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Delegations will find attached document SWD(2026) 232 final - Part 24/27.

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PART 24/27

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

European Commission

Romania

Country staff working document
on the implementation of the Nitrates Directive

Period: 2020-2023

Contents

1. KEY FINDINGS AND RECOMMENDATIONS

Romania submitted its report under the Nitrates Directive for the period 2020-2023 in July 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 Romanian 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 Romania, the utilised agricultural area (UAA) accounts for 54% of the country's total land area, which is higher than the EU average (38%). The livestock density is 0.3 livestock units per hectare (LSU/ha) of UAA, which is lower than the EU average of 0.7 LSU/ha. The gross nitrogen balance is -4 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 6 stations per 1 000 km^2, which is lower than the EU average (8 stations). Compared to the previous reporting period, the density decreased by 2%.

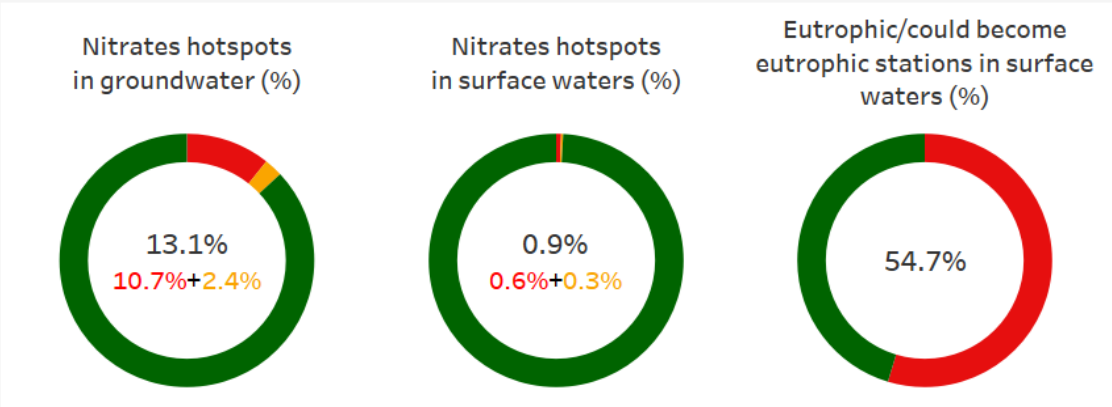
For surface freshwater, the density of the monitoring network is around 5 stations per 1 000 km^2, which is lower than the EU average (7 stations). Compared to the previous reporting period, the density decreased by 2%. The monitoring network includes river and lake/water reservoir stations.

For saline surface waters, the monitoring network includes transitional waters, coastal waters, and 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, 89.3% of monitoring points show nitrate concentrations below 50 mg/l.

Overall, 13.1% of monitoring points fall in two categories illustrated in Figure 1, i.e. they show nitrate concentrations either ≥ 50 mg/l (10.7%), or between 37.5 and 49.99 mg/l with an increasing trend (2.4%). Compared to the data reported in the previous reporting period, this represents a decrease of 1.9 percentage points (from 15.0% to 13.1%). The regions with the highest share were Sud-Vest Oltenia (22.5%), Nord-Est (19.9%) and Sud-Est (14.6%).

Compared to the previous reporting period, nitrate concentrations decreased in 36.5% of groundwater monitoring points and increased in 27.7%. Among points with nitrate concentration ≥ 50 mg/l, there was the same share of points where nitrate concentrations increased and decreased (47.6%).

In surface water, 99.4% of monitoring points show nitrate concentrations below 50 mg/l and 45.3% are classified as non-eutrophic.

Overall, 0.9% of monitoring points are in two categories illustrated in Figure 1, i.e. they show nitrate concentrations either ≥ 50 mg/l (0.6%), or between 37.5 and 49.99 mg/l with an increasing trend (0.3%). Compared to the data reported in the previous reporting period, this represents a decrease of 0.3 percentage points (from 1.2% to 0.9%). 7% of surface water monitoring stations show nitrate concentrations ≥ 10 mg/l, which is relevant for eutrophication.

Compared to the previous reporting period, the nitrate concentrations decreased in 19.9% of surface water monitoring points and increased in 11.4%.

The share of monitoring points reported as eutrophic/could become eutrophic is 54.7%. This represents an increase of 2.9 percentage points compared to the data reported in the previous period (from 51.6% to 54.7%). The regions with the highest share are Nord-Est (75.6%), București-Ilfov (73.3%) and Sud-Est (64.7%).

Nitrate Vulnerable Zones

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

Action Programme

Romania modified its action programme during this reporting period. Amendments concerned the fertiliser prohibition period, fertiliser application rules, buffer strips near watercourses, manure storage, and the record-keeping period.

1.2. Recommendations

- Review and where necessary reinforce efforts to improve water quality, notably with a view to addressing:
  - 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

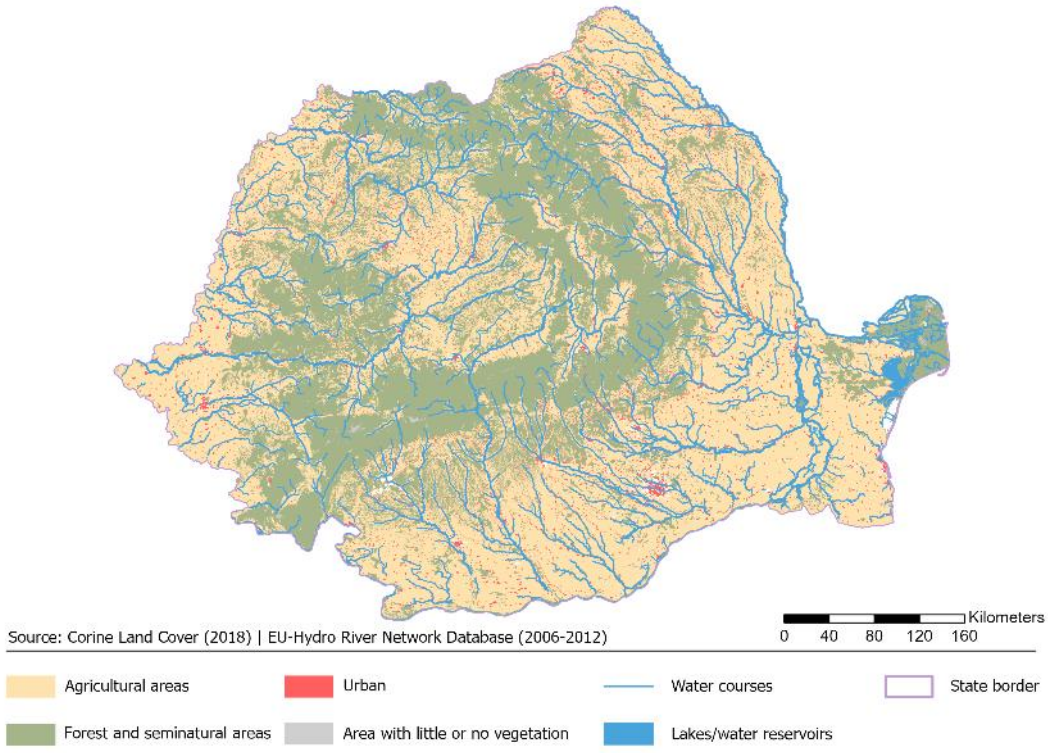
In Romania, crop production accounted for the largest portion of the agricultural sector's total output value at 65.5% in the reporting period 2020-2023. Animal production followed with 23.5%, and other outputs made up 11.0% ([6]). The share of agricultural land used for organic farming increased from 2.2% in the reporting period 2016-2019 to 4.6% 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 Romania along with watercourses and lakes/water reservoirs.

