

EUTROPHICATION OF WATER COURSES

WATER 5

Excessive phosphorus inputs into freshwater cause eutrophication, which is usually accompanied by significant algal growth and oxygen depletion of the water, which is critical for certain aquatic organisms. Water courses affected by this phenomenon may not achieve the good ecological status required by the Water Framework Directive (WFD) 2000/60/EC.

The most eutrophic water courses in the north

The water courses with the highest concentrations of orthophosphates are mainly located in the Scheldt Basin and in the downstream Meuse sub-basin (Geer)¹. This area has a high density of urban and industrial areas (waste water discharges) as well as numerous agricultural soils enriched with phosphorus and sensitive to erosion². In addition, these water courses have relatively low flow rates³, which reinforces the negative impacts of phosphorus inputs into water courses.

Improvements show one-off variations

Water quality has improved due to various factors, including:

- the reduction of phosphorus fertiliser inputs in agriculture (-65% between 1995 and 2014)⁴;
- the reduction of industrial pollutant loads⁵;
- the reduction of domestic pollutant loads, in particular following the ban on phosphates in detergents⁵;
- the compliance of treatment plants in tertiary treatment (denitrification and phosphate removal) required in Wallonia in stations with a capacity of more than 10,000 population equivalents and practically completed⁶.

However, this overall improvement was characterised by one-off variations, mainly linked to:

- the increase in water courses flows in some years³ (e.g. 2012) which diluted the pollution;
- diffuse inputs (runoff, eroded soil particles) which are

larger in rainy years, especially north of the Sambre-et-Meuse line, where phosphorus soil saturation rates are higher (fertiliser inputs)²;

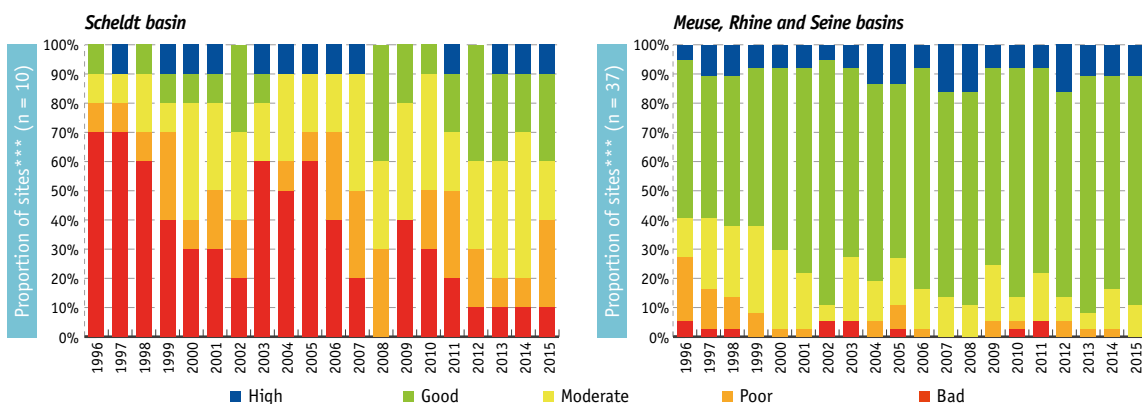
- a local increase in industrial phosphorus discharges (uncontrolled spillages).

The observed improvement is expected to continue with the implementation of the measures listed in the second River Basin Management Plans (RBMPs)⁷ and certain measures of the Sustainable Management Programme for Nitrogen in Agriculture (*Programme de gestion durable de l'azote en agriculture - PGDA*)⁸.

The orthophosphate and nitrate loads of the Walloon rivers contribute in part to eutrophication of the North Sea. To achieve the good ecological status of North Sea coastal waters required by the WFD for 2015 (extension of the deadline to 2027), the modelled reductions in nitrogen and phosphorus to be achieved at the mouth of rivers would range from -41% (Scheldt) to -73% (Rhine/Meuse) for inorganic nitrogen and -23% (Scheldt) to -70% (Rhine/Meuse) for inorganic phosphorus, compared to the period 2000-2010⁹. The respective inputs from neighbouring states should be assessed.

[1] → Map 27 | [2] → SOILS 3 & 4 | [3] → WATER 2 | [4] → AGRI 5 | [5] → WATER 4 | [6] → WATER 19 | [7] RBMPs 2016-2021 adopted by the Walloon Government on 28/04/2016; → WATER 21 | [8] PGDA III (Walloon Government Decree of 13/06/2014); → AGRI 9 | [9] European EMoSEM project 2013-2014 (Desmit *et al.*, 2015)

Fig. WATER 5-1 Status* of water courses according to orthophosphate concentrations** in Wallonia



* The limits of the status classes for the parameter "orthophosphates" differ according to the typology of water bodies (Walloon Government Decree of 13/09/2012).

** 90th percentile of annual concentrations

*** Monitoring sites for which data are available annually between 1996 and 2015