

Heavily modified waterbodies' development in river-catchments in Northern German lowlands

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Background/ Research Goals

The primary "Water Framework Directive" goal of reaching a good ecological status / good ecological potential in all water bodies until 2015 was not achieved. Especially in North Rhine-Westfalia a high impact by diverse land utilizations such as urbanization, infrastructure or agriculture required a designation of many heavily modified water bodies (HMWB). In many cases anthropogenic usages of those water bodies will remain in future so that comprehensive restoration measures cannot be carried out.



Münstersche Aa in the city of Münster – heavily modified sections and restoration measures (Westerholtsche Wiese)

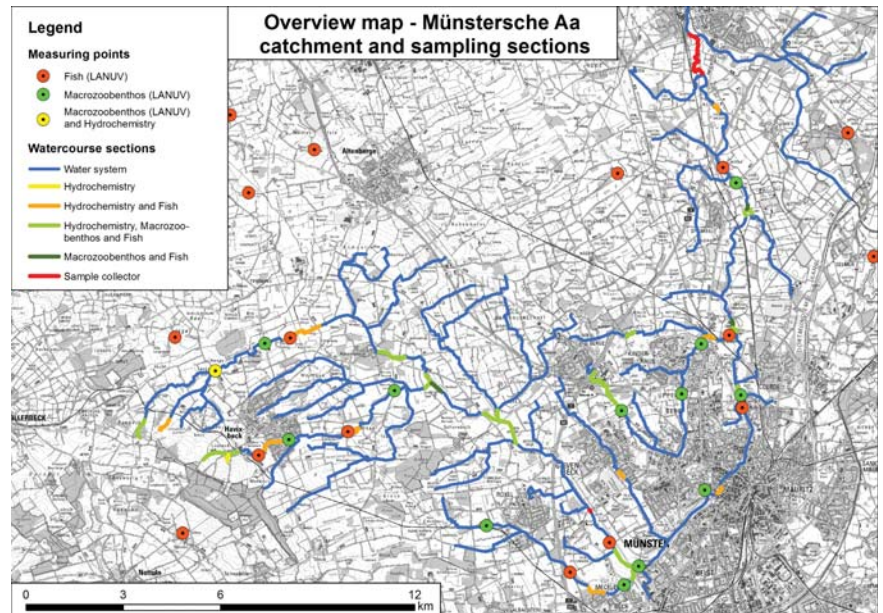
As study area the Münstersche Aa-catchment – a typical river system in the Northern German lowlands – mirrors this situation. Instead of a restoration of the whole river-catchment, smaller individual restoration measures are taken to support river-catchment's populations of biological quality elements. To expand knowledge about ecological effects of these small measures, spatially and temporally, highly resolved data will be generated: faunistic data about biological quality elements will be combined with hydrochemical data to improve knowledge about interactions of these components and to investigate causes of unsuccessful restoration measures. By evaluation of different measures and production of a high data density, statements regarding to prioritization of measures should be made. Furthermore, an underestimation of populations and inventory of FFH-species should be prevented.

Cooperation Partners:

- Institute of Landscape Ecology (ILÖK)
- Institute of Geology and Palaeontology (IGP)
- Working group „Wasser- und Bodenverbände Westfalen-Lippe (AG WuB)“

Investigation Parameters/Methods

- Hydrochemical studies include TOC, anionic and cationic concentrations, pesticides and pharmaceuticals, Non-Target-Screenings via LC-MS, etc.
- Continous hydrochemical investigations by sampling collectors are combined with measurement campaigns
- Biological investigation parameters are the biological quality elements macrozoobenthos and fish
 - Dense faunistic measuring network of approx. 30 sampling sections
 - In accordance with North Rhine-Westfalia's WFD-monitoring methods fish populations are measured by electrofishing; invertebrate populations are inspected by „Multi-Habitat-Sampling“



Model Area: „Münstersche Aa“ - River Catchment



Münstersche Aa-River catchment's different land uses

- catchment-size: 172 km²
- riversystem in Northern German lowlands, including sand-, loess- and loam-dominated water bodies
- heavily modified water bodies (HMWB)
 - diverse utilizations and anthropogenic degradations: agriculture, impoundments, land sealing and urbanization, wastewaterfeed, agricultural drainage, forestry
- substrate conditions
 - marly upper reaches of low permeability west of Münster
 - sandy riverbeds in the lower catchmet area north of Münster
- special features
 - considerable increase in waterlevel caused by heavy precipitation
 - low water levels –partially dry falling- in summer months



Long period of drought in 2018 causes dry falling in many river catchment's places

