



Natural measures for water and nutrient retention – examples from North-Eastern Germany

Regional Workshop
„Integration of natural water retention measures (NWRM)
into river basin management in the Baltic Sea Region“

Riga, January 30-31, 2014

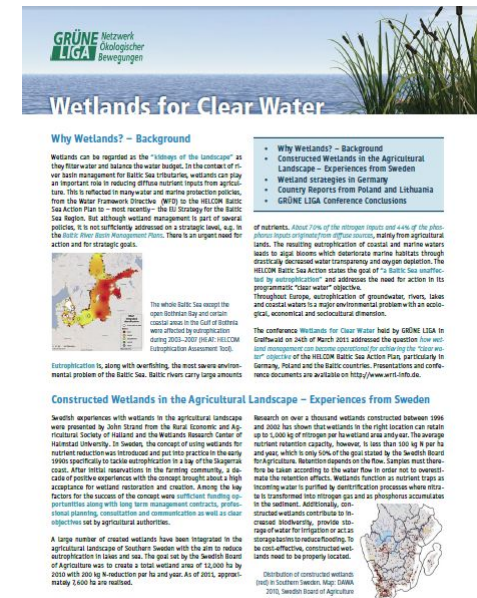
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„Wetlands for Clear Water“

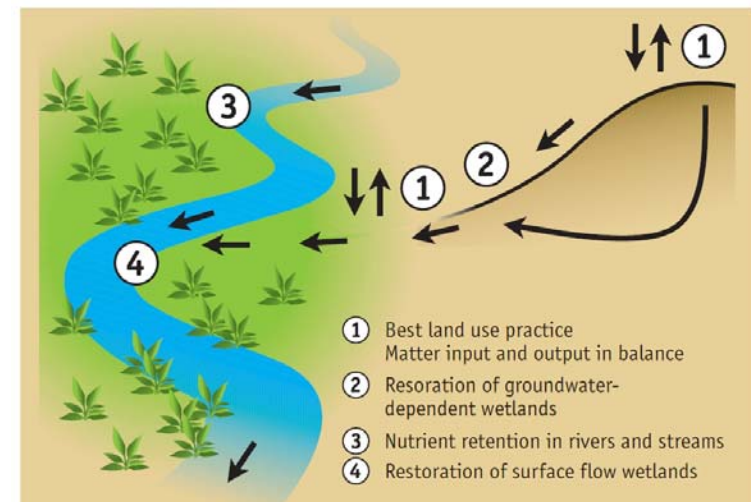
Conference in Greifswald, Germany, March 2011

- **Agricultural runoff is a problem as important as urban wastewater:**
 - > more than 70% of nitrogen, 44% of phosphorus inputs to the Baltic Sea come from diffuse sources
 - > leakage of nutrients to groundwater, surface runoff and erosion
- **Wetlands are effective filters for nutrient retention**
 - > „Kidneys of the landscape“
- **Wetlands offer cost-efficient solutions**
 - > nitrogen reduction cost estimates for the state of Schleswig-Holstein, Germany:
 - 5-20 Euro per kg N for wetland measures
 - 16-77 Euro per kg per kg N for further investments in urban wastewater treatment
- **Effectiveness of wetlands depends on**
 - > location in the catchment and its hydrological conditions
 - > type of wetland ecosystem
- **Management along the flow path is essential**
 - > „ecohydrological“ solutions are of growing interest

EU-Strategy for the Baltic Sea Region (Action Plan 2009):
„Establish and restore more wetlands“



Solutions along the flow path of water:



Source: Michael Trepel (adapted)

Artificial wetland near Neukloster, Germany

– nutrient retention to protect lake Neuklostersee

Combined treatment of

1. effluent from urban wastewater treatment plant (town of Neukloster, 7.900 inhabitants)
2. agricultural runoff from drained fields (126 ha)

Functional design maximizing nutrient retention:

- location: former wetland, highly degraded
- shallow basin (2 ha) with deep water zones and islands
- medium depth 0,3
- Water volume 5.650 m³
- Inflow and outflow over wide timber barriers
- Initial plantation with reeds and other repository plants
- control of hydraulic load via two existing ponds

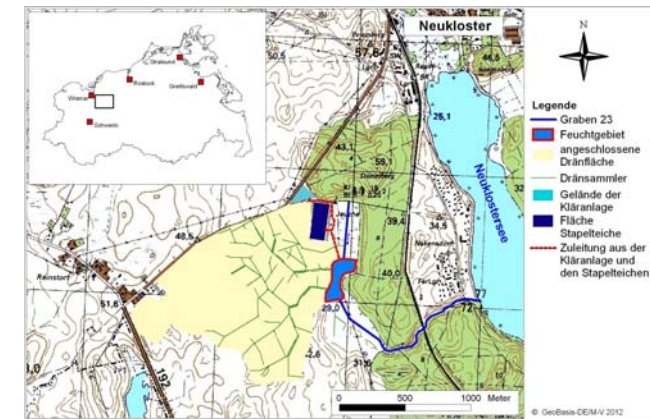
Benefits:

