

# 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

Tobias Schäfer
GRÜNE LIGA e.V.
Water Policy Office, Berlin
European Environmental Bureau (EEB) member
www.wrrl-info.de



#### "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"



Why Wetlands? - Background

Williams can be regarded as the "sittings of the indication" in the pittine value and states the value from legal, in the centext of it was been in assignment for failtie for large from the center of any pin an important role in reacting offices entire integers from agricultum. This indirected in many value and martine protection policies from the Natural Francisco Disorctice (Video ) to the NATIONE SIGNATURE of the Natural Francisco Disorctice (Video ) to the NATIONE SIGNATURE of Sea Region. But although vestical management in part of sweez Sea Region. But although vestical management in part of sweez policies, it is not infractively advisessed on a strategic level, as, to the Biblic Rev. Butto Management Plants. There is an urgent need for action and for Extracting depaid.



The whole Ballic Sea except to open Bothnian Bay and cortain coastal areas in the Guiff of Br were affected by extrephical during 2003–2007 (HEAF: HE

Eutrophication is, along with overfishing, the most savera envi

Why Wetlands? - Background
 Constructed Wetlands in the Agricultural Landscape - Experiences from Sweden
 Wetland strategies in Germany
 Country Reports from Poland and Lithual
 GRÜME LIGA Conference Conclusions

of materials. About 7% of the interspect injusts and 44% of the placeblower injustice organization of the about an elicity from a pricational lands. The resulting entrophication of coastal and martine waters laudes to align blooms which destinates instrume habitatis through destricting decreased water transparency and oxygen optication. The HELLOW Bastic Sea Article status the good of a Ballic Sea underlieted by outrophications' and addresses the need for action in its programmatic "Cales water objective, the programmatic "Cales water objective, Throughost Europe, extraphication of groundwater, rivers, Liskes and contact waters in a pulper environmental problem-with an accident

The conference Wetlands for Clear Water held by GRÜNE LIEA in Graithwald on 34th of Warch 2011 addressed the question how wetland monogenent can become operational for activating the "clear water" objective of the HELCON Battle See Action Plan, particularly in Germany, Poland and the Baltic countries. Presentations and confe-

onstructed Wetlands in the Agricultural Landscane - Experiences from Swee

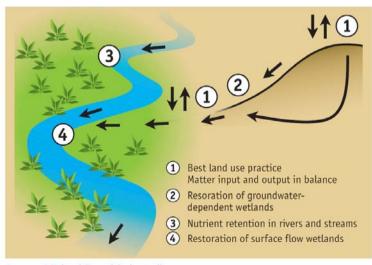
Neeths apparence with vestions to the approximate intensity were presented by Alba Teach from the Nation (Economic and Agrications) october of instituted and the Netterlos Research Center (Instituted Diversity). In Seeding, this course, of their will vestion the instituted Diversity. In Seeding, this course, of their vestion of their vestions of their vestions of their vestions of their vestion of their vestions of the contract vestion of their vestions of their vestions of the contract vestions of their vestions of the contract vestions of their vestions of the contract vestions of their vestions

A large number of created wetlands have been integrated in a agricultural landscape of Southern Swedon with the aim to reduce eutrophication in takes and sea. The goal set by the Swedish Box of Agriculture was to create a total wetland area of 12,000 ha 2010 with 200 kg N-reduction per ha and year. As of 2011, appro security on one of a throughout section of controlled positions of one of a throughout section of controlled positions of the controlled position of controlled positions of the controlled positions of controlled positions

is the sediment. Additionally, constructed wetlands contribute to increased bloolwardly, provide storage of water for irrigation or act as the storage basins to reduce flooding. To cobe cost-effective, constructed wellands need to be properly located.

Distribution of constructed wetlands (red) in Southern Sweden, Map: DAWA 2009, Swedish Broad of Antrolhers

## 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

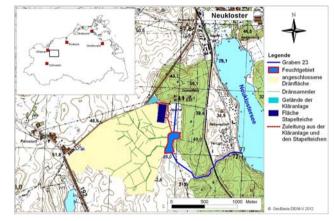
#### Benefits:

- 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)

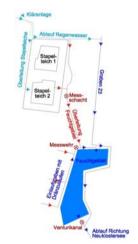
#### Costs and funding:

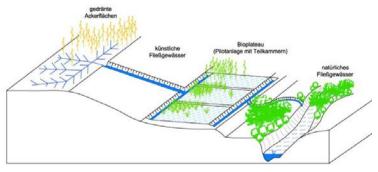
- ~ 560.000 Euro plus VAT (construction, planning, surveying, land acquisition, maintenance, monitoring)
- 80% through state program on water protection (ELER cofunding)

