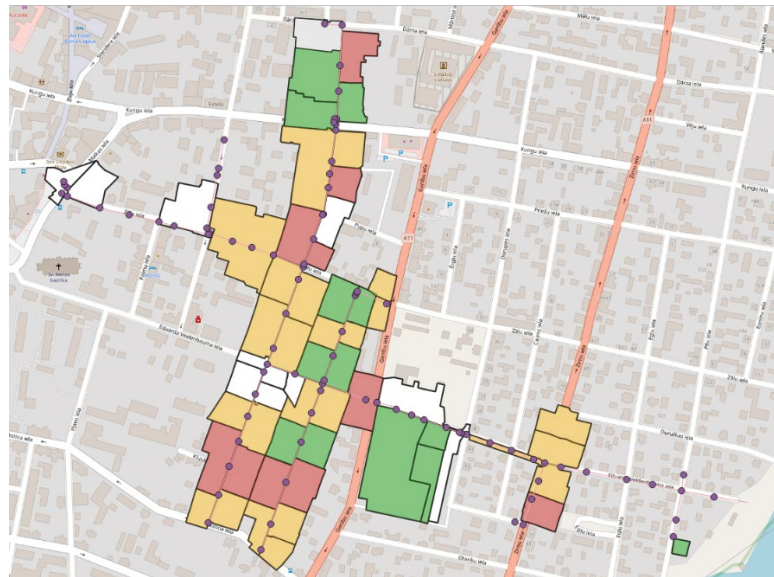
Due to the changes in travels, also the project workshop 4, which was planned to be organized in Riga, Latvia, to discuss and assess the project visualization, was cancelled.

Taken the circumstances into account, the action plan was revised, and the renewed plan was finalized in February 2021. As a result, the documenting of the pilot sites and the installations had to be transferred to local NOAH partners working with the sites. SAMK composed detailed email requests to collect the material needed for the output:

- images and videos of pilot sites and water management installations from pilot municipalities of the project (example in Picture 1),
- stormwater management models and NOAH Extreme Weather Layer simulation images from the technical universities of the project (example in Picture 2).



Picture 1. Water level sensor installation in Liepaja, Latvia.



Picture 2. Extreme Weather Layer (EWL) map image of a selected area in Liepaja city center, displaying the flood risks within a moderate climate change scenario.

In addition to collecting the visual material, plenty of detailed information regarding the sites needed to be collected by SAMK, both from local partners in pilot areas as well as from reports already published in the project. Getting to know the areas and installations, without visiting them, required time and effort.

With the renewed plan of the activity, the collected material was analyzed and sorted together with the essential information to compose a set of visualization material for each pilot site.

