

TAL TECH

PREPARING FOR EXTREME WEATHER EVENTS – NOAH PROJECT RESULTS

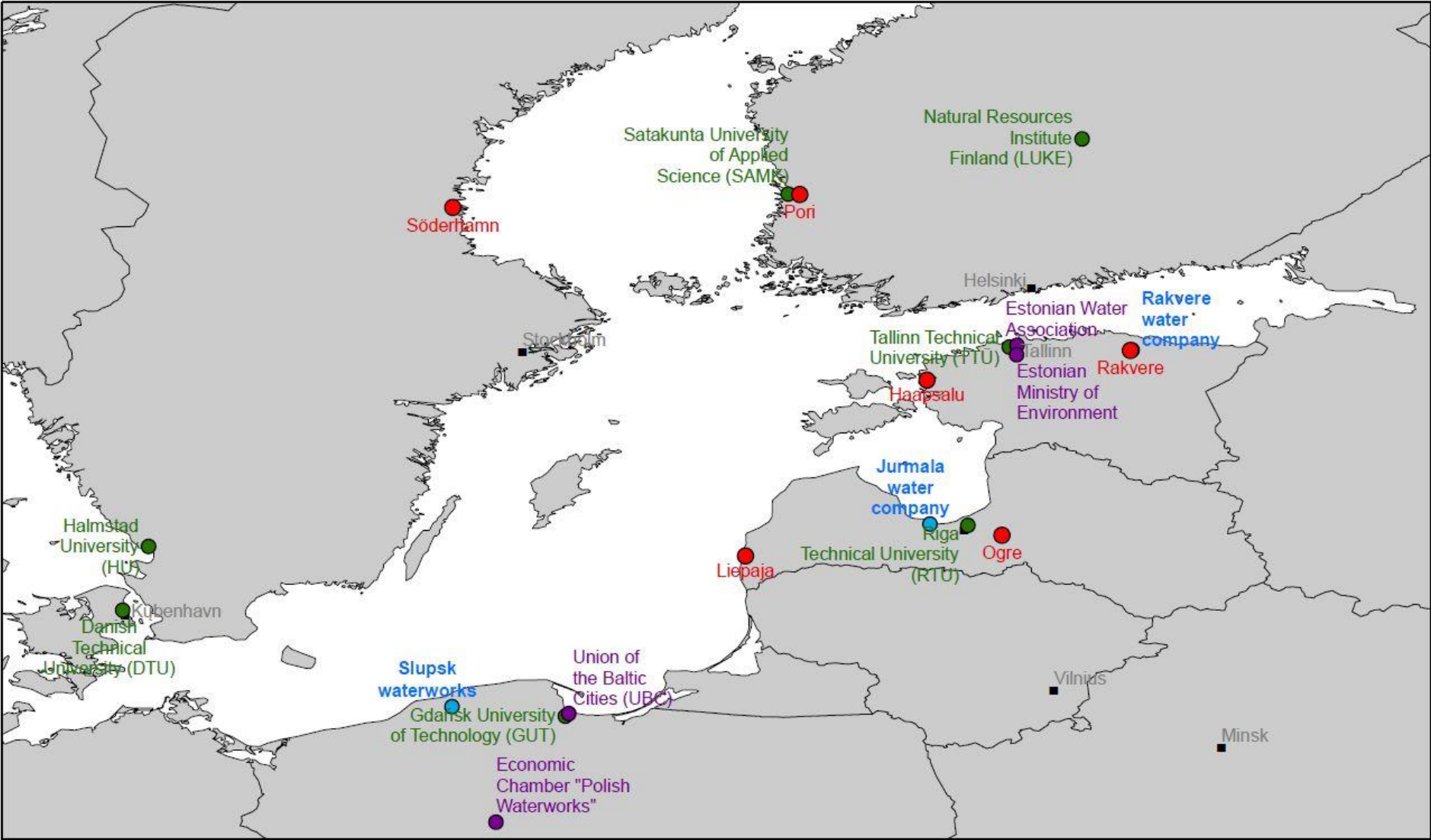


OUTLINE

- NOAH project in a nutshell
- Preparing for extreme weather events:
 - Active measures – how to improve the existing infrastructure
 - Passive measures – how to reduce the load on the infrastructure
- Conclusions and lessons learnt



