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A MIKE SHE hydrological-solute transport model including nitrate reduction is employed to evaluate the delayed response in nitrogen loads in catchment streams following the implementation of nitrogen mitigation measures since the 1980s. The nitrate transport lag times between the root zone and the streams for the period 1950-2011 were simulated for two catchments in Denmark and compared with observational data. Results include nitrogen concentration and mass discharge to streams. By automated baseflow separation, stream discharge was separated into baseflow and drain flow components, and the nitrogen concentration and mass discharge in baseflow and drain flow were determined. This provided insight on the development of stream nitrogen loads, with a short average lag time in drain flow and a long average lag time in baseflow. The long term effect of nitrogen mitigation measures was determined, with results showing that there is a 15 years long delay in the appearance of peak nitrogen loads in streams. This means that real time stream monitoring data cannot be used alone to assess the effect of nitrogen mitigation measures. (C) 2018 Elsevier B.V. All rights reserved.
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