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***Multidimensional storm
water treatment in urban
areas for cleaner Baltic Sea***

*Introduction to Multidimensionality
of Nature-Based Stormwater
Treatment Solutions*

2024-03-06, Tallinn

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Background



- The need to manage and treat stormwater is increasing
- Managing flood risk
 - Increased urbanization and more impermeable surfaces like pavement and concrete
 - Climate change leading to an increase in intense storms and rainfall
- Nutrients, oil products, metals, organic pollutants and other substances are released into the Baltic Sea through urban stormwater systems



Photo: Jenni
Gästgivar
/ SK



Photo: Carolus
Manninen / Yle



Photo: Ville Maali / HS



Photo: Heidi Krüger
/ Syke

Project Synergies

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Develop digital and technical solutions for multiobjective stormwater planning



Improve the efficiency of urban stormwater treatment of nutrients and substances



Diverse challenge → diverse pilots → diverse solutions

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What is multidimensional stormwater treatment?

Multidimensional

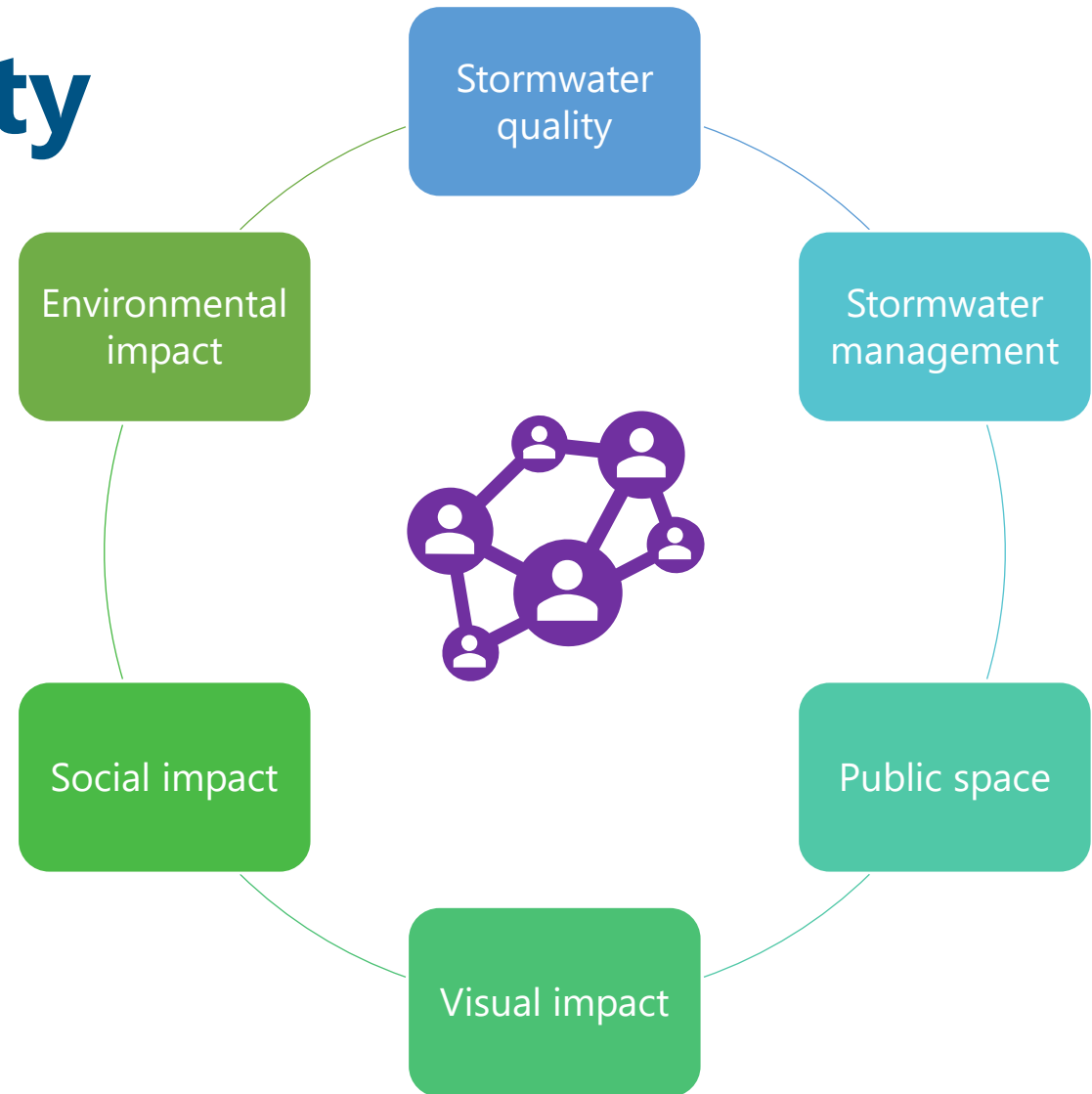
“Having or relating to multiple dimensions or aspects”

