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COMMISSION STAFF WORKING DOCUMENT

**Member State country fiche
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 States reports for the period 2020–2023**

EN EN

Poland

Country staff working document
on the implementation of the Nitrates Directive

Period: 2020-2023

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1. KEY FINDINGS AND RECOMMENDATIONS

Poland submitted its report under the Nitrates Directive for the period 2020-2023 in October 2024 ([1]) via electronic reporting on Reportnet 3 portal ([2]).

This country staff working document is presented in line with the reporting guidelines and it is based on the data reported by the Member State ([3]), Eurostat and other EU official data sources. The Polish authorities were consulted for factual correctness. There may be differences with the information presented in their national report ([4]).

The numbers presented below are indicators of the situation in the Member State but need further interpretation to draw specific conclusions. In some cases, changes in the monitoring networks and in methodology for assessing trophic status may complicate comparisons between reporting periods.

1.1. Key findings

Pressures from agriculture

In Poland, the utilised agricultural area (UAA) accounts for 48% of the country's total land area, which is higher than the EU average (38%). The livestock density is 0.7 units per hectare (LSU/ha) of UAA, which is like the EU average of 0.7 LSU/ha, but there are regional variations with livestock densities above 1 LSU/ha UAA in some regions. The gross nitrogen balance is 31 kg/ha UAA and the gross phosphorus balance is -1 kg/ha UAA ([5]).

Monitoring network

For groundwater, the density of the monitoring network is around 5 stations per 1 000 km^2, which is lower than the EU average (8 stations). Compared to the previous reporting period, the density increased by 2%.

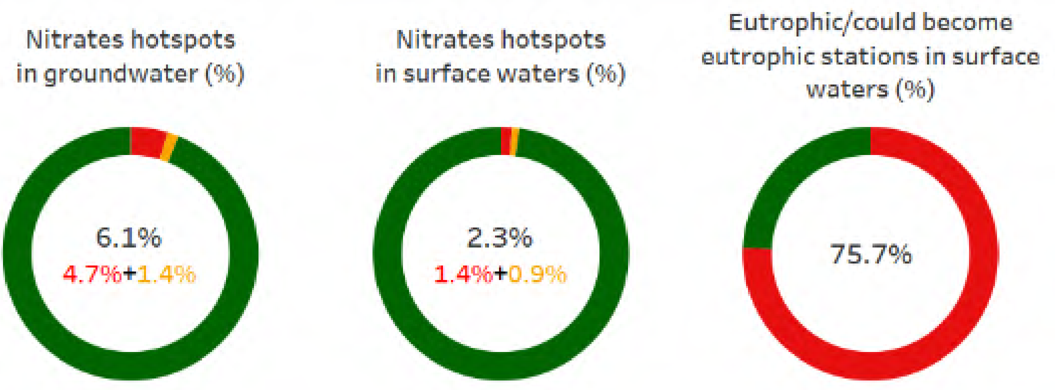
For surface freshwater, the density of the monitoring network is around 14 stations per 1 000 km^2, which is higher than the EU average (7 stations). Compared to the previous reporting period, the density increased by 7%. The monitoring network includes river and lake/water reservoir stations.

For surface saline waters, the monitoring network includes transitional waters, coastal waters, and marine waters. However, trophic status is not reported in marine waters.

([1]) Final version was received in November 2024.
([2]) Reportnet 3 is an e-Reporting platform for reporting environmental and climate data to the European Environment Agency (EEA).
([3]) Only monitoring points electronically reported with nitrate concentration or trophic status, which were not removed from the monitoring network were considered for this assessment.
([4]) A uniform data-processing approach is applied to all Member States. In some instances this may not fully correspond to the specific methodology used in the Member State.
([5]) The EU average is not available due to data gaps.

Water quality

Figure 1 – Share of monitoring points showing pollution in groundwater and surface waters



Note: The percentage share of **nitrate hotspots** refers to monitoring points with average annual nitrate concentrations ≥ 50 mg/l (red), or between 37.5 and 49.99 mg/l with an increasing trend (orange). This is calculated relative to the total number of points with measurements. The percentage share of monitoring points classified as **eutrophic or could become eutrophic** (red) is calculated relative to the total number of points with trophic status reported.

In **groundwater**, 95.3% of monitoring points show nitrate concentrations below 50 mg/l.

Overall, 6.1% of monitoring points fall in two categories illustrated in Figure 1, i.e. they show nitrate concentrations ≥ 50 mg/l (4.7%) or between 37.5 and 49.99 mg/l with an increasing trend (1.4%). Compared to the data reported in the previous reporting period, this represents an increase of 0.3 percentage points (from 5.8% to 6.1%). The regions with the highest share were Opolskie (13.2%), Łódzkie (10.5%), Wielkopolskie (9.5%) and Lubelskie (9.2%).

Compared to the previous reporting period, nitrate concentrations decreased in 16.0% of groundwater monitoring points and increased in 13.4%. Among points with nitrate concentration ≥ 50 mg/l, increases (57.1%) were more frequent than decreases (39.3%).

In **surface water**, 98.6% of monitoring points show nitrate concentrations below 50 mg/l and 24.3% are classified as non-eutrophic.

Overall, 2.3% of monitoring points fall in two categories illustrated in Figure 1, i.e. they show nitrate concentrations ≥ 50 mg/l (1.4%) or between 37.5 and 49.99 mg/l with an increasing trend (0.9%). Compared to the data reported in the previous reporting period, this represents an increase of 2.3 percentage points (from 0% to 2.3%). 25% of surface water monitoring stations show nitrate concentrations ≥ 10 mg/l, which is relevant for eutrophication.

Compared to the previous reporting period, nitrate concentrations decreased in 25.5% of surface water monitoring points and increased in 25.8%.

The share of monitoring points reported as eutrophic/could become eutrophic is 75.7% as illustrated in Figure 1. This represents an increase of 8.9 percentage points compared to the data reported in the previous reporting period (from 66.9% to 75.8%). The regions with the highest share are Warszawski stołeczny (93.3%), Wielkopolskie (87.8%) and Opolskie (87.1%).

Nitrate Vulnerable Zones

In line with Article 3 paragraph 5, Poland applies an action programme with mandatory measures throughout the entire national territory.

Action Programme

Poland modified its action programme during the reporting period. Amendments concerned the periods when land application of different types of fertilisers is prohibited, the capacity of storage vessels for livestock manure, balanced fertilisation and the amount of livestock manure that can be applied to the land.

1.2. Recommendations

- Review and where necessary reinforce measures to improve water quality, notably with a view to addressing:
    - high or increasing nitrate concentrations in groundwater hotspots
    - high or increasing nitrate concentrations in surface waters
    - eutrophication of surface water bodies including coastal and marine waters.
- When preparing the Nitrates Action Programme:
    - take into account objectives and deadlines of the Water Framework Directive, ensuring coherence with the 4th RBMP
    - consider introducing limitations on phosphorus fertilisation, if not yet implemented
    - ensure the cooperation between competent authorities in different sectors, such as agriculture and water, and with stakeholders
    - consider where measures could be simplified without compromising on results, working with the Commission and the other member States in the light of the findings of the evaluation of the Nitrates Directive
- Promote the dissemination of best practice, scientific knowledge and innovation to:
    - improve the analysis of expected future evolution in water quality and develop gap assessments for the nutrient load reductions required to reach water quality objectives
    - accelerate preparedness and resilience of action programmes and measures in the context of climate change

2. PRESSURES FROM AGRICULTURE

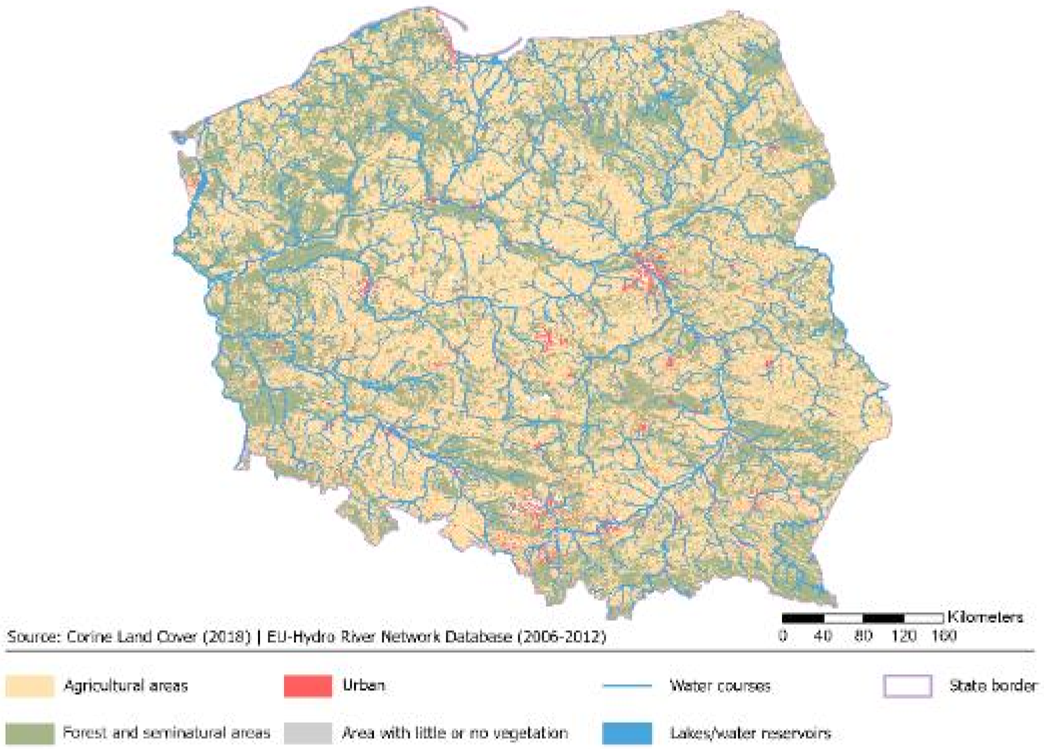
In Poland, crop production accounted for the largest portion of the agricultural sector's total output value at 49.2% in the reporting period 2020-2023. Animal production followed with 48.3%, and other outputs made up 2.6% ([6]). The share of agricultural land used for organic farming increased from 3.5% in the reporting period 2016-2019 to 3.9% in the reporting period 2020-2023. ([7])

The risk of diffuse pollution of waters by nutrients from agriculture is primarily dependent on the agricultural pressures in the Member State, expressed in terms of utilised agricultural area (UAA), livestock density, the use of mineral and manure fertilisers, as well as the nitrogen and phosphorus balance. This section describes the evolution of these indicators.

2.1. Land use

The map below presents the distribution of land use in Poland along with watercourses and lakes/water reservoirs.

Figure 2 – Land use distribution in Poland



([6]) Source: Eurostat (aact_eaa01)
([7]) Source: Eurostat (ef_m_org)

The utilised agricultural area (UAA) in Poland covered 14.8 million hectares in 2020, making up 48.1% of the country's total land area. Arable land accounts for 75.4% of UAA, followed by permanent grassland at 21.9% and permanent crops at 2.6%.

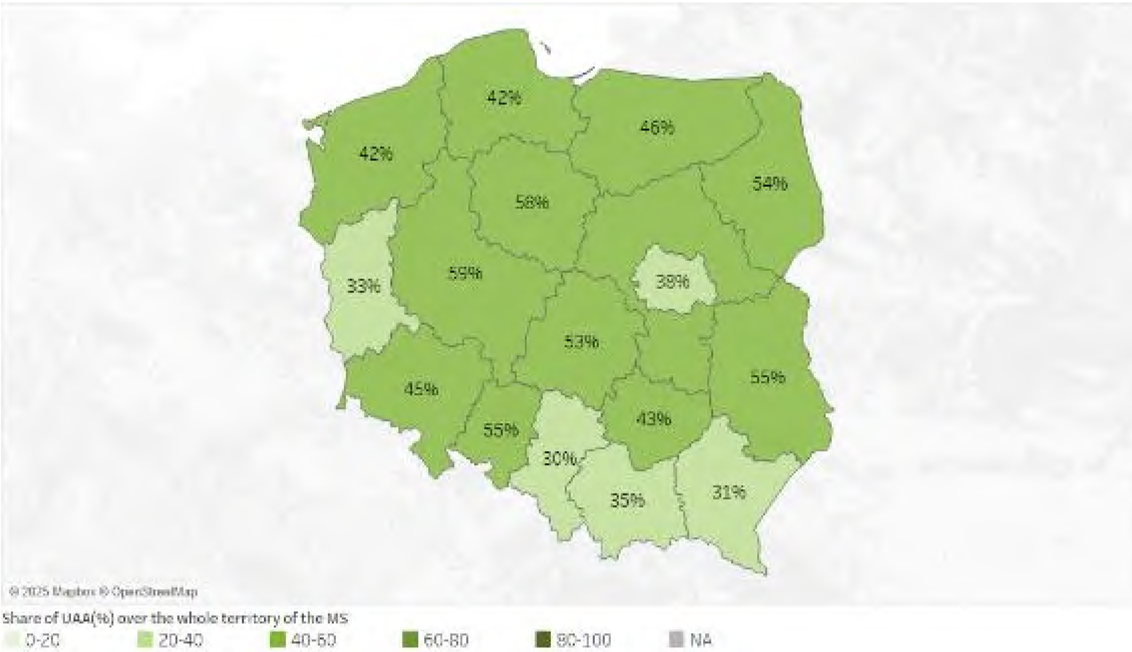
Table 1 – Evolution of the utilised agricultural area

	2010	2013	2016	2020	2023
utilised agricultural area (1000 ha)	14,447	14,410	14,406	14,784	NA
arable land (1000 ha)	10,797	10,760	10,806	11,147	NA
permanent grassland (1000 ha)	3,229	3,206	3,176	3,235	NA
permanent crops (1000 ha)	390	412	393	380	NA
kitchen gardens (1000 ha)	31	32	31	22	NA

Source: Eurostat (ef_lus_main)

In 2020, the share of the UAA ranged from 59% in Wielkopolskie, to 30% in Śląskie.

Figure 3 – Share of utilised agricultural area (UAA) at NUTS2 level in 2020 ([8])



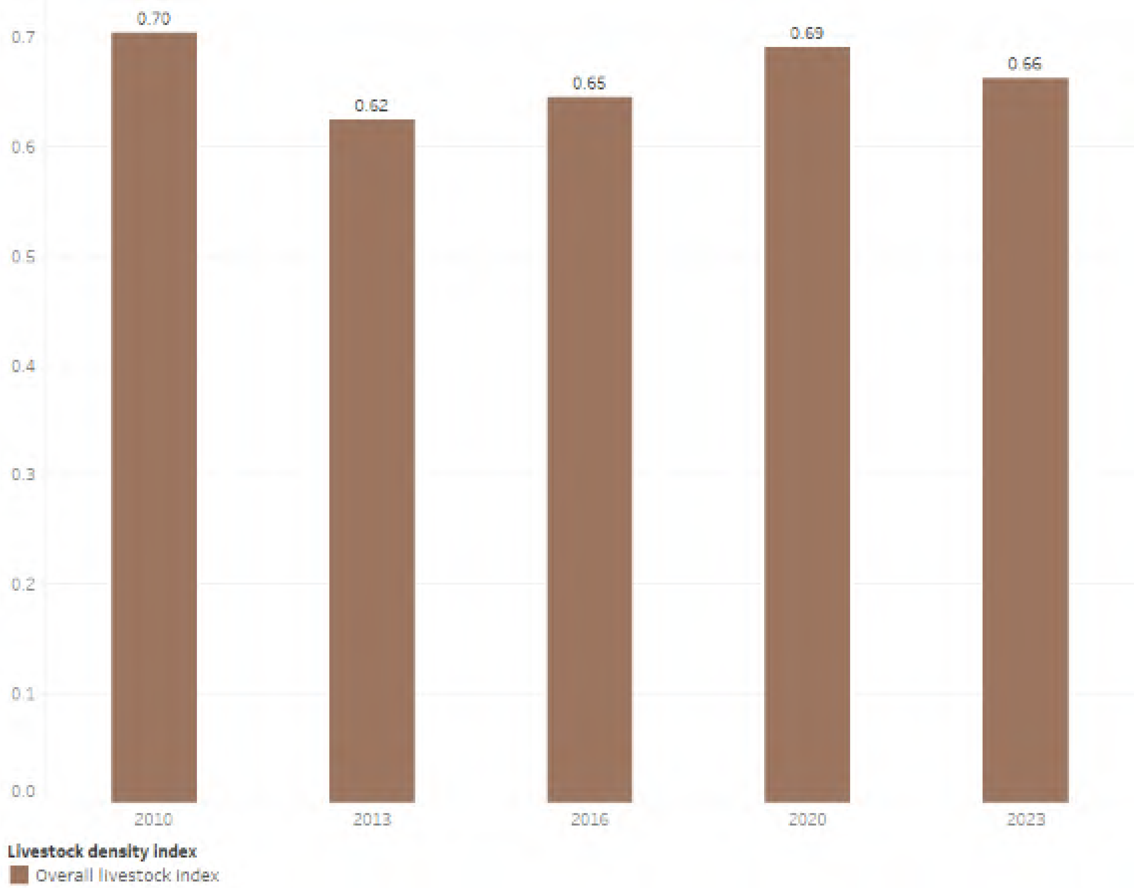
Source: Eurostat (ef_lus_main)

([8]) Latest available data.