NOAH PROJECT



NOAH PARTNERS

- TOWNS
- WATER COMPANIES
- ORGANISATIONS AND POLICY MAKERS
- ACADEMIES



NOAH MAIN GOALS AND ACTIVITIES

- **The first objective of NOAH** is to decrease discharges of nutrients and hazardous substances from urban stormwater runoff to the Baltic Sea by enhancing capacity of public and private actors dealing with land use and spatial planning. **NOAH solution – planning support system Extreme Weather Layer.**
- **The second objective of NOAH** is to decrease spillages of untreated wastewater from urban drainage network to the Baltic Sea by enhancing capacity of water utilities responsible for urban drainage system operation. **NOAH solution – implementation of smart urban drainage systems.**

NOAH PILOTS

NOAH

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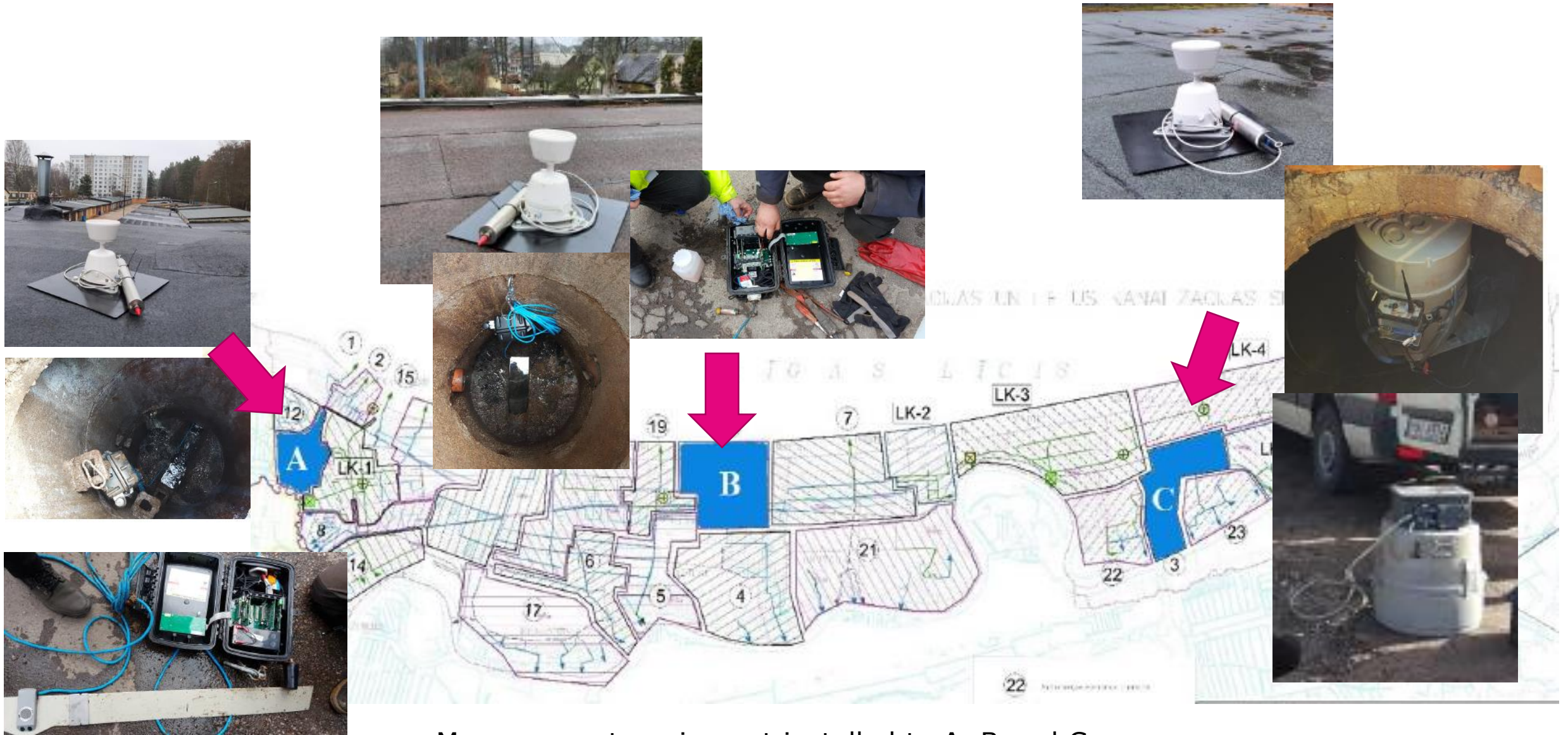


