Developing improved methods for identifying the cost-efficient abatement set in the Baltic Sea region –Janne Helin, Aarhus University

Economic nutrient abatement models analysing the Baltic Sea protection policies commonly operate on a large scale, grouping river systems to large catchment areas. However, operating at the level of large catchment areas has consequences for policy recommendations. In particular, averaging the instream capacity of river systems to retain nitrogen from reaching the sea, removes the opportunity of targeting measures to the most vulnerable regions within the catchment, while overestimating the capacity of abatement measures in the upstream areas.   In this study we build a model to show what kind of bias in the optimal abatement set is caused by the assumption of spatial homogeneity. We classify catchment area to zones with increasing distance from the coast and solve the model with and without the zones. We find that while assuming homogeneity prevents from using abatement measures where they would be the most effective (typically close to coast) , it also leads to ignoring spatial limitations that are more relevant to a subset of abatement measures, such as the wetlands and buffer zones. Therefore, the bias for setting economic instruments optimally is not only derived from overestimating the costs due to underestimated efficiencies, but also from overestimating the abatement measure capacities relative to the average efficiency. We illustrate this analytical outcome with numerical Swedish data on reaching the good ecological status for the South-West coastal waters.