

# Reducing nutrient pressures on aquatic ecosystems in Europe

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## Abstract

In Europe (EU28) nutrient pollution from diffuse agricultural sources and domestic waste emissions represents a major pressure on rivers, lakes, groundwater and coastal waters, impairing the condition of the aquatic ecosystems and their services. Since 2000, the Water Framework Directive has promoted the protection and restoration of European water resources and ecosystems, through the implementation of River Basin Management Plans, with the aim to reduce significant pressures and achieve ‘good ecological status’ of all water bodies.

This research quantified the current pressures of point and diffuse nitrogen and phosphorus emissions to European waters (reference year 2012) and analysed the effects of three scenarios of nutrient reduction: 1) the application of water protection measures planned in the Rural Development Plans, supported by the EU Common Agricultural Policy; 2) an enhanced reduction of point and diffuse pollution by full implementation of the Urban Waste Water Directive and the absence of derogations in the Nitrates Directive; 3) a scenario of maximum technical feasibility in the reduction of nutrients, using best technologies in wastewater treatment and decreasing mineral fertilisers application in agriculture to minimize nitrogen surplus. Where possible associated costs were evaluated.

The results of the three scenarios for nitrogen and phosphorus were compared for the whole Europe and for different regional seas, and the expected improvement on the ecological status of aquatic ecosystems was estimated.

The analysis quantifies the possible achievement of good ecological status for European freshwater bodies and coastal water according to the current River Basin Management Plans, and explores improvements by further investments in available technologies and agricultural practices.

Keywords: nitrogen, phosphorus, scenarios, water ecosystems, Europe, ecological status, water ecosystem services, EU Water Framework Directive

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