**TAL
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Interreg
Baltic Sea Region



ACTIVE MEASURES – MONITORING AND CONTROL, JURMALA

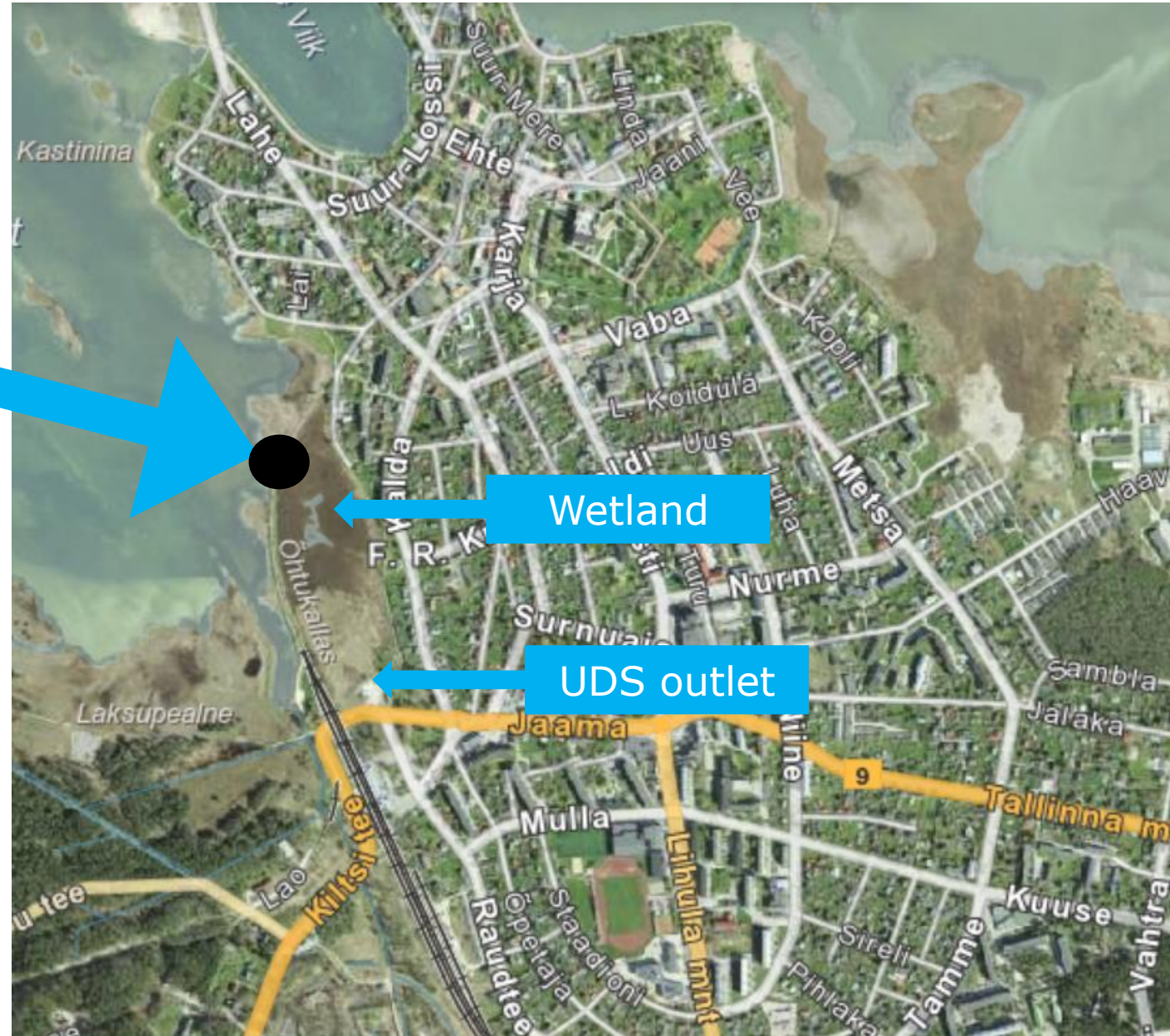


- Measurement equipment installed to A, B and C

ACTIVE MEASURES – MONITORING AND CONTROL, HAAPSALU



- SWS measures water level at the wetland and at the sea
- Based on the water level differences the SWS opens and closes automatically