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



Map and figures: Institut biota

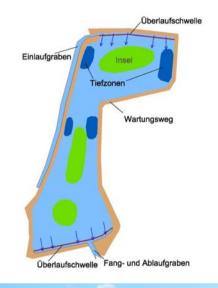




## Artificial wetland near Neukloster

- realisation 2011





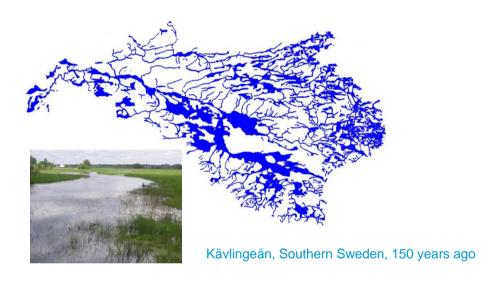


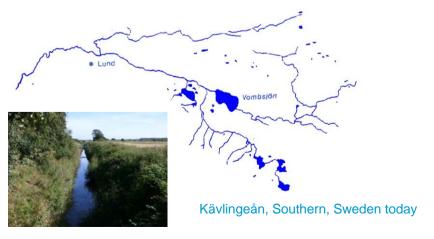
Photos and figures: Institut biota, Bützow



## Why do we need wetlands in the agricultural landscape?

### - because most natural filters have disappeared





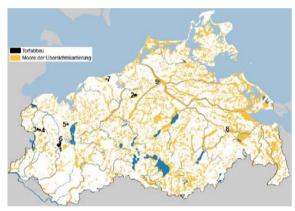
Citics/urban areas
County boarder
Lakes
Constructed wetlands
1995-2009

Articficial 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

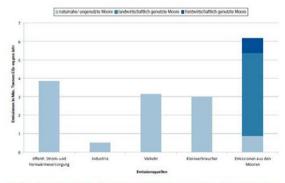


Abbildung 13: Emissionen aus den Mooren im Vergleich zu anderen relevanten Quellen<sup>14</sup> in Mecklenburg Vorpommern

# Regional strategies for wetland restoration in North-Eastern Germany

## "Large Scale Nature Conservation Project" Uckermark Lakes Region

- natural water retention measures aimed at
  - > improving water balance and
  - > water quality for
  - > biodiversity and
  - > tourism
- climate change adaptation

Shrinking lakes - a problem also for tourism



Peatbog complex serving flood retention (100.000m³)







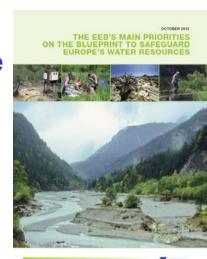
## **Conclusions**

Wetlands as NWRM / as elements of green infrastructure

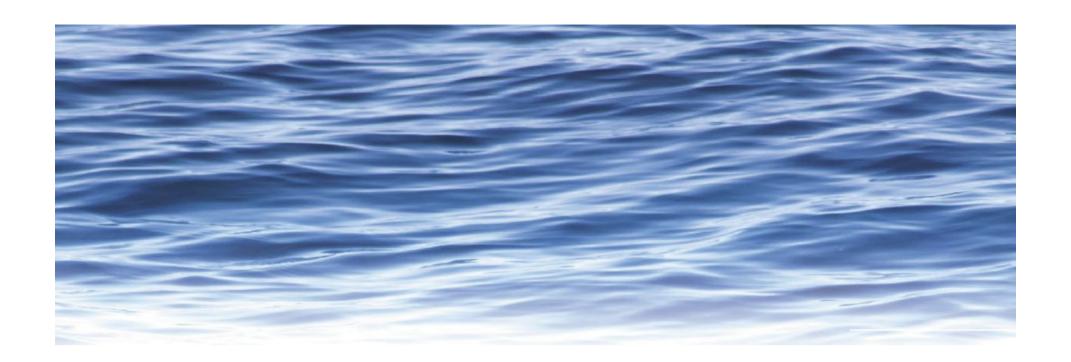
- are effective nutrient filters if properly located in the catchment (flow path oriented)
  - > verv cost-efficient
  - > multiple benefits for nature and society
- receive increasing attention and funding opportunities

  - 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 Ecolgical Focus Areas under the CAP?







## Thank you for your attention!

Tobias Schäfer GRUENE LIGA Water Policy Office, Berlin wasser@grueneliga.de www.wrrl-info.de

