



Centre for Economic Development,
Transport and the Environment

Natural flood risk management solutions in the Baltic Sea region

UBC TALKS Webinar Pekka Parkkila
Water as a resource in a climate-resilient city 25.5.2021

Briefly on the project



Ministry for Foreign
Affairs of Finland

- Baltic Sea Cooperation for Climate Resilience - Flood and Drought Risk Management
- Funded by Finland's Ministry of foreign affairs (2019-2021)
- Coordinated by ELY- centre of Southwestern Finland
- 4 reports
- 3(+1) workshops
- 1 benchmarking visit (hopefully)
- Final webinar



Natural flood risk management solutions in the Baltic Sea region

- This report was made by Antti Parjanne and Mika Marttunen from Finnish environmental institute (SYKE) during 2020.
- Basic idea was to survey coastal countries around Baltic Sea to benchmark the best practices on flood risk management and more specifically on nature based solutions.
- Research was conducted by literature review and interviews, covering eight countries.

Natural flood risk management solutions in the Baltic Sea region

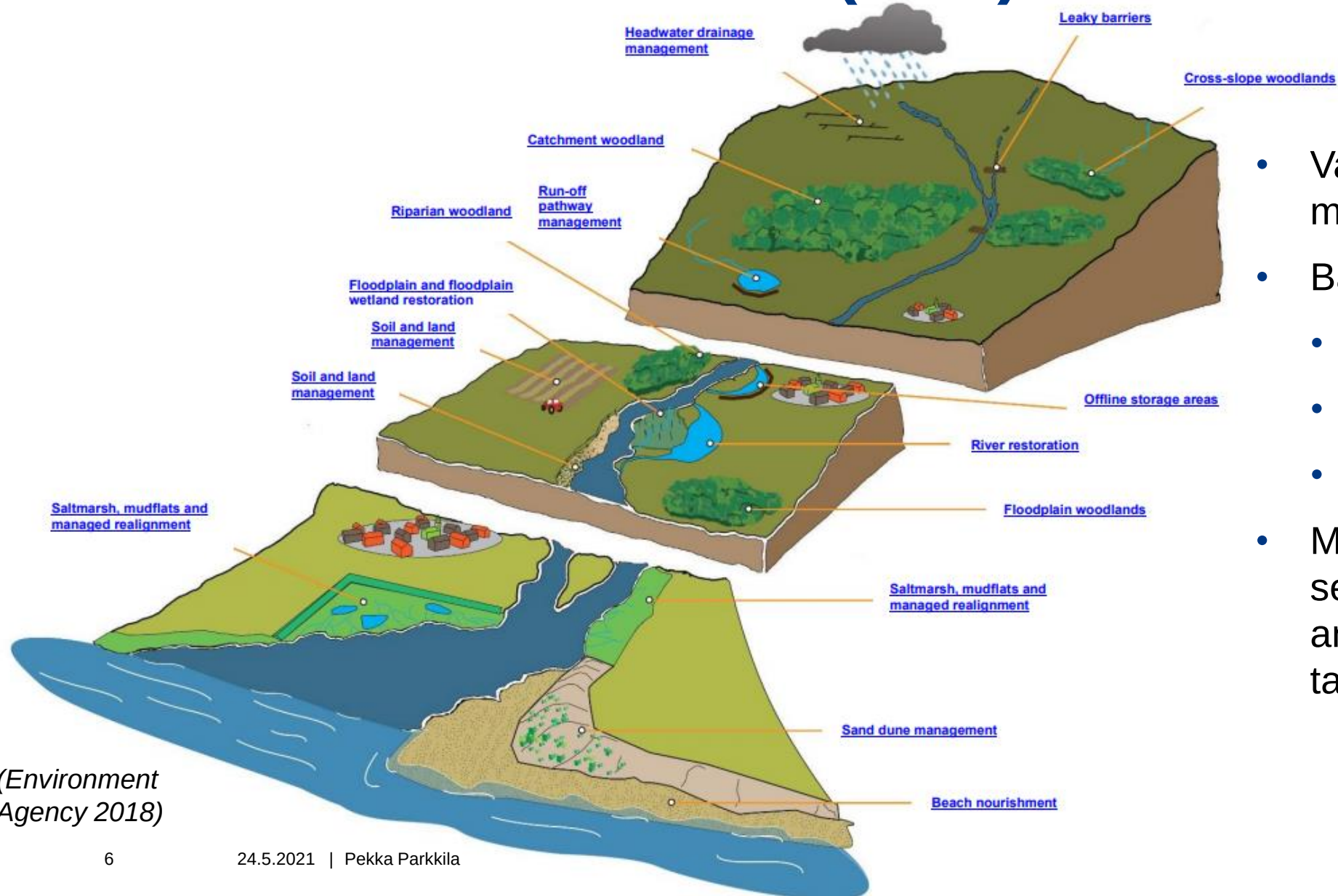
- Natural flood risk management solutions in the Baltic Sea region (in Finnish)
 - Download:
<https://helda.helsinki.fi/handle/10138/325482?locale-attribute=en>
- Combined English summary of all the surveys will be made before end of this year.