ACTIVE MEASURES – MONITORING AND CONTROL, RAKVERE



- SWS measures water level at the pond and at the UDS main collector
- Based on the water level at the collector, the SWS automatically adjusts its position
- Landmark in Rakvere



PASSIVE MEASURES - EXTREME WEATHER LAYER

- A new concept for mitigating flood risks in the urban planning process.
- The developed planning support system called extreme weather layer (EWL) creates dynamic interlinkage between land developments, existing storm water system and flood risks in densely populated areas.
- The EWL, built on the digital twin of the existing storm water system and allowing modelling of hydraulic processes, takes into account the land use and soil types to simulate the response of the storm water system and the catchments to different rainfall events.
- **GOAL – How to make cities more climate proof?**

EXTREME WEATHER LAYER – BUILD-UP

Step 0: Preparation, data acquisition

Step 1: Development of hydraulic model

Step 2: Defining catchments

Generate catchment areas for each inlet (gutter, curb opening) manhole that is included in the hydraulic model. Add the generated catchment areas to the UDS modelling software (in NOAH case, SWMM has been used).

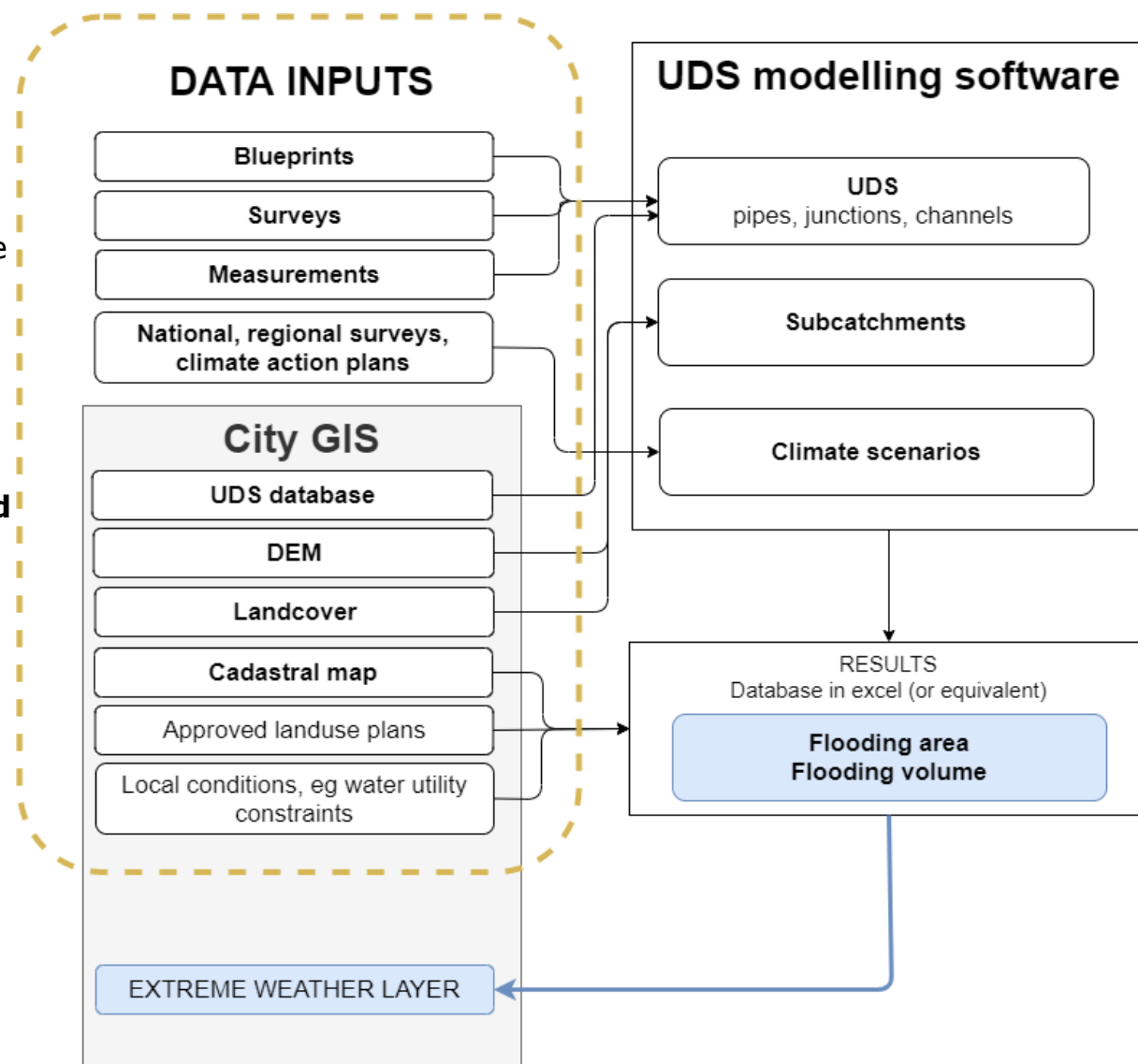
Step 3: Defining and running climate scenarios in the hydraulic model

