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COMMISSION STAFF WORKING DOCUMENT

Accompanying the document

REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT

on the implementation of Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources based on Member State reports for the period 2016–2019

{COM(2021) 1000 final}

Water Quality Monitoring - Wallonia

In Wallonia, nitrate monitoring to support the implementation of the Nitrates Directive is organized by the "Service Public de Wallonie Agriculture, Ressources Naturelles Environnement (SPWARNE), either directly or relying on local potable water producers. For groundwater, drinking water producers represent almost 70% of the groundwater monitoring network. Groundwater monitoring frequency is highly variable and range from 4 measurements per year to 4 measurements every 3 to 4 years depending on the location of the well and the concentration. For surface water, the network was designed to have long time series and ensuring that the network covers the whole territory of Wallonia. Monitoring frequency for surface water is 12 samples per year.

It is noteworthy that in some cases in the bar charts the total value can differ from 100% due to rounding errors.

Groundwater quality monitoring network

Table 7. Number of GW stations with measurements and trends per type

		Number of stations with measurements			Number of stations with Trends		
Station Type	Description	2008-2011	2012-2015	2016-2019	2008-2011	2012-2015	2016-2019
0	Phreatic groundwater (shallow): 0-5 m	518	499	470	503	494	470
1a	Phreatic groundwater (deep) 5-15 m	95	91	93	92	90	93
1b	Phreatic groundwater (deep) 15-30 m	71	91	89	70	90	89
1c	Phreatic groundwater (deep) >30 m	117	117	120	112	116	120
2	Captive groundwater	12	12	12	12	12	12
3	Karstic groundwater	54	54	54	52	53	54
9	Not specified	32	0	0	31	0	0
	Total	**899**	**864**	**838**	**872**	**855**	**838**

Surface water quality monitoring network

Table 8. Number of SW stations with measurements, trends and trophic status per type

		Number of stations with measurements			Number of stations with Trends			Number of stations with Trophic status		
Station Type	Description	2008-2011	2012-2015	2016-2019	2008-2011	2012-2015	2016-2019	2008-2011	2012-2015	2016-2019
4	River water	64	66	47	58	63	47	52	66	47
5	Lake/reservoir water	0	0	12	0	0	12	0	0	12
6	Transitional water	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Coastal water	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Marine water	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	Not specified	0	0	0	0	0	0	0	0	0
	Total	**64**	**66**	**59**	**58**	**63**	**59**	**52**	**66**	**59**

Groundwater Quality - Wallonia

Groundwater average annual nitrate concentration

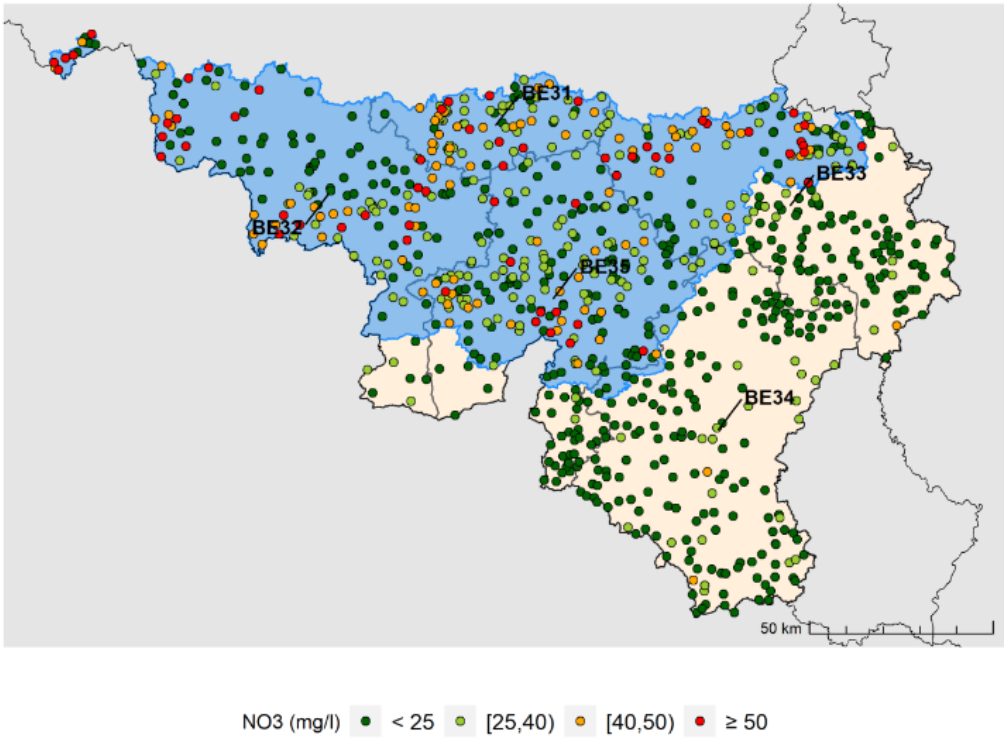


Figure 22. Spatial distribution of average NO3 annual concentration (map) and corresponding percentage of monitoring points per classes of concentration by reporting period (x axis). In the map in blue the NVZ.

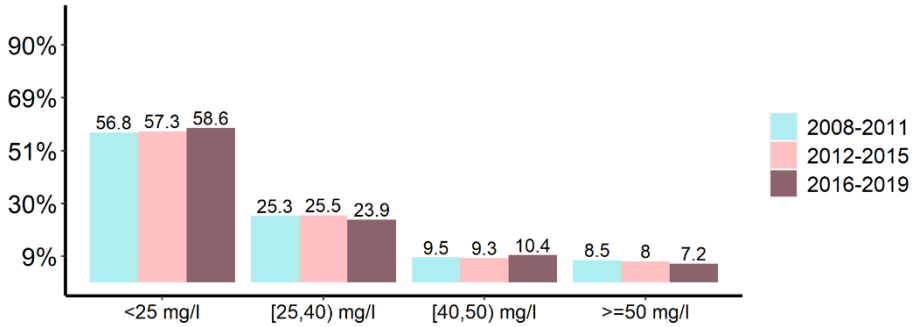
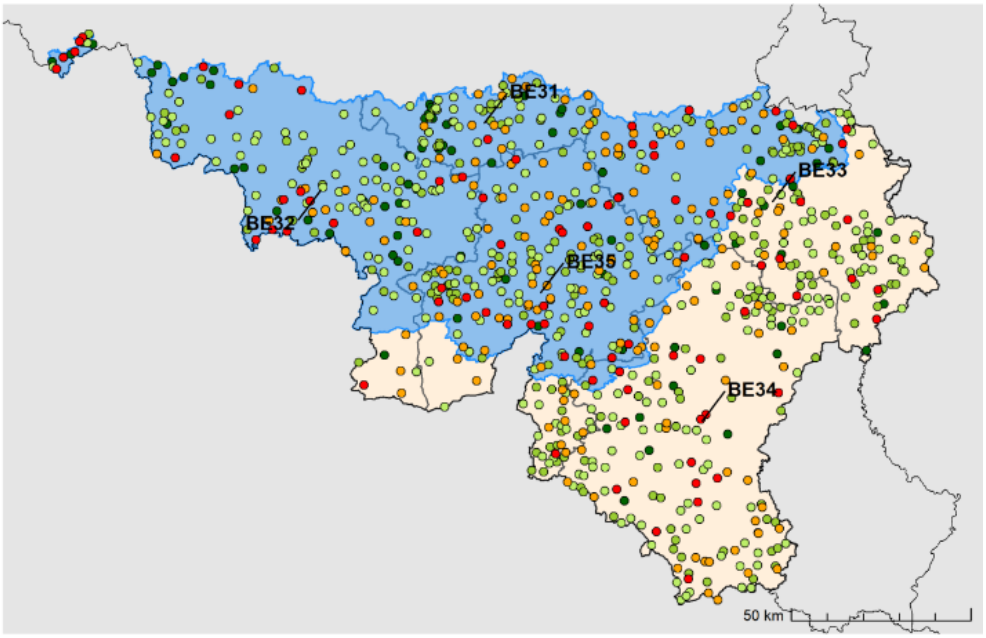


