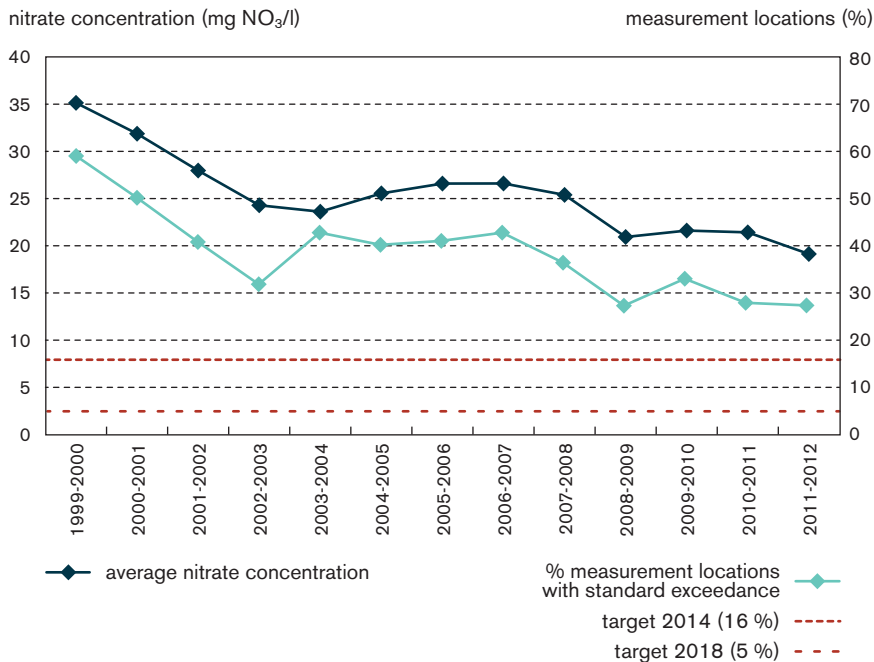


☺ Nitrate in surface water in agricultural areas

DPSIR



Source: VMM

Still a long way to go

Excessive nitrate concentration in the surface water threatens the drinking water supply and can lead to excessive algae growth in the surface water. The Manure Action Plan (MAP) surface water monitoring network is located in smaller watercourses where agriculture is the determining factor in water contamination. The results are presented per winter year (July-June).

The average nitrate concentration and the percentage of measurement locations with standard exceedance follow quite parallel trend. Between 2003-2004 and 2007-2008, little changed. In the winter year 2011-2012, the nitrate concentration exceeded the standard at 28 % of the measurement points in agricultural areas. The standard specifies 50 mg nitrate per litre as the maximum per measurement point. The situation must improve significantly if the target of the standard being exceeded by 16 % at the most in 2014 as specified in the MINA plan 4 (2011-2015) is to be achieved. The ambition is to decrease that percentage to less than 5 % before 2018.

Improvement at 29 % of the measurement points

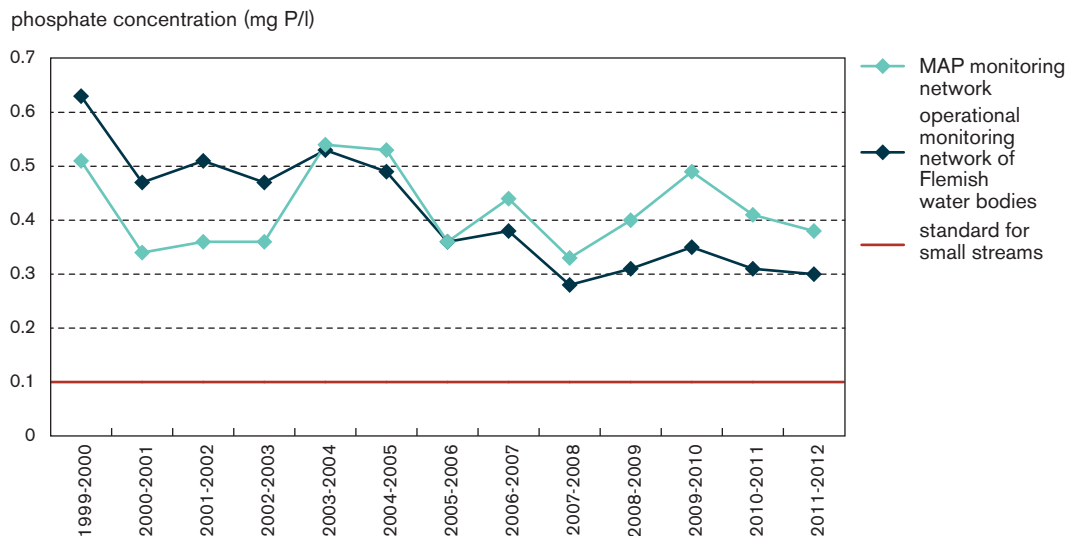
A statistical trend analysis per measurement location shows that, at approximately 68 % of the locations, the nitrate concentration does not show any significant trend in the period 2000-2011. 29 % of the measurement locations show a significant downward trend and nearly 3 % a significant upward trend. This analysis thus shows that the improved situation by no means applies to all measurement points.