3 Composition of the output

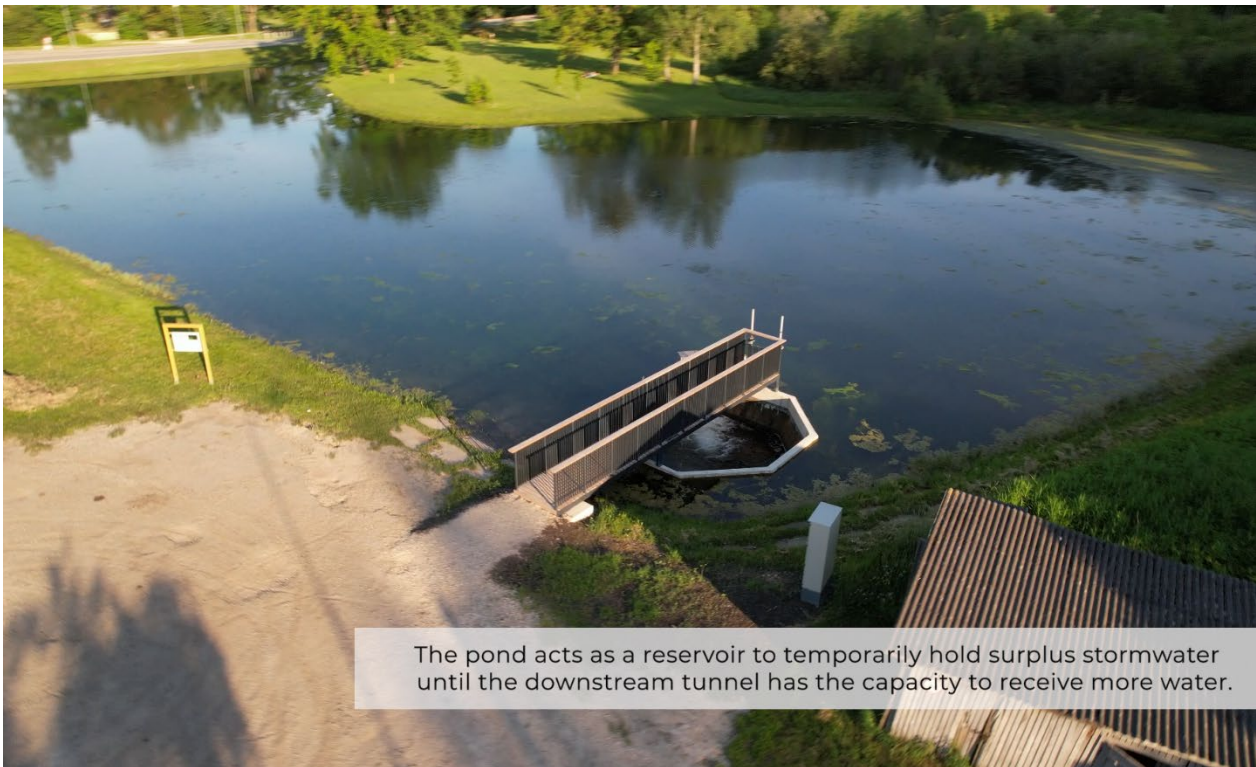
Already in an early phase of the planning of the activity, it was decided that the visualization of the results for each NOAH pilot site will be implemented in video format. In addition to the video presentations, an A4-sized leaflet was composed for each pilot site, giving the essential information in a summarized format.

3.1 Visualization videos

According to the modified and accepted plan that SAMK as the activity lead presented, videos of all project pilot sites were created. Although the content of the videos differs in terms of the characteristics of the pilot site and the installations etc., all the videos follow the same basic structure – it makes it easier for the viewers to grasp the information given, but also to notice the differences between the sites.

The videos consist of the following sections:

- 1) a general presentation of the current impacts of climate change and extreme weather events,
- 2) a presentation of the NOAH framework, i.e. planning and data analysis, introducing the pilot site in general, stormwater measurements and sampling and the created stormwater management model of the area,
- 3) an introduction of the NOAH actions in the pilot site, i.e. the stormwater management improvements performed as installations in the selected area (example in Picture 3),
- 4) an overview of the NOAH tool, i.e. the tool created for holistic planning in the field of stormwater management, explaining the use and benefits of the NOAH Extreme Weather Tool (EWL) in detail,
- 5) a summary of the NOAH impact, i.e. the aims and actions performed for a cleaner Baltic Sea, a synergy of mitigating the effects of extreme weather events by decreasing flood risks in urban areas with targeted measures and efficient spatial planning.



Picture 3. Screenshot of the visualization video for Rakvere, Estonia, showing the finalized weirwall installation in the pilot site.

As stated in the introduction of this report, the target audience of the visualization videos are the stakeholders inside and outside the project community, especially the groups that wish to see presentations of the NOAH project results on a general level. The aim was to create content that suits a wide range of target groups, from experts of the field all the way to local residents of the pilot municipalities.

The videos are published on YouTube, the links can be found in the Appendix of this report.

3.2 Leaflets

In addition to the videos, A4-sized leaflets were created for all NOAH pilot sites. The aim was to present the essential information summarized in written format with a few pictures (example in Picture 4). As the videos, the leaflets share a basic structure. The brief sections consist of:

- 1) pilot site name and country, project logo and duration,
- 2) basic information of the pilot site and challenges regarding flood control,
- 3) NOAH actions in the site,
- 4) NOAH impact,
- 5) links to project website and social media channels.