- [Merriam-Webster](#)

Multidimensionality

- Water quality
- Water quantity
- Limitations in public space
- Transportation
- Interest of developers (stakeholders)
- Already functioning ecosystems (streams)

(MUSTBE main challenges, Nils Kändler in Riga 10/2023)



Nature-Based Solutions NBS

“Solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions.” - [European Commission](#)

Work Packages



WP1 Analysis and design

- GIS based database
- Modeling
- Monitoring program
- Procurement documentation



WP2 Installation of new solutions

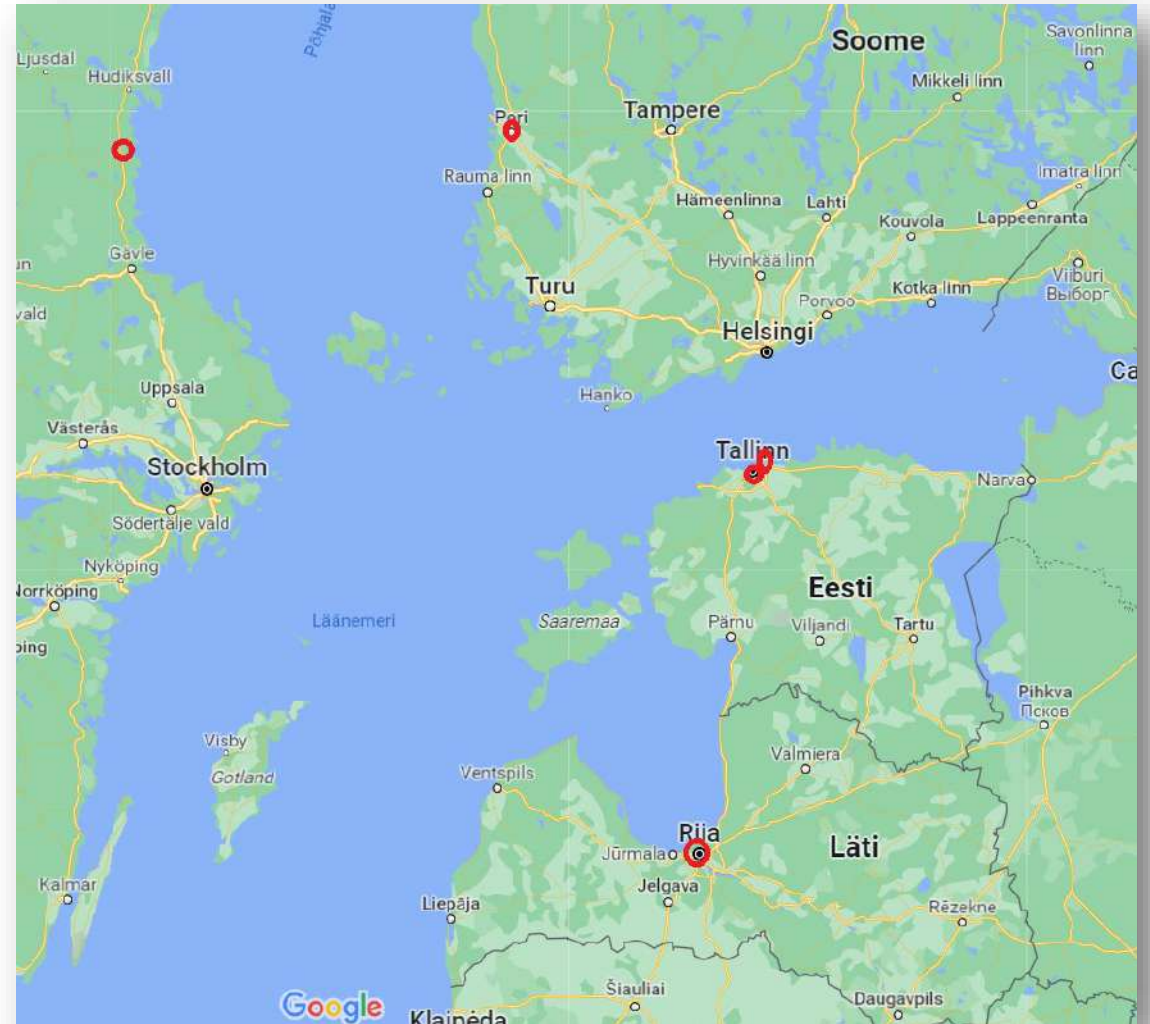


WP3 Monitoring of pilot investments

- Handbook on cost-effective monitoring methods
- Real-time sensing
- Analysing the impact, efficiency and sustainability

Seven Pilot Sites Four Countries

- Viimsi
- Tallinn
- Söderhamn (2)
- Pori (2)
- Riga



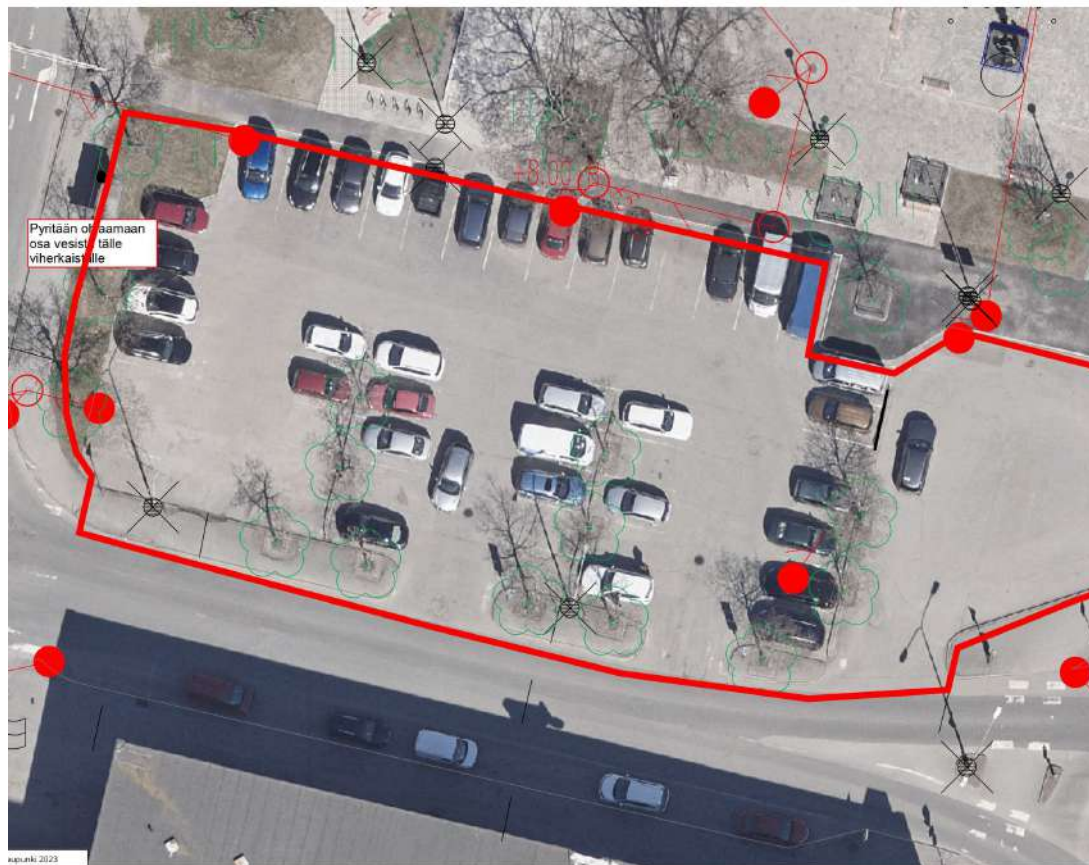
Pori, Finland (1)