2.2. Livestock density

In Poland the livestock density was 0.66 livestock units per hectare (LSU/ha) of UAA in 2023. The livestock density has decreased since 2010 with an intermediate peak in 2020.

Figure 4 – Evolution of the livestock density (LSU/ha UAA)



Source: Eurostat (ef_fsi_lskds)

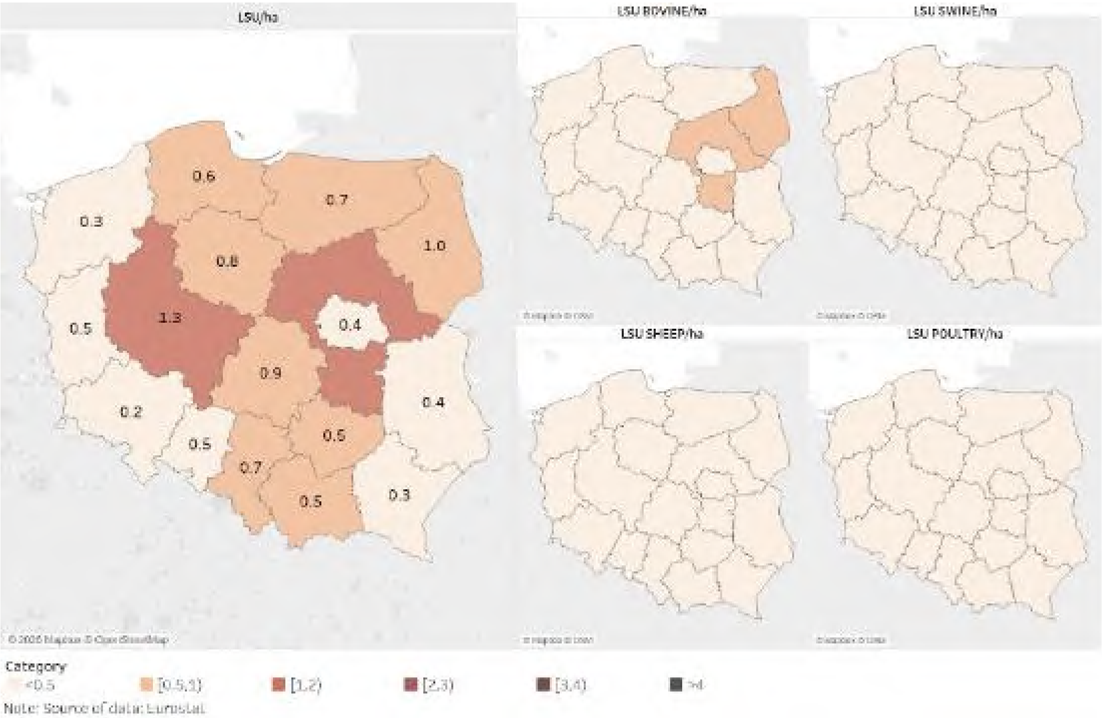
Table 2 – Evolution of the livestock numbers by animal type

	2007	2010	2013	2016	2020	2023
live bovines (Million heads)	5.41	5.56	5.59	5.97	6.28	6.27
of which dairy cows (Million heads)	2.68	2.53	2.30	2.13	2.13	2.24
live pigs (Million heads)	17.62	14.78	10.99	11.11	11.73	9.77
live poultry (Million heads)	NA	174.30	149.19	198.36	225.74	195.15
live sheep (Million heads)	NA	0.26	0.25	0.24	0.28	0.27
live goats (Million heads)	0.14	0.12	NA	NA	NA	NA

Source: Eurostat, for live poultry and live sheep data complemented with FAOSTAT

There are regional variations, with livestock densities of 1.0 LSU/ha UAA or more in Wielkopolskie and in Mazowiecki regionalny and Podlaskie.

Figure 5 – Livestock density distribution by animal type (LSU/ha UAA) at NUTS2 level in 2020 (9)



Source: Eurostat (Livestock units: ef_lsk_main; Utilised agricultural area: ef_lus_main)

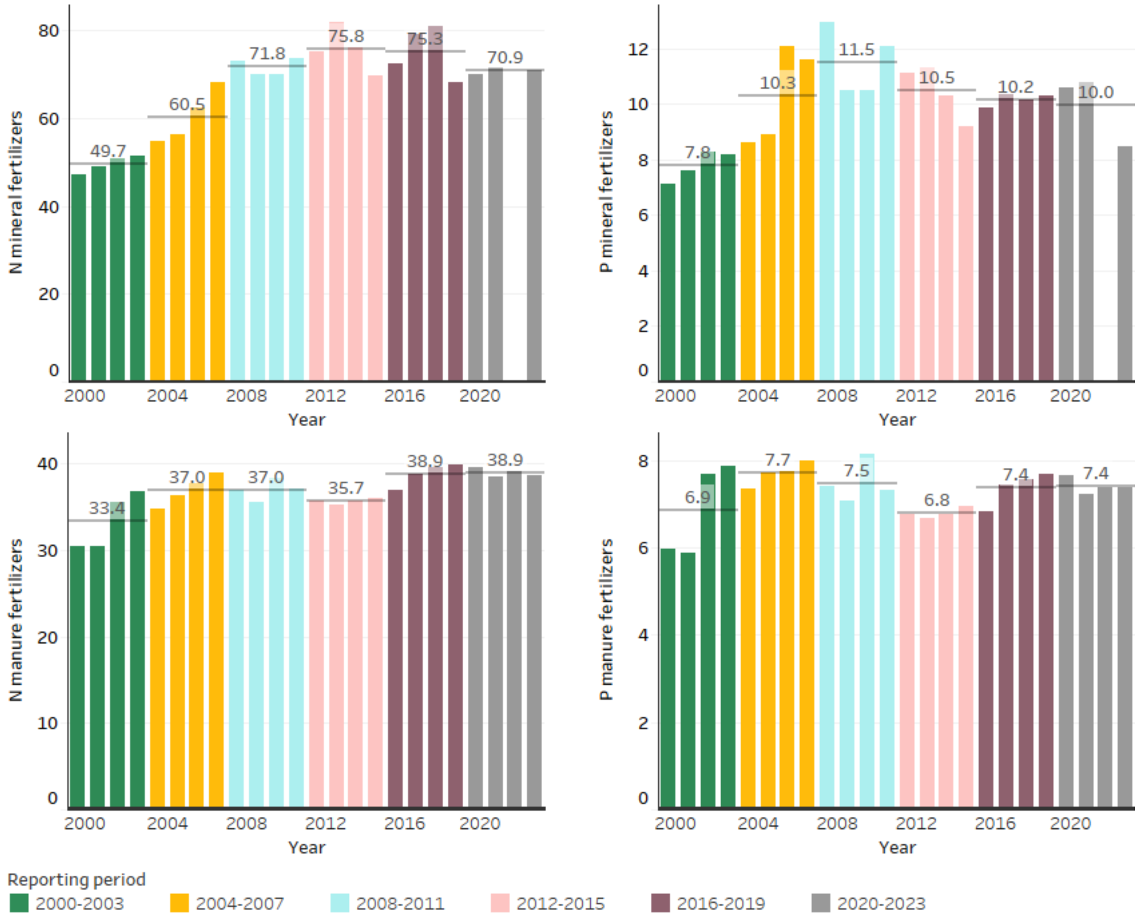
(9) Latest available data.

2.3. Nitrogen and phosphorus fertiliser use

In Poland, the **use of nitrogen (N) fertilisers** was 70.9 kg/ha UAA for mineral fertilisers in 2020-2021 and 2023 and 38.9 kg/ha UAA for manure fertilisers in 2020-2023. The use of mineral fertilisers has decreased by 4.4 kg/ha UAA whereas the use of manure fertilisers has remained the same since the last reporting period.

The **use of phosphorus (P) fertilisers** was 10.0 kg/ha UAA for mineral fertilisers in 2020-2021 and 2023 and 7.4 kg/ha UAA for manure fertilisers in 2020-2023. The use of mineral fertilisers decreased by 0.2 kg/ha UAA whereas the use of manure fertilisers remained the same since the last reporting period.

Figure 6 – Evolution of nitrogen and phosphorus fertiliser use (kg/ha UAA)



Source: Eurostat (aei_pr_gnb)

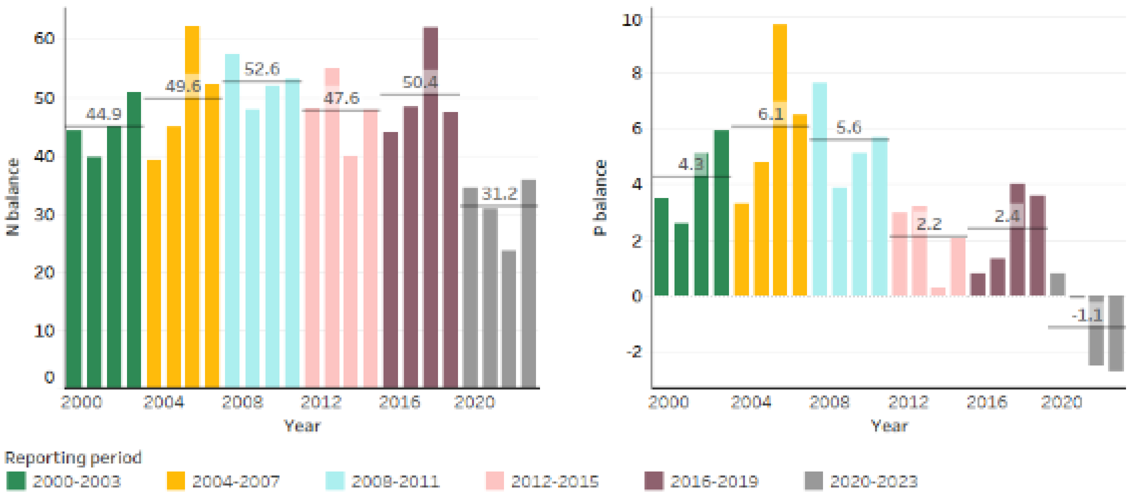
2.4. Nitrogen and phosphorus balance

The nutrient balance ([10]) per hectare of agricultural land (kg/ha UAA) is an indicator of the success that farmers have had in implementing balanced fertilisation and of the resulting nutrient pressure from agriculture. A high surplus (positive balance) indicates a risk of emissions into water and air.

In Poland, the **gross nitrogen (N) balance** was 31.2 kg/ha UAA in 2020-2023. The nitrogen balance decreased by 19.2 kg/ha UAA since previous reporting.

The **gross phosphorus (P) balance** was -1.1 kg/ha UAA in 2020-2023. The phosphorus balance decreased by 3.5 kg/ha UAA since previous reporting.

Figure 7 – Evolution of gross nitrogen and phosphorus balance (kg/ha UAA)



Source: Eurostat (aei_pr_gnb)

2.5. Nitrogen discharge to the environment

Poland provided information that the nitrogen loss from agriculture to environment was 139.7 kilotonnes during the reporting period 2016-2019 and 223.7 kilotonnes during the reporting period 2020-2023. The agricultural sector's contribution to the country's total nitrogen loss increased from 84.8% to 89%. However, the amount of nitrogen discharged from agriculture was determined by different methods in those periods.

([10]) Gross nutrient balance (aei_pr_gnb)

3. NITRATE VULNERABLE ZONES

In line with Article 3 paragraph 5, Poland applies an action programme with mandatory measures throughout the entire national territory (whole country approach) since 2017 and is thus exempted from designating NVZ.

4. NITRATES IN GROUNDWATER

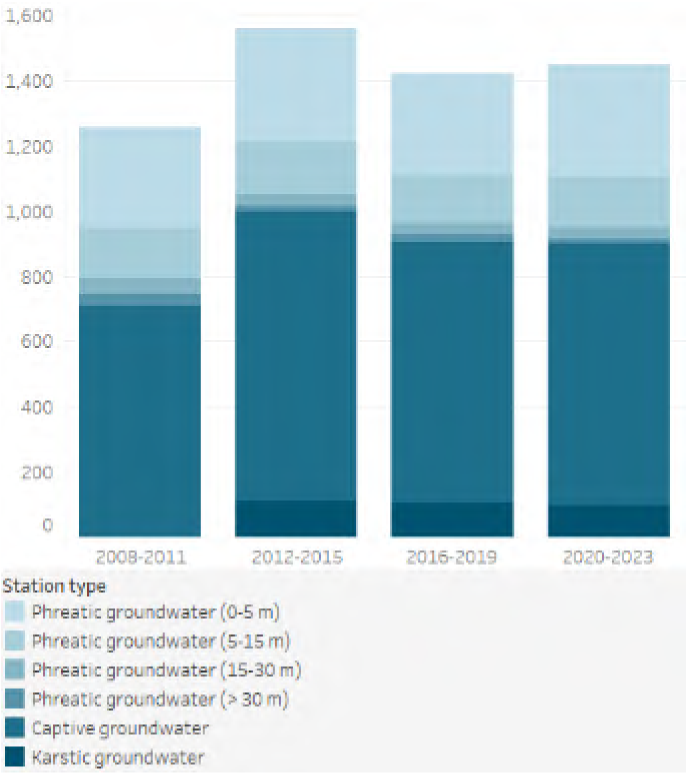
4.1. Monitoring of nitrate concentrations in groundwater

Poland has a State Environmental Monitoring system implemented by the Chief Inspector of Environmental Protection (GIOŚ) from which information on water quality is provided for reporting on the implementation of the Directive. The majority of the monitoring points are stations used for testing domestic groundwater. In 2022 a modification in the monitoring network took place due to the need to adapt the distribution and codification of monitoring points to the new subdivision into water bodies.

During the reporting period 2020-2023 nitrate concentrations were reported at 1 450 groundwater monitoring points. The station density was 4.6 stations per 1 000 km^2.

The overall number of monitoring points increased by 29 (2.0%) compared to the previous reporting period. The graph below presents the changes in the monitoring network over the last four reporting periods.

Figure 8 – Evolution of groundwater monitoring network (monitoring points with measurements of nitrates)



In this reporting period, changes in nitrate concentrations compared to the previous monitoring period (trends) were assessed for 1 220 monitoring points, accounting for 84.1% of all points with measurements. The share of monitoring points with trends decreased compared to the previous reporting period, which was 91.8% in reporting period 2016-2019. The table below presents the number of monitoring points with measurements and trends in the last four reporting periods.

