European briefings

Freshwater quality

Much cleaner than 25 years ago, many waterbodies are still affected by pollutants and/or altered habitats. In 2009, only 43% showed a good/high ecological status; the expected 10 percentage point increase for 2015 (to 53%) constitutes only a modest improvement in aquatic ecosystem health.

Water management should improve with the second round of river basin management plans covering the 2016-2021 period resulting in the realisation of more policy objectives through stringent, well-integrated implementation and public participation.

Context

The continuing presence of pollutants in Europe's waters threatens aquatic ecosystems and raises concerns for public health. Discharge from urban wastewater treatment, and industrial effluents and losses from farming, are the main sources for water pollution. For example, agriculture causes widespread problems of nutrient enrichment in freshwater across Europe, despite recent improvements in some regions.

The main aim of European Union (EU) water policy is to ensure that throughout the EU, a sufficient quantity of good quality water is available for people's needs and for the environment. Since the first water directives in the 1970s, the EU has worked to create an effective and coherent water policy. The Water Framework Directive (WFD), which came into force in 2000, establishes a new framework for the assessment, management, protection and improvement of the quality of water resources across the EU.

EU Member States should aim to achieve good status in all bodies of surface water and groundwater by 2015 unless there are grounds for exemption. Only in this case may achievement of good status be extended to 2021 or 2027 at the latest. Achieving good status involves meeting certain standards for the ecology, chemistry, morphology, and quantity of waters. In general terms, good status means that water shows only a slight change from what would normally be expected under undisturbed conditions (i.e. with a low human impact).

Water quantity and water quality are closely linked, and good ecological status depends as much on the quantitative water resource aspects as on its quality. In many locations, water demand often exceeds availability. Over-abstraction is causing low river flows, lower groundwater levels, and the drying-up of wetlands, which have detrimental impacts on freshwater ecosystems. Climate change is projected to increase water shortages, particularly in the Mediterranean region.[1]

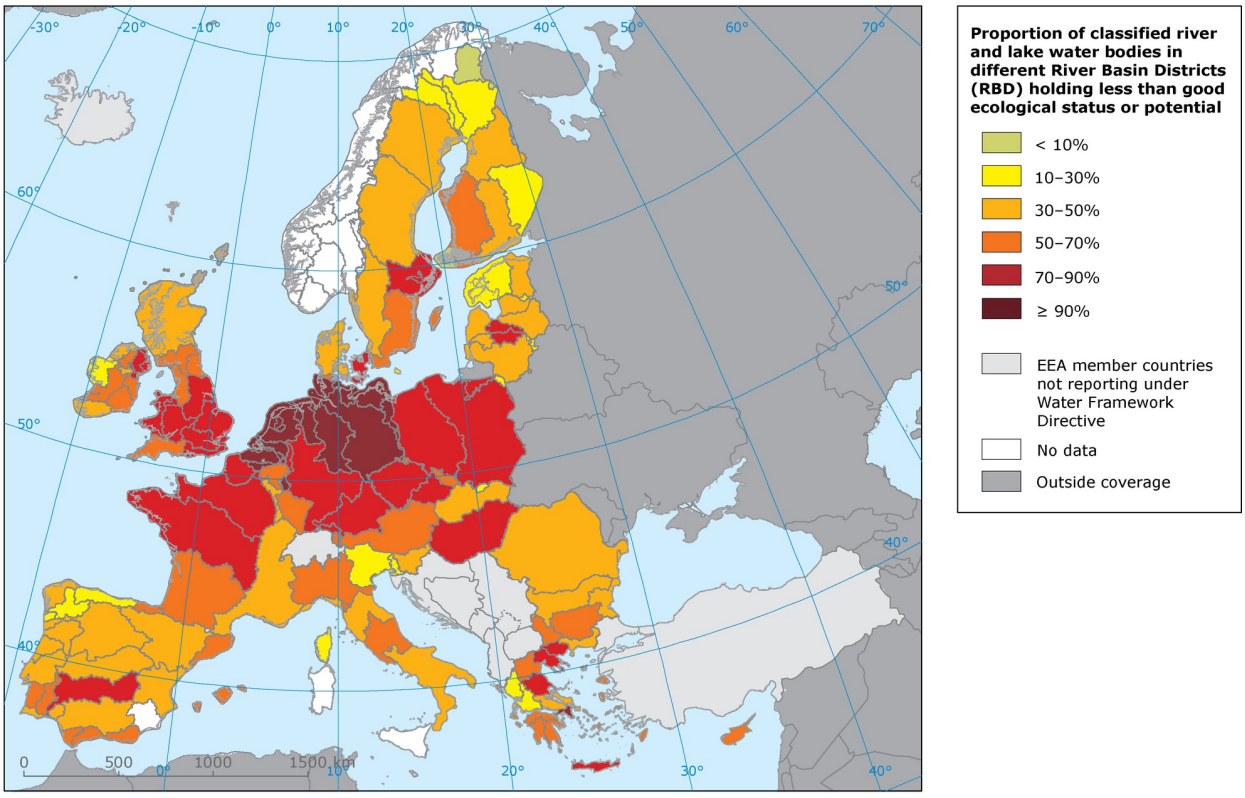
In 2010, EU Member States released 160 River Basin Management Plans (RBMPs), which contain plans for protecting and improving the water environment. The information in the RBMPs, together with other related sources of information, has been analysed to establish an assessment of the status of and pressures affecting Europe's waters. Over the last few years, European countries that are not EU Member States have developed similar river basin activities to those introduced by the Water Framework Directive. During 2015 EU Member States will finalise the second set of RBMPs. These will be the basis for an update of the status of Europe's waters and will illustrate progress in reducing pressures.