- energy cost savings (treated effluent was previously pumped towards the sea via pressure pipe)
- no negative effect on bathing water quality of lake
- no deterioration of ecological status of lake (Natura 2000)

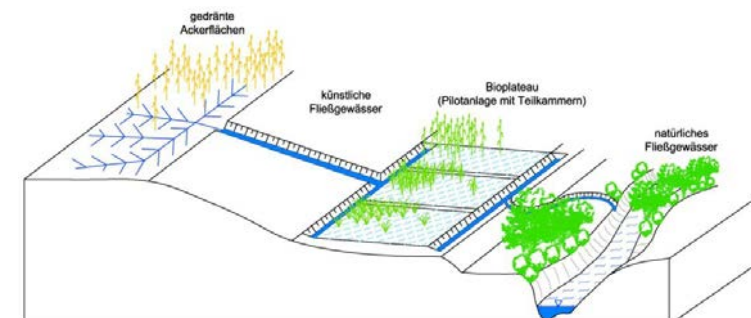
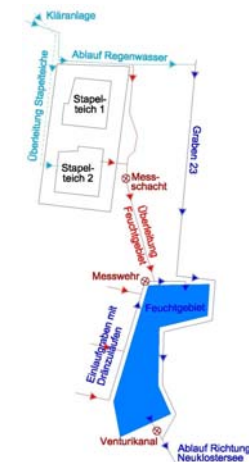
Costs and funding:

- ~ 560.000 Euro plus VAT (construction, planning, surveying, land acquisition, maintenance, monitoring)
- 80% through state program on water protection (ELER cofunding)

Planning: **biota** – Institut für ökologische Forschung und Planung, Bützow. www.institut-biota.de



Map and figures: Institut biota



Artificial wetland near Neukloster – realisation 2011

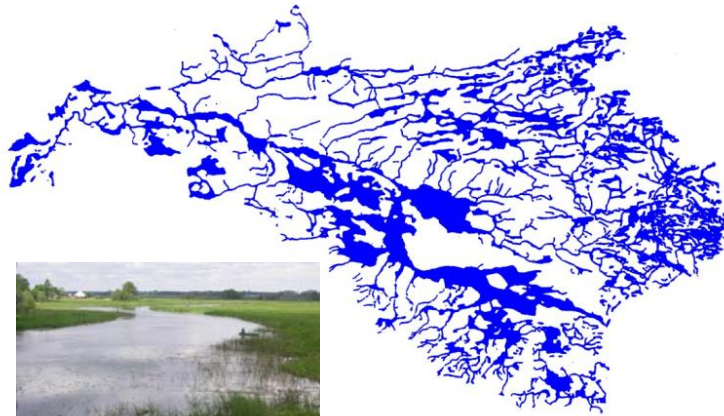


Photos and figures:
Institut biota, Bützow

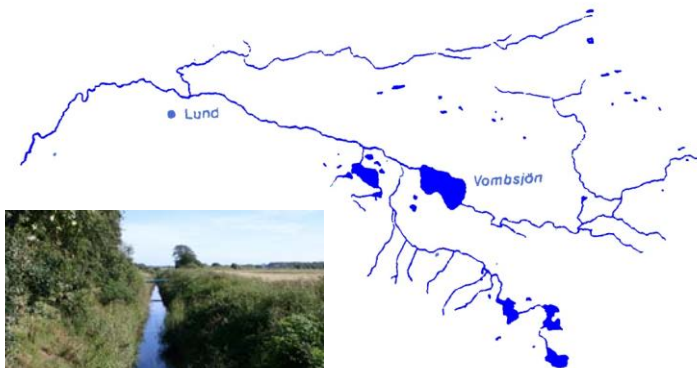


Why do we need wetlands in the agricultural landscape?

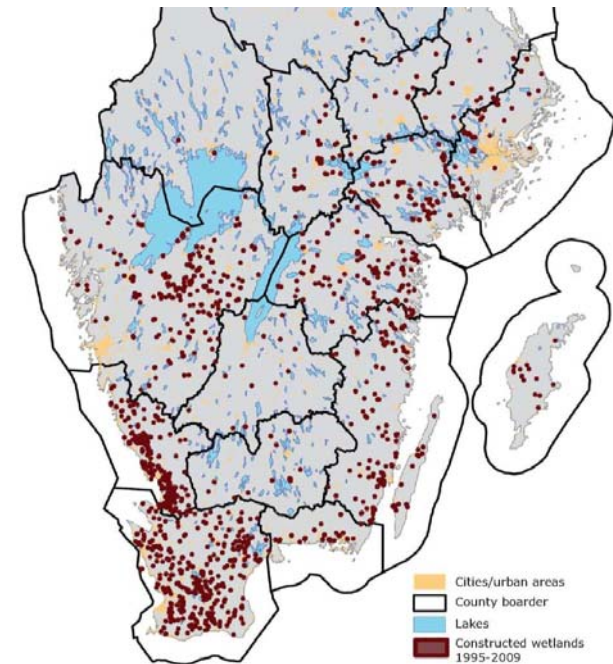
– because most natural filters have disappeared