Figure 23. Comparison of percentage of monitoring points in the three reporting periods by classes of average NO3 annual concentration (x axis)

Groundwater concentration trend



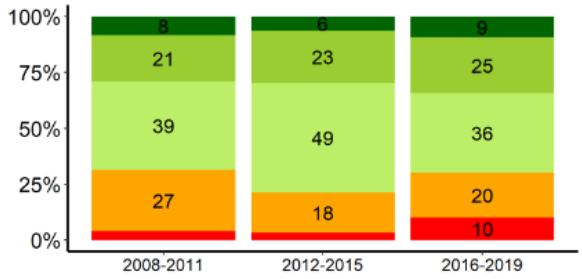


Figure 24. Spatial distribution of average NO3 annual trends (map) and corresponding percentage of monitoring points per classes of trends by reporting period (x axis). The percentages below 5% are not labelled, see the next plot for more information. In the map in blue the NVZ.

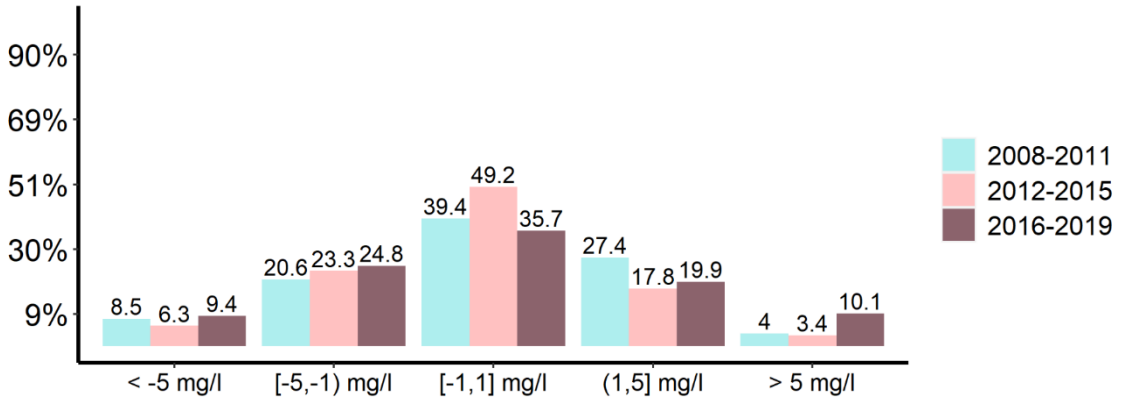
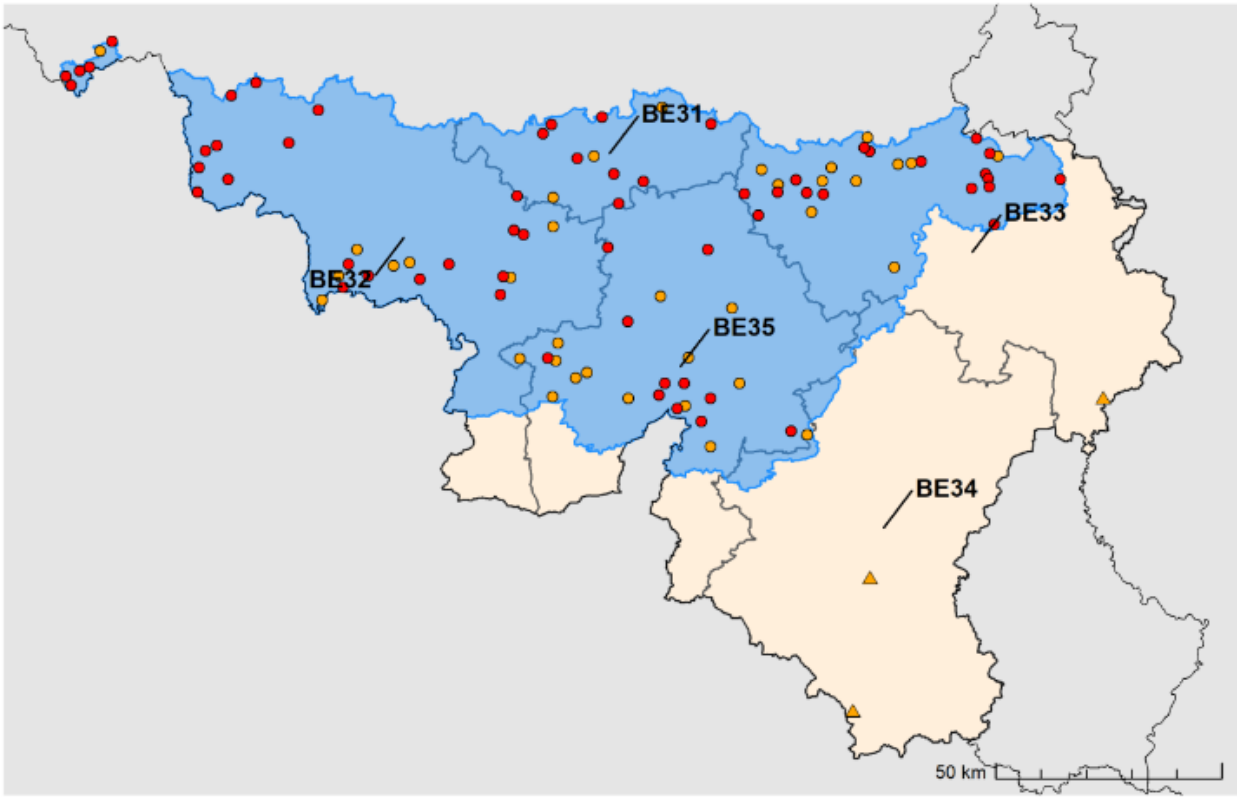


Figure 25. Comparison of percentage of monitoring points in the three reporting periods by classes of average NO3 annual trends (x axis)

Groundwater hotspot



		>=40 and < 50 mg/l incr.trend		>=50 mg/l	
NUTS ID	NUTS NAME	InNVZ	OutNVZ	InNVZ	OutNVZ
BE31	Prov. Brabant Wallon	3	0	9	0
BE32	Prov. Hainaut	8	0	23	0
BE33	Prov. Liège	11	1	17	0
BE34	Prov. Luxembourg (BE)	1	2	0	0
BE35	Prov. Namur	13	0	11	0
	Total	**36**	**3**	**60**	**0**

Figure 26. GW hotspot analysis map (top graph) and distribution by NUTS2 (lower graph) of average NO3 annual concentration greater than 40 mg/l. In the map in blue the NVZ.

The hotspot analysis identifies all the GW monitoring stations that have NO3 concentration in the range of 40-50 mg/l with increasing trends and above 50 mg/l. The map shows the spatial distribution of these points, and the table reports the number of stations by NUTS inside and outside NVZ. Only the NUTS of interest are reported.