Table 3 – Number of groundwater monitoring points with measurements of nitrates and trends by station type (11)

	Stations with measurements				Stations with trends			
Station type	2008-2011	2012-2015	2016-2019	2020-2023	2008-2011	2012-2015	2016-2019	2020-2023
Phreatic groundwater (0-5 m)	307	351	311	346	274	225	282	280
Phreatic groundwater (5-15 m)	158	161	147	154	142	104	130	119
Phreatic groundwater (15-30 m)	50	36	35	34	49	26	28	26
Phreatic groundwater (> 30 m)	34	15	21	14	32	11	12	11
Captive groundwater	709	889	802	806	628	620	755	696
Karstic groundwater		111	105	96		77	97	88
Not specified								
Total	1,258	1,563	1,421	1,450	1,125	1,063	1,304	1,220

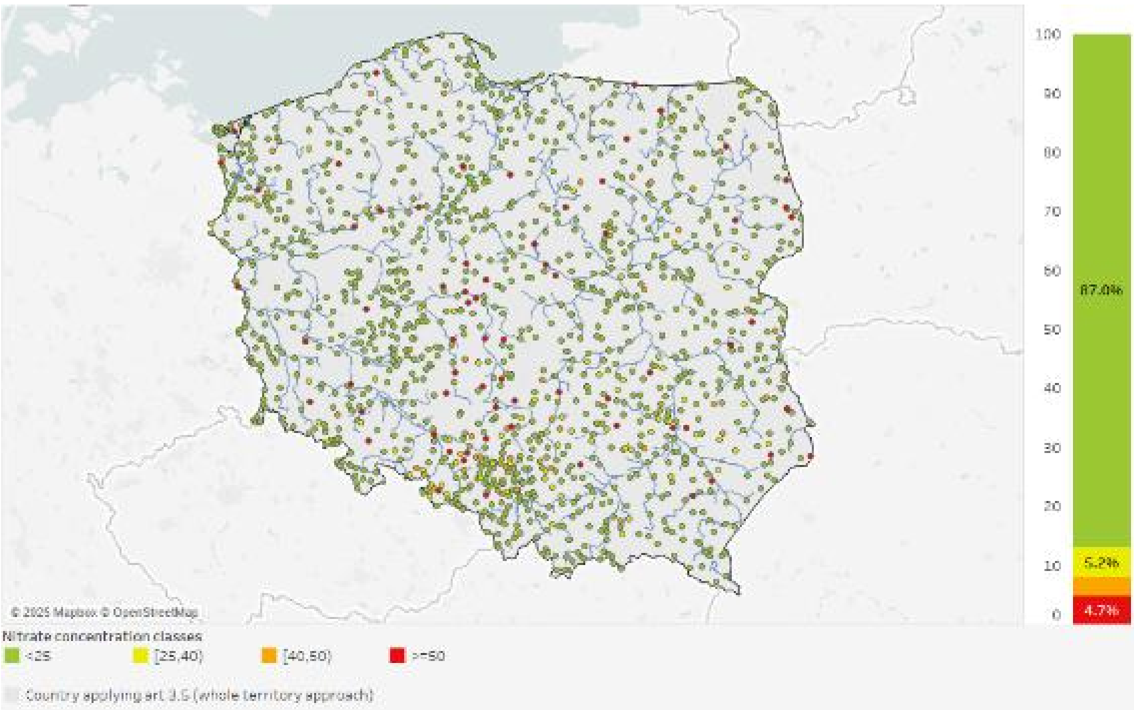
(11) Poland reported that monitoring was discontinued in 289 monitoring points points relative to the previous reporting period. Discontinuation may be due to nitrate concentrations below 25 mg/l, change in station code or type, or other specific reasons.

4.2. Nitrate concentrations in groundwater

In Poland, 4.7% of groundwater monitoring points showed average nitrate concentrations above the drinking water threshold of ≥ 50 mg/l, whereas 3.2% had concentrations between 40-49.99 mg/l, 5.2% showed concentrations between 25-39.99 mg/ and 87.0% below 25 mg/l.

The figure below shows a spatial distribution of the average nitrate concentrations and the shares in corresponding nitrate concentration classes.

Figure 9 – Map of average nitrate concentrations in groundwater and share of monitoring points by nitrate concentration class in the reporting period 2020-2023



Note: In the map, monitoring points with higher values are plotted on top.

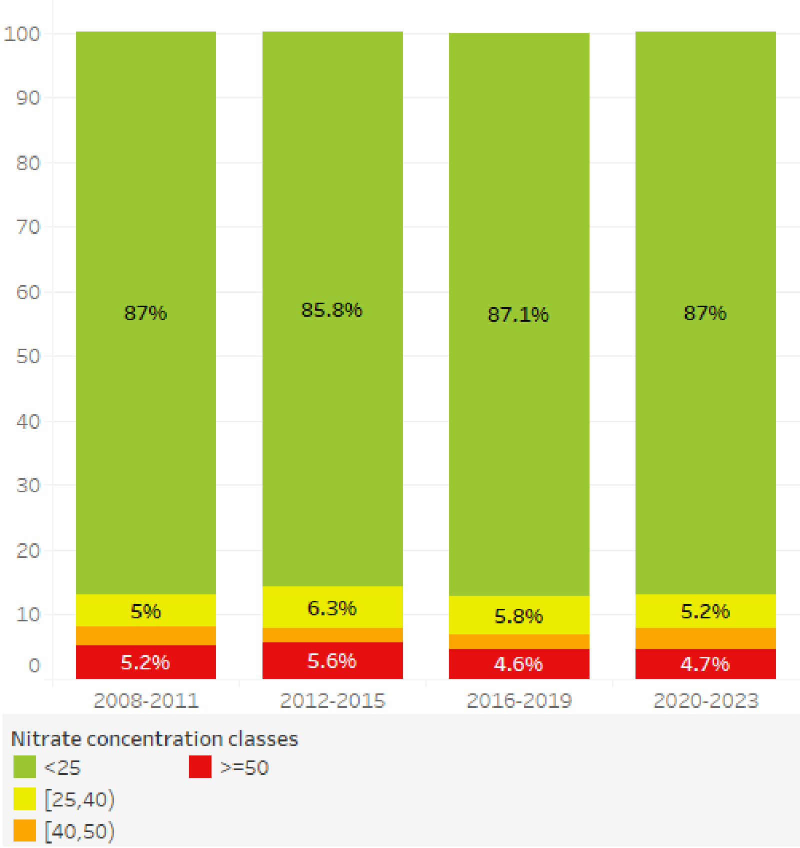
The station type category with the highest share of points with nitrate concentrations equal to or above 50 mg/l was phreatic groundwater (5-15m) with share of 10.4%, as shown in the table below.

Table 4 – Share of groundwater monitoring points by nitrate concentration class (mg/l) in the reporting period 2020-2023, categorised by station type

	Number of stations	% of Total	<25	[25,40)	[40,50)	>=50
Phreatic groundwater (0-5 m)	346	23.9%	86.4%	5.8%	2.9%	4.9%
Phreatic groundwater (5-15 m)	154	10.6%	76.6%	5.2%	7.8%	10.4%
Phreatic groundwater (15-30 m)	34	2.3%	85.3%	2.9%	5.9%	5.9%
Phreatic groundwater (> 30 m)	14	1.0%	78.6%	21.4%		
Captive groundwater	806	55.6%	92.3%	3.3%	1.4%	3.0%
Karstic groundwater	96	6.6%	62.5%	16.7%	11.5%	9.4%
Total	1,450	100.0%	87.0%	5.2%	3.2%	4.7%

Compared to the data reported in the previous reporting period, the share of monitoring points with concentration ≥ 50 mg/l increased from 4.6% to 4.7%. The graph below presents the share of monitoring points per class of nitrate concentration in the last four reporting periods.

Figure 10 – Share of monitoring points in groundwater by class of nitrate concentration ([12]) in the current and previous reporting periods



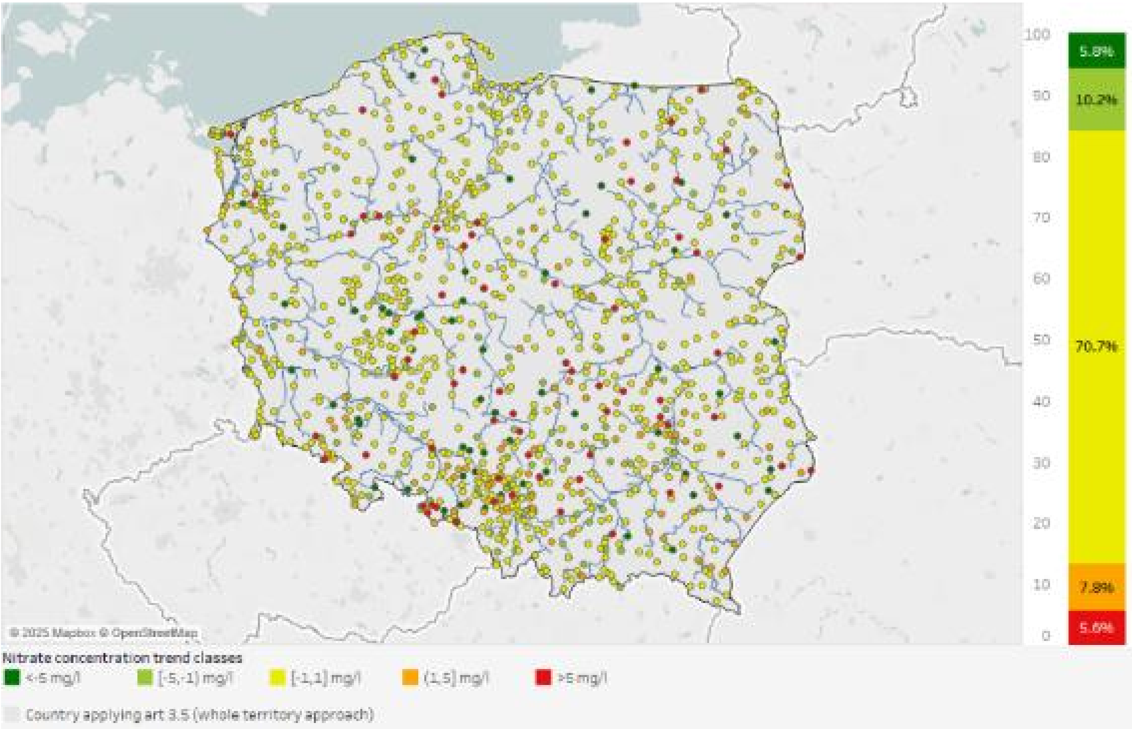
([12]) Average of annual mean values over the reporting period.

4.3. Trends in nitrate concentrations in groundwater

Compared to the last reporting period, there has been a decrease of nitrate concentrations in 16.0% of monitoring points and an increase in 13.4%. For the remaining 70.7% there was no significant change.

The increase or decrease can be categorised as weak if it is between 1 and 5 mg/l, and as strong if its above 5 mg/l.

Figure 11 – Map of trends in average nitrate concentrations (13) in groundwater between the periods 2016-2019 and 2020-2023 and share of monitoring points by trend class



Note: In the map, monitoring points with higher values are plotted on top.

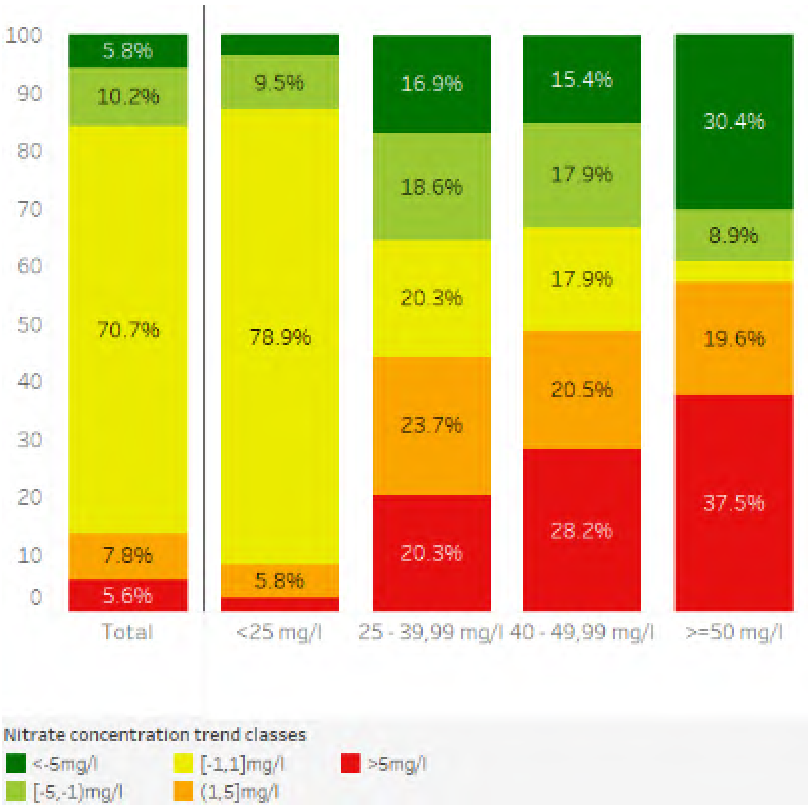
Table 5 – Share of groundwater monitoring points by trend class (mg/l) between the periods 2016-2019 and 2020-2023, categorised by station type

	Total Number of Stations	% Total Number of Stations	<-5	[-5,-1)	[-1,1]	(1,5]	>5
Phreatic groundwater (0-5 m)	280	23.0%	8.9%	12.9%	63.9%	7.1%	7.1%
Phreatic groundwater (5-15 m)	119	9.8%	10.9%	13.4%	51.3%	10.9%	13.4%
Phreatic groundwater (15-30 m)	26	2.1%		15.4%	50%	26.9%	7.7%
Phreatic groundwater (>30 m)	11	0.9%	9.1%	27.3%	63.6%		
Captive groundwater	696	57.0%	3.6%	7.3%	80.7%	5.2%	3.2%
Karstic groundwater	88	7.2%	8%	15.9%	45.5%	21.6%	9.1%
Total	1,220	100.0%	5.8%	10.2%	70.7%	7.8%	5.6%

(13) The average of annual mean values of nitrate concentrations over the reporting period 2020-2023 compared to the average for the reporting period 2016-2019.

When looking at the trend for waters that are polluted in the current reporting period (above or equal 50 mg/l), there has been an increase of nitrate concentration for 57.1% and a decrease for 39.3% between the previous and the current reporting periods. The graph below shows the increase (in red and orange) and decreases (in green) per nitrate concentration class.

Figure 12 – Share of groundwater monitoring points by classes of trend between the periods 2016-2019 and 2020-2023, across different nitrate concentration classes (<24.99 mg/l, 25-39.99 mg/l, 40-49.99 mg/l and ≥50mg/l) ([14])

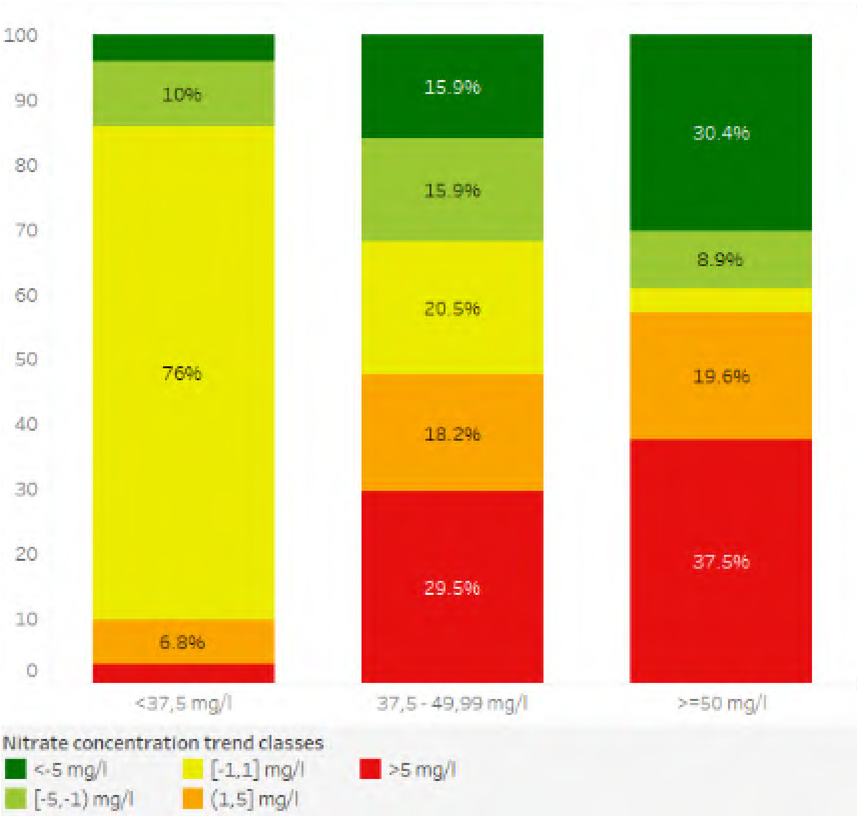


Note: The percentages below 5% are not labelled.

