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## **Modelling climate change effects on nutrient discharges from the Baltic Sea catchment: processes and results**

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**Abstract** The effects of climate changes on nutrient discharges within the Baltic Sea catchment were modelled, indicating increases in concentrations of phosphorus, but decreases in nitrogen for the southern Baltic Sea catchment. The process-based hydrological and nutrient flux model, HYPE, was set up for the entire Baltic Sea catchment area. The model was then used to examine how water and nutrient fluxes may change during four different climate scenarios. Changes to discharge varied regionally, with increases seen in the northeastern Baltic Sea catchment and decreases in the south and southwest. Changes to total nutrient loads did not necessarily follow the changes in discharge, indicating significant changes in nutrient concentrations. This indicates the importance of a process-based hydrological and nutrient model for analyses: it is the net result of several different nutrient sink and source processes that determine the predicted status of nutrients as a result of climate change.

**Key words** water quality modelling; nutrient modelling; climate change; discharge modelling; Baltic Sea