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Regional overview of nutrient load in Europe – challenges when using a large-scale model approach, E-HYPE

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Abstract The homogenous set-up of the HYPE model for Europe (E-HYPE) gives an overview of riverine nutrient transport from land to sea and surface water concentrations across the continent. Results indicate that loads and concentrations of total nitrogen are highest in the western part of Europe, draining to the North Atlantic Ocean. High phosphorous concentrations were more dispersed and coincided principally with major urban centres. Spatially-consistent moderate total phosphorous loads were also seen across the agricultural regions of Western Europe and north of the Black Sea. By analysing where modelled data and observations agree or disagree it may be possible to identify major knowledge gaps in the model. Spatial variation in results can help contribute to understanding of hydrological and nutrient processes in the wide variety of climates, physiological and anthropogenic conditions represented across the European continent. The predictability is limited by the quality of the continental-scale input data and the optimisation of model parameters to multiple sites.

Key words water; nitrogen; phosphorous; load; concentration; spatial pattern; pan-Europe; open data; model; predictability; knowledge gaps