Key trends

Overall, more than half of the river and lake water bodies in Europe are reported to hold less than good ecological status or potential (Map 1). Ecological status is a criterion for the quality of the structure and functioning of surface water ecosystems. River water bodies are reported to have worse ecological status and more pressures and impacts than lakes.

The pressures reported to affect most surface water bodies are pollution from diffuse sources, in particular from agriculture, causing nutrient enrichment. Hydromorphological pressures also affect many surface water bodies, mainly from hydropower, navigation, agriculture, flood protection and urban development resulting in altered habitats. A large proportion of water bodies have poor ecological status and are affected by pollution pressures, particularly in central and north-western European areas with intensive agricultural practices and high population density.

Map 1: Proportion of classified river and lake water bodies in different River Basin Districts (RBD) holding less than good ecological status or potential

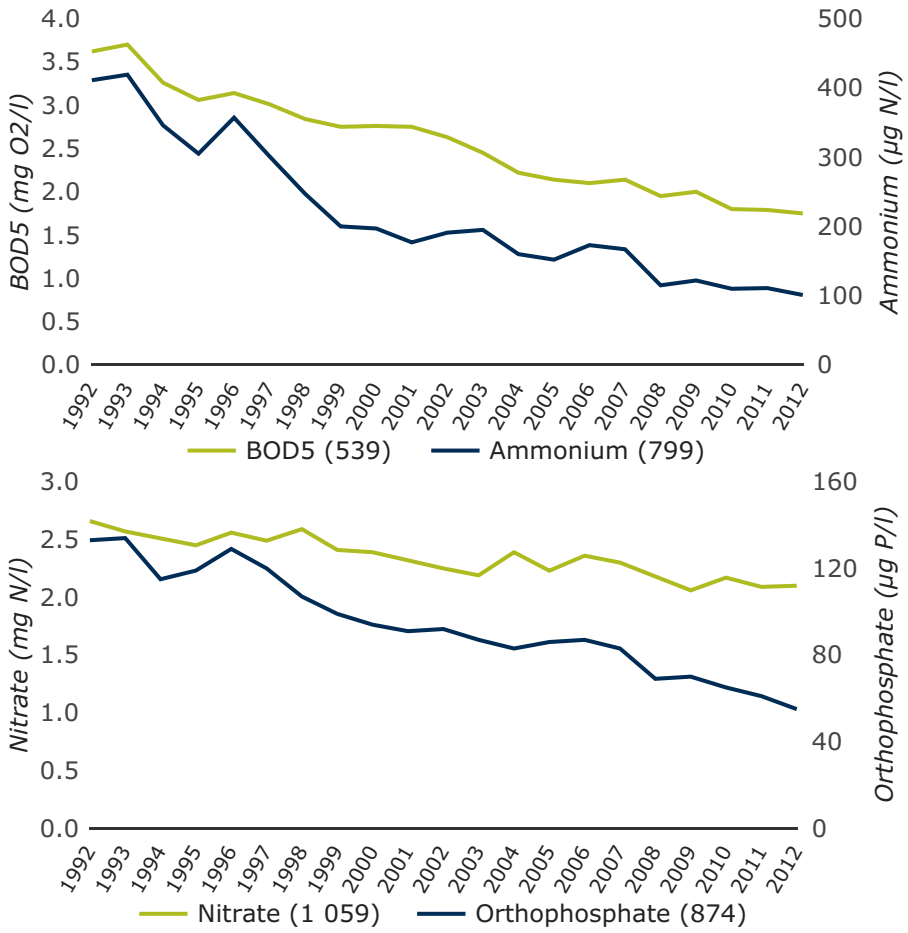


Source: WISE WFD Database.