Surface Water Quality - Wallonia

Surface water average annual nitrate concentration

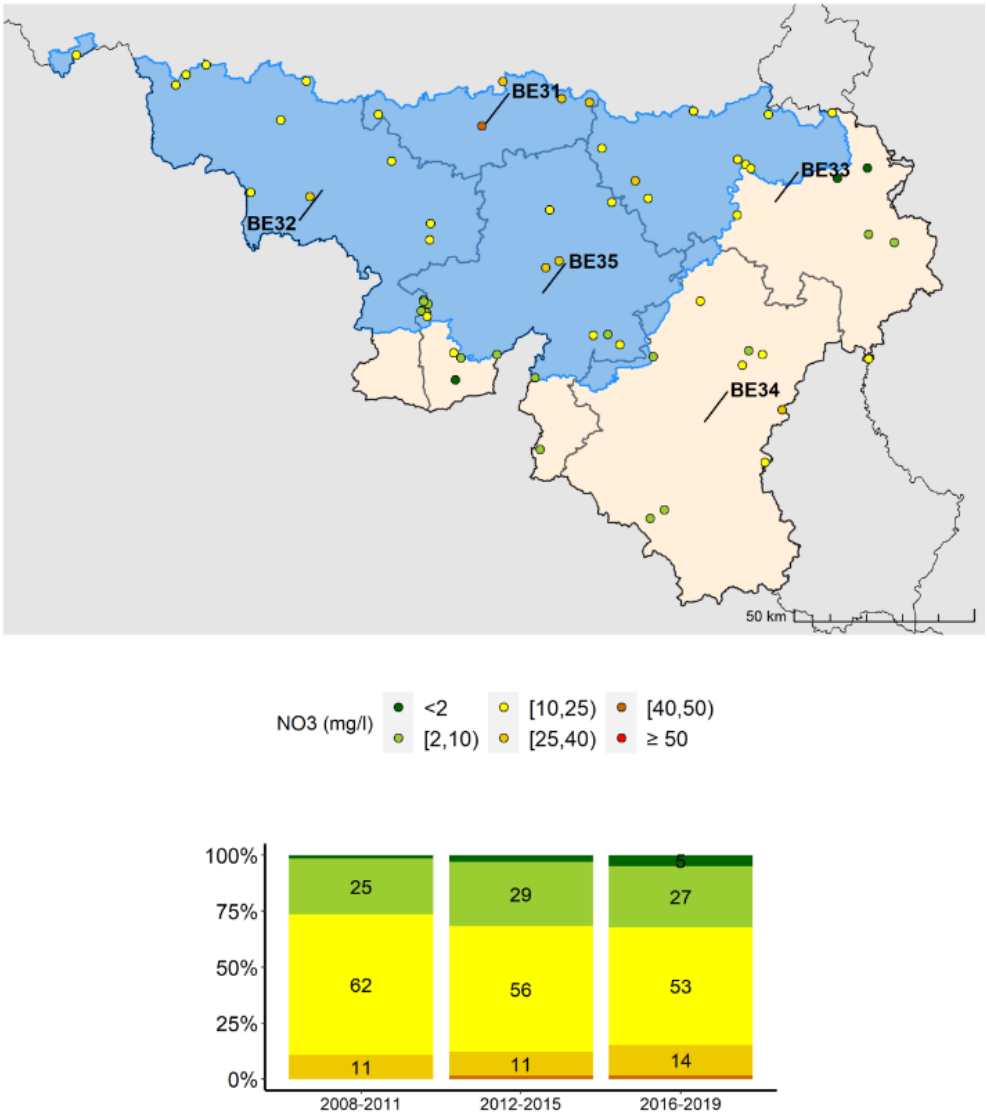


Figure 27. Spatial distribution of average NO3 annual concentration (map) and corresponding percentage of monitoring points per classes of concentration by reporting period (x axis). The percentages below 5% are not labelled, see the next plot for more information. In the map in blue the NVZ.

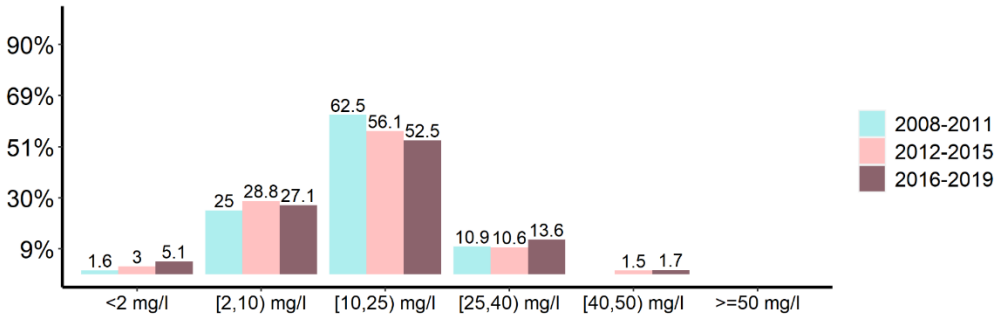


Figure 28. Comparison of percentage of monitoring points in the three reporting periods by classes of average NO3 annual concentration (x axis)

Surface water average annual nitrate concentration trend

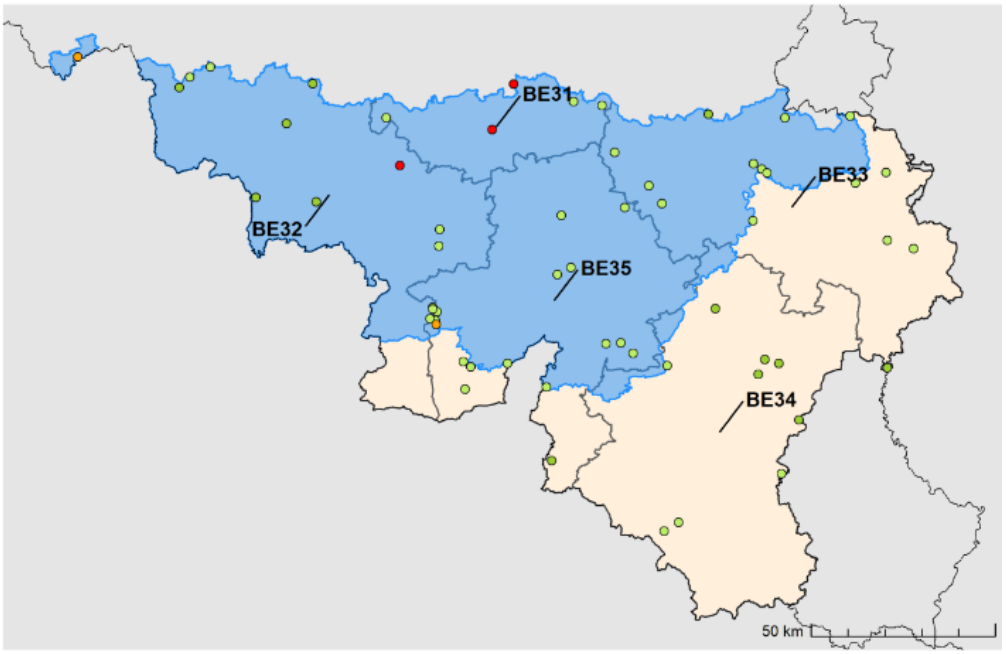


Figure 29. Spatial distribution of average NO3 annual trends (map) and corresponding percentage of monitoring points per classes of trends by reporting period (x axis). The percentages below 5% are not labelled, see the next plot for more information. In the map in blue the NVZ.