Kävlingeån, Southern Sweden, 150 years ago



Kävlingeån, Southern, Sweden today

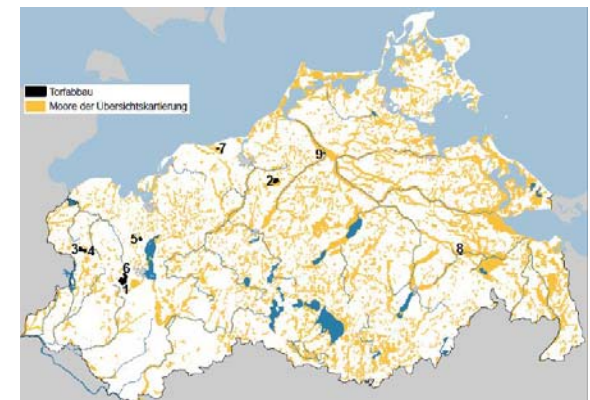


Artificial wetlands in Southern Sweden 2010

Regional strategies for wetland restoration in North-Eastern Germany

State program for peatland restoration in Mecklenburg-West Pomerania („Moorschutzprogramm“)

- drained peatlands cause emissions of 6.2 million (!) tons of CO₂ equivalents per year (more than transport and industry)
- emissions of >25 tons per year and hectare
- high cost-efficiency of CO₂-reductions through rewetting
- large benefits also for water quality, flood protection and biodiversity
- opportunities for sustainable wood and fibre production on rewetted peatlands: “paludiculture”



Peatlands in the state of Mecklenburg-West Pomerania

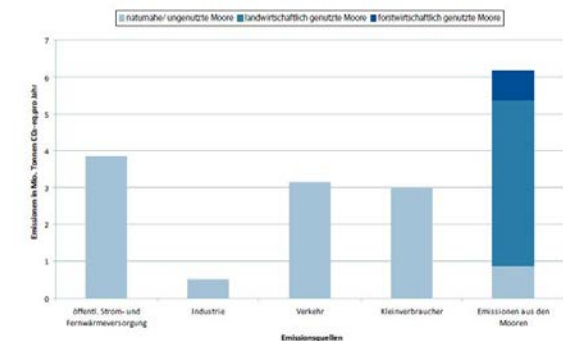


Abbildung 13: Emissionen aus den Mooren im Vergleich zu anderen relevanten Quellen¹⁶ in Mecklenburg-Vorpommern

„Large Scale Nature Conservation Project“ Uckermark Lakes Region

- [illegible]

A photograph showing a wooden walkway or bridge structure made of dark wood, extending over a body of water. The water is calm and reflects the sky. In the foreground, there are tall, dry reeds and some green grass. The background shows a line of trees and a hillside. The sky is overcast.

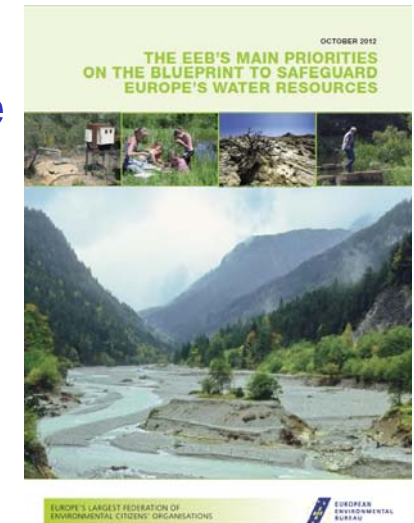
An aerial photograph showing a large, dark, circular crater in a forested area. The crater is surrounded by a dense forest of tall, thin trees. The ground around the crater appears disturbed and dark, possibly due to the impact. The surrounding forest is lush and green, contrasting with the dark, charred ground of the impact site.



Conclusions

Wetlands as NWRM / as elements of green infrastructure

- are effective nutrient filters if properly located in the catchment (flow path oriented)
 - > very cost-efficient
 - > multiple benefits for nature and society
- receive increasing attention and funding opportunities
 - > e.g. Ostseestiftung (Germany)
 - > e.g. MoorFutures (Mecklenburg-West Pomerania, Brandenburg)
- need more support from public policies and less harm from adverse subsidies
 - > NWRM in the 2nd River Basin Management Plans?
 - > NWRM as Ecological Focus Areas under the CAP?





Thank you for your attention!

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