Figure 2 – Land use distribution in Romania



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

The utilised agricultural area (UAA) in Romania covered 12.6 million hectares in 2023, making up 53.6% of the country's total land area. Arable land accounted for 67.6% of UAA, followed by permanent grassland at 28.8% and permanent crops at 2.6%.

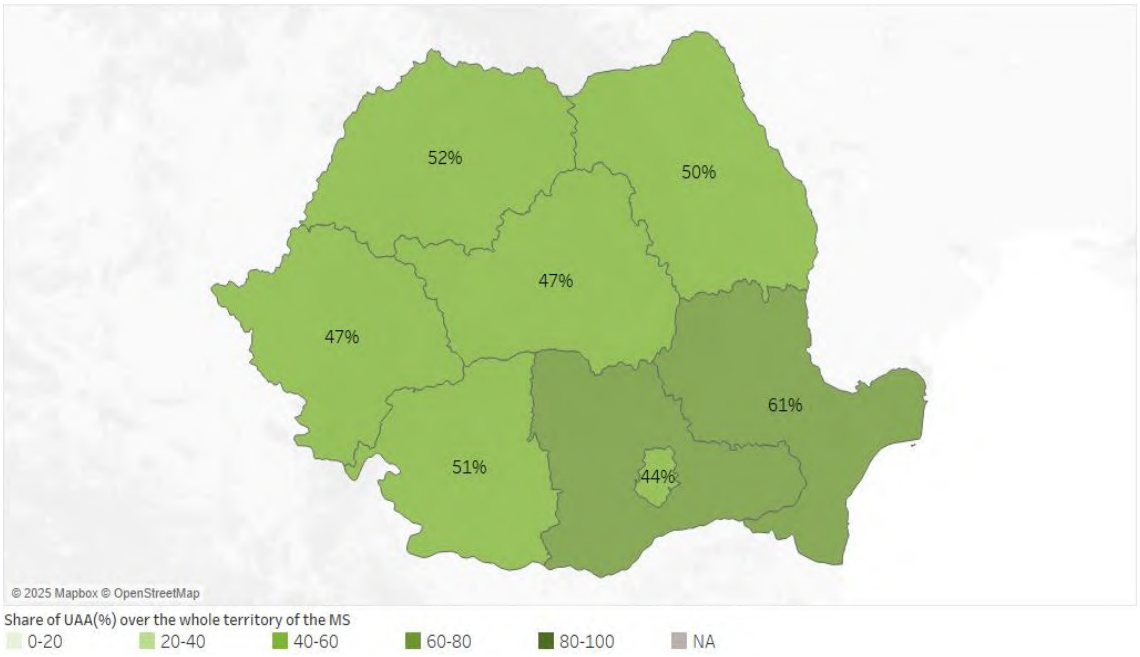
Table 1 – Evolution of the utilised agricultural area

	2010	2013	2016	2020	2023
utilised agricultural area (1000 ha)	13,306	13,056	12,503	12,763	12,550
arable land (1000 ha)	8,306	8,198	7,813	8,571	8,482
permanent grassland (1000 ha)	4,506	4,398	4,245	3,724	3,617
permanent crops (1000 ha)	311	302	301	344	325
kitchen gardens (1000 ha)	182	157	142	124	125

Source: Eurostat (ef_lus_main)

In 2020, the share of the UAA ranged from 61% in Sud-Muntenia, to 44% in București-Ilfov.

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



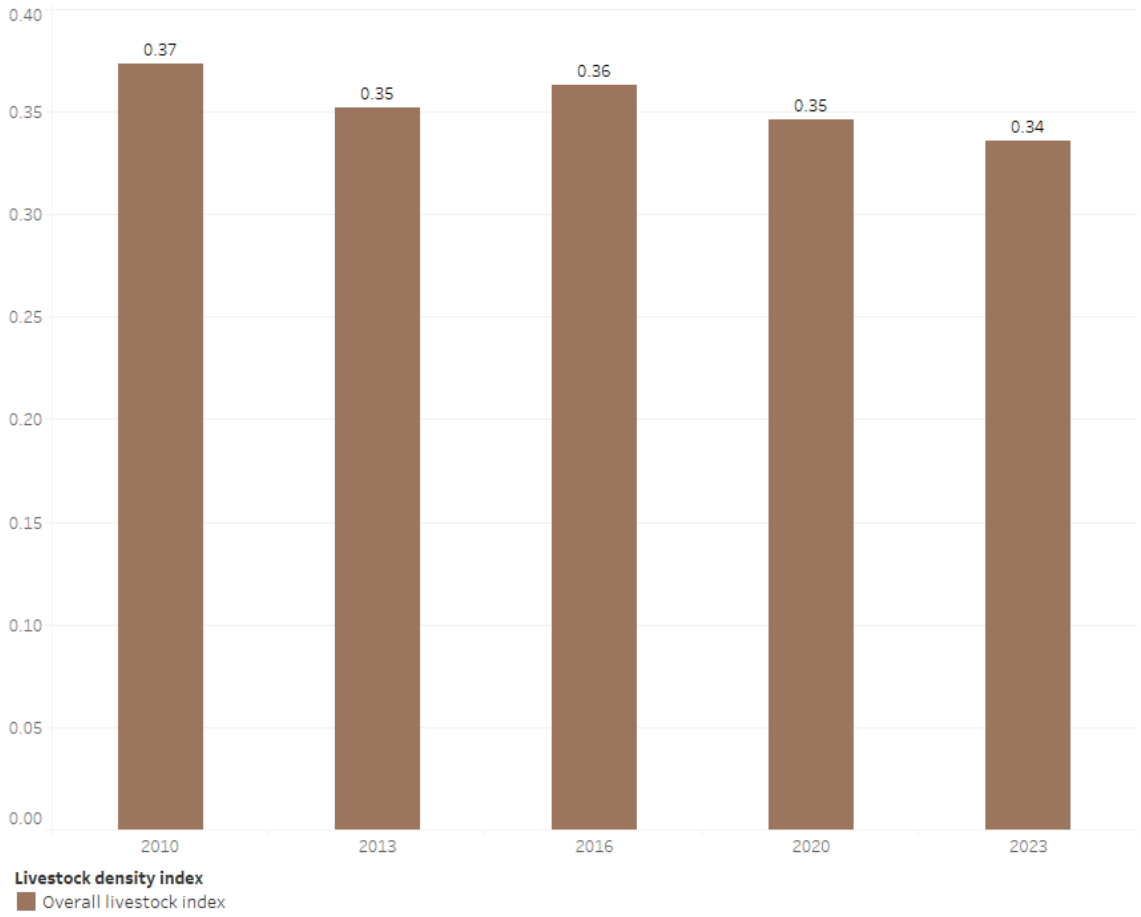
Source: Eurostat (ef_lus_main)

([8]) Latest available data.