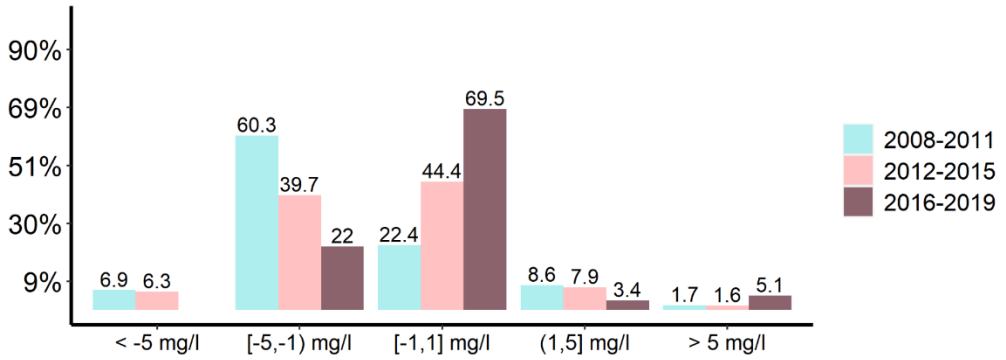


Figure 30. Comparison of percentage of monitoring points in the three reporting periods by classes of average NO3 annual trends (x axis)

Surface Water Eutrophication

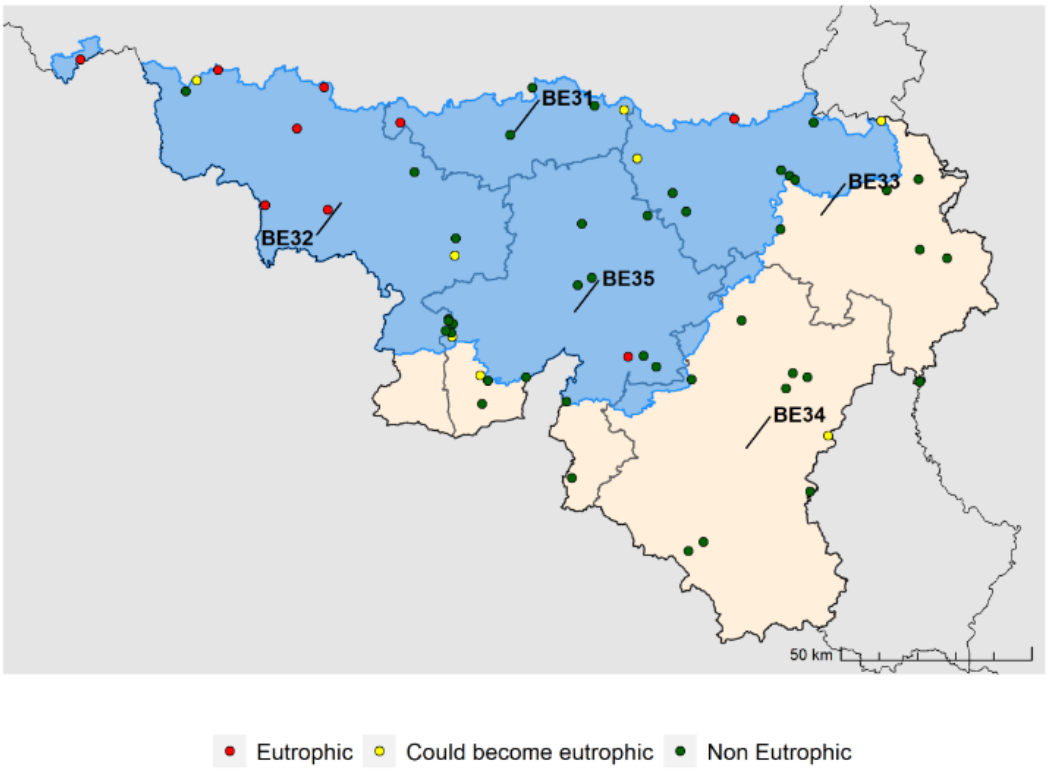


Figure 31. Spatial distribution of eutrophic status (map) and corresponding percentage of monitoring points per classes of status by reporting period (x axis). In the map in blue the NVZ.

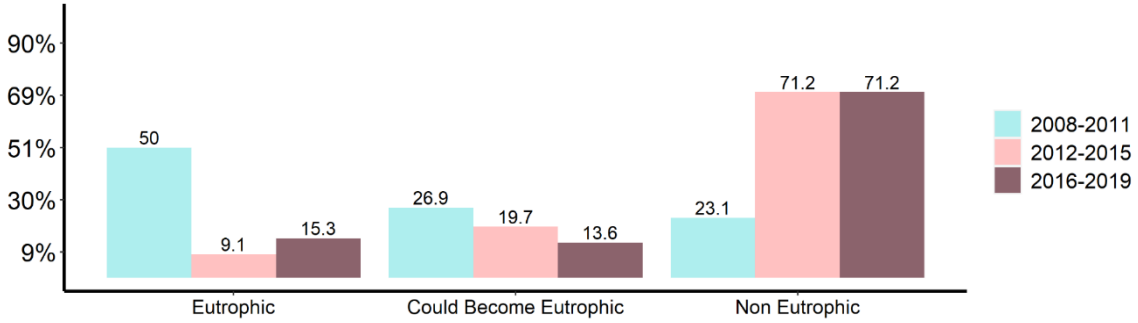
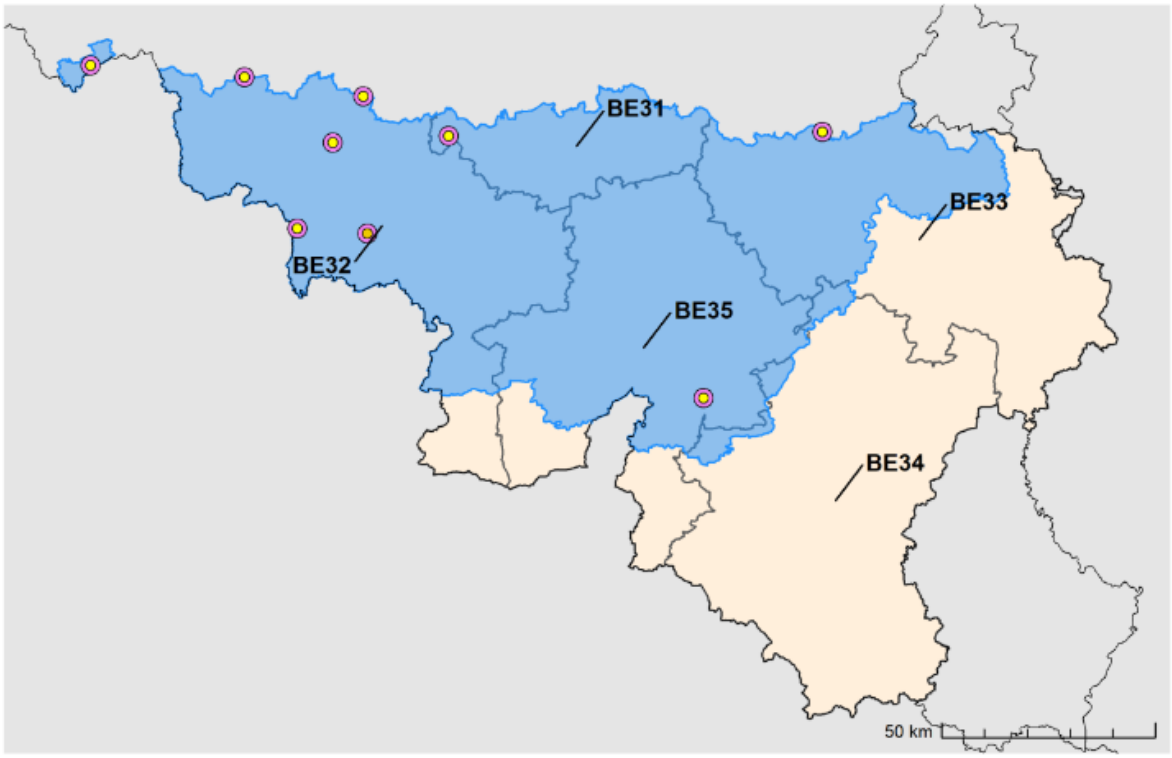


Figure 32. Comparison of percentage of monitoring points in the three reporting periods by classes of status (x axis)

The Eutrophic status vs average NO3 annual concentration



			Number of stations by classes of concentration						
NUTS ID	NUTS NAME	High trophic status	<2 mg/l	[2,10) mg/l	[10,25) mg/l	[25,40) mg/l	[40,50) mg/l	>=50 mg/l	Unclassified
BE31	Prov. Brabant Wallon	1	0	0	1	0	0	0	0
BE32	Prov. Hainaut	6	0	0	5	1	0	0	0
BE33	Prov. Liège	1	0	0	1	0	0	0	0
BE35	Prov. Namur	1	0	0	1	0	0	0	0
	Total	**9**	**0**	**0**	**8**	**1**	**0**	**0**	**0**

Figure 33. The SW monitoring stations with eutrophic status versus the average NO3 annual concentration. In the map in blue the NVZ.