Farmers can reduce the nitrate losses further by using less manure and applying it better, but also, for example, by sowing green cover crop in winter and creating buffer strips alongside watercourses. To this end, farmers are invited to participate in so-called water quality groups to exchange knowledge and practical experiences.

	99-00	01-02	03-04	05-06	07-08	08-09	09-10	10-11	11-12
average nitrate concentration (mg NO ₃ /l)	35.1	28.0	23.6	26.6	25.4	20.9	21.6	21.4	19.1
% measurement locations with standard exceedance	59	41	43	41	37	28	33	28	28

☹ Phosphate in surface water in agricultural areas

DPSIR



Source: VMM

Monitoring in surface water

Too much phosphate in surface water can lead to excessive algae growth and thus adversely affect the quality of the surface water. This phosphate mainly comes from discharges of household waste water and losses from agricultural land. The quality of the surface water in agricultural areas is monitored in the MAP monitoring network. The evolution of the annual average concentrations in the MAP monitoring network is compared with that of the operational monitoring network of Flemish water bodies. These are freshwater rivers with a basin larger than 50 km² and waters that form the transition to the sea. The environmental quality standards for phosphate in surface water have been specified per watercourse type. Here, all MAP measurement locations are assessed against the standard for small streams. This standard is 0.1 mg P/l for the annual average phosphate concentrations.

A great challenge

When considering the whole period 1999-2012, the average phosphate concentration in the MAP monitoring network shows little or no improvement. This contrasts with the concentrations in the operational monitoring network of Flemish water bodies. That improvement is due mainly to the development of the public water treatment, but also to the decrease in discharges by companies. The fact that no or hardly any improvement of the phosphate concentrations is noticeable in the MAP monitoring network is also confirmed by a statistical trend analysis per measurement location over the period 2000-2011. No statistically significant trend could be demonstrated at nearly 84 % of the measurement locations. Significantly downward and significantly upward trends were observed at nearly 9 % and 8 % of the locations respectively.

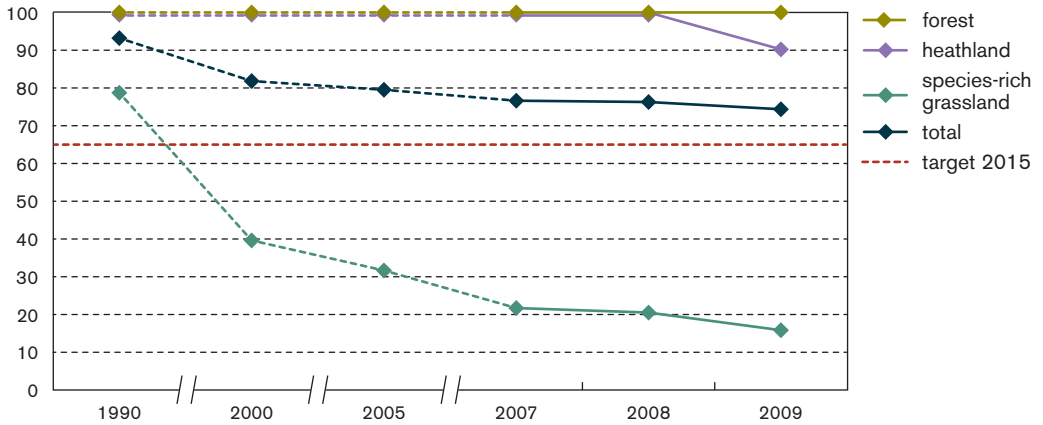
Farmers can reduce the phosphate losses further by using less manure and applying it better, but also, for example, by sowing green cover crops and creating buffer strips alongside watercourses.

average phosphate concentration (mg P/l)	99-00	01-02	03-04	05-06	07-08	08-09	09-10	10-11	11-12
MAP monitoring network	0.51	0.36	0.54	0.36	0.33	0.40	0.49	0.41	0.38
operational monitoring network of Flemish water bodies	0.63	0.51	0.53	0.36	0.28	0.31	0.35	0.31	0.30

☹ Nature area with exceedance of the critical load for eutrophication

DPSIR

nature area with exceedance of critical load for eutrophication (%)



results for all years calculated with VLOPS deposition model, which was modified in 2012

Source: VMM

Exceeding critical load leads to damage to vegetation

Eutrophication causes damage to natural vegetation. Nitrofilous plants are favoured and biodiversity is affected. Nitrate leaching can occur. For each type of vegetation, 'critical loads' for eutrophication are determined as the damage threshold for atmospheric nitrogen deposition. If these deposition limits are exceeded, this leads in the long term to harmful effects on the vegetation. By 2015, only 65 % of the surface nature in Flanders may still exceed the limits according to the target in the MINA plan 4 (2011-2015).