2.2. Livestock density

In Romania the livestock density was 0.34 livestock units per hectare (LSU/ha) of UAA in 2023. The livestock density has decreased since 2010.

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



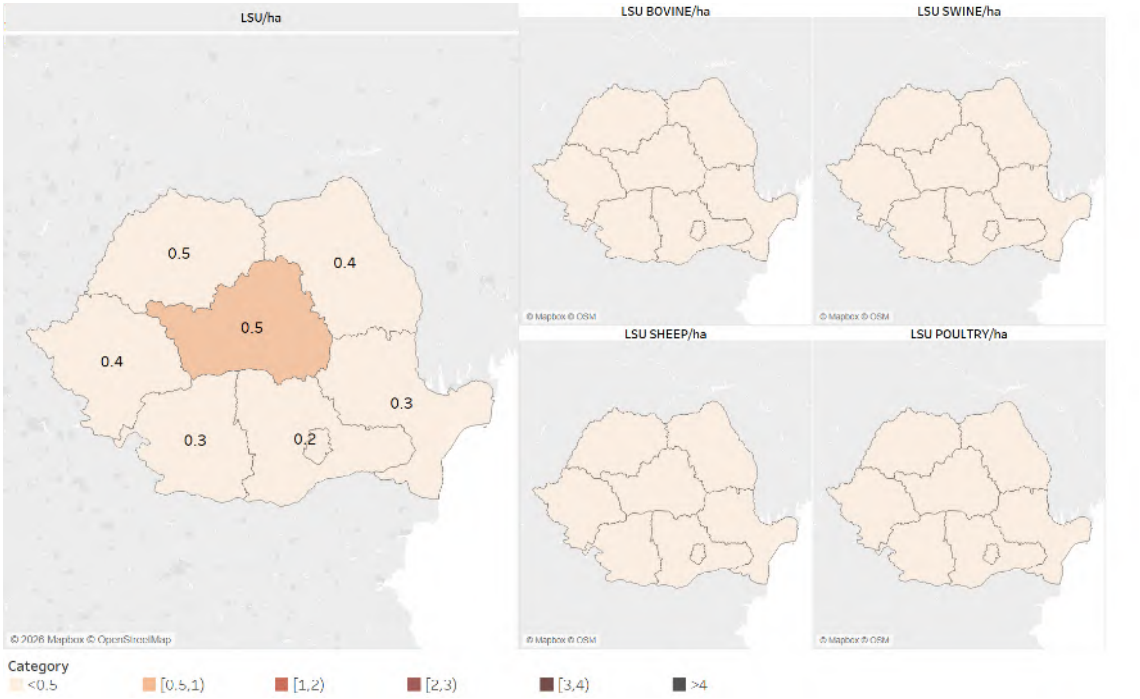
Source: Eurostat (ef_fsi_lskds)

Table 2 – Evolution of the livestock numbers by animal type

	2007	2010	2013	2016	2020	2023
live bovines (Million heads)	2.82	2.00	2.02	2.05	1.88	1.81
of which dairy cows (Million heads)	1.57	1.18	1.17	1.19	1.12	1.06
live pigs (Million heads)	6.56	5.43	5.18	4.71	3.78	3.15
live poultry (Million heads)	NA	79.19	76.30	77.20	77.35	77.75
live sheep (Million heads)	NA	9.14	9.14	9.88	10.28	10.30
live goats (Million heads)	0.87	1.24	1.31	1.48	1.61	1.42
Source of data: Eurostat						

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

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)

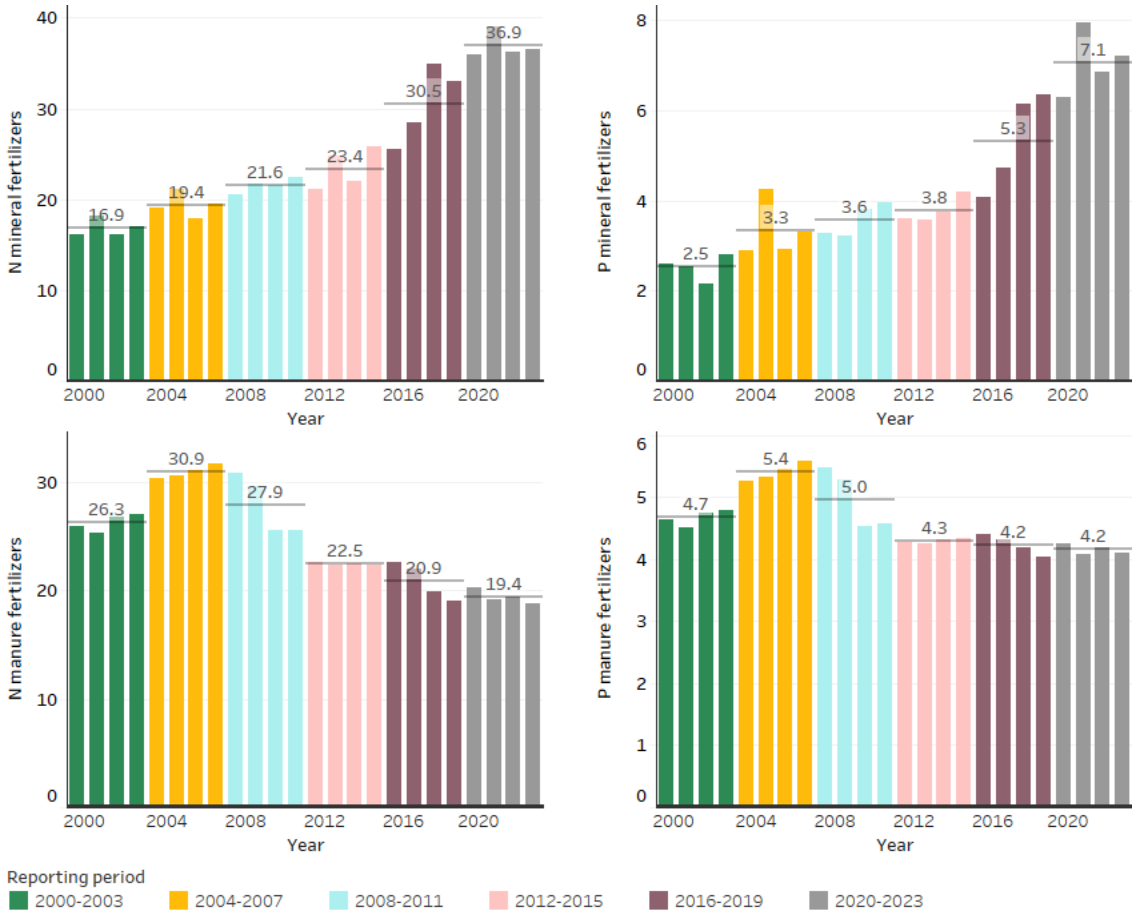
([9]) Latest available data.

2.3. Nitrogen and phosphorus fertiliser use

In Romania, the use of **nitrogen (N) fertilisers** was 36.9 kg/ha UAA for mineral fertilisers and 19.4 kg/ha UAA for manure fertilisers in 2020-2023. The use of mineral fertilisers has increased by 6.4 kg/ha UAA whereas the use of manure fertilisers has decreased by 1.5 kg/ha UAA since the last reporting period.