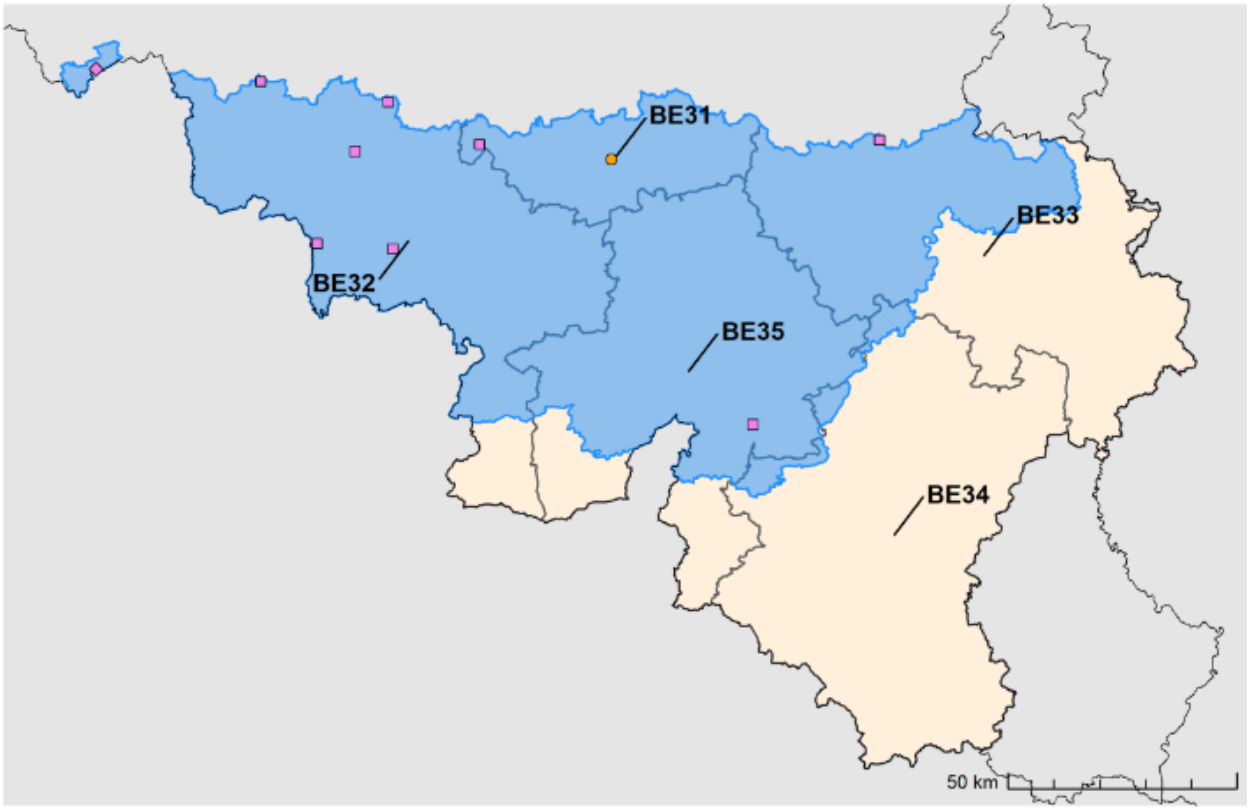
The analysis shows all the SW monitoring stations with the highest trophic status and the corresponding value of NO3 concentration. The map shows the spatial distribution of these points, and the table reports the number of stations with measurements with highest trophic status and the corresponding stations by classes of NO3 concentration. Only the NUTS of interest are reported.

Like for the previous report the eutrophication criteria are those used for the Water Framework Directive. For rivers, eutrophication is evaluated by river type based on orthophosphate and total phosphorus thresholds. For surface water reservoirs, eutrophication is based on summer chlorophyll-a concentration.

Table 9. Summary of SW stations by classes of trophic status and type.

		Number of stations with Trophic status		
Station Type	Description	Eutrophic	Could become eutrophic	Non Eutrophic
4	River water	9	8	30
5	Lake/reservoir water	0	0	12
6	Transitional water	NA	NA	NA
7	Coastal water	NA	NA	NA
8	Marine water	NA	NA	NA
9	Not specified	0	0	0
	Total	**9**	**8**	**42**

Surface Water quality hotspot



		High trophic status		>=40 and < 50 mg/l incr.trend		>=50 mg/l	
NUTS ID	NUTS NAME	InNVZ	OutNVZ	InNVZ	OutNVZ	InNVZ	OutNVZ
BE31	Prov. Brabant Wallon	1	0	1	0	0	0
BE32	Prov. Hainaut	5	1	0	0	0	0
BE33	Prov. Liège	1	0	0	0	0	0
BE35	Prov. Namur	1	0	0	0	0	0
	Total	**8**	**1**	**1**	**0**	**0**	**0**

Figure 34. SW hotspot analysis map (top graph) and distribution by NUTS2 (lower graph) of average NO3 annual concentration greater than 40 mg/l and trophic status. In the map in blue the NVZ.

The hotspot analysis identifies all the SW monitoring stations that have high trophic status (eutrophic and hypertrophic), NO3 concentration in the range of 40-50 mg/l with increasing trends and above 50 mg/l. The map shows the spatial distribution of these points, and the table reports the number of stations by NUTS inside and outside NVZ. Only the NUTS of interest are reported.

Measures in the Action Programme - Wallonia

Wallonia implements an Action Programme throughout its territory. The Action Programme includes basic measures to be implemented in the whole territory and additional measures to be implemented in NVZ areas. No changes were made to the Action Programme from the last reporting period.

Control-Wallonia

Controls of implementation of the code of good agricultural practices are performed under the framework of cross-compliance. Around 1% of the concerned farmers are visited on a yearly basis. Compliance was 100% for all criteria but for the storage capacity criteria for which compliance was 99.1%. In addition to these checks, addition checks are performed controlling potential nitrogen leaching for farms partially in NVZ areas. The proportion of samples that were compliant with the soil- and crop-specific reference levels was around 80% for the 2016-2020 period.

Designation of NVZs-Wallonia

Wallonia (Belgium) has not modified the designation of the nitrate vulnerable zones during the reporting period. The NVZs extend over an area of 9596.15 km^2, representing 57% of the whole territory and 69.2% of the UAA.

Forecast of Water Quality-Wallonia

Future water quality is predicted based on the use of the EPIC-Grid model. The model was run for a period extending until 2050 including scenarios of climate change. It was assumed that land use and fertilization practices were those of 2017, while the introduction of intercropping in a rotation sequence led to a decrease of mineral fertilization by 20 kgN/ha. The results are variable and depend on the selection of the climate change scenario. However, it is expected that climate change will have a significant impact of surface water and groundwater quality.