- Wetland is situated on acid sulphate soil
- Oxidation of sulphate → formation of sulphuric acid → acidification → dissolving of metals
- Restoration of wetland
- Filtration/dams
- Greenery
- Online monitoring



Photo: Marjatta Halme

Pori, Finland (2)



- High traffic area with limited space in the city centre
- Stormwater treatment trees with detention structures
 - Balancing stormwater peaks and dry periods
- Pervious paving
- Online monitoring

Viimsi, Estonia



Photo: Siim Reinla MUSTBE demo presentation in Riga

- Flood risk
- Heavy traffic nearby
- Catchment area 19 ha

- Detention bonds and rain gardens
- Stormwater fountain
- Smart weir to control outflow
- Greenery

Tallinn, Estonia

- Tondimõisa park
- Catchment area of 37 ha
- Sand-oil trap
- Culverts
- Online monitored water quality and valve system

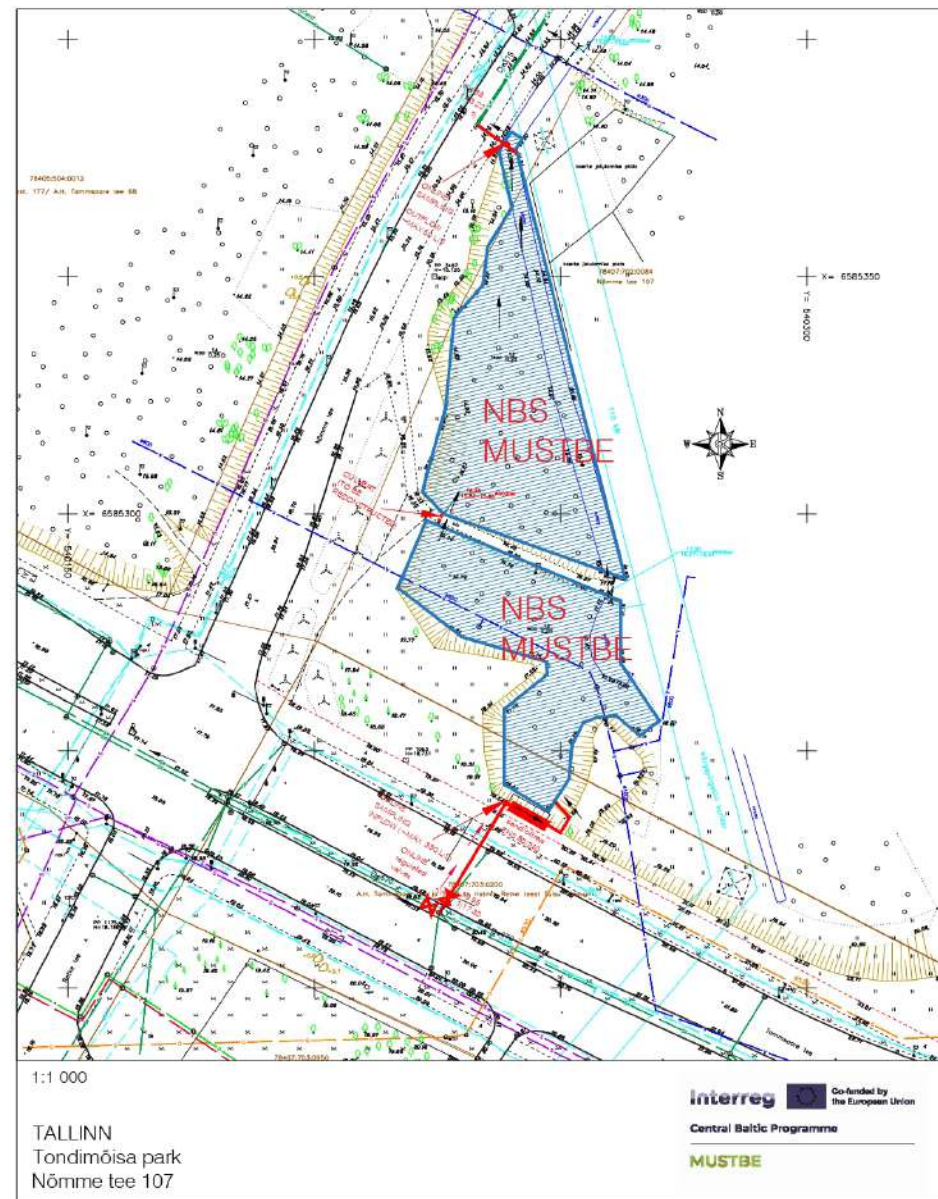
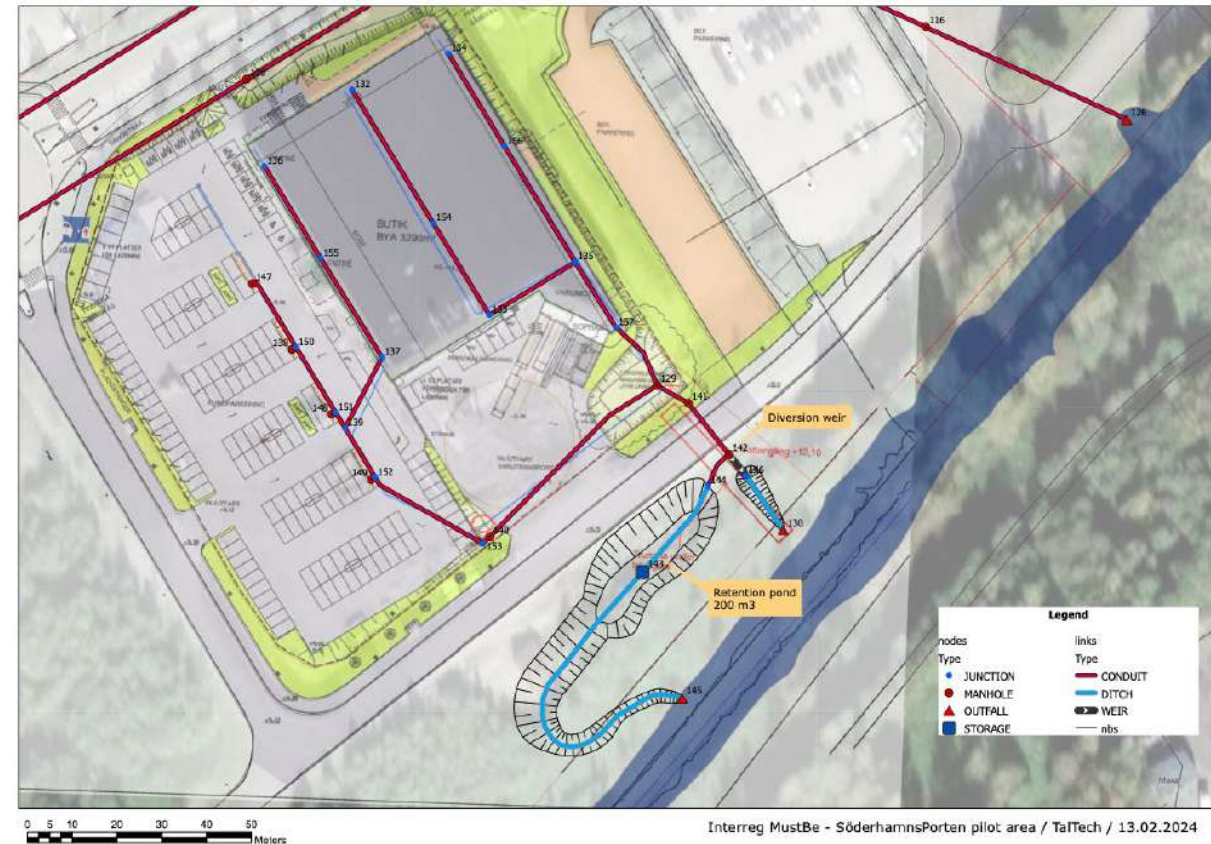