The use of **phosphorus (P) fertilisers** was 7.1 kg/ha UAA for mineral fertilisers and 4.2 kg/ha UAA for manure fertilisers in 2020-2023. The use of mineral fertilisers increased by 1.8 kg/ha UAA since the last reporting period and the use of manure fertilisers remained stable since the last reporting period.

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



Source: Eurostat (aei_pr_gnb)

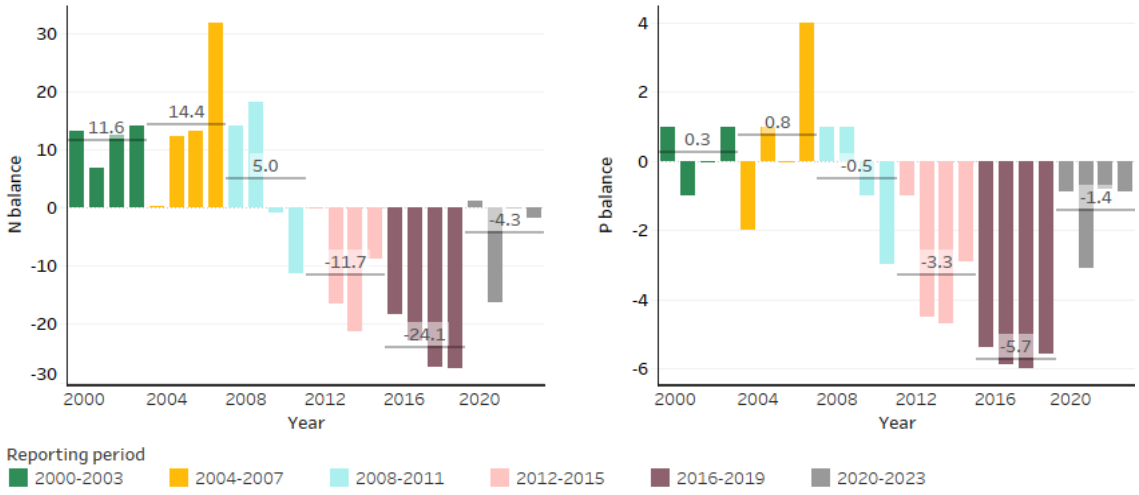
2.4. Nitrogen and phosphorus balance

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 Romania, the **gross nitrogen (N) balance** was -4.3 kg/ha UAA in 2020-2023. The nitrogen balance increased by 19.8 kg/ha UAA since previous reporting.

The gross **phosphorus (P) balance** was -1.4 kg/ha UAA in 2020-2023. The phosphorus balance increased by 4.3 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

Romania provided information that the nitrogen losses from agriculture were 1 173 kilotonnes during the reporting period 2016-2019 and 862 kilotonnes during the reporting period 2020-2023. The agricultural sector's contribution to the country's total nitrogen loss increased from 11.9% to 13.0%.

([10]) Gross nutrient balance (aei_pr_gnb)

3. NITRATE VULNERABLE ZONES

In line with Article 3 paragraph 5, Romania applies an action programme with mandatory measures throughout the entire national territory (whole country approach) since 2013 and is thus exempted from designating NVZ.

4. NITRATES IN GROUNDWATER

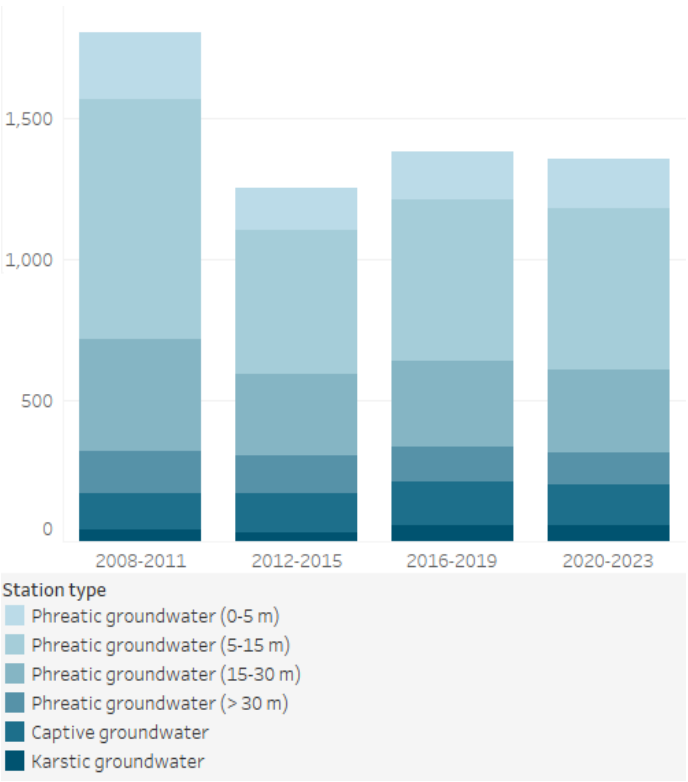
4.1. Monitoring of nitrate concentrations in groundwater

The National Administration „Romanian Waters" manages the National Integrated Monitoring System of Romanian Waters. Groundwater monitoring was conducted with a frequency of 1-2 samplings per year for surveillance monitoring and 2 samplings per year for operational monitoring points. In this monitoring period all aquifers were monitored through operational programmes due to increased vulnerability to pollution. Various reasons led to a slightly smaller monitoring network in the reporting period 2020-2023 compared to the previous period. These are a low impact of agricultural activity, the need for uniform distribution of monitoring points, technical issues such as damaged wells, adjustments in sampling depth and access limitations.

During the reporting period 2020-2023 nitrate concentrations were reported at 1 355 groundwater monitoring points. The station density was 5.7 stations per 1 000 km^2.

The overall number of monitoring points decreased by 29 (2.1%) 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 1 345 monitoring points, accounting for 99.3% of all points with measurements. The share of monitoring points with trends increased compared to the previous reporting period, which was 80.5% 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])