([14]) Nitrate concentration classes as per the Nitrates Directive report.

To better align the water quality assessment with the thresholds defined under the Groundwater Directive, trends were also calculated for the water quality class with nitrate concentrations between 37.5-49.99 mg/l. When looking at the trend in this concentration category, there has been an increase of nitrate concentration for 47.7% and a decrease for 31.8% of monitoring points.

Figure 13 – Share of groundwater monitoring points by classes of trend between the periods 2016-2019 and 2020-2023, in different nitrate concentration classes (<37.5 mg/l, 37.5-49.99 mg/l and ≥50mg/l) ([15])

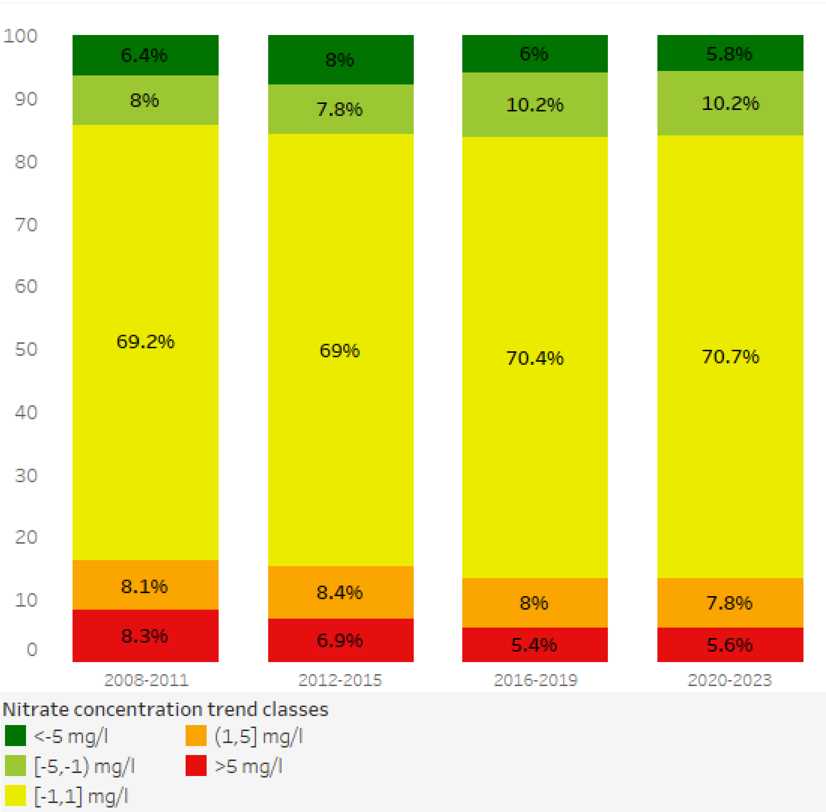


Note: The percentages below 5% are not labelled.

([15]) Nitrate concentration classes as in the Water Framework Directive guidance on GW status and trend assessment as division of nitrates quality standard (50mg/l and 75 % of this value [37.5 mg/l]).

Compared to the previous reporting period, there is a lower share of monitoring points with decreasing nitrate concentrations (16.0% in the current reporting period compared to 16.2% in the previous reporting period) but also a stable share of monitoring points with increasing nitrate concentrations (13.4% compared to 13.4%). The graph below shows the share of monitoring points with increases (in red and orange), decreases (in green) and without significant change (in yellow) in nitrate concentrations between reporting periods.

Figure 14 – Share of groundwater monitoring points by class of nitrate concentration trend (16) in the current and previous reporting periods



(16) Change in average annual mean nitrate concentrations to the previous reporting period

4.4. Nitrate pollution hotspots in groundwater

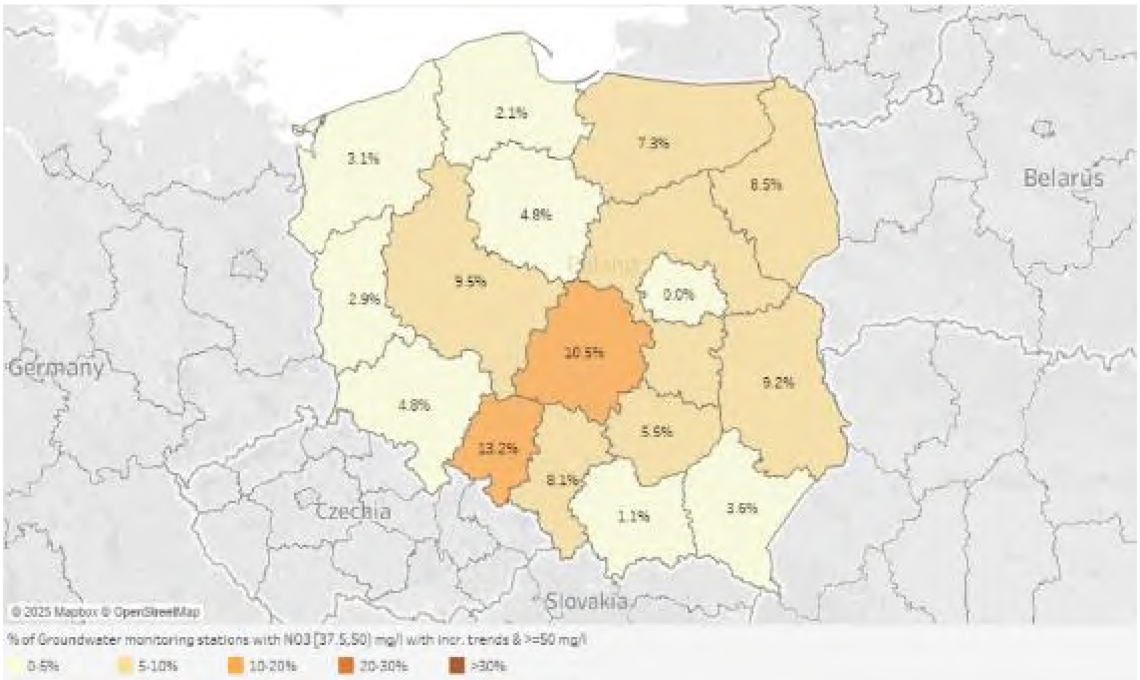
A nitrate pollution hotspot in groundwater is here defined as a monitoring point where the average annual nitrate concentration is either ≥ 50 mg/l or between 37.5 and 49.99 mg/l with an increasing trend. In Poland there are 89 groundwater nitrate pollution hotspots.

Figure 15 – Groundwater nitrate pollution hotspots

		inside NVZ	outside NVZ	Total
Groundwater	[37.5,50) with incr. trend	21		21
	>=50	68		68
Total		89		89

The NUTS2 regions with the highest share of hotspots are in Opolskie (13.2%), Łódzkie (10.5%), Wielkopolskie (9.5%) and Lubelskie (9.2%).

Figure 16 – Share of groundwater nitrate pollution hotspots at NUTS2 level



5. NITRATES IN SURFACE WATERS

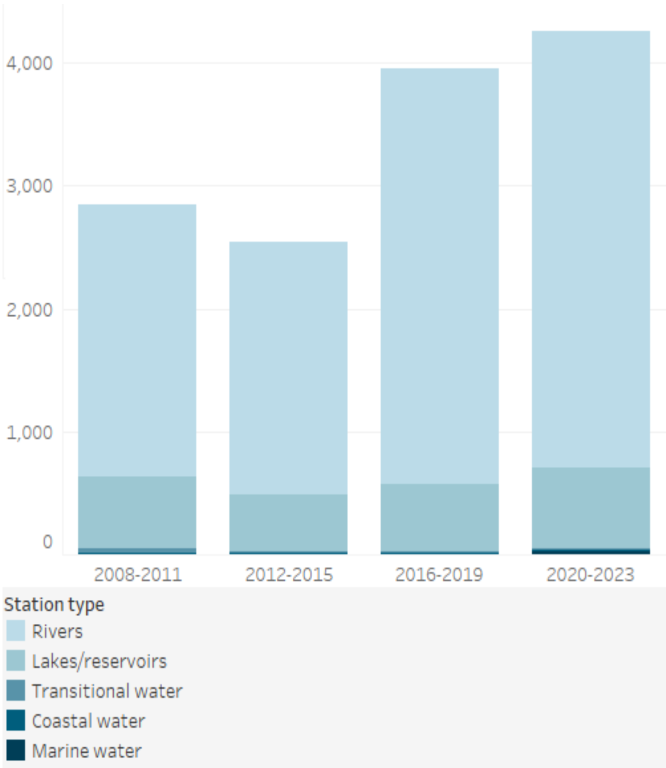
5.1. Monitoring of nitrate concentrations in surface waters

Poland has a State Environmental Monitoring system implemented by the Chief Inspector of Environmental Protection (GIOŚ) from which informtaion on water quality is provided for reporting on the implementation of the Directive.

During the reporting period 2020-2023 nitrate concentrations were reported at 4 264 surface water monitoring points. Among these, 83.4% were in rivers, 15.5% were in lakes or reservoirs, and 1.0% were in saline waters. The freshwater monitoring points density was 13.5 stations per 1 000 km^2.

The overall number of monitoring points increased by 310 (7.8%) compared to the previous reporting period. The number of monitoring stations has remained relatively stable between 2016-2019 and 2020-2023 whereas there was a strong increase from 2012-2015 to now, in particular river monitoring stations. The graph below presents the changes in the monitoring network over the last four reporting periods.

Figure 17 – Evolution of surface water monitoring network (monitoring points with measurements of nitrates)



In this reporting period, changes in nitrate concentrations compared to the previous monitoring period (trends) were assessed for 3 087 monitoring points, accounting for 72.4% of all points with measurements. The share of monitoring points with trends increased compared to the previous reporting period (55.6% in reporting period 2016-2019). The table below presents the number of monitoring points and the number of monitoring points with trends in the last four reporting periods.

Table 6 – Number of surface water monitoring points with measurements of nitrates and trends per type (17)

	Stations with measurements				Stations with trends			
Station type	2008-2011	2012-2015	2016-2019	2020-2023	2008-2011	2012-2015	2016-2019	2020-2023
Rivers	2,211	2,053	3,384	3,557	1,571	1,628	1,892	2,641
Lakes/reservoirs	591	473	551	663	14	28	289	429
Transitional water	31	9	9	9	17	4	9	8
Coastal water	15	10	10	10	5	3	9	9
Marine water				25				
Total	2,848	2,545	3,954	4,264	1,607	1,663	2,199	3,087

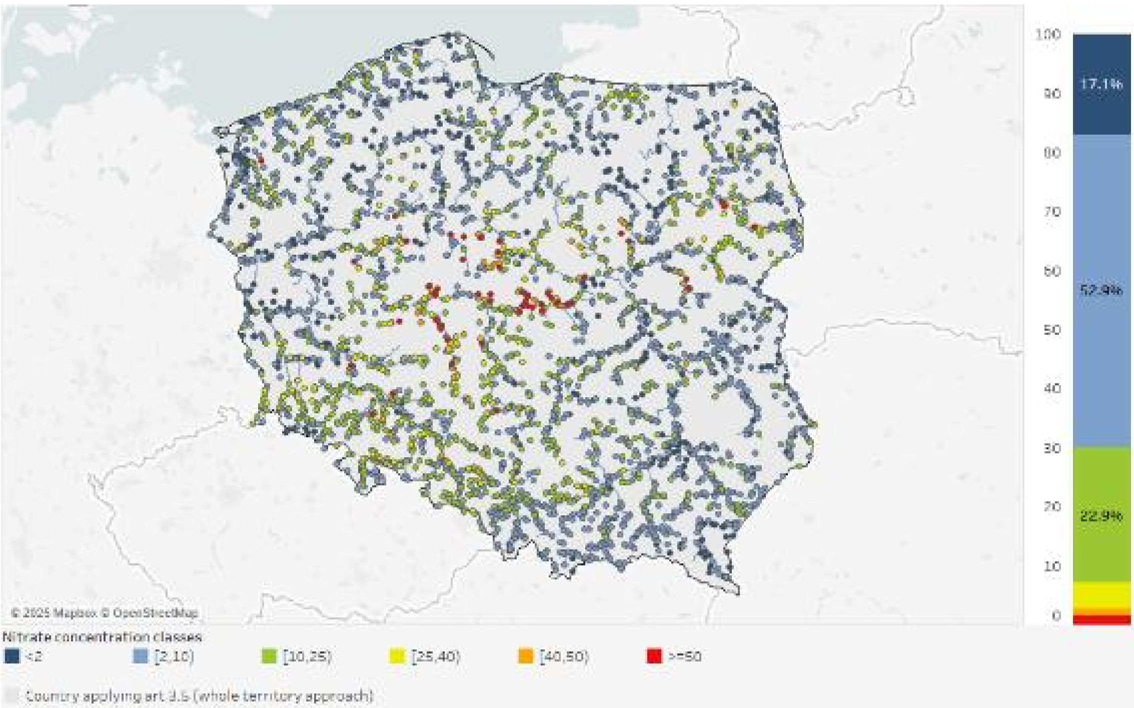
(17) Poland reported that monitoring was discontinued in 867 monitoring points relative to the previous reporting period. Discontinuation may be due to nitrate concentrations below 25 mg/l, change in station code or type, or other specific reasons.

5.2. Nitrate concentrations in surface waters

Rivers

In Poland, 1.7% of monitoring points in rivers showed average nitrate concentrations equal to or above the drinking water threshold of 50 mg/l, whereas 1.2% had concentrations between 40-49.99 mg/l, 4.4% showed concentrations between 25-39.99 mg/, 22.9% in the class 10-24.99 mg/l, 52.9% in the class 2-9.99 mg/l and 17.1% below 2 mg/l.
It is relevant to look at the distribution in nitrate concentration classes below 25 mg/l for surface water as there can be a risk of eutrophication in lower concentration classes.

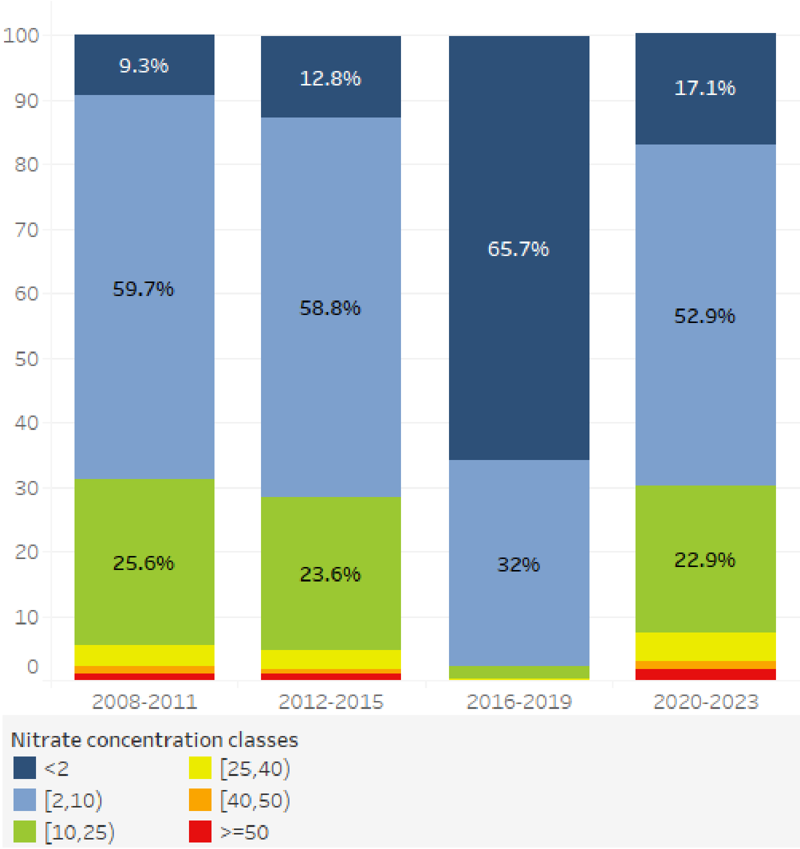
Figure 18 – Map of average annual mean nitrate concentrations in rivers and share of monitoring points by concentration class in the reporting period 2020-2023



Note: In the map, monitoring points with higher values are plotted on top. In the graph, the percentages below 5% are not labelled.