Photo: Elina Saat MUSTBE presentation in Riga

<https://centralbaltic.eu/project/mustbe/>

Söderhamn, Sweden (1)

- Newly developed area with mainly impermeable hard surfaces
- Surrounding area is also being developed
- Söderhamnsån nearby, goes out to the Baltic Sea
- NBS with a retention pond and a natural meandering ditch
- Real-time management

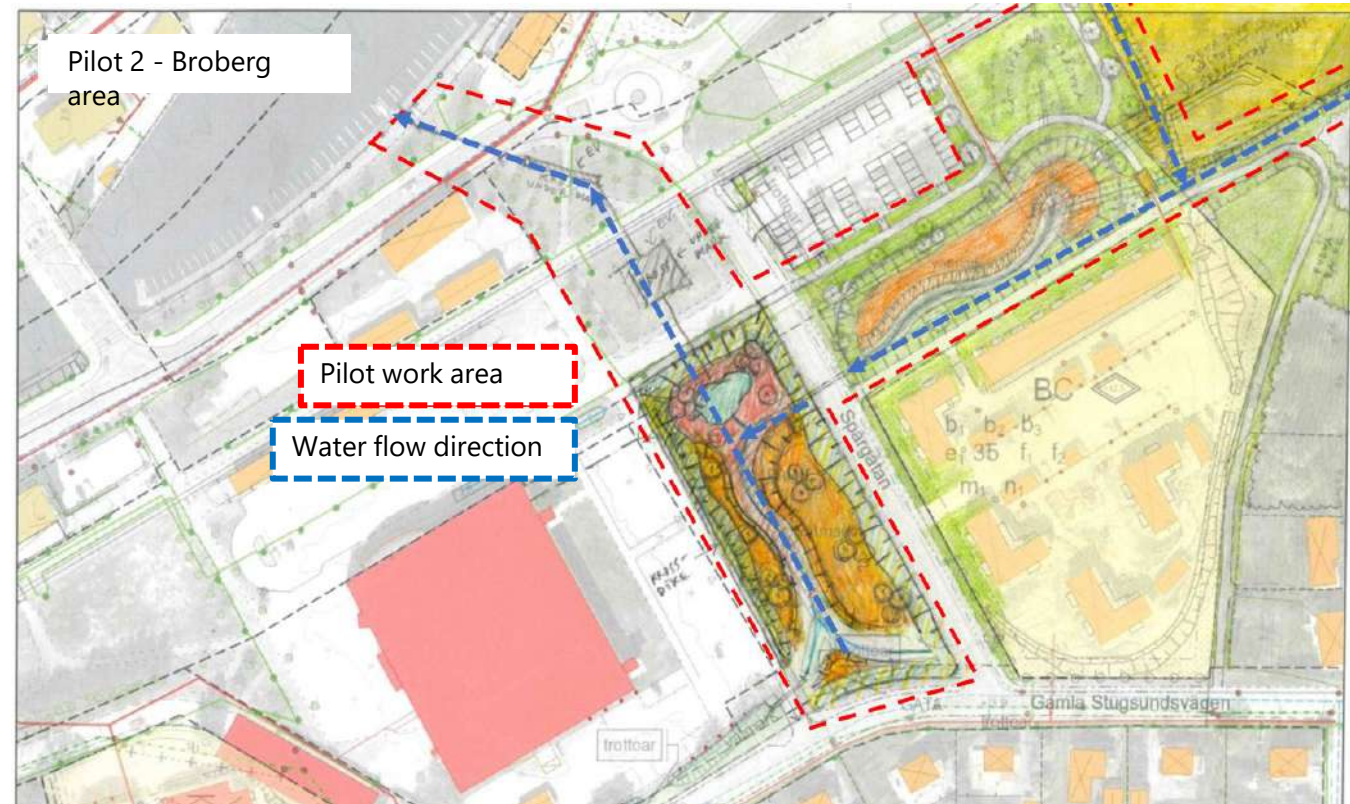


Drawing: Tal-Tech, Nils Kändler

<https://centralbaltic.eu/project/mustbe/>

Söderhamn, Sweden (2)