In addition to the pilot site leaflets, a one-page description was created about the NOAH Extreme Weather Layer (EWL) tool, as well. All leaflets can easily be shared both as printed and digital version, and together with the videos form a coherent entity giving plenty of information of an individual pilot site.

NOAH project pilot site

OGRE LATVIA

BSR NOAH: January 2019 - December 2021



ABOUT THE PILOT SITE

- OGRE is a town located in central Latvia, about 50km from the Baltic Sea coastline
- Separate sewage and stormwater systems

CHALLENGES

- The pilot area has been selected due to its major river flood problem and estimated future challenges caused by climate change.
- The Loka street area's surface water run-off drains into the OGRE river through open ditches. When the river's water level rises e.g. due to ice blockages in the spring, the stormwater outlet gets blocked, resulting in flooding.

NOAH ACTIONS

A Stormwater Management Model (SWMM) of the OGRE pilot area was created to estimate the amount of urban run-off. In addition, water flow measurements and sampling were carried out.

Automatic Hydrological Stations (AHS) were installed in three different locations in OGRE. The stations consist of:

- mobile multiparameter probes
- water flow meters
- water level sensors

The data gathered about the OGRE river through the automatic hydrological stations can be used as an **alarm system** that alerts about flood threats. With the help of the AHS, e.g. water level and water flow in the river can be monitored in real-time.

The Extreme Weather Layer (EWL) is a new tool created in the NOAH project and is used for planning in the town of OGRE. The tool assists in spatial planning and flood risk prediction in urban areas.



NOAH IMPACT

- With NOAH actions, financial damages can be reduced, and flood risks mitigated.
- Consequently, wastewater spillages and overflows are reduced, resulting in less pollutants and excessive nutrients flowing to the Baltic Sea.



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Picture 4. Leaflet of the OGRE pilot site.

4 Summary of the activity

The aim of the output 4.2 *Visualization of the results* was to form an illustrative entity of material depicting the positive effects of NOAH activities in project pilot sites.

The activity and the final content of the output underwent some changes along the way due to the nature of the results accumulated in the project and due to the restrictions caused by the COVID-19 pandemic. The changes required flexibility and an innovative approach from the partners working with the output. All in all, fluent cooperation via online tools eventually played a significant role in the planning and preparation of the output.

The challenge with composing the presentations mostly dealt with the selection of material – what to choose and what to leave out to give enough, but not an overload of information. Lots of effort was put in creating the “prototype”, the basic structure which then was utilized in all of the videos. Regular contact with the partners in the pilot municipalities, as well as academies of the project, was essential for a successful visualization process.

The output, i.e. the material produced as a result of the activity 4.2, will be used as an input for building the capacity of public authorities involved in the NOAH project, delivering results through trainings and seminars, and to communicate the positive effect of the project throughout the Baltic Sea region.

Appendix

BSR NOAH results – Haapsalu, Estonia: <https://www.youtube.com/watch?v=pcs-0aUQ3e8>

BSR NOAH results – Rakvere, Estonia: <https://www.youtube.com/watch?v=M3M7fdicIE0>

BSR NOAH results – Jurmala, Latvia: https://www.youtube.com/watch?v=Dj7Tw_sjrGk

BSR NOAH results – Ogre, Latvia: https://www.youtube.com/watch?v=uuF3_vlniQM

BSR NOAH results – Liepaja, Latvia: <https://www.youtube.com/watch?v=9JfaEGY5Rag>

BSR NOAH results – Slupsk, Poland: https://www.youtube.com/watch?v=x3C_VMYdqko

BSR NOAH results – Söderhamn, Sweden: <https://www.youtube.com/watch?v=aq8SnNewbmQ>

BSR NOAH results – Pori, Finland: <https://www.youtube.com/watch?v=egzmUe9FGus>