Summary – Wallonia

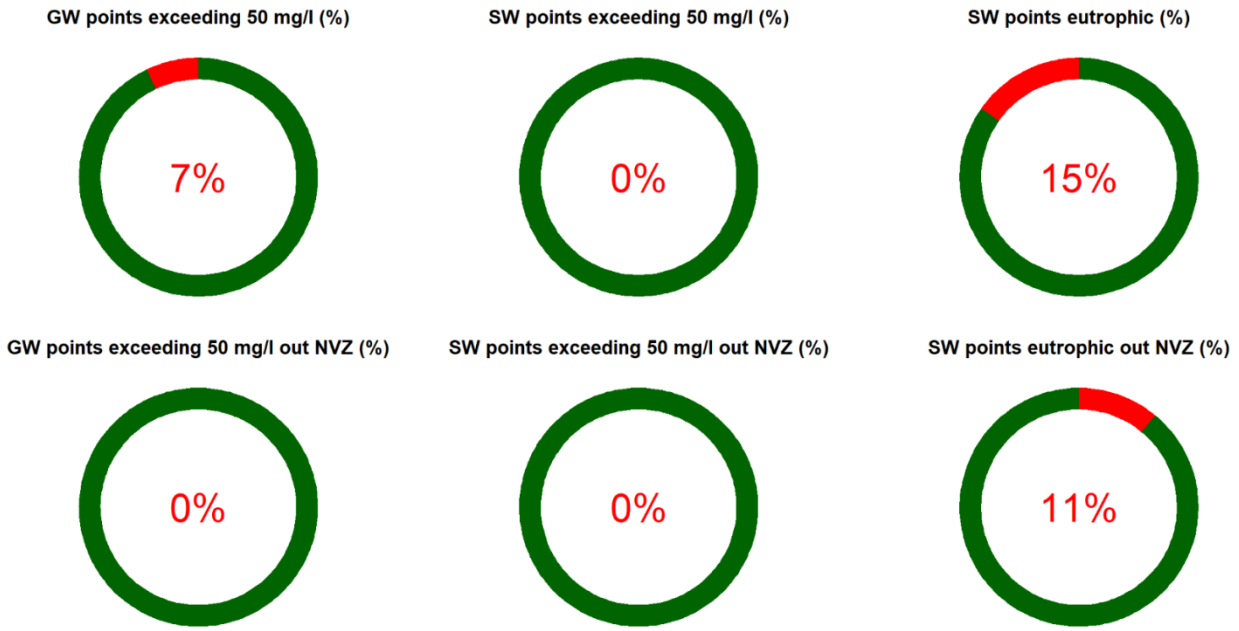


Figure 35. Summary plot

This plot provides in the first row the percentage of stations exceeding 50 mg/l with respect to the total stations with measures and the percentage of eutrophic SW stations with respect to the total for which the trophic status is reported. In the second row, the percentage of stations exceeding 50 mg/l that are outside NVZ with respect to the total of stations exceeding 50 mg/, and the percentage of SW eutrophic stations that are outside NVZ with respect to the total that are eutrophic.

Long term analysis - Wallonia

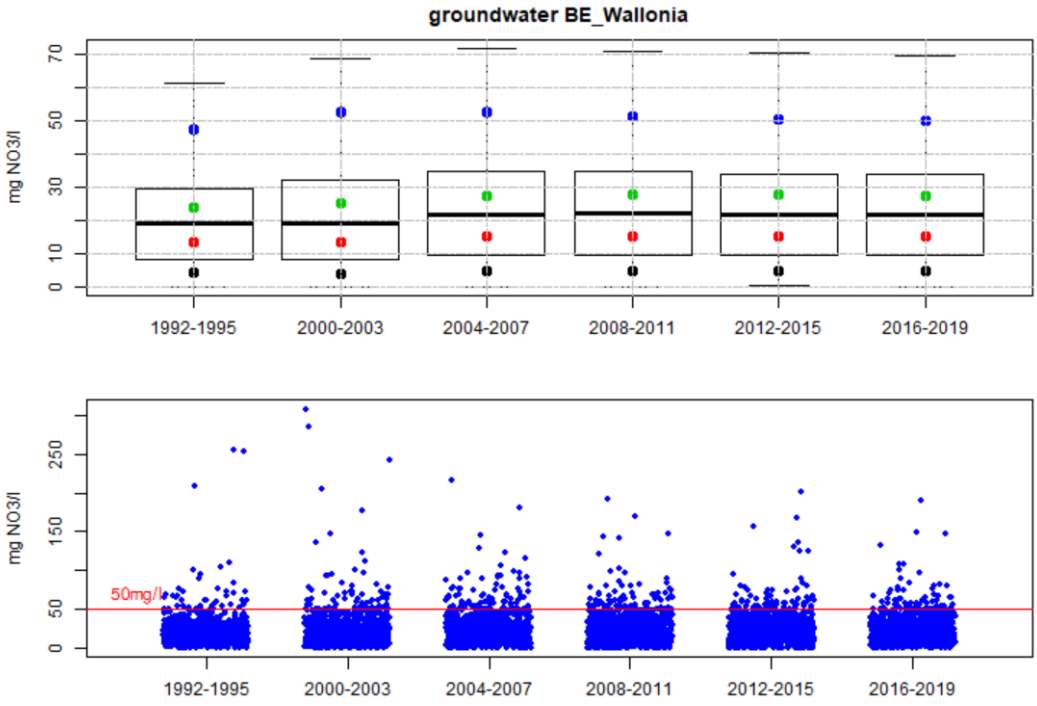


Figure 36. Time series of box whisker plots along with the distribution of the measured values for groundwater stations. RPs represent the reporting periods, RP7 being the last period (2016-2019). The blue, red, green and black dots represent the mean of the fourth third, second and first quartiles, respectively.

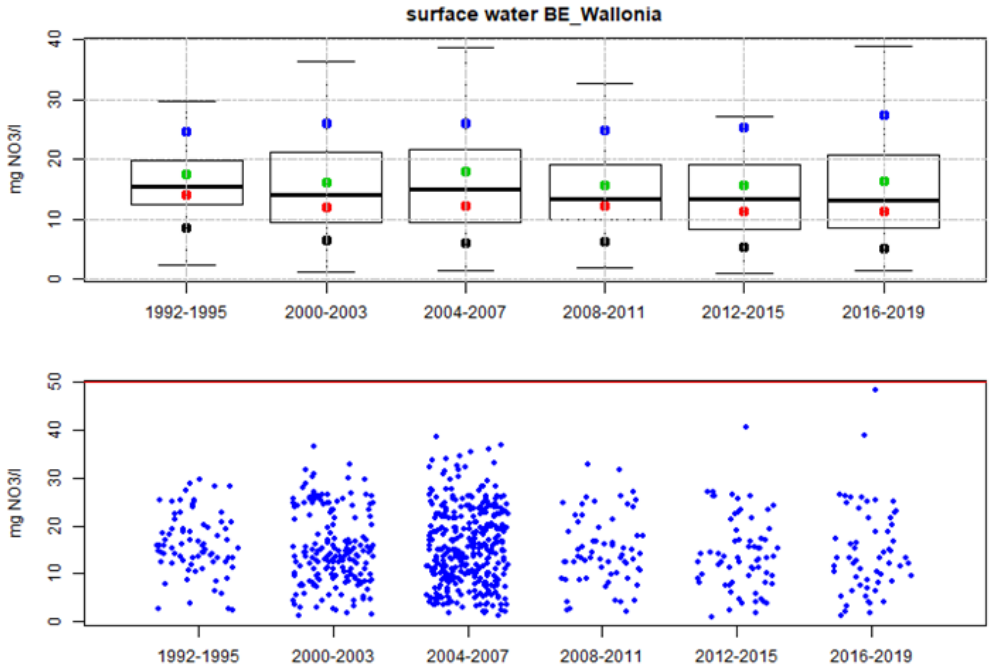


Figure 37. Time series of box whisker plots along with the distribution of the measured values for surface water stations. RPs represent the reporting periods, RP7 being the last period (2016-2019). The blue, red, green and black dots represent the mean of the fourth third, second and first quartiles, respectively.