Compared to the data reported in the previous reporting period, the share of monitoring points in rivers with concentrations ≥ 50 mg/l increased from 0% to 1.7%. The graph below presents the shares of monitoring points per classes of nitrate concentration in last four reporting periods.

Figure 19 – Share of monitoring points in rivers by class of nitrate concentration ([18]) in the current and previous reporting periods



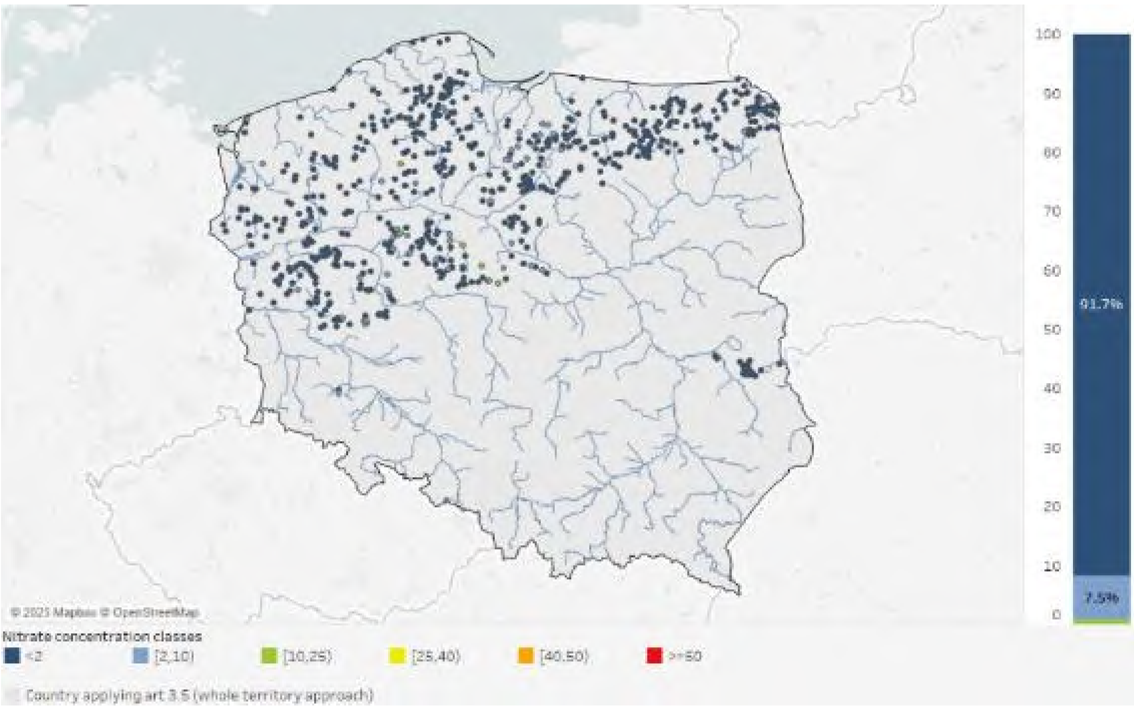
Note: The percentages below 5% are not labelled.

([18]) Average of annual mean values over the reporting period.

Lakes/water reservoirs

In Poland, none the of monitoring points in lakes/water reservoirs showed average nitrate concentration above the drinking water threshold of ≥ 50 mg/l, between 40-49.99 mg/l and between 25-39.99 mg/, 0.8% in the class 10-24.99 mg/l, 7.5% in the class 2-9.99 mg/l and 91.7% below 2 mg/l.
It is relevant to look at the distribution in nitrate concentration classes below 25 mg/l for surface water as there can be a risk of eutrophication in lower concentration classes.

Figure 20 – Map of average annual mean nitrate concentrations in lakes/water reservoirs and share of monitoring points by concentration class in the reporting period 2020-2023



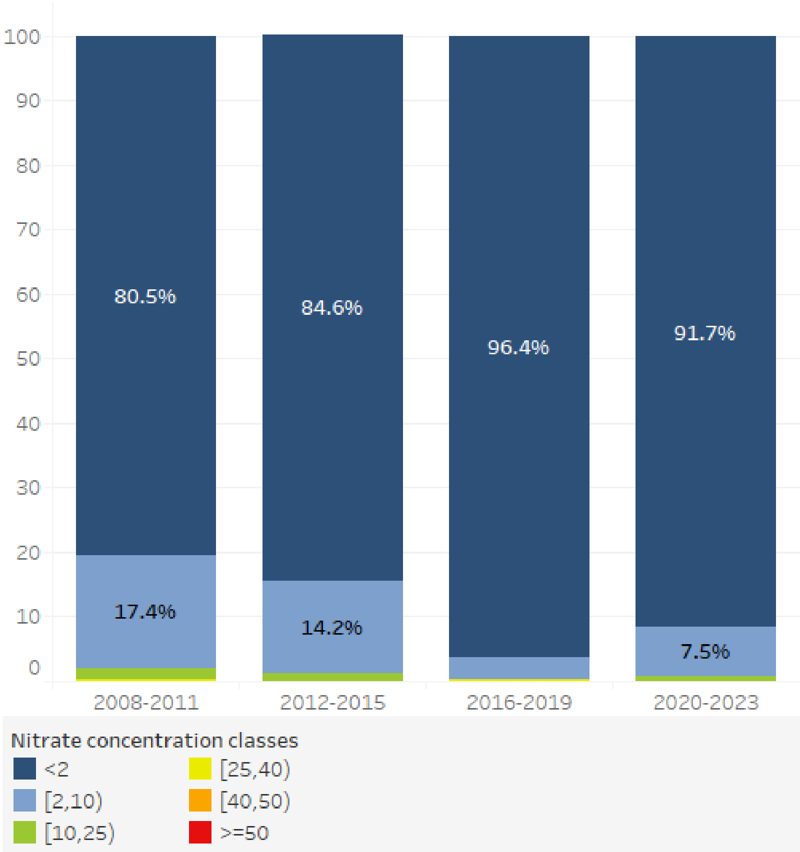
Note: In the map, monitoring points with higher values are plotted on top. In the graph, the percentages below 5% are not labelled.

Table 7 – Share of freshwater monitoring points by nitrate concentration class (mg/l) in reporting period 2020-2023, categorised by station type

	Number of stations	% of Total	<2	[2,10)	[10,25)	[25,40)	[40,50)	>=50
Rivers	3,557	84.3%	17.1%	52.9%	22.9%	4.4%	1.2%	1.7%
Lakes/reservoirs	663	15.7%	91.7%	7.5%	0.8%			
Total	4,220	100.0%	28.8%	45.7%	19.4%	3.7%	1.0%	1.4%

Compared to the data reported in the previous reporting period, the share of monitoring points in lakes/water reservoirs with concentration ≥ 50 mg/l remained at 0%. The graph below presents the shares of monitoring points per classes of nitrate concentration in last four reporting periods.

Figure 21 – Share of monitoring points in lakes/water reservoirs by class of nitrate concentration ([19]) in the current and previous reporting periods



Note: The percentages below 5% are not labelled.

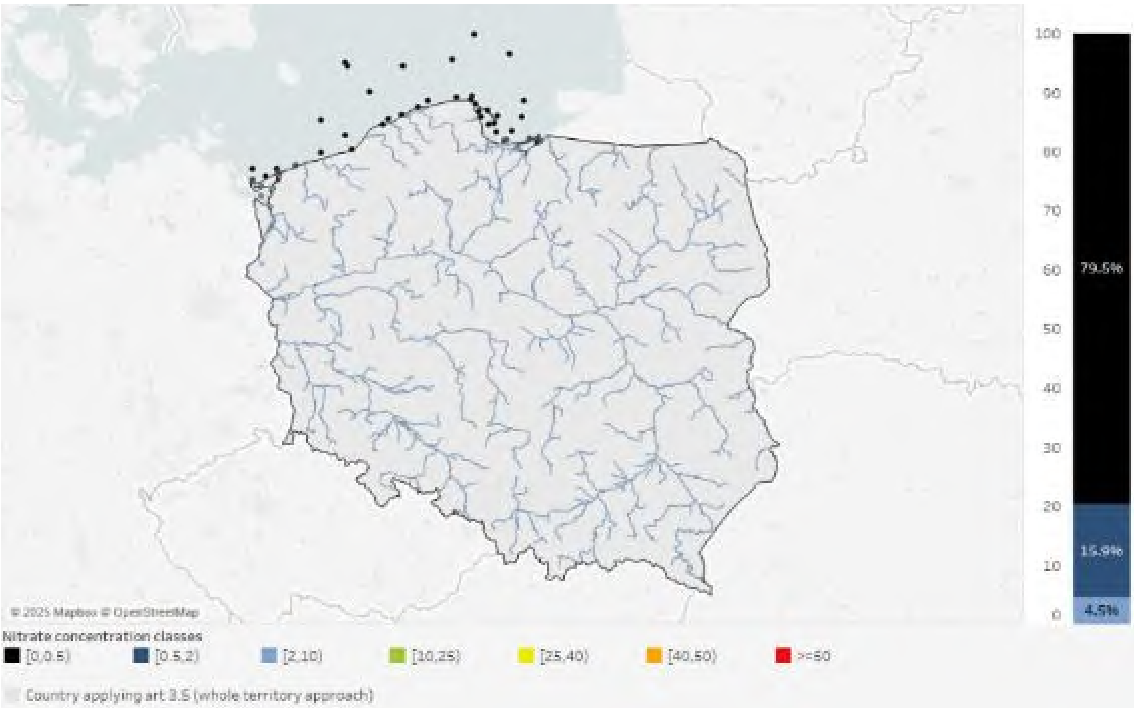
([19]) Average of annual mean values over the reporting period.

Saline waters [20]

No monitoring points in saline waters showed average nitrate concentrations ≥ 10 mg/l, 4.5% showed concentrations between 2-9.99 mg/l and 15.9% between 0.5-2 mg/l and 79.5% below 0.5 mg/l.

It is relevant to look in detail at very low nitrate concentrations, also below 0.5 mg/l and between 0.5 mg/l and 2 mg/l, because saline waters tend to have very low concentrations and some saline waters can become eutrophic even at concentrations below 2 mg/l.

Figure 22 – Map of average annual mean nitrate concentrations in saline waters and share of monitoring points by concentration class in reporting period 2020-2023



Note: In the map, monitoring points with higher values are plotted on top.

It is also relevant to look separately at transitional waters as they typically show higher nitrate concentrations. In Poland, 22.2% of monitoring points showed concentrations between 2-9.99 mg/l, 44.4% between 0.5-2 mg/l and 33.3% below 0.5 mg/l, as shown in the table below.

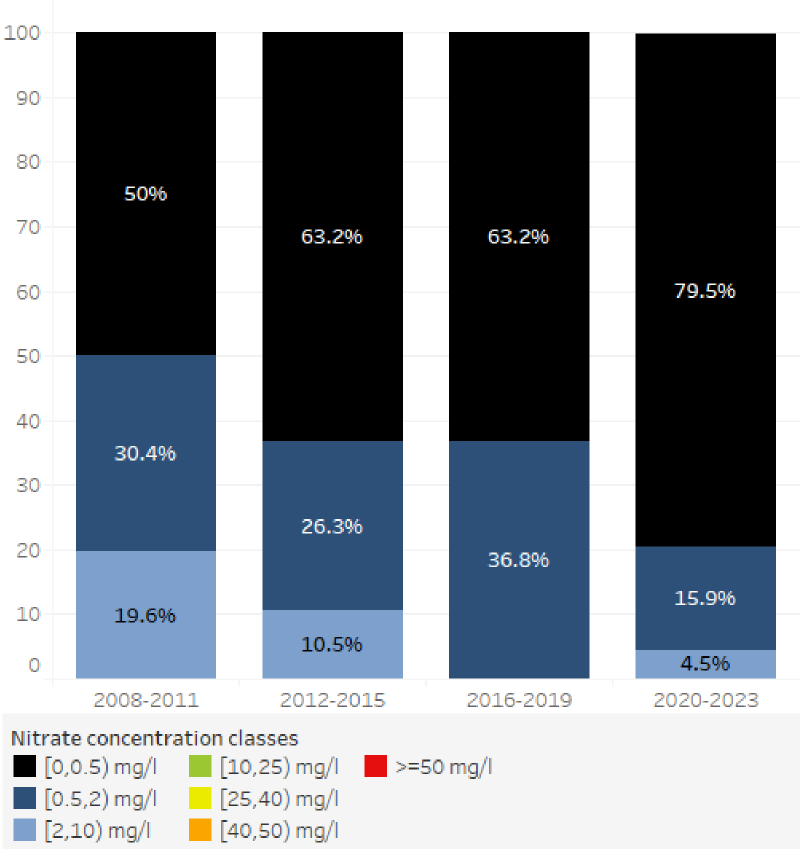
Table 8 – Share of saline water monitoring points by nitrate concentration class (mg/l) in the reporting period 2020-2023, categorised by station type

	Number of stations	% of Total	<0.5	[0.5,2)	[2,10)	[10,25)	[25,40)	[40,50)	>=50
Transitional water	9	20.5%	33.3%	44.4%	22.2%				
Coastal water	10	22.7%	80.0%	20.0%					
Marine water	25	56.8%	96.0%	4.0%					
Total	44	100.0%	79.5%	15.9%	4.5%				

[20] This includes coastal, marine and transitional waters.

The graph below presents the shares of monitoring points per classes of nitrate concentration in the last four reporting periods.

Figure 23 – Share of monitoring points in saline waters by class of nitrate concentration ([21]) in the current and previous reporting periods



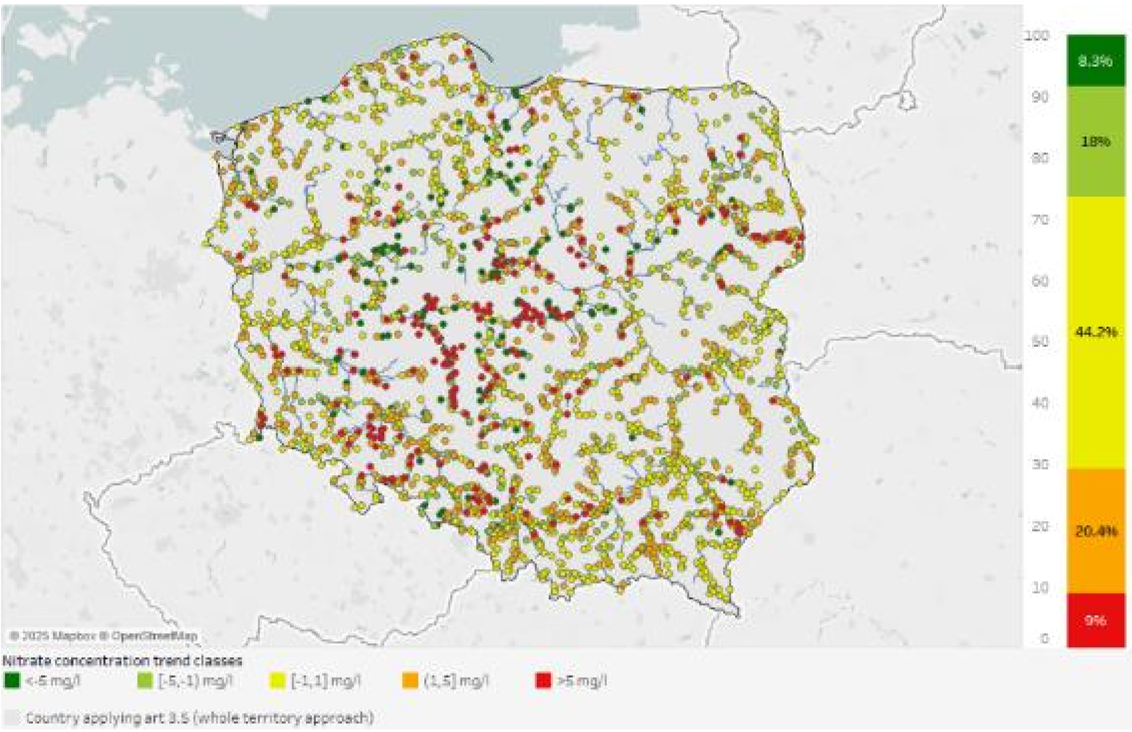
([21]) Average of annual mean values over the reporting period.

