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European nitrogen policies, nitrate in rivers and the use of the INCA model

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Abstract. This paper is concerned with nitrogen inputs to European catchments, how they are likely to change in future, and the implications for the INCA model. National N budgets show that the fifteen countries currently in the European Union (the EU-15 countries) probably have positive N balances – that is, N inputs exceed outputs. The major sources are atmospheric deposition, fertilisers and animal feed, the relative importance of which varies between countries. The magnitude of the fluxes which determine the transport and retention of N in catchments is also very variable in both space and time. The most important of these fluxes are parameterised directly or indirectly in the INCA Model, though it is doubtful whether the present version of the model is flexible enough to encompass short-term (daily) variations in inputs or longer-term (decadal) changes in soil parameters. As an aid to predicting future changes in deposition, international legislation relating to atmospheric N inputs and nitrate in rivers is reviewed briefly. Atmospheric N deposition and fertiliser use are likely to decrease over the next 10 years, but probably not sufficiently to balance national N budgets.

Keywords: nitrogen deposition, nitrogen fertilisers, nitrogen budgets, nitrogen balance, nitrate leaching, INCA Model, environmental legislation, EU directives, air pollution, water pollution

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