Many years of investment in the sewage system, and better wastewater treatment under the Urban Waste Water Treatment Directive — together with national legislation — have led to some remarkable improvements. Europe's waters are much cleaner today than they were 25 years ago when large quantities of untreated or partially treated urban and industrial wastewater were discharged into water.

Levels of oxygen-consuming substances (BOD5), ammonium, and phosphate decreased markedly in European rivers over the last two decades (Figure 1).

Figure 1: Changes in water quality variables during the last two decades



Source: Waterbase - Rivers provided by European Environment Agency (EEA)

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European Environment Agency

Modern-day agricultural practices often entail the intensive use of fertilisers and manure, leading to high nutrient surpluses that are transferred to groundwater as well as surface water. About 25% of groundwater across Europe is classified as having poor chemical status, with nitrate being the primary cause. In European rivers, the nitrate concentration on average declined by 20% over the period 1992 to 2012 (Figure 1). This reflects the effect of measures to reduce agricultural inputs of nitrate at a European level (the Nitrates Directive) and at national level, as well as improvements in wastewater treatment.

The Bathing Water Directive and the Drinking Water Directive have, together with national measures, resulted in good bathing water quality and clean drinking water in Europe. Some sites (e.g. bathing waters polluted during heavy rain or some shallow wells) still have to improve their performance.

Hazardous substances in freshwater resulting in poor chemical status can harm aquatic life and pose a risk to human health. The information provided in the RBMPs on chemical status is not sufficiently clear to establish a baseline for 2009. Hazardous substances are emitted to waters through a range of substances via many different pathways and from a variety of sources, including industry, agriculture, transport, mining and waste disposal, as well as from homes,

where chemicals found in household products are discharged. Pesticides used in agriculture have been widely detected in surface water and groundwater. Mining, landfill sites, and contaminated land from historical industrial and military activities all exert a localised but significant pressure upon waters in parts of Europe.

If the morphology (structure) is degraded or the water flow (hydrology) is markedly changed, a water body with good water quality will not achieve its full potential as an ecosystem. For centuries humans have altered European surface waters (straightening and canalisation, disconnection of flood plains, land reclamations, dams, weirs, bank reinforcements, etc.) to facilitate agriculture and urbanisation and to produce energy and protect against flooding. There are several hundred thousand barriers and transverse structures in European rivers, and many water courses have had their seasonal or daily flow regimes changed. The WFD is the first piece of European environmental legislation that addresses hydromorphological modifications and their impacts on water bodies. The next RBMPs are obliged to include measures to reduce hydromorphological pressures if they cause less than good ecological status.

Prospects

The results from the first River Basin Management Plans showed that many European water bodies currently fail the WFD's objective of achieving good ecological and chemical status. In 2009, 43% of surface water bodies were in good or high ecological status, and in 2015, 53% of water bodies are expected to reach good ecological status.[2] This is far from meeting the objective of good ecological status and only constitutes a modest improvement in ecological status.

To achieve good status, Member States will have to address the pressures affecting water bodies. Pollution is one pressure. Morphological changes, over-abstraction, and hydrological changes affecting water flow are others. While Member States are relatively clear about the types of pressures their river basins are encountering, precise information is missing on how these pressures will be addressed and to what extent the selected measures will contribute to the achievement of the environmental objectives in 2015.

Full implementation of the WFD throughout all sectors is needed to reduce the different pressures and to commit all users in a river basin to focus on the achievement of healthy water bodies with good status. Although considerable success has been achieved in reducing the discharge of pollutants into Europe's waters in recent decades, challenges remain for urban and industrial wastewater and for pollution from agricultural sources. Wastewater treatment must continue to play a critical role in the protection of Europe's surface waters, and investment will be required to upgrade wastewater treatment and to maintain infrastructure in many European countries. Measures are needed to ensure the removal of emerging pollutants and to reduce storm water discharges.

Despite improvements in some regions, diffuse pollution from agriculture remains a major cause of the poor water quality currently observed in parts of Europe. Measures exist to tackle agricultural pollution and they need to be implemented. Full compliance with the Nitrates Directive is also required. The new reform of the Common Agricultural Policy (CAP) provides an opportunity to further strengthen water protection.

There are ample possibilities for improving water management through stringent and well-integrated implementation in order to achieve the objectives of the WFD. However, the next cycle of River Basin Management Plans, which will be agreed on in 2015, need to also take into account a wider consideration of water resource management as well as the impacts of climate change.

SOER 2015 European briefings present the state, recent trends and prospects in 25 key environmental themes. They are part of the EEA's report SOER 2015, addressing the state of, trends in and prospects for the environment in Europe. The EEA's task is to provide timely, targeted, relevant and reliable information on Europe's environment.

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