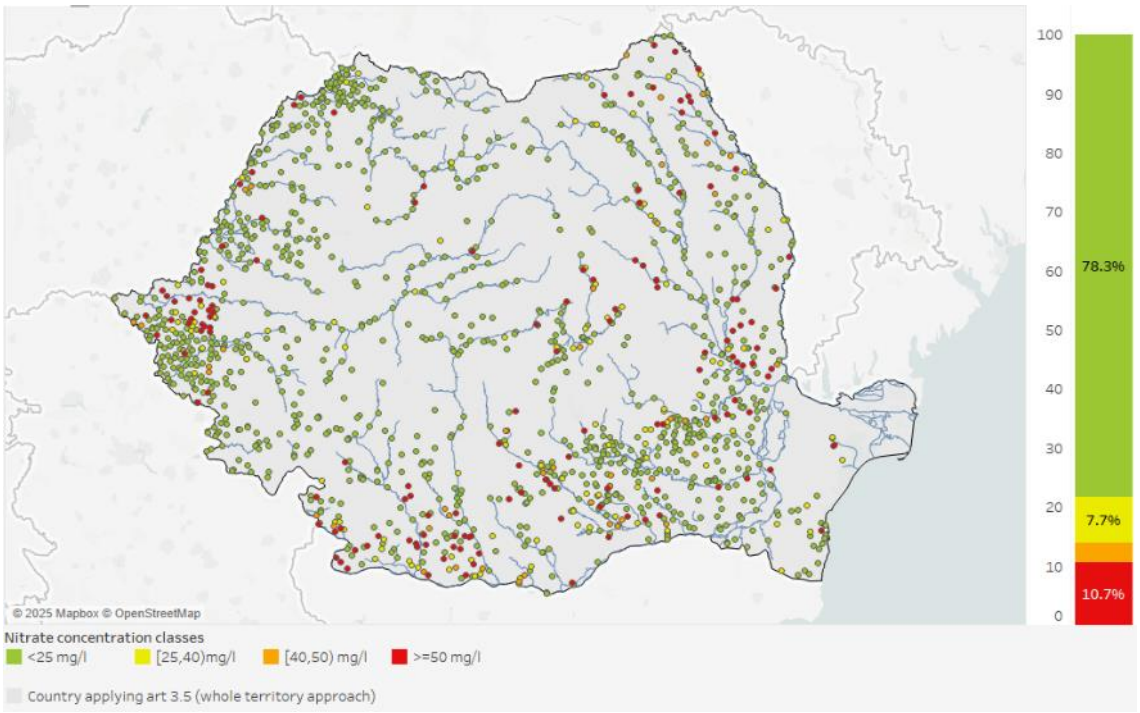
	Stations with measurements				Stations with trends			
Station type	2008-2011	2012-2015	2016-2019	2020-2023	2008-2011	2012-2015	2016-2019	2020-2023
Phreatic groundwater (0-5 m)	242	150	173	172	143	85	117	172
Phreatic groundwater (5-15 m)	852	511	572	572	461	376	464	566
Phreatic groundwater (15-30 m)	396	291	305	297	178	207	258	295
Phreatic groundwater (> 30 m)	151	134	123	113	51	82	111	113
Captive groundwater	125	139	152	143	79	78	122	141
Karstic groundwater	43	31	59	58	17	21	42	58
Not specified								
Total	1,809	1,256	1,384	1,355	929	849	1,114	1,345

([11]) Romania reported that monitoring was discontinued in 85 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.

4.2. Nitrate concentrations in groundwater

In Romania, 10.7% of groundwater monitoring points showed average nitrate concentrations equal to or above the drinking water threshold of 50 mg/l, whereas 3.3% had concentrations between 40-49.99 mg/l, 7.7% showed concentrations between 25-39.99 mg/ and 78.3% 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 annual mean 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. In the graph, the percentages below 5% are not labelled.

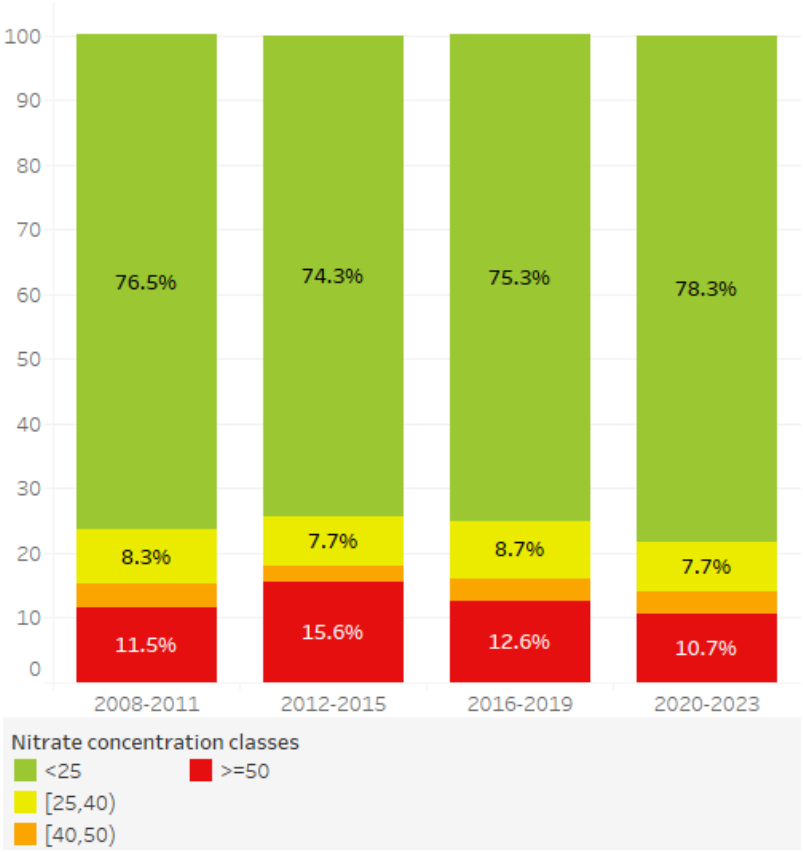
The station type category with the highest share of points with nitrate concentrations equal to or above the drinking water threshold of 50 mg/l was phreatic groundwaters at depth 15-30m with share of 19.9%, as shown in the table below.

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)	172	12.7%	85.5%	4.7%	1.7%	8.1%
Phreatic groundwater (5-15 m)	572	42.2%	80.6%	7.2%	3.1%	9.1%
Phreatic groundwater (15-30 m)	297	21.9%	63.0%	12.1%	5.1%	19.9%
Phreatic groundwater (> 30 m)	113	8.3%	68.1%	9.7%	6.2%	15.9%
Captive groundwater	143	10.6%	93.0%	4.9%	1.4%	0.7%
Karstic groundwater	58	4.3%	96.6%	1.7%		1.7%
Total	1,355	100.0%	78.3%	7.7%	3.3%	10.7%

Compared to the previous reporting period, the share of monitoring points with concentrations ≥ 50 mg/l decreased from 12.6% to 10.7%. The graph below presents the share of monitoring points per classes of nitrate concentrations 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



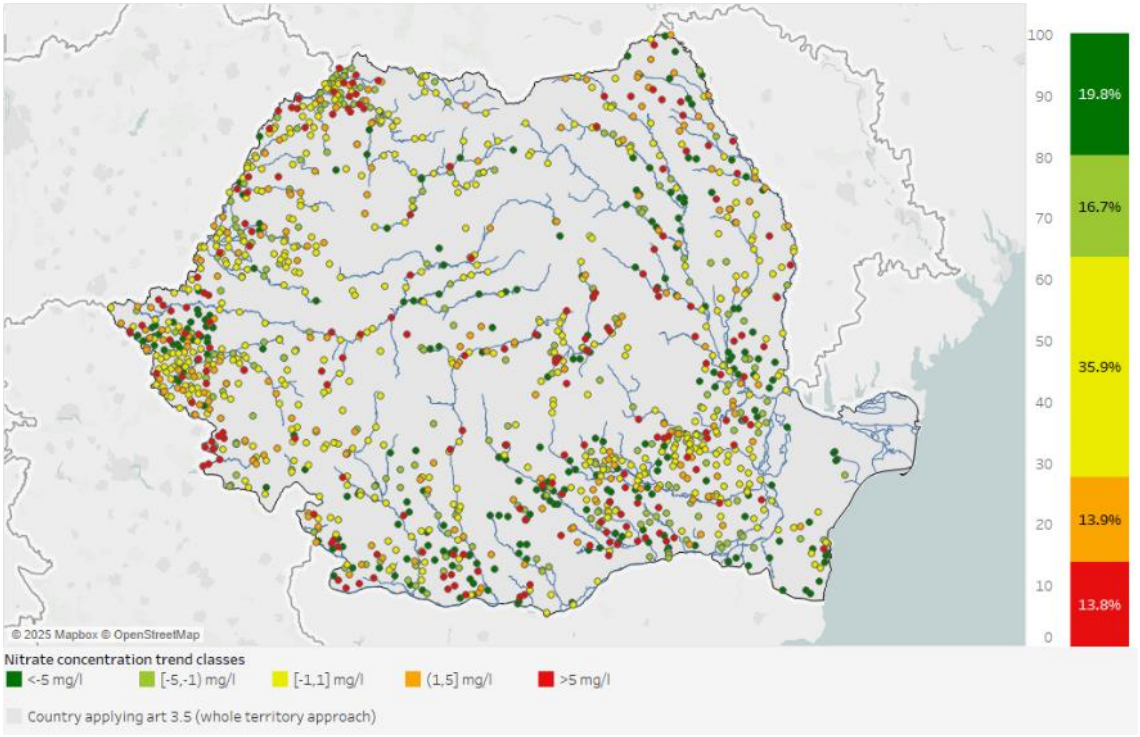
Note: The percentages below 5% are not labelled.

