

Estimating monthly discharge from Danish river catchments

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The development of tools for assessing runoff and nutrient loads from unmonitored areas has been defined as one important task of the current National Monitoring Programme on the Aquatic Environment (NOVA) in Denmark. Previous studies to estimate annual river discharge in Danish catchments based on multiple regressions have shown that area many areas, where runoff cannot easily be attributed to natural processes within the area marked off by the topographic catchment boundary. Hence, our efforts to model monthly water balances for unmonitored areas was initially focused on catchments, where the long-term mean river discharge was slightly larger than the climatic water balance (precipitation minus potential evapotranspiration). There were two main reasons for choosing the monthly water balance modelling system MWB6 for our analysis. Firstly, after identifying the best model type among a number of eight are available in the system, the user needs to specify only 3 parameters. Secondly, earlier studies showed that the values of these 3 parameters could successfully be related to catchment properties. This parameter optimisation routine available in MWB6, however, is very restrictive with respect to catchment and runoff properties and may fail in cases where runoff is significantly impacted by either management practises or natural conditions such as large deviation between the topographic catchment boundaries and the groundwatersheds. These properties had to be dealt with separately.