5.3. Trends in nitrate concentrations in surface waters

Rivers

Compared to the last reporting period, there has been a decrease of nitrate concentrations in 26.3% of monitoring points and an increase in 29.4%. For the remaining 44.2% there was no significant change. The increase or decrease can be categorised as weak if it is between 1 and 5 mg/l, and as strong if its above 5 mg/l.

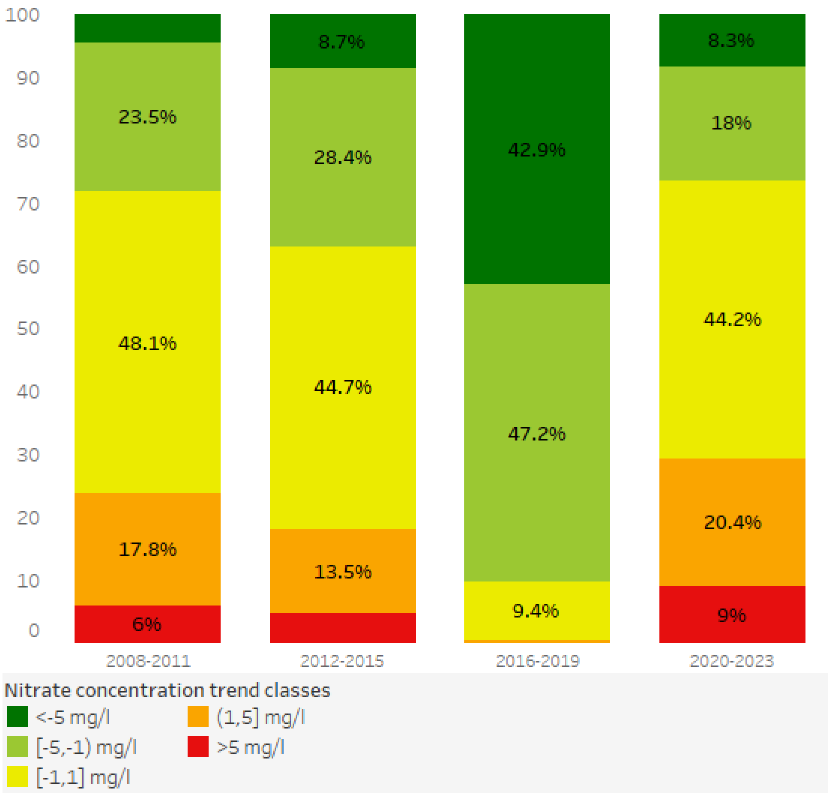
Figure 24 – Map of trends in average annual mean nitrate concentrations in rivers between the periods 2016-2019 and 2020-2023 and share of monitoring points by trend class



Note: In the map, monitoring points with higher values are plotted on top.

Compared to the data reported in the previous reporting period, there is a lower share of monitoring points with decreasing nitrate concentrations (26.3% in the current reporting period compared to 90.1% in the previous reporting period compared) and a higher share of monitoring points with increasing nitrate concentrations (29.4% compared to 9.8%). The graph below shows the share of monitoring points with increases (in red and orange), decreases (in green) and without significant change (in yellow) in nitrate concentrations between reporting periods.

Figure 25 – Share of monitoring points in rivers by class of nitrate concentration trend (22) in the current and previous reporting periods



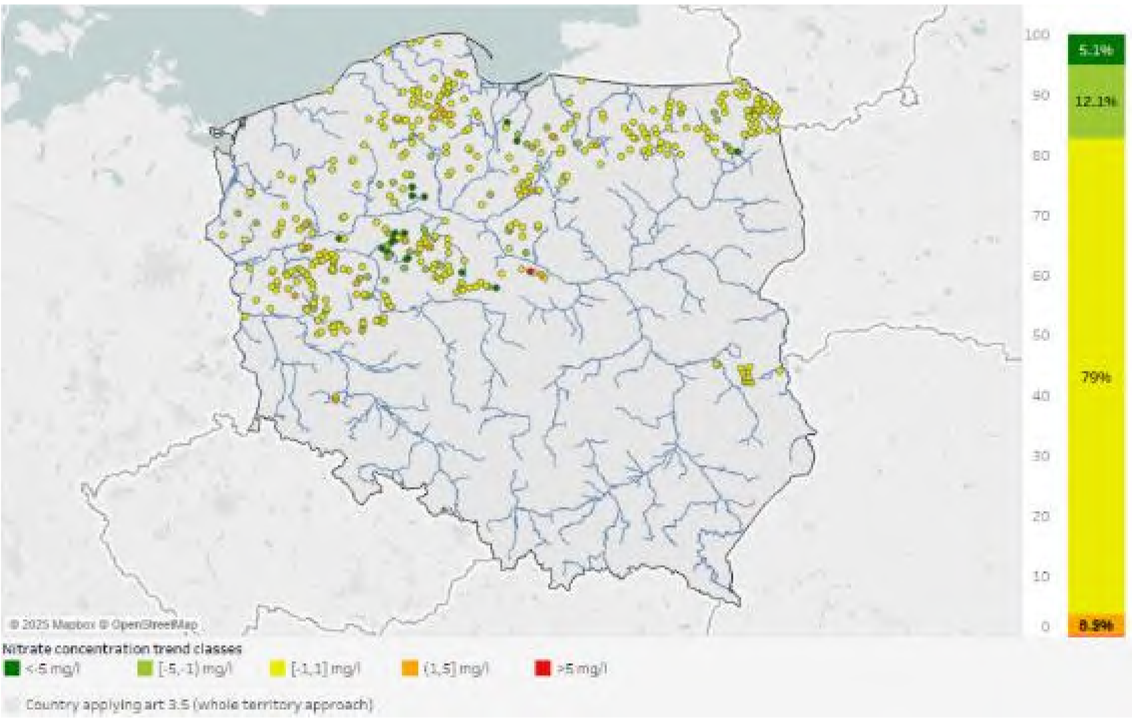
Note: The percentages below 5% are not labelled.

(22) Change in average annual mean nitrate concentrations to the previous reporting period.

Lakes/water reservoirs

Compared to the last reporting period, there has been a decrease of nitrate concentrations in 17.2% of monitoring points and an increase in 3.7%. For the remaining 79.0% there was no significant change. The increase or decrease can be categorised as weak if it is between 1 and 5 mg/l, and as strong if its above 5 mg/l.

Figure 26 – Map of trends in average annual mean nitrate concentrations in lakes/water reservoirs between the periods 2016-2019 and 2020-2023 and share of monitoring points by trend class



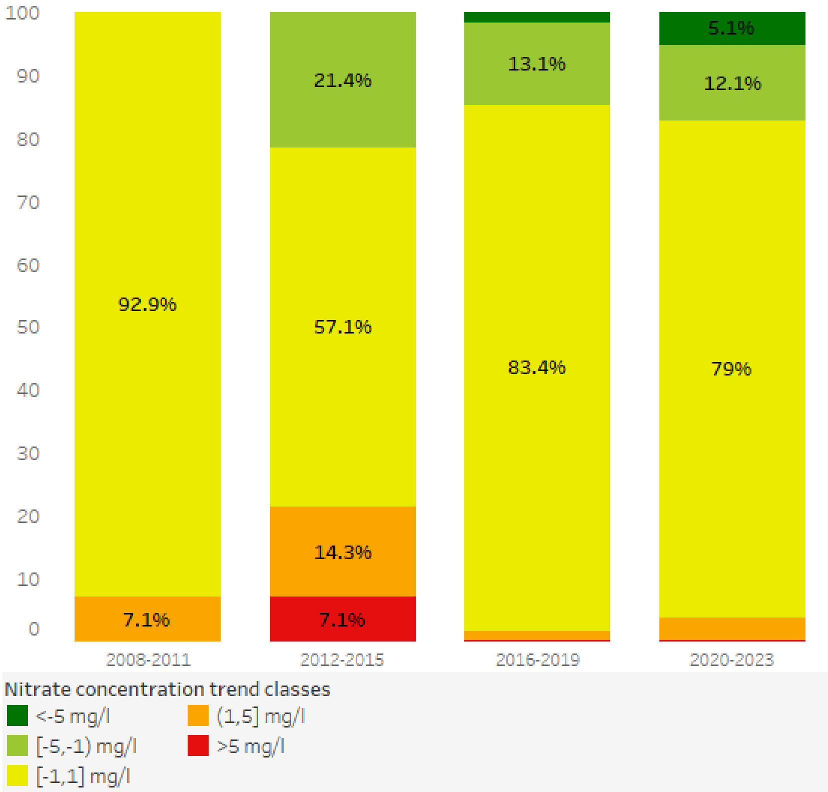
Note: In the map, monitoring points with higher values are plotted on top.

Table 9 – Share of freshwater monitoring points by trend class (mg/l) between the periods 2016-2019 and 2020-2023, categorised by station type

	Total Number of Stations	% Total Number of Stations	<-5	[-5,-1)	[-1,1]	(1,5]	>5
River	2,641	86.0%	8.3%	18%	44.2%	20.4%	9%
Lake/Reservoir	429	14.0%	5.1%	12.1%	79%	3.5%	0.2%
Total	3,070	100.0%	7.9%	17.2%	49.1%	18.1%	7.8%

Compared to the previous reporting period, there is higher share of monitoring points with decreasing nitrate concentrations (17.2% in the current reporting period compared to 14.8% in the previous reporting period) but also a higher share of monitoring points with increasing nitrate concentrations (3.7% compared to 1.8%). The graph below shows the share of monitoring points with increases (in red and orange), decreases (in green) and without significant change (in yellow) in nitrate concentrations between reporting periods.

Figure 27 – Share of monitoring points in lakes/water reservoirs by class of nitrate concentration trend ([23]) in the current and previous reporting periods



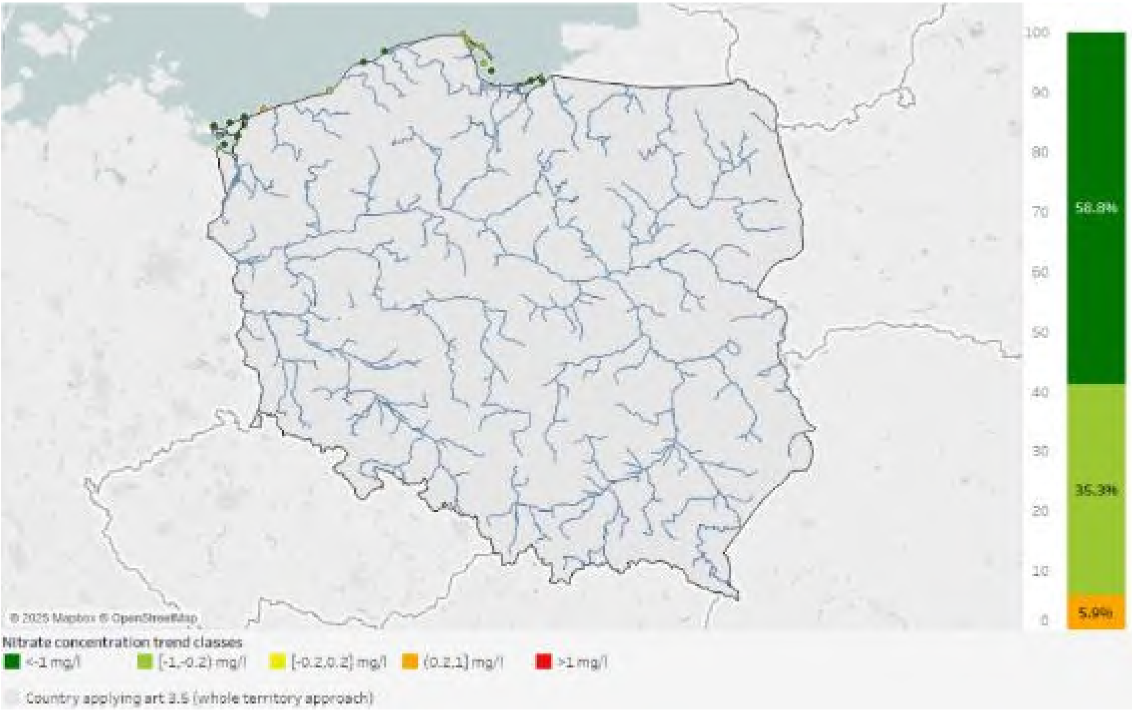
Note: The percentages below 5% are not labelled.

([23]) Change in average annual mean nitrate concentrations to the previous reporting period.

Saline waters

Compared to the last reporting period, there has been a decrease of nitrate concentrations in 94,1% of monitoring points and an increase in 5,9%. The increase or decrease can be categorised as weak if it is between 0.2 and 1 mg/l, and as strong if its above 1 mg/l.

Figure 28 – Map of trends in average annual mean nitrate concentrations in saline waters between periods 2016-2019 and 2020-2023 and share of monitoring points by trend class



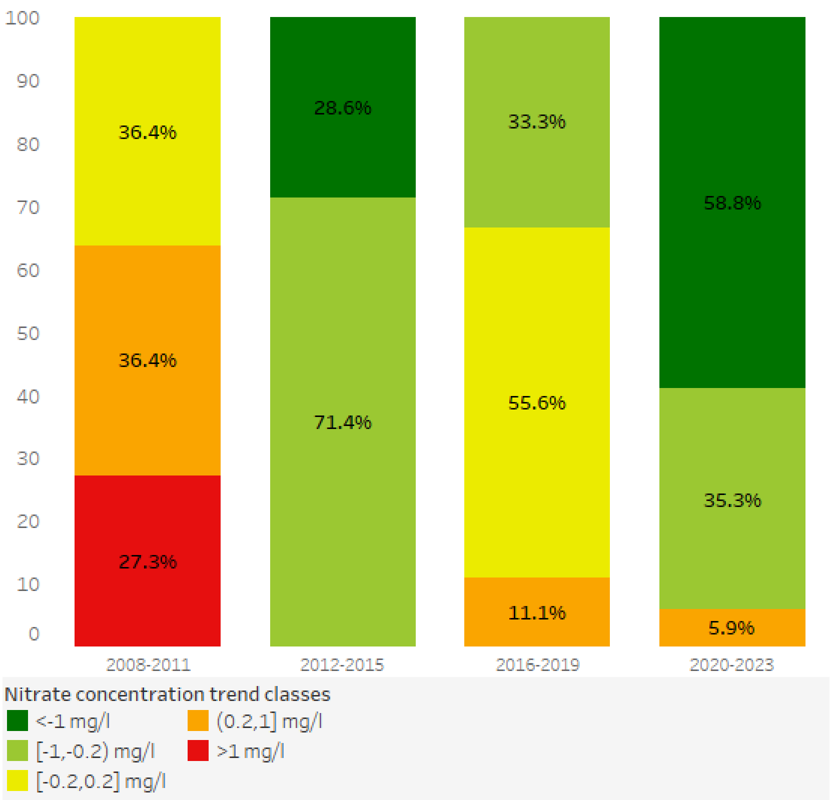
Note: In the map, monitoring points with higher values are plotted on top.

Table 10 – Share of saline water monitoring points by trend class (mg/l) between the periods 2016-2019 and 2020-2023, categorised by station type

	Total Number of Stations	% Total Number of Stations	<-1	[-1,-0.2)	[-0.2,0.2]	(0.2,1]	>1
Transitional water	8	47.1%	75%	25%			
Coastal water	9	52.9%	44.4%	44.4%		11.1%	
Marine water							
Total	17	100.0%	58.8%	35.3%		5.9%	

Compared to the previous reporting period, there is higher share of monitoring points with decrease of nitrate concentrations (94.1% in the current reporting period compared to 33.3% in the previous reporting period) and a lower share of monitoring points with increase of nitrate concentrations (5.9% compared to 11.1%). The graph below shows the share of monitoring points with increases (in red and orange), decreases (in green) and without significant change (in yellow) in nitrate concentrations between reporting periods.

Figure 29 – Share of monitoring points in saline waters by classes of nitrate concentrations ([24]) in the current and previous reporting periods



([24]) Change in average annual mean nitrate concentrations to the previous reporting period.