([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 36.5% of monitoring points and an increase in 27.7%. For the remaining 35.9% 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 it is above 5 mg/l.

Figure 11 – Map of trends in average annual mean 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.

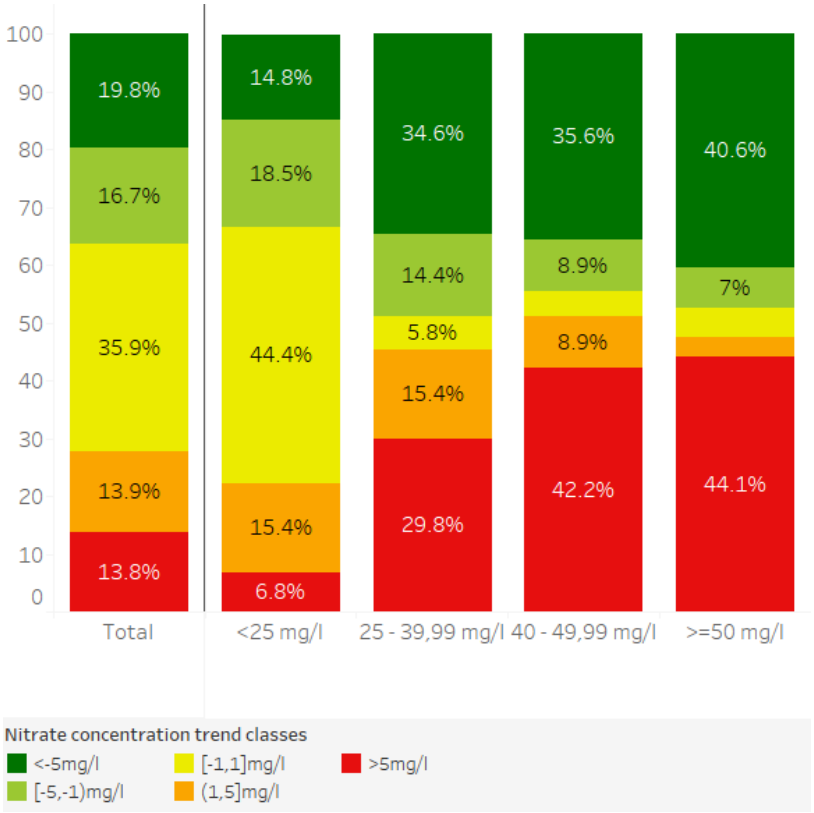
Table 5 – Share of groundwater monitoring points by trend class (mg/l) between the periods 2016-2019 and 2020-2023, categorised by station type

	Total Number of Stations	% Total Number of Stations	<-5	[-5,-1)	[-1,1]	(1,5]	>5
Phreatic groundwater (0-5 m)	172	12.8%	23.3%	11%	41.3%	15.7%	8.7%
Phreatic groundwater (5-15 m)	566	42.1%	19.3%	19.6%	34.6%	13.3%	13.3%
Phreatic groundwater (15-30 m)	295	21.9%	24.7%	15.9%	23.1%	16.6%	19.7%
Phreatic groundwater (>30 m)	113	8.4%	23%	14.2%	24.8%	14.2%	23.9%
Captive groundwater	141	10.5%	7.1%	10.6%	64.5%	12.1%	5.7%
Karstic groundwater	58	4.3%	13.8%	27.6%	50%	5.2%	3.4%
Total	1,345	100.0%	19.8%	16.7%	35.9%	13.9%	13.8%

([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 during the current reporting period (equal to or above 50 mg/l), there has been an increase of nitrate concentration for 47.6% and also a decrease for 47.6% 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])

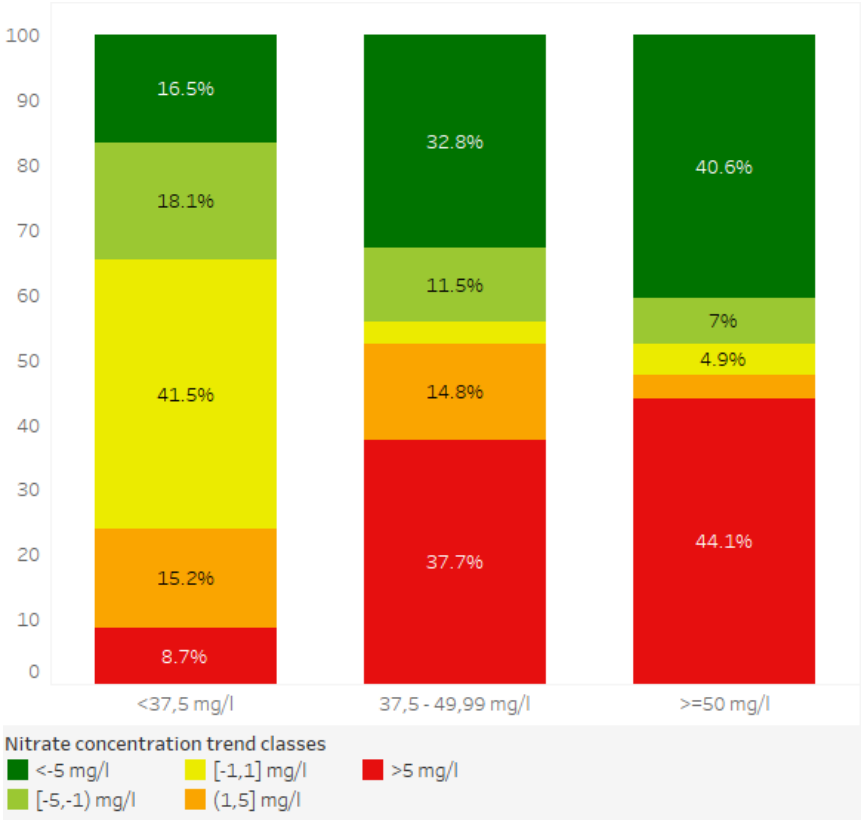


Note: The percentages below 5% are not labelled.

([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 52.5% and a decrease for 44.3% of monitoring points.