Step 4: Identifying flood-prone manholes according to each used climate scenario

Use the SWMM reporting tool to deduce the manholes where flooding occurred under defined climate scenario. Export the data to Excel or similar database.

Step 5: Determine acceptance rates for flooding intervals

Add condition to the database based on the maximum flooding rate, maximum flooding volume or duration.



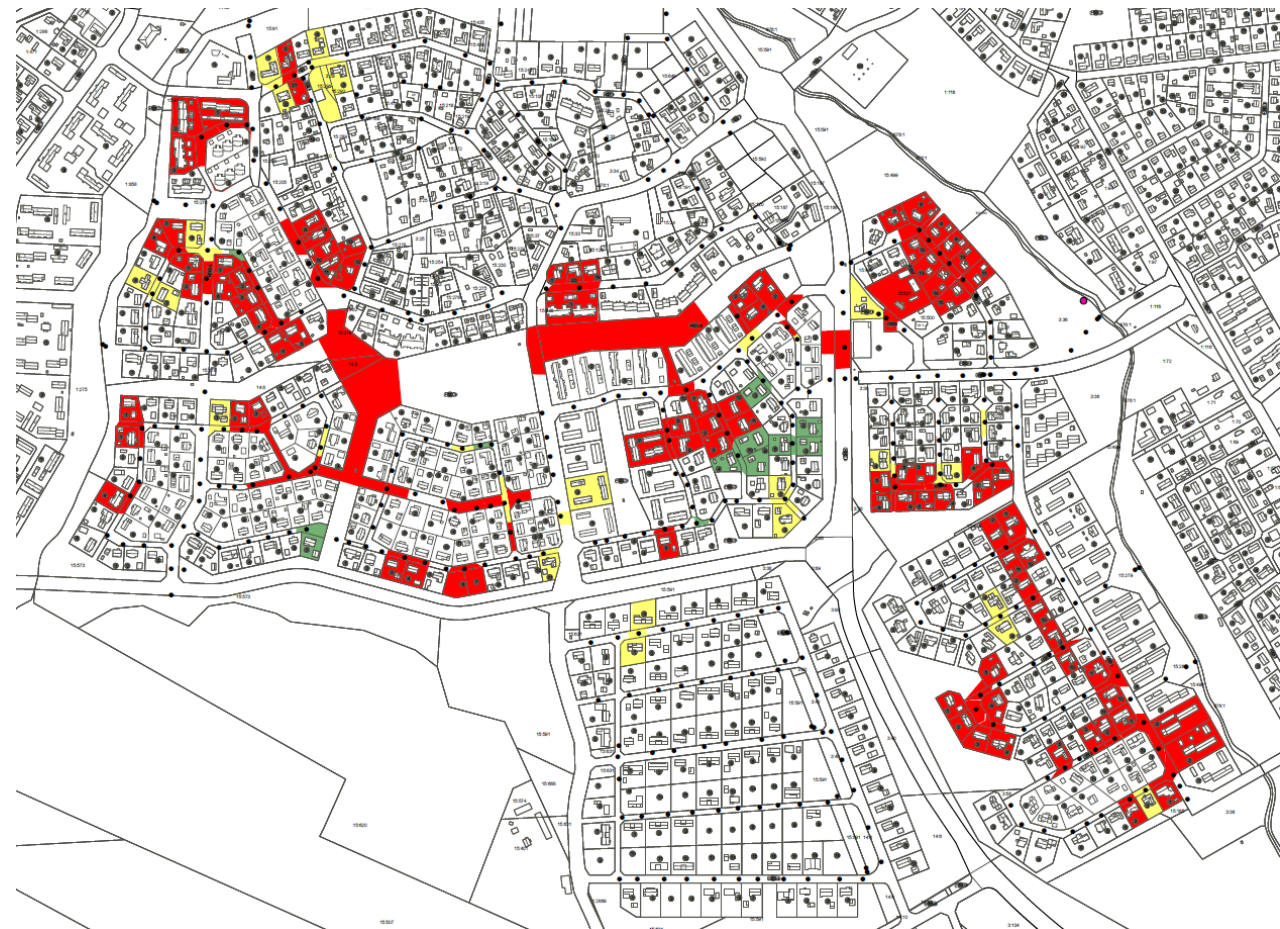
EXTREME WEATHER LAYER – HAAPSALU (TODAY, RCP4.5, RCP8.5)