Nature based solutions (NbS)

- **“actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits”- IUCN**
- **Also:** ecosystem-based adaptation, natural water retention measures, green infrastructure, sustainable urban drainage systems.

Nature based solutions (NbS)



- Variation of definitions and methods
- Basic idea:
 - Absorb
 - Slow down
 - Redirect
- Methods are always selected by the type of flood and the conditions of the target area.

(Environment Agency 2018)

What method to use?

- **NbS** should be utilized when it is sufficient
- **Hybrid** solutions when there is time
- **Grey** solutions when the risk is imminent

Traditional grey infrastructure

Applicable where:

- There is an Immediate need
- A significant change in flood risk is projected
- Relatively large number of people and infrastructure are at risk (more likely in large urban areas)
- Financing is available

Less applicable where:

- The problem is localised to smaller areas
- Smaller or incremental changes in flood risk
- Rural area or less people or infrastructure are at risk
- Finance is minimised
- Uncertainty of future flood risk

Soft engineering to accompany grey

Adding soft engineering methods to a range of flood management techniques being used. Useful where:

- The other ecosystem benefits it creates can raise the funding levels for the whole project
- To provide flexibility to incremental changes in flooding
- To manage upstream impacts of downstream river defences

Soft engineering as an alternative to grey

Undertaking catchment level flood risk management using a number of purely soft engineering measures. Useful where:

- Smaller catchments
- Level of flooding could be controlled by soft engineering alone
- Grey infrastructure is physically not possible in the landscape, or would significantly harm the landscape
- The need is longer term and not immediate
- Some other ecosystem benefits are being targeted
- Lower levels of financing are available or grey infrastructure does not represent value for money

(Frontier Economics)

NbS in Baltic Sea

- Measures for managing natural flood risks have been implemented in all Baltic Sea states.
 - Mainly in a small scale
 - Broad scale implementation is required to have an impact on flood management

	Inhabitants under a floodrisk (pers/a)*	Inhabitants under a flood risk 2080 (pers/a)	Yearly expected damage cost 2020 (M€/y)		Yearly expected damage cost 2080 (M€/y)		Adaptation costs along the waterways (M€/y)	Adaptation costs along the coasts (M€/y)
			water system / sea		water system / sea			
Finland	<u>39 000</u>	<u>105 000</u>	<u>83</u>	<u>1,6</u>	<u>380</u>	<u>520</u>	<u>323</u>	<u>9-13</u>
Sweden	<u>58 000</u>	<u>331 000</u>	<u>440</u>	<u>5</u>	<u>5 200</u>	<u>1500</u>	<u>46</u>	<u>13-23</u>
Denmark	<u>17 000</u>	<u>97 000</u>	50	<u>30</u>	<u>600</u>	<u>6400</u>	11	<u>45-80 (5-9)</u>
Germany	<u>100 000</u>	<u>340 000</u>	<u>2 000</u>	<u>300</u>	<u>8 200</u>	<u>47000</u>	<u>170</u>	<u>50-101 (12-23)</u>
Poland	<u>46 000</u>	<u>83 000</u>	<u>650</u>	<u>12</u>	<u>3 300</u>	<u>3300</u>	<u>127</u>	<u>12-16</u>
Estonia	4 000	4 000	14	0,4	200	150	10	<u>21-29</u>
Latvia	7 000	10 000	<u>83</u>	0,7	150	19	<u>30</u>	7-11
Lithuania	5 000	4 000	36	0,3	110	96	<u>34</u>	3-4
Russia	<u>350 000</u>	<u>619 000</u>	<u>3 600</u>	<u>7,3</u>	<u>26 000</u>	<u>2000</u>	-	-
sum	626 000	1 593 000	6 956	357	44140	60 985	751	160-277(82-128)

(Aqueduct flood analyser)

Summary of challenges in Baltic countries

- **Organizational issues**

- Almost all countries had some issues with organizing NbS methods (legislation, land ownership)

