

EFFECTS OF VEGETATED BUFFER STRIPS ON NUTRIENT EMISSION – A COMPARISON STUDY AT SUB-CATCHMENT SCALE

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The efficiency of buffer strips in the reduction of nutrient export from agricultural land to surface waters has almost been exclusively studied at the plot-scale while catchment studies can not be found. The difficulty in studying the impact of vegetated buffers at larger scales arises from the general incomparability of catchments and river basins besides technical aspects.

In this study we were aiming at identifying two small basins suitable for a comparison study in order to test the effect of buffer strips on nutrient export. Selection criteria of catchments were among others size, reach length to surface area ratio, fraction of tile drained arable land, land use, soil and presence of buffer strips. The latter criteria was considered as most relevant as only long term established buffer strips are believed to be possibly effective in today measurements especially if the groundwater path is considered. The investigations took place in the lowland of north-eastern Germany, in the federal state of Mecklenburg-Pomerania.

5478 catchments between 1 and 10 km² have been analysed. 20 to 30 pre-selected study areas were inspected. Finally, two sub-catchments with a comparable fraction of arable land (90 %) which is more or less entirely artificially drained were identified. Sub-catchment 'Camsbäk' has got a well established buffer strip along the one ditch with a variable width between 5 and 40m. There is almost no buffer strip (< 1.5 m) along the ditch in the 'Fauler Bach' catchment. A first monitoring campaign revealed the general high level of nitrogen-nitrate concentrations in both catchments. However, although both considered small basins are artificially drained, nitrate concentrations were greater in the 'Fauler Bach' catchment where no buffer strips are present. In both ditches concentrations decreased along flow direction from spring to outlet indicating self-cleaning processes to be operational. Future work will concentrate on groundwater monitoring in both catchments in addition to the quantification of the nutrient export load.

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