CATCHMENT BASED VIEW



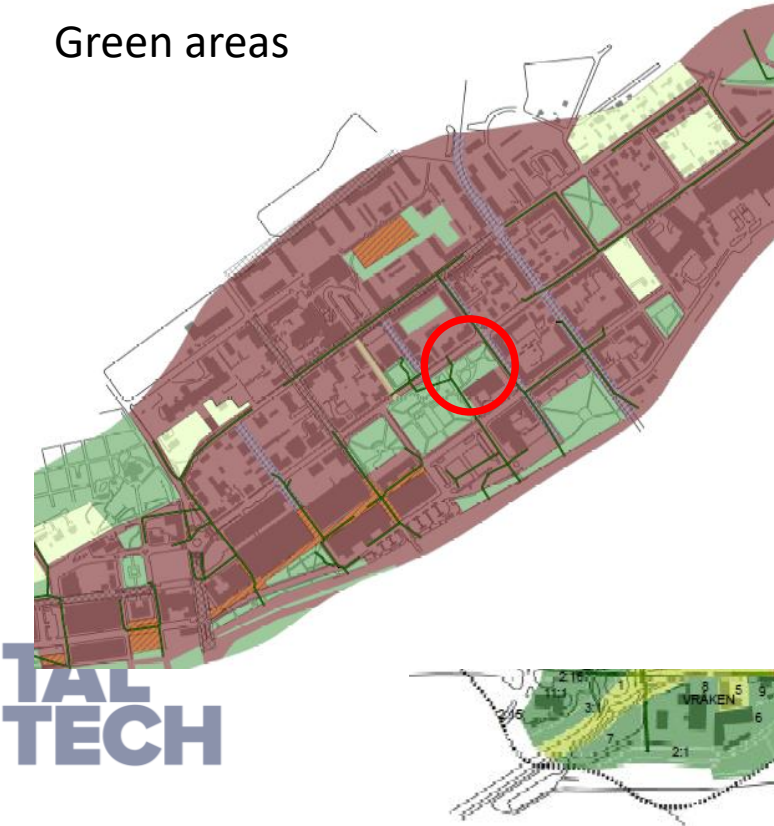
EXTREME WEATHER LAYER – PORI (TODAY, RCP8.5)