Water Quality Monitoring - Federal

The Belgian Federal report presents the water quality of coastal and marine waters. Currently only 3 stations have measurement of concentrations and trends. There is no eutrophic station. The stations have NO3 concentration < 2 mg/l and stable trends.

Surface water quality monitoring network

Table 10. Number of SW stations with measurements, trends and trophic status per type

		Number of stations with measurements			Number of stations with Trends			Number of stations with Trophic status		
Station Type	Description	2008-2011	2012-2015	2016-2019	2008-2011	2012-2015	2016-2019	2008-2011	2012-2015	2016-2019
4	River water	0	0	0	0	0	0	0	0	0
5	Lake/reservoir water	0	0	0	0	0	0	0	0	0
6	Transitional water	0	0	0	0	0	0	0	0	0
7	Coastal water	6	6	2	6	6	2	0	0	2
8	Marine water	4	4	1	3	4	1	0	0	1
9	Not specified	0	0	0	0	0	0	0	0	0
	Total	**10**	**10**	**3**	**9**	**10**	**3**	**0**	**0**	**3**

Surface Water Quality

Surface water average annual nitrate concentration

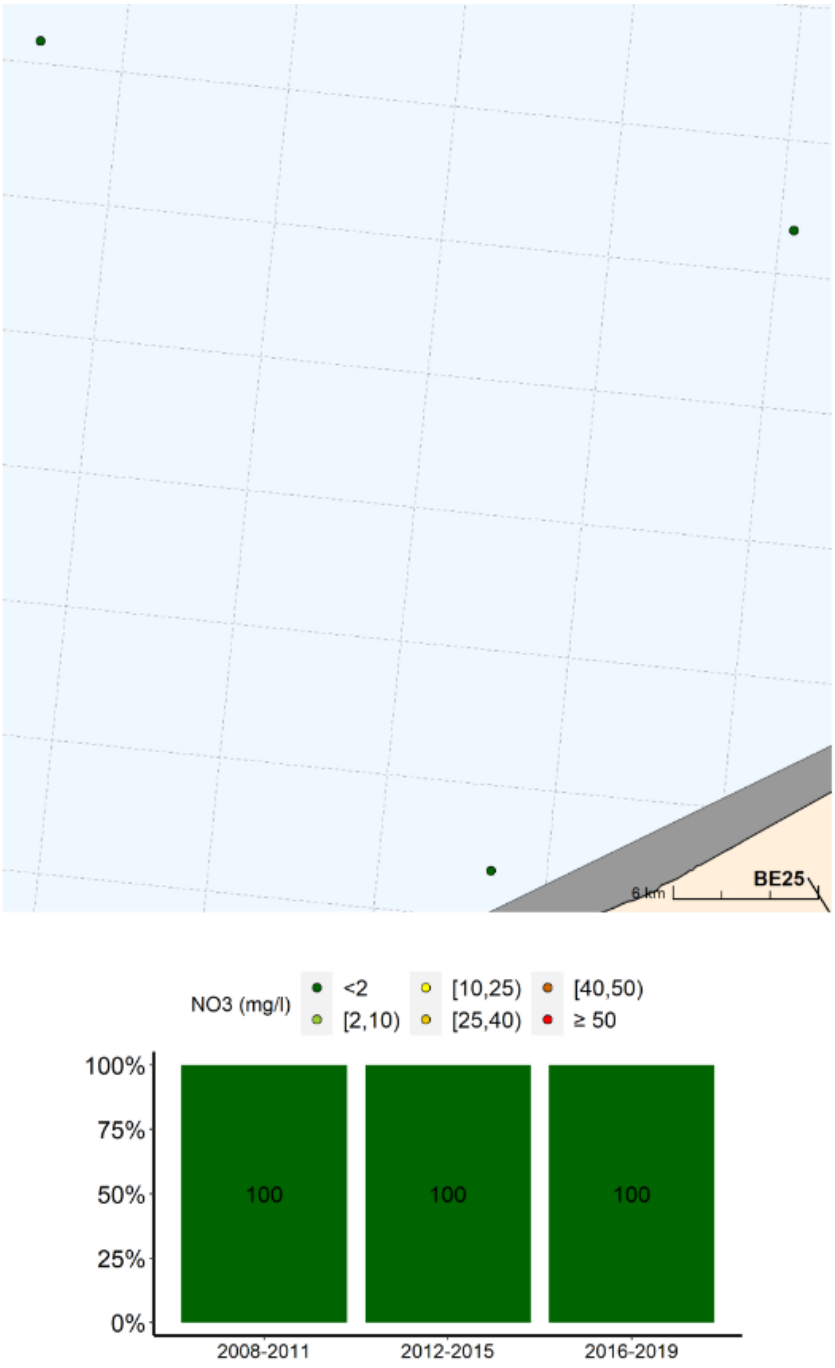


Figure 38. Spatial distribution of average NO3 annual concentration (map) and corresponding percentage of monitoring points per classes of concentration by reporting period (x axis).

