

**O46.5****Developing a global economic valuation function for nitrogen impacts on coastal and marine ecosystem services**

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**Abstract**

The ecological and economic importance of coastal and marine ecosystems is widely recognised. Yet, excessive nutrient loads into these ecosystems can lead to eutrophication, impair ecosystem services (ES), and cause significant economic costs. The estimation of the economic costs and benefits of Nitrogen (N) mitigation measures can help support policy and decision-making towards more sustainable and efficient management of the coastal and marine environment. To this end, this study reviews and synthesizes in a quantitative meta-analysis three decades of scientific research in the Baltic Sea focusing on the economic valuation of the impacts of N loads on ES provision, and the associated costs and benefits of mitigation measures. The following main research questions are addressed: i) Which ES are most impacted by N loads in coastal and marine ecosystems? ii) Which economic methods have been used to assess and value these impacts? iii) Which role have scientifically established causal pathways between changes in N loads and ES provision played in estimating the economic values of the affected ES? We combine different sources of data and information to generate meta-regression models that help explain and predict how changes in N loads change the economic values of ES in a cost-benefit analysis (CBA) framework. We start in the Baltic Sea since this marine ecosystem has been intensively studied, and is hence data rich. Recreation and water quality improvements are the most frequently valued benefits impacted by N loads in the Baltic Sea. The estimated meta-regression models are used to provide preliminary indicator values for a reduction N loads globally. Although statistically significant relationships are found between costs, benefits and N baseline and N reduction levels, location and context-specific N-indicators underpinning unit costs and benefits challenge their combined use in a common global CBA framework.

**Keywords**

Coastal and marine ecosystems, Nitrogen loads, Ecosystem services