- **Lack of knowledge**

- Implementation of NbS in flood management vs gray methods

- **Narrow scope of NbS implementation**

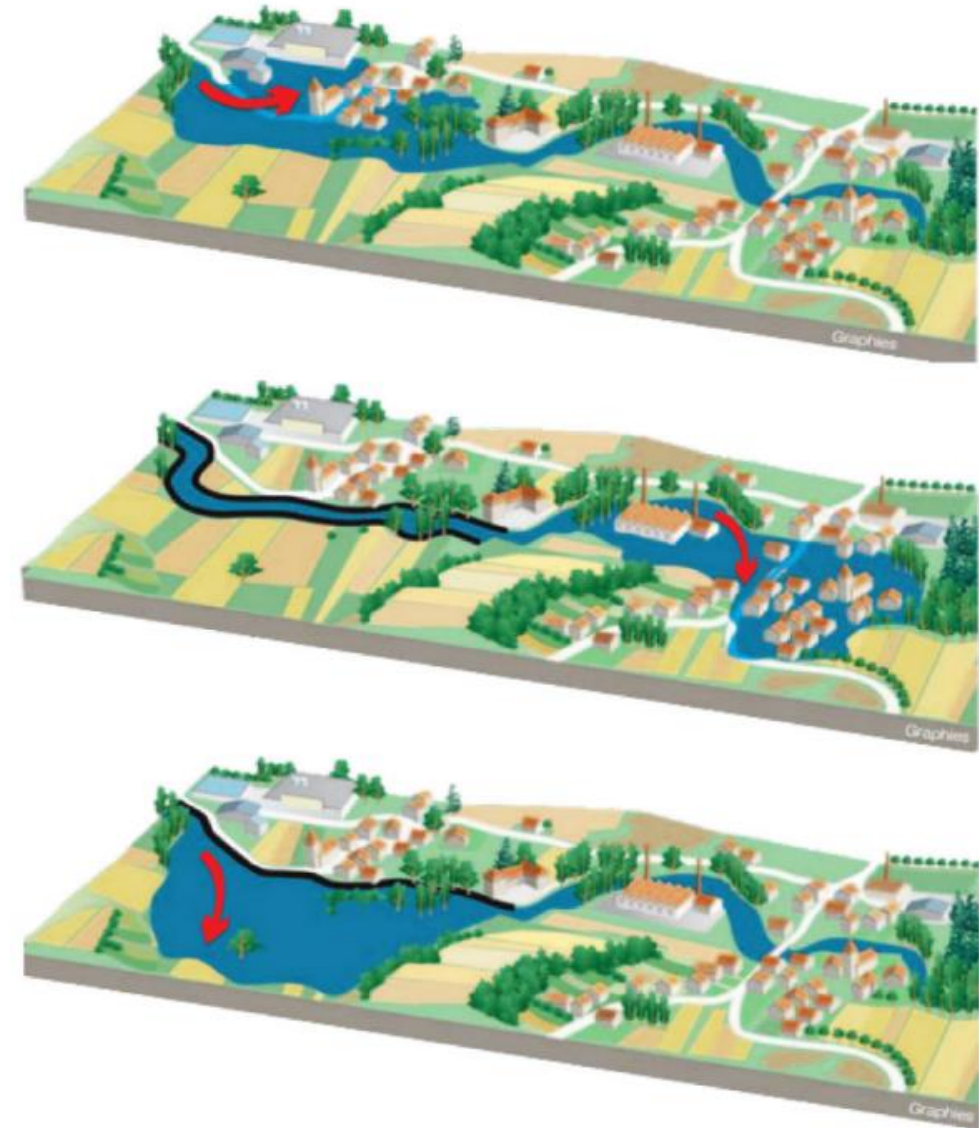
- When used – NbS methods are often very small and specific and therefore results are also very limited

Some of the best practices

- Stakeholder participation ([Augustenborg](#))
- Use of small water retention areas ([Poland](#))
 - 27% water retention also combating drought
- Wetland biodiversity protection in Kamanos Strict Nature Reserve([Lithuania](#))
 - Cross sectoral cooperation
- Building With Nature ([Denmark](#))
 - Landowner guided planning, Coastal politics integrated into Municipal planing

Notes and recommendations

- NbS should be integrated into other plans for visibility
- Prioritizing: 1. NbS 2. Hybrid 3. Grey
- Planning is the key but is the legislation up to date?
- There should be universal standard for evaluating effectiveness of actions and programs/plans (E.g. IUCN standard)
- Stakeholder participation is important for successful implementation



(European court of auditors)



Thank you!

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