Surface water average annual nitrate concentration trend

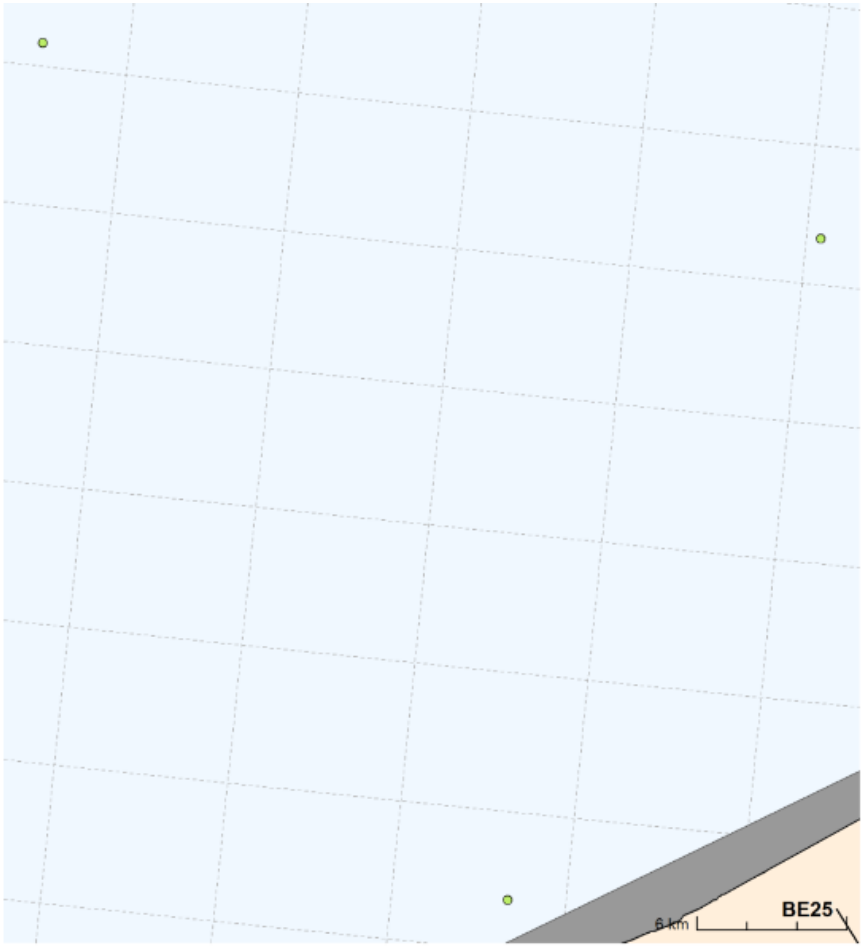


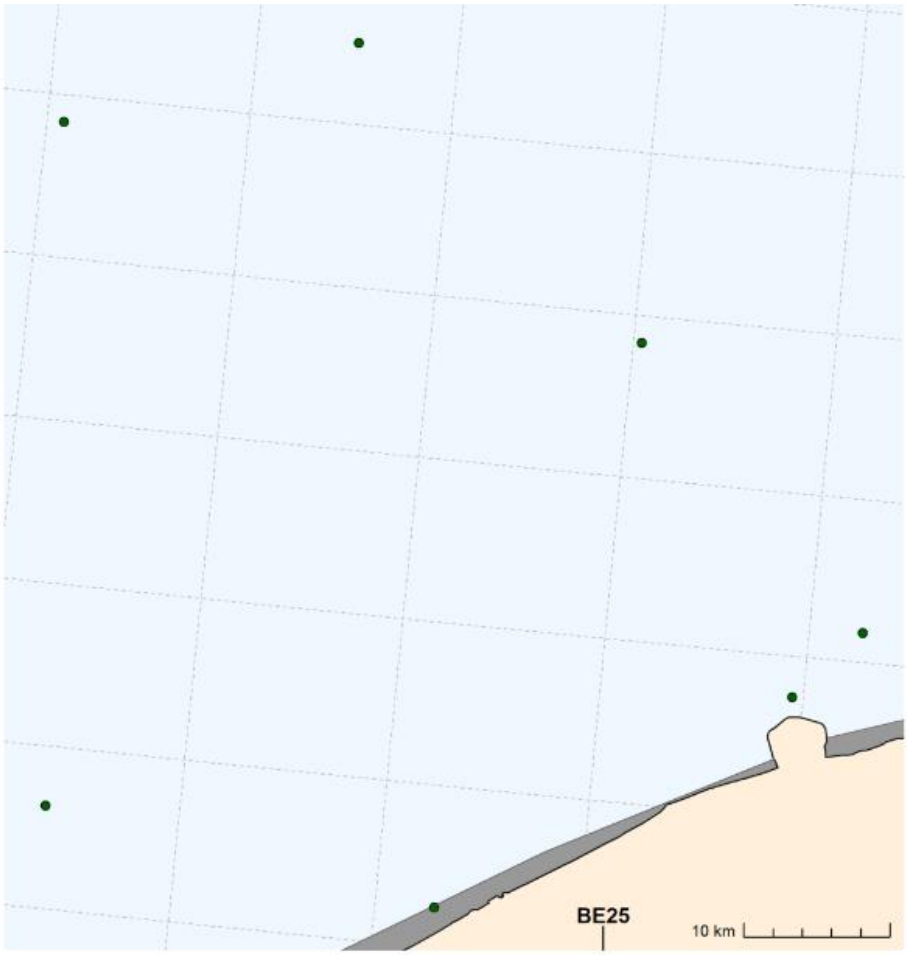
Figure 39. Spatial distribution of average NO3 annual trends (map) and corresponding percentage of monitoring points per classes of trends by reporting period (x axis).

Surface Water Eutrophication



Figure 40. Spatial distribution of eutrophic status (map) and corresponding percentage of monitoring points per classes of status by reporting period (x axis).

Surface Water Stations Removed



NO3 (mg/l) <2 [2,10) [10,25) [25,40) [40,50) ≥ 50 NA

Station Type	Description	Number of removed stations			
		total removed	with measurements	with trends	with trophic status
4	River water	0	0	0	0
5	Lake/reservoir water	0	0	0	0
6	Transitional water	0	0	0	0
7	Coastal water	4	4	4	0
8	Marine water	3	3	3	0
9	Not specified	0	0	0	0
	Total	**7**	**7**	**7**	**0**

Figure 41. SW removed stations map (top graph) and distribution by type (lower graph).

Long term analysis - Federal

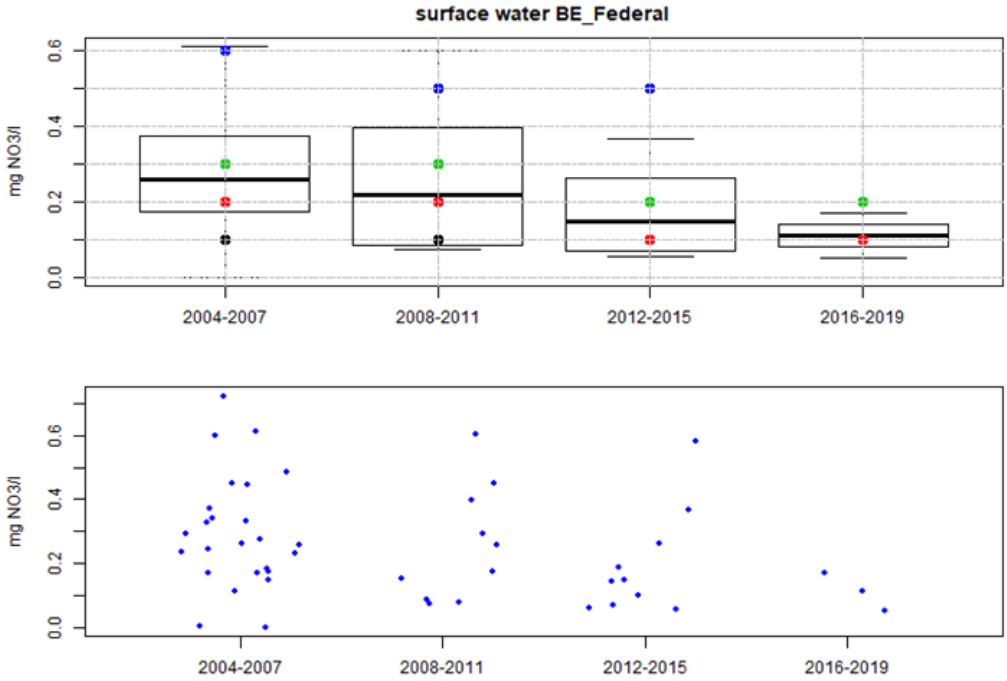


Figure 39. Time series of box whisker plots along with the distribution of the measured values for surface water stations. RPs represent the reporting periods, RP7 being the last period (2016-2019). The blue, red, green and black dots represent the mean of the fourth third, second and first quartiles, respectively.

Conclusions and recommendations

Belgium has a very high livestock pressure and the nitrogen surplus is above the average for the EU.

There is a very well elaborated network of monitoring stations. The groundwater quality is bad in particular in Flanders, where also the nitrate concentration in many monitoring points exhibit a strong increasing trend. The water quality in Wallonia is better than the average in the EU and remained stable or improved during the recent years.

Nitrate levels in the surface waters of Flanders are also too high and increased over the last reporting period. While the trophic status is generally good in Wallonia, almost all surface waters are eutrophic in Flanders.

Flanders reviewed its nitrate action programme 2019, including a gradual introduction of reinforced measures in the most polluted areas. Even though a number of deficiencies in the Nitrate Action Program of Wallonia have been identified, this region did not review its action programme during this reporting period.

The Commission urges Flanders to take additional measures that match the severity of the problems and to support farmers switching to more resilient and less intensive production models. Wallonia is required to adapt its programme in accordance with the nitrate Directive.