5.4. Nitrate pollution hotspots in surface waters

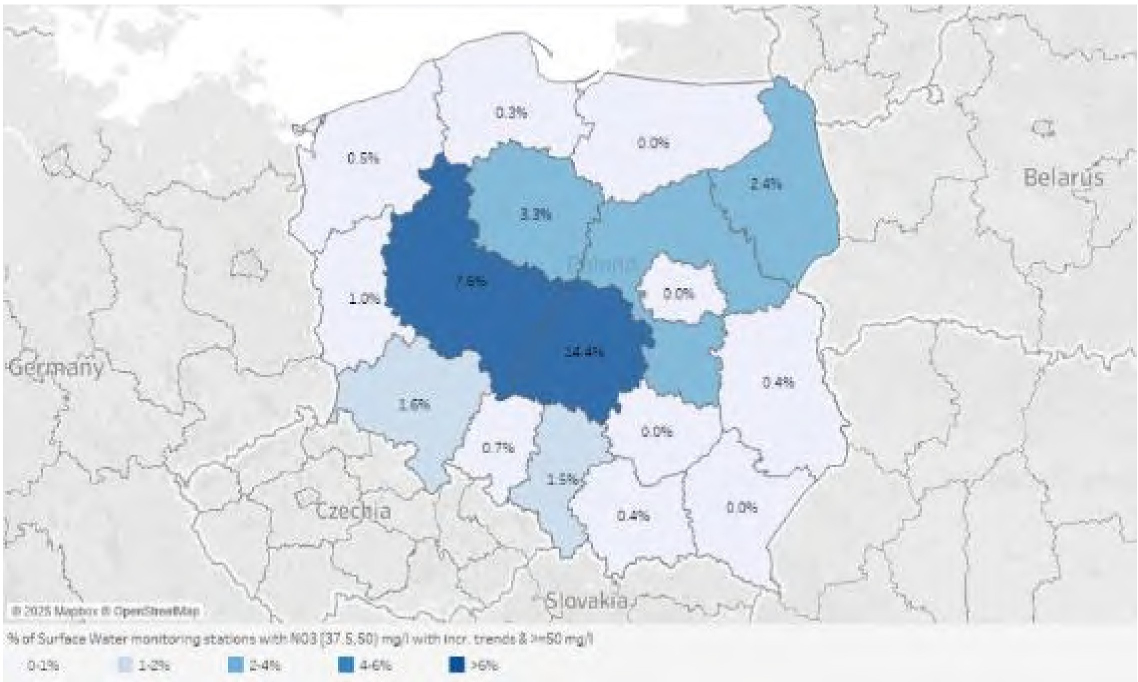
A nitrate pollution hotspot is defined here as a monitoring point where the average annual nitrate concentration is ≥ 50 mg/l or between 37.5 and 49.99 mg/l with an increasing trend. There are 98 surface water nitrate pollution hotspots.

Figure 30 – Surface water nitrate pollution hotspots

		inside NVZ	outside NVZ	Total
Rivers	[37.5,50) with incr. trend	39		39
	>=50	59		59
Lakes/reservoirs	[37.5,50) with incr. trend			
	>=50			
Total		98		98

The highest share of the hotspots is in regions Łódzkie (14.4%), Wielkopolskie (7.6%) and Mazowiecki regionalny (3.5%).

Figure 31 – Share of surface water nitrate pollution hotspots at NUTS2 level



6. EUTROPHICATION OF SURFACE WATERS

6.1. Monitoring of trophic status in surface waters

The GIOŚ carries out this assessment on the basis of measurement data obtained under State Environmental Monitoring.

During the reporting period 2020-2023 trophic status was reported at 4 136 monitoring points. Among these, 83.6% were in rivers, 15.9% were in lakes or reservoirs, and 0.4% were in saline waters. The station density was 13.2 stations per 1 000 km^2.

The overall number of freshwater monitoring points increased by 521 (14.5%), and number of saline water monitoring points remained stable compared to the previous reporting period. The number of monitoring stations has increased steadily over the past three and current reporting periods from under 2000 in 2008-2011 to over 4000 in 2020-2023.

Figure 32 – Evolution in surface water monitoring network (number of points with trophic status reported)

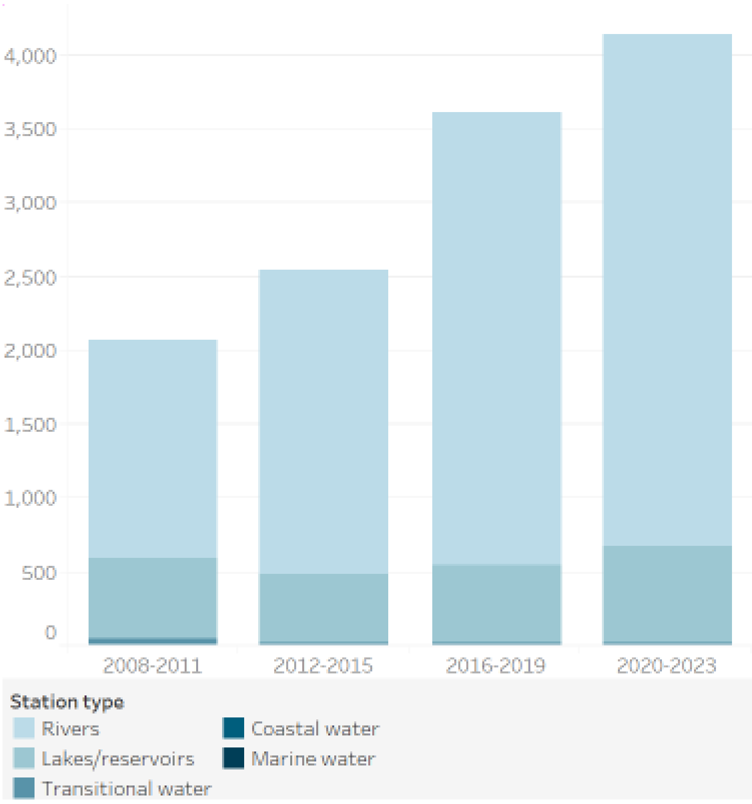


Table 11 – Number of monitoring points reporting trophic status by station type (25)

Station type	Stations With Trophic Status			
	2008-2011	2012-2015	2016-2019	2020-2023
Rivers	1,475	2,053	3,063	3,459
Lakes/reservoirs	551	473	533	658
Transitional water	31	9	9	9
Coastal water	15	10	10	10
Marine water				
Total	2,072	2,545	3,615	4,136

6.2. Methodology for the assessment of trophic status

Eutrophication in surface waters (rivers, lakes, reservoirs, and transitional and coastal waters) was identified on the basis of the results of the eutrophication assessment carried out by the Chief Inspector of Environmental Protection (GIOŚ).

The assessment is based on classification of biological and physico-chemical elements indicators for individual monitoring stations. The classification of these elements is in line with the 'One Out–All Out' (OOAO) principle imposed by the WFD. This means that the assessment of the water body whose class is being determined cannot be better than that of the lowest-rated element. The bioindicators analyses include phytoplankton, phytobentos while the physico-chemical indicators used include water transparency, dissolved oxygen, BOD5, nitrate nitrogen, total nitrogen and total phosphorus.

The current assessment clearly indicates the classification of waters as eutrophic or non-eutrophic, without specifying the categories of water that may become eutrophic in the future. Eutrophication assessments carried out in previous reporting periods (2012-2016 and earlier) were based on different methodological approaches, so any comparison of results between periods should be approached with great caution.

The assessment of eutrophication of marine waters was conducted with different methodology as part of the implementation of the Marine Strategy Framework Directive (MFSD) in Polish marine areas. The results of the eutrophication assessment of Polish sea basins showed the occurrence of eutrophication of waters throughout the 2020-2023 period.

Poland reported that the parameters and limit values used in the eutrophication assessment for the Nitrates Directive align with those of the Water Framework Directive.

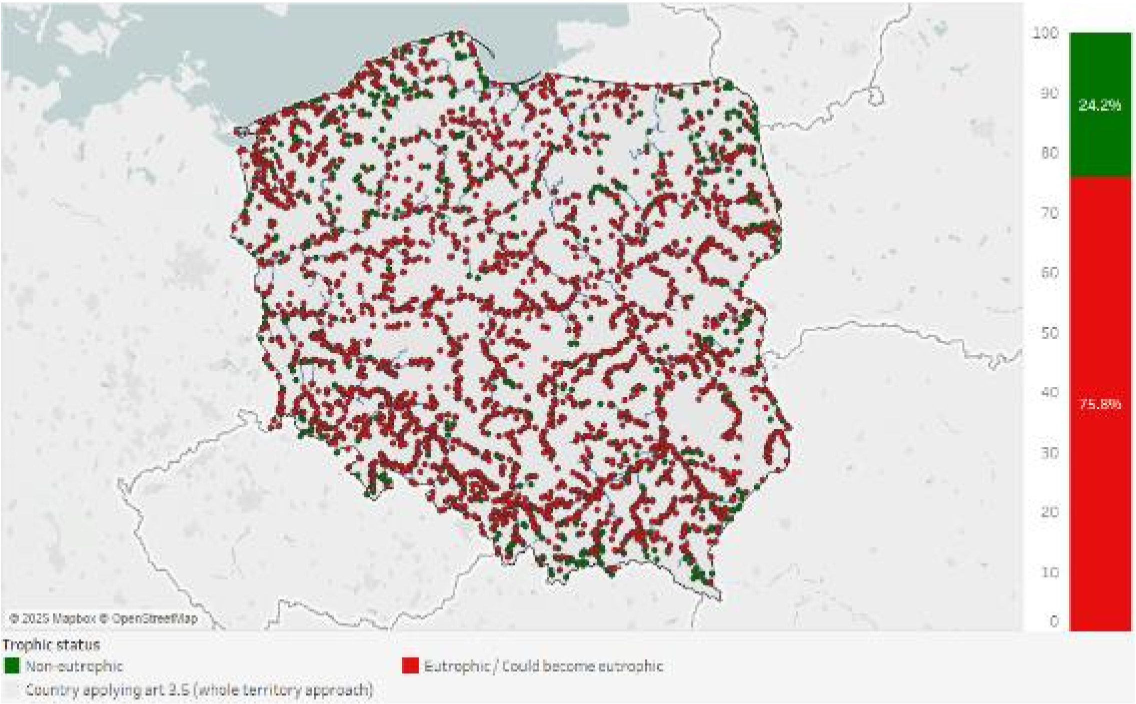
(25) Poland reported that monitoring was discontinued in 664 monitoring points relative to the previous reporting period. Discontinuation may be due to nitrate concentrations below 25 mg/l, change in station code or type, or other specific reasons.

6.3. Eutrophication of surface waters

Rivers

75.8% of monitoring points in rivers were eutrophic/could become eutrophicThe figure below shows the shares in respective classes in a graph and spatial distribution in the map.

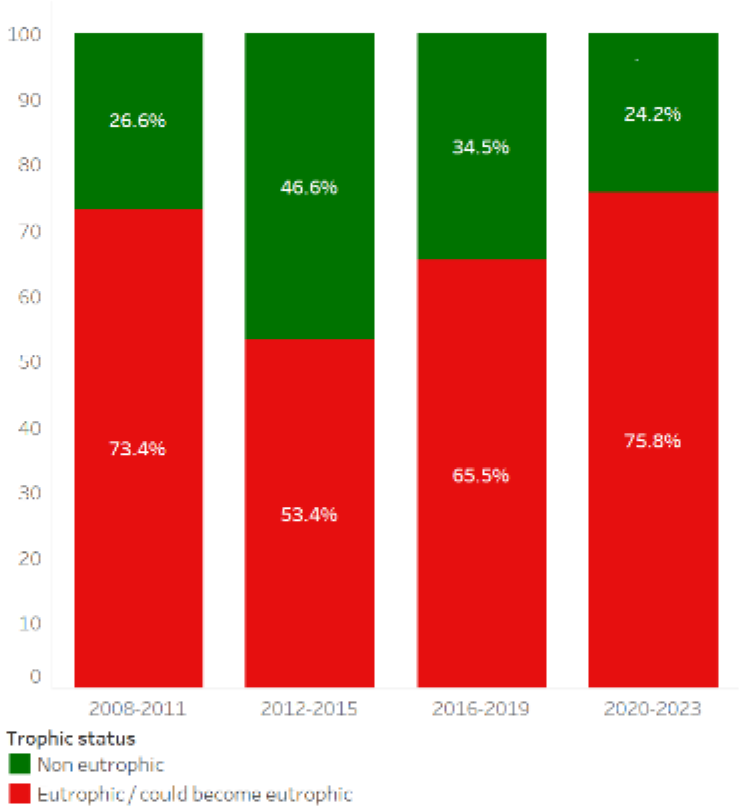
Figure 33 – Map of trophic status in rivers and share of monitoring points by trophic class in the reporting period 2020-2023



Note: In the map, eutrophic/could become eutrophic monitoring points are plotted on top.

Compared to the data reported in the previous reporting period, the share of monitoring points increased from 65.5% to 75,8%. The graph below presents the shares of monitoring points according to their trophic status in the last four reporting periods.

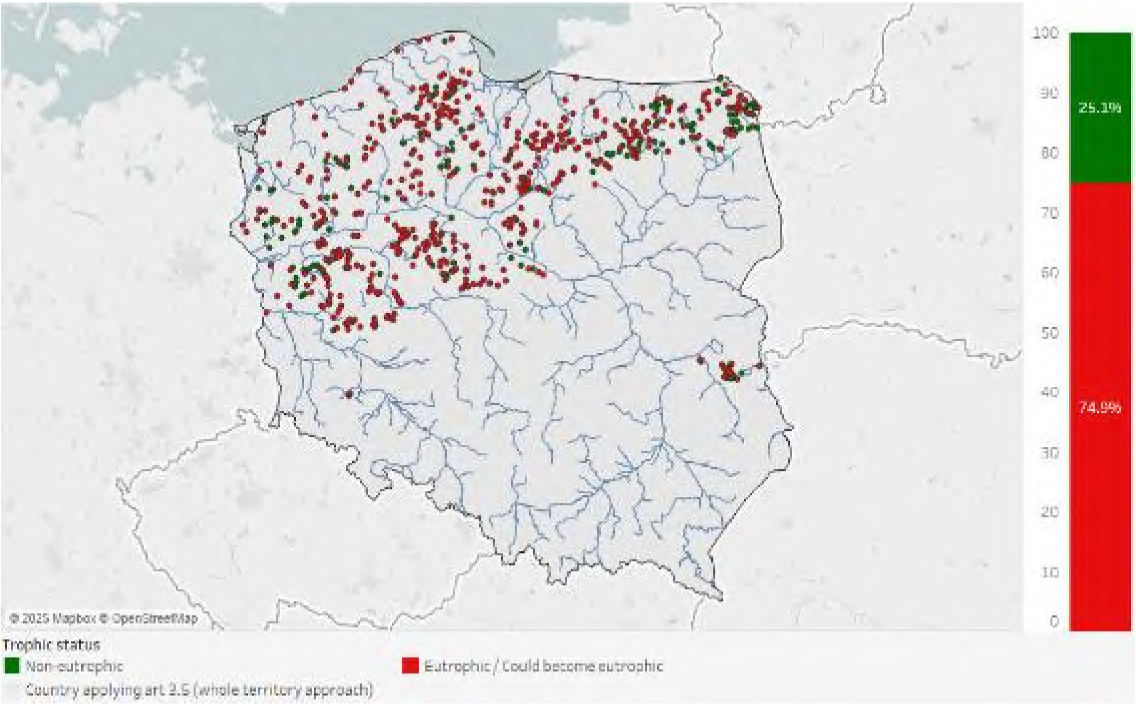
Figure 34 – Share of monitoring points in rivers by class of trophic status in the current and previous reporting periods



Lakes and water reservoirs

74.9% of monitoring points in lakes/water reservoirs were eutrophic/could become eutrophic. The figure below shows the shares in respective classes in a graph and spatial distribution in the map.