In 2009, on 74 % of the Flemish nature area (forest, heathland and species-rich grassland) the critical load for eutrophication was exceeded. For forest, the figure is 100 %. For heathland and species-rich grassland, it is 90 % and 16 % respectively. In 2004, 47 % of the nature in the EU-25 was exposed to nitrogen deposition levels higher than the critical load.

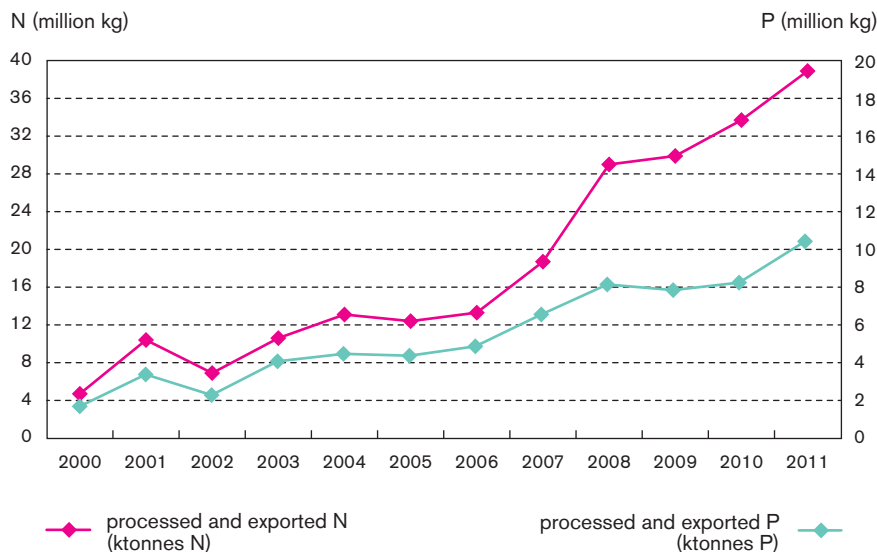
Eutrophication a greater threat to biodiversity than acidification

The long-term objective is that there should be no nature area where the critical load is exceeded. The nitrogen oxide and ammonia emissions reduction in 2009 achieved a small improvement. In addition, the conversion from coniferous forest to broadleaf forest reduced the sensitivity to acidification. Moreover, the long-term effect of the critical load being exceeded leads to an accumulation of nitrogen in the soil, the effects of which are not yet understood very well. This implies that eutrophication is a much greater threat to the conservation of biodiversity than acidification. The current deposition values pose a barrier to achieving the conservation objectives for Natura 2000 areas. Further emission reductions under international agreements are necessary. For Flanders this means that both NO_x and NH_3 emissions must be reduced further.

nature area with exceedance of critical load for eutrophication (%)	1990	2000	2005	2007	2008	2009
forest	100	100	100	100	100	100
heathland	100	100	100	100	100	90
species-rich grassland	79	40	32	22	21	16
total	93	82	80	77	76	74

☺ Manure processing and export

DPSIR



Source: VLM

Manure processing eases the surplus

Manure processing with the final product being exported with no shift towards emissions into the water and/or air not only contributes to reducing the pressure of fertilisers, but also to a reduction in the ammonia emissions. Manure processing is one of the measures for tackling the manure surplus in Flanders. Manure can also be exported unprocessed and in this context is referred to as manure export.

Since 1996, manure processing and export in Flanders has grown to 39 million kg of nitrogen (N) and 10.5 million kg of phosphorus (P) in 2011, including 8.5 million kg of N from other organic materials used in the processing. Proportionately, more phosphorus is processed and exported than nitrogen because more chicken manure is processed and exported than pig manure. Chicken manure is richer in phosphorus. In comparison with the actual animal manure production, approximately 19 % of the nitrogen content was processed in 2011. Manure processing consequently makes a real contribution to reducing the manure surplus. This does not, however, mean that the water quality objectives are being achieved.

Manure processing continues to be necessary

Since 1 January 2007, the whole of Flanders has been designated as a sensitive area so that a general maximum of 170 kg N/ha from animal manure can be applied on agricultural land, with regional variations. Since then, increasing the number of livestock is allowed only if, among other things, additional animal manure is processed. In 2011, the fertilisation standards were differentiated even further. This limits the manure spreading area in Flanders. Manure processing, therefore, remains one of the preferred routes for limiting the amount of manure so that the quality targets for surface water and groundwater can be reached.

(million kg)	2000	2005	2007	2008	2009	2010	2011
manure processing and export N	4.7	12	19	29	30	34	39
manure processing and export P	1.7	4.4	6.6	8.2	7.9	8.3	10.5
actual animal manure production N	181	157	154	155	156	160	159
actual animal manure production P	31.6	27.0	26.6	25.9	25.9	26.6	26.5