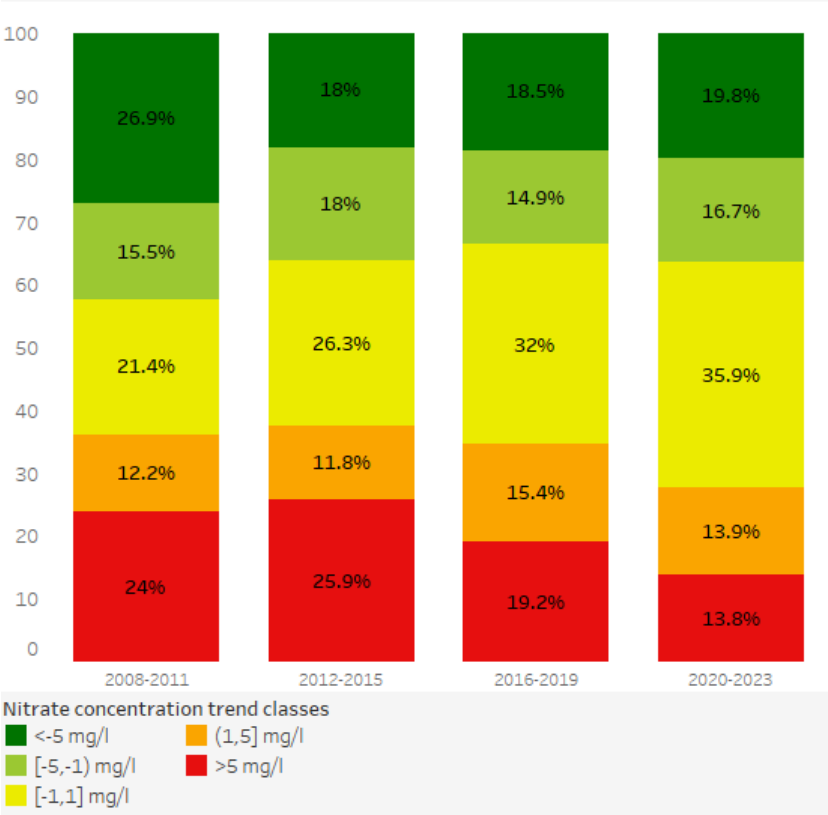
Figure 13 – Share of groundwater monitoring points by classes of trend between the periods 2016-2019 and 2020-2023, in different nitrate concentration classes (<37.5 mg/l, 37.5-49.99 mg/l and ≥50mg/l) ([15])



([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 higher share of monitoring points with decreasing nitrate concentrations (36.5% in the current reporting period compared to 33.4% in the previous reporting period) and a lower share of monitoring points with increasing nitrate concentrations (27.7% compared to 34.6%). 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

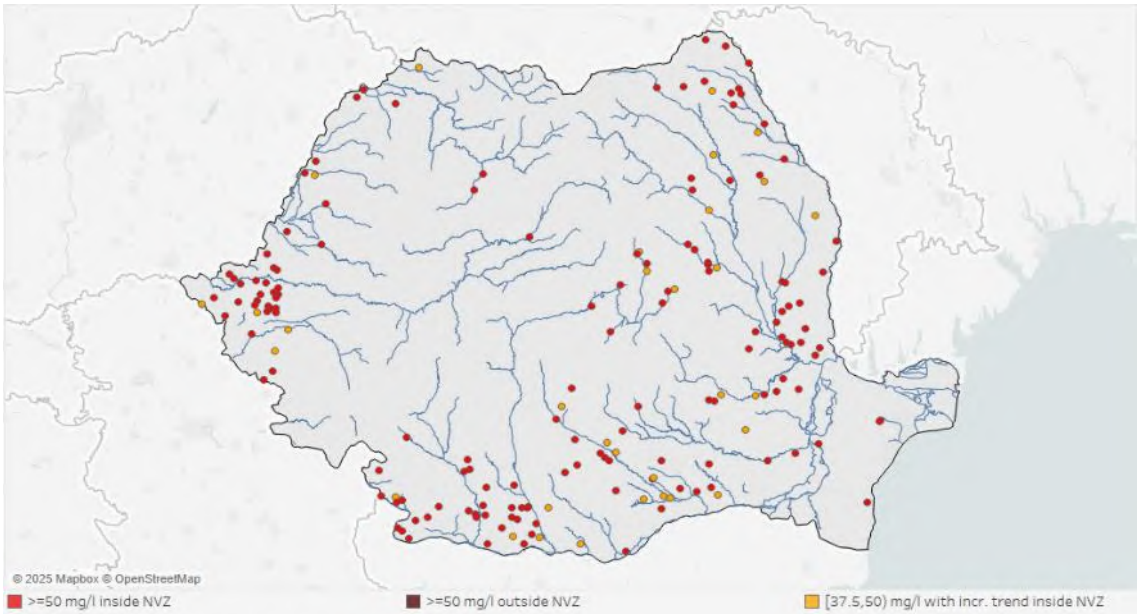


([16]) Change in average annual mean nitrate concentrations compared to the previous reporting period.

4.4. Nitrate pollution hotspots in groundwater

A nitrate pollution hotspot in groundwater is defined here 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 Romania there are 177 groundwater nitrate pollution hotspots.

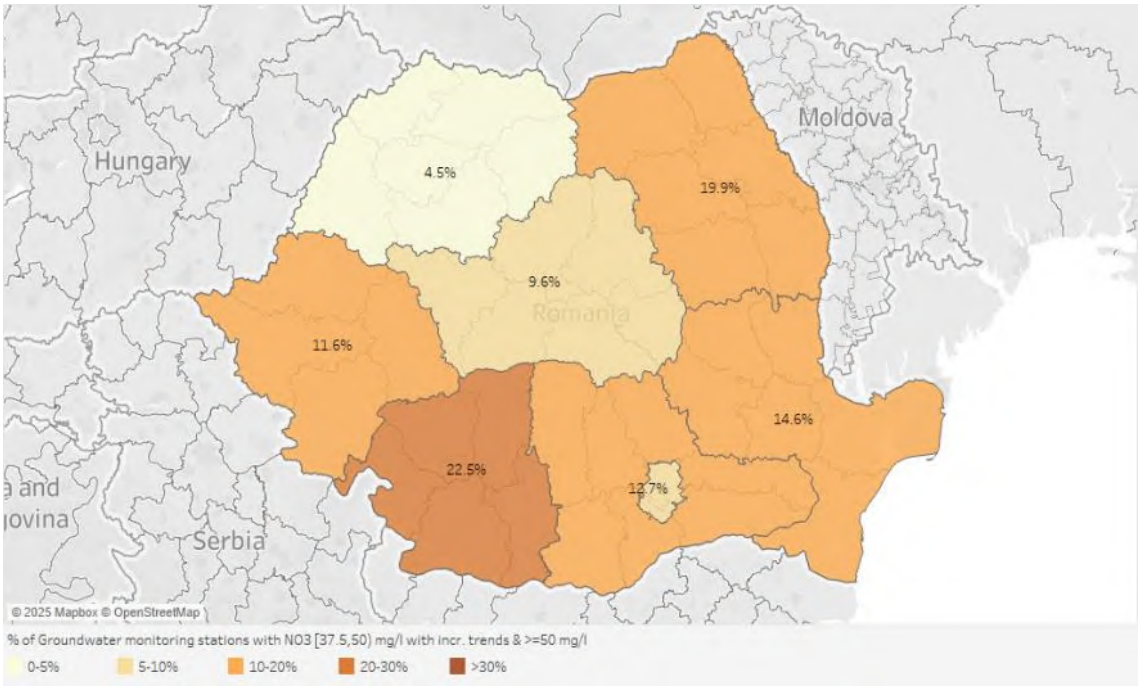
Figure 15 – Groundwater nitrate pollution hotspots



	inside NVZ	outside NVZ	Total
Groundwater [37.5,50) with incr. trend	32		32
>=50	145		145
Total	177		177

The regions with the highest share of hotspots are Sud-Vest Oltenia (22.5%), Nord-Est (19.9%) and Sud-Est (14.6%).