Figure 35 – Map of trophic status in lakes/water reservoirs and share of monitoring points by trophic class in the reporting period 2020-2023



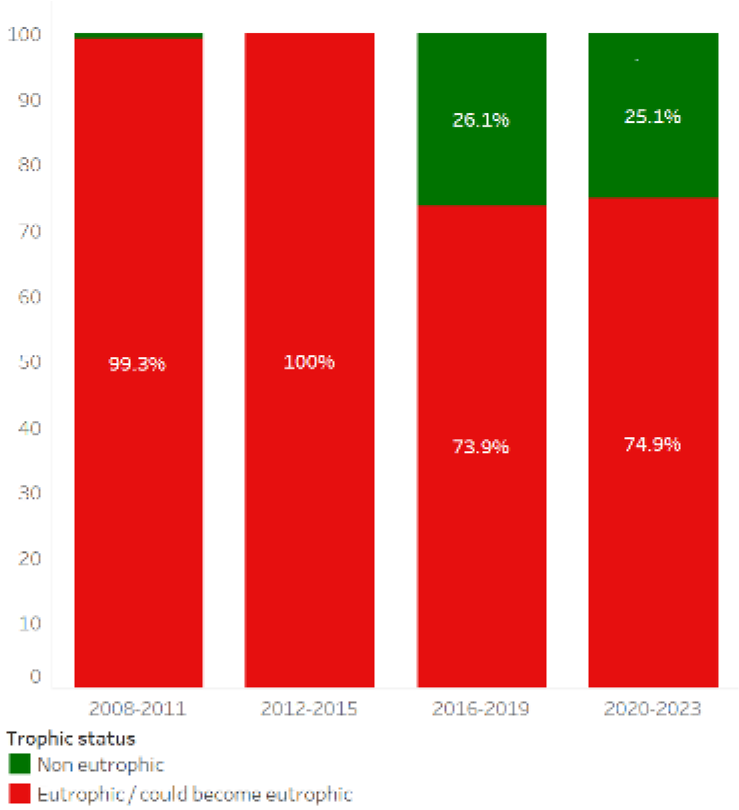
Note: In the map, eutrophic/could become eutrophic monitoring points are plotted on top.

Table 12 – Share of freshwater monitoring points by class of trophic status, categorised by station type

Station type	Number of Stations	% of Total	Non-eutrophic	Eutrophic/could become eutrophic
Rivers	3,459	84.0%	24.2%	75.8%
Lakes/reservoirs	658	16.0%	25.1%	74.9%
Total	4,117	100.0%	24.4%	75.6%

Compared to the data reported in the previous reporting period, the share of eutrophic/could become eutrophic monitoring points increased from 73.9% to 74.9%. The graph below presents the shares of monitoring points according to their trophic status in the last four reporting periods.

Figure 36 – Share of monitoring points in lakes/water reservoirs by class of trophic status in the current and previous reporting periods



Saline waters

100% of saline water monitoring points were eutrophic/could become eutrophic. The figure below shows the shares in respective classes in a graph and spatial distribution in the map.

Figure 37 – Map of trophic status in saline waters and share of monitoring points by trophic class in the reporting period 2020-2023

Note: In the map, eutrophic/could become eutrophic monitoring points are plotted on top.

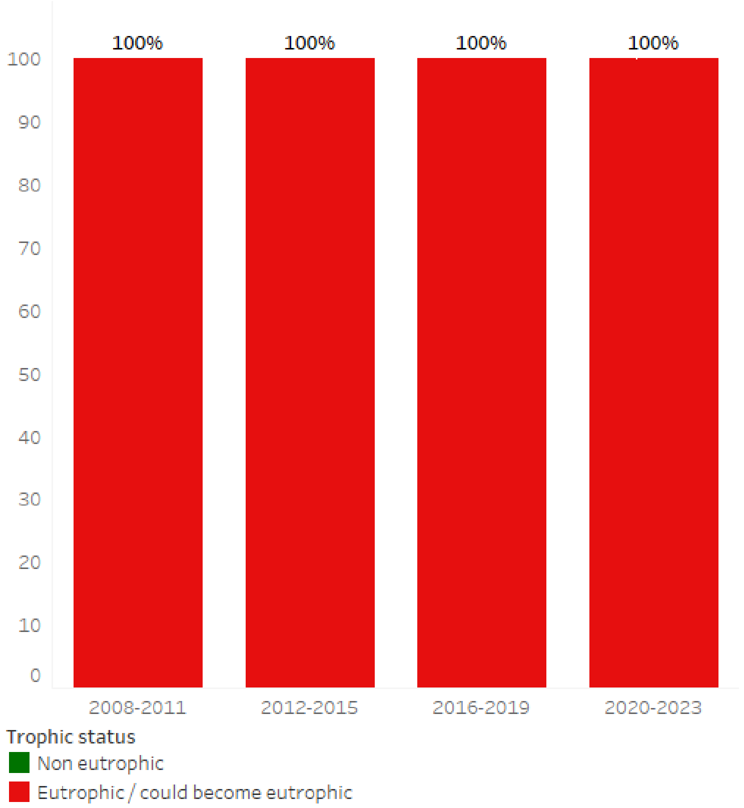
It is relevant to look separately at different types of saline waters (transitional, coastal and marine). In Poland, 100% of transitional water and 100% of coastal water monitoring points were eutrophic/could become eutrophic, as shown in the table below.

Table 13 – Share of saline water monitoring points by class of trophic status, categorised by station type

Station type	Number of Stations	% of Total	Non-eutrophic	Eutrophic/could become eutrophic
Transitional water	9	47.4%		100.0%
Coastal water	10	52.6%		100.0%
Marine water				
Total	19	100.0%		100.0%

Compared to the data reported in the previous reporting period, the share of eutrophic/could become eutrophic monitoring points in saline waters remained at 100%. The graph below presents the shares of monitoring points according to their trophic status in the last four reporting periods.

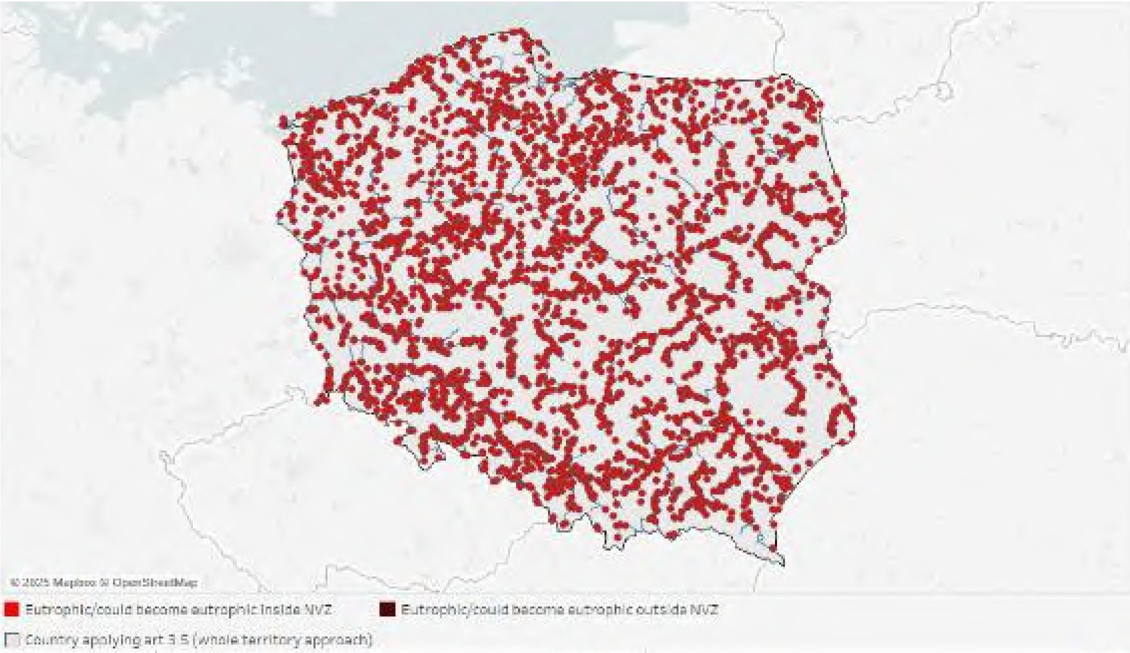
Figure 38 – Share of monitoring points in saline waters by class of trophic status in the current and previous reporting periods



6.4. Eutrophication hotspots in surface waters

A eutrophication hotspot in surface waters is defined here as a monitoring point with trophic status evaluated as “eutrophic” or “could become eutrophic”. Overall, there are 3 133 surface water monitoring points which were reported eutrophic/could become eutrophic.

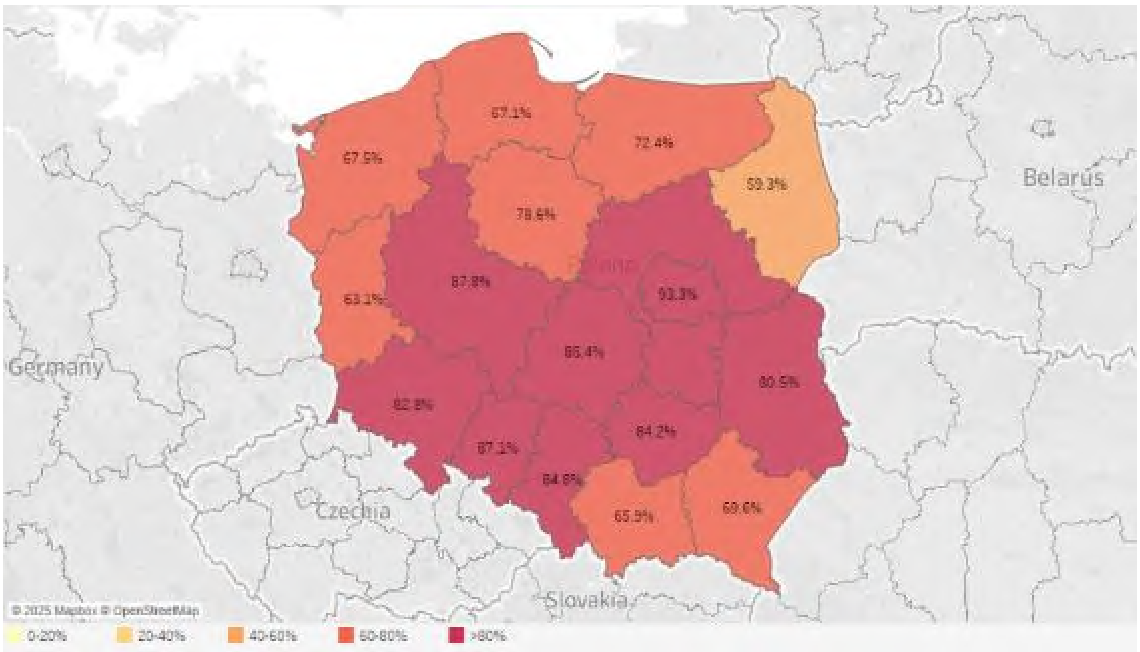
Figure 39 – Eutrophic/could become eutrophic monitoring points



	Inside NVZ	Total
Rivers	2,621	2,621
Lakes	493	493
Transitional water	9	9
Coastal water	10	10
Total	3,133	3,133

The highest share of the hotspots is in Warszawski stołeczny (93.3%), Wielkopolskie (87.8%) and Opolskie (87.1%).

Figure 40 – Share of eutrophic/could become eutrophic monitoring points at NUTS2 level



7. NITRATES ACTION PROGRAMME

The Nitrates Directive mandates the establishment of a code of good agricultural practice that shall be implemented by farmers on a voluntary basis, and promoted through training and information for farmers. Action programmes with mandatory requirements for farms should be established and enforced in NVZ or across the entire territory with mandatory measures applicable to all farms in those areas. These requirements primarily focus on implementing good practices for the handling of fertilisers and manure on farms to minimise the risk of nutrient leaching and run-off from fields. Annex II and III of the directive set the types of measures to be included. The directive leaves wide discretion to Member States to design the measures in line with local circumstances. Compliance with the action programme measures is monitored by public authorities.

The action programmes contain measures concerning fertiliser application (periods when land application of different types of fertilisers is prohibited, land application on steeply sloping ground, prohibition of land application on water-saturated, flooded, frozen or snow-covered ground, the conditions for land application of fertiliser near water courses, balanced fertilisation and the amount of livestock manure that can be applied to the land), and the capacity of storage vessels for livestock manure. They may also include additional measures in relation to fertilizer planning and record keeping, land use management, including the use of crop rotation systems, minimum vegetation cover during sensitive periods, irrigation systems and other relevant measures complementing the nitrates action programme.

7.1. Measures in the action programme and code of good agricultural practices

In Poland, a Code of Good Agricultural Practices (CGAP) is provided in the form of *Recommendations of good agricultural practice for voluntary use*. The first CGAP was published in 2004. Part H of the CGAP of 2004 “Short set of rules of good agricultural practice for the implementation of the Nitrates Directive” was replaced by the CGAP of 2019. The latter is last updated in September 2025.

The provisions of the Nitrates Directive were formally introduced into Poland legislation in 2004. Poland adopted its first nationwide Nitrates Action program in 2018. The most recent update entered into force in February 2023. The Action Programme is currently established by the *Regulation of the Council of Ministers of 31 January 2023*.

The main changes introduced during the reporting period 2020-2023 include the introduction of a flexible end date of the closed fertilisation period, depending on weather conditions and soil status, the establishment of a nitrogen utilisation coefficient for mineral nitrogen fertilizers specific for grassland, and a reduction of the amount of active nitrogen remaining after the cultivation of legumes. In addition, provisions were introduced for so-called “open rearing system”, including corresponding nitrogen fertilisation doses and application methods. Open rearing systems are defined as group keeping of animals with grazing on fenced, limited area with supplementary feeding and without the use of buildings.

A consolidated overview of the action programme currently in force is provided in a separate document ([26]).

7.2. Controls

Compliance with the Action Programme is monitored by the competent authorities of the Environmental Protection Inspectorate, namely the Provincial Environmental Protection Inspectors (WIOŚ). As the obligations under the Action Programme are also integrated into CAP conditionality requirements, the Agency for Restructuring and Modernisation of Agriculture (ARiMR) also carries out controls on its implementation to a certain extent.

During the period 2020-2023, WIOŚ carried out between 1 412 and 2 478 on-site inspections per year. Over the same period, ARiMR inspected between 3 758 and 12 657 holdings annually.

On-the-spot inspections by WIOŚ identified between 367 and 528 cases of non-compliance per year during the reporting period 2020-2023. The most frequent infringements concerned storage conditions for liquid or solid organic fertilisers and the handling of leachate (6.8-12.2 %), the absence of incompleteness of documentation demonstrating compliance with the Action Programme (4.5-9.5 %), the lack of a nitrogen fertilisation plan or non-compliance with such a plan (3.9-7.2 %), and incorrect doses or methods of nitrogen fertilisation (0.6-1.3 %).

Financial constraints, as well as organisational and procedural challenges, continue to limit investments in manure storage infrastructure, including the construction of platforms and reservoirs for organic fertilisers. Additional factors contributing to non-compliance or implementation difficulties include the lack of publicly available, free tools for preparing nitrogen fertilisation plans or performing the calculations required under the Action Programme, limited digital skills among farmers, an insufficient number of advisory services, and an inadequate number or effectiveness of controls.

([26]) https://environment.ec.europa.eu/publications/summaries-national-nitrates-action-programmes_en

8. WATER QUALITY OUTLOOK

The forecast of future water quality was made by extrapolation of the evolution of water quality derived from current monitoring. In surface waters the analysis show that nitrate concentrations are increasing in 1 186 monitoring points, stable at 1, and decreasing at 947 points. Further analysis identified 42 monitoring points as either polluted or at risk of pollution. Among these, recovery is expected at 3 locations by 2034, at 1 location after year 2034, while 38 points did not show a decreasing trend. For groundwater, nitrate concentrations are rising in 808 monitoring points, stable at 4 points, and decreasing in 447 points. Thirty-two locations are classified as vulnerable, with recovery anticipated for 8 by 2027, 6 by 2031, 5 by 2035, and 13 by 2039.

Poland has initiated an attempt to explain the discrepancies observed between the nitrate concentrations estimated in the previous reporting cycle and the outcomes actually achieved in both surface and groundwater. The analysis has pinpointed certain areas where changing climate conditions imply that reductions in agricultural water pollution are unlikely.

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