PLOT BASED VIEW



EWL APPLICATIONS IN SÖDERHAMN

Green areas



Type

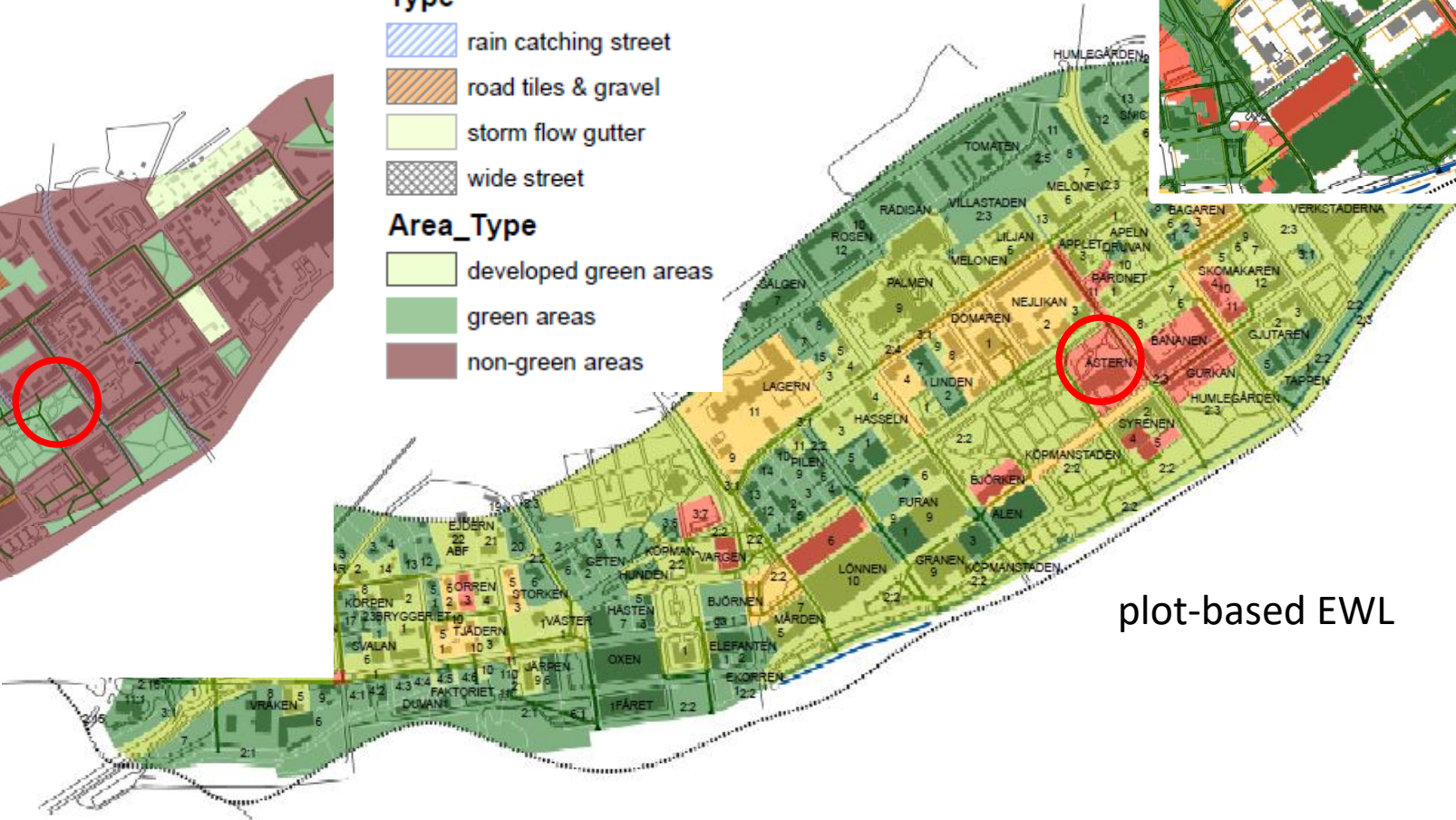
- rain catching street
- road tiles & gravel
- storm flow gutter
- wide street

Area_Type

- developed green areas
- green areas
- non-green areas



catchment-based EWL



plot-based EWL

NOAH Söderhamn
Plot view

rcp45_risk_plotview
rcp45_sum

- high
- medium
- low
- no risk

CONCLUSIONS

- Reduction of pluvial flood risks in urban areas requires better management of the existing infrastructure and integrated planning of the urban space
- Collaboration between the academia and municipalities/water companies is inevitable in order to transfer the innovation from paper to practice
- Interreg is a great platform to support such knowledge transfer
- How to ensure the sustainability of the project outcomes?



Your project in one picture / ©Margareta Örn-Liljedahl
/ submitted by Hanna Rissanen

"Man in a manhole" - Tony Persson from the Swedish Ljusnan-Voxnan water association installing a stormwater sampler in Söderhamn, Sweden.



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