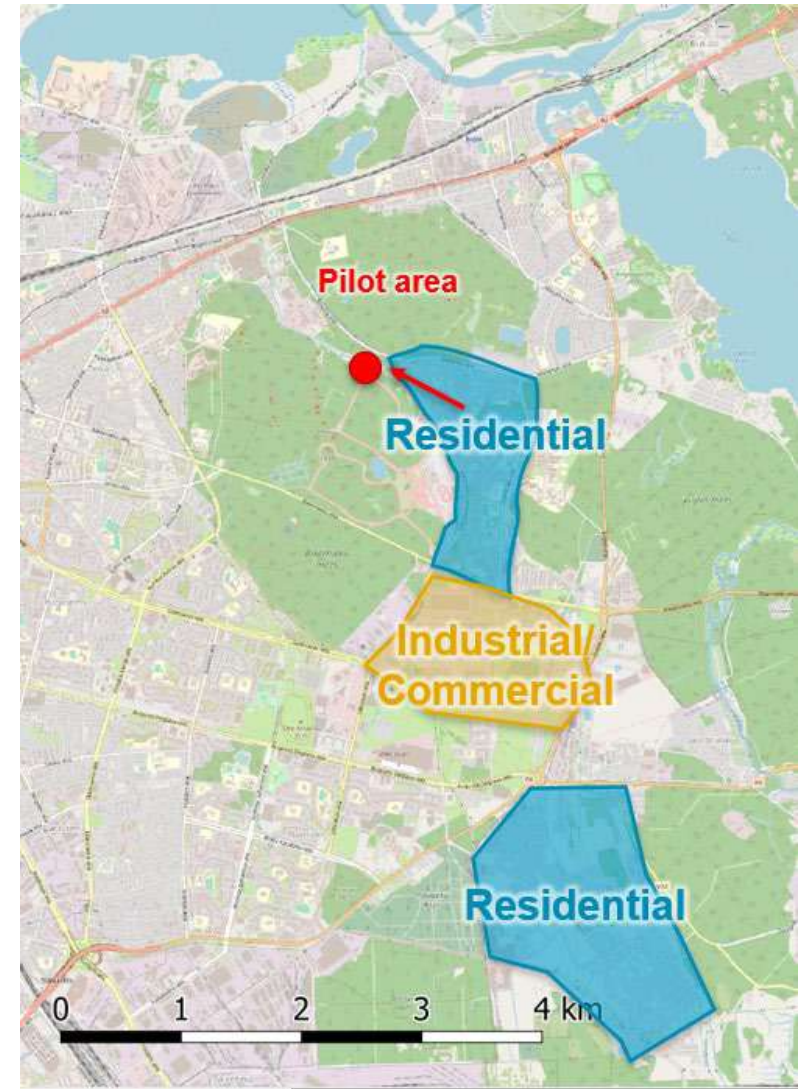
- Undeveloped area with mostly natural surface
- Area reserved for a new care facility for the elderly
- Söderhamn Bay nearby
- Rebuilding urban ditches
- Water quality monitoring
- Actuators capable of regulating the flow



Sketch: Anders Bloom, landscape architect, Söderhamns kommun

Riga, Latvia

- Catchment area: approx. 10 km²
- Multiple upstream catchments:
 - Mežciems, Dreiliņi
- 2 polluted areas nearby
- A series of settlement / treatment wetlands
- Renaturalisation of the creek
- Smart sensing



Site overview, Jurijs Kondratenko in Riga 10/2023

Target Groups

All of those that border with the Central Baltic area

Local public authorities

Regional public authorities

Sectoral agencies

Infrastructure and public service providers

Business support organisations

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How to reach the general public?

QUESTIONS?

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THANK YOU!



Further information:

www.centralbaltic.eu/mustbe

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