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



5. NITRATES IN SURFACE WATERS

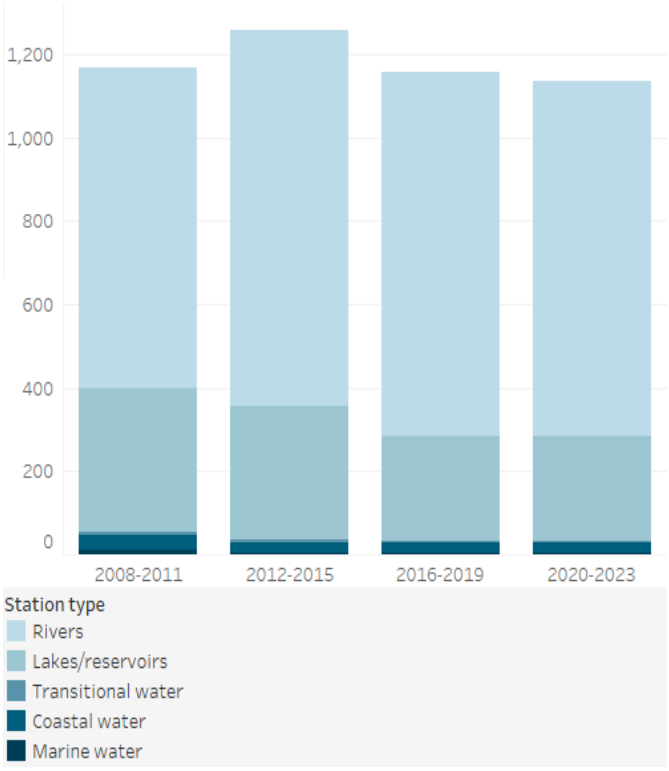
5.1. Monitoring of nitrate concentrations in surface waters

The National Administration „Romanian Waters" manages the National Integrated Monitoring System of Romanian Waters, including surface waters. The actual monitoring network was established in 2006 and covers 11 river basins covering the requirement of the WFD and the Nitrates Directive. Surface water monitoring was conducted with a frequency ranging between 4 and 32 times per year, with a minimum sampling frequency of 12 times per year for sites relevant to agricultural pressure. The monitoring network decreased slightly due to impact assessments of agricultural pressure, transposing stations to other water bodies or the exclusion of fishing lakes from nitrate monitoring

During the reporting period 2020-2023 nitrate concentrations were reported at 1 134 surface water monitoring points. Among these, 75.0% were in rivers, 22.2% were in lakes or reservoirs, and 2.8% were in saline waters. The freshwater monitoring points density was 4.6 stations per 1 000 km^2.

The overall number of monitoring points decreased by 21 (1.8%) compared to the previous reporting period. The decrease was exclusively driven by the removal of river points. The total number of stations has decreased since 2012-2015. 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 1 089 monitoring points, accounting for 96.0% of all points with measurements. The share of monitoring points with trends increased compared to the previous reporting period (86.2% 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	768	905	871	850	612	671	723	830
Lakes/reservoirs	345	319	252	252	277	260	241	227
Transitional water	7	5	5	5	6	4	5	5
Coastal water	35	25	23	23	31	23	23	23
Marine water	12	5	4	4	4	4	4	4
Total	1,167	1,259	1,155	1,134	930	962	996	1,089

([17]) Romania reported that monitoring was discontinued in 69 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.

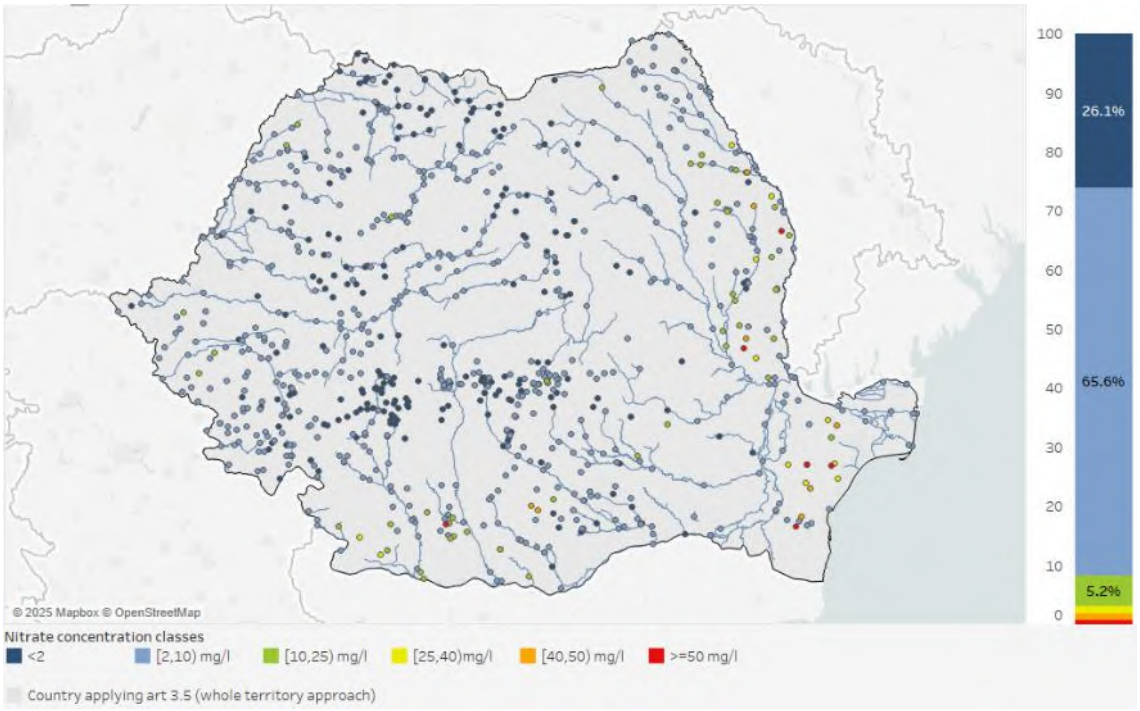
5.2. Nitrate concentrations in surface waters

Rivers

In Romania, 0.8% of monitoring points in rivers showed average nitrate concentrations equal to or above the drinking water threshold of 50 mg/l, whereas 0.9% had concentrations between 40-49.99 mg/l, 1.3% showed concentrations between 25-39.99 mg/, 5.2% in the class 10-24.99 mg/l, 65.6% in the class 2-9.99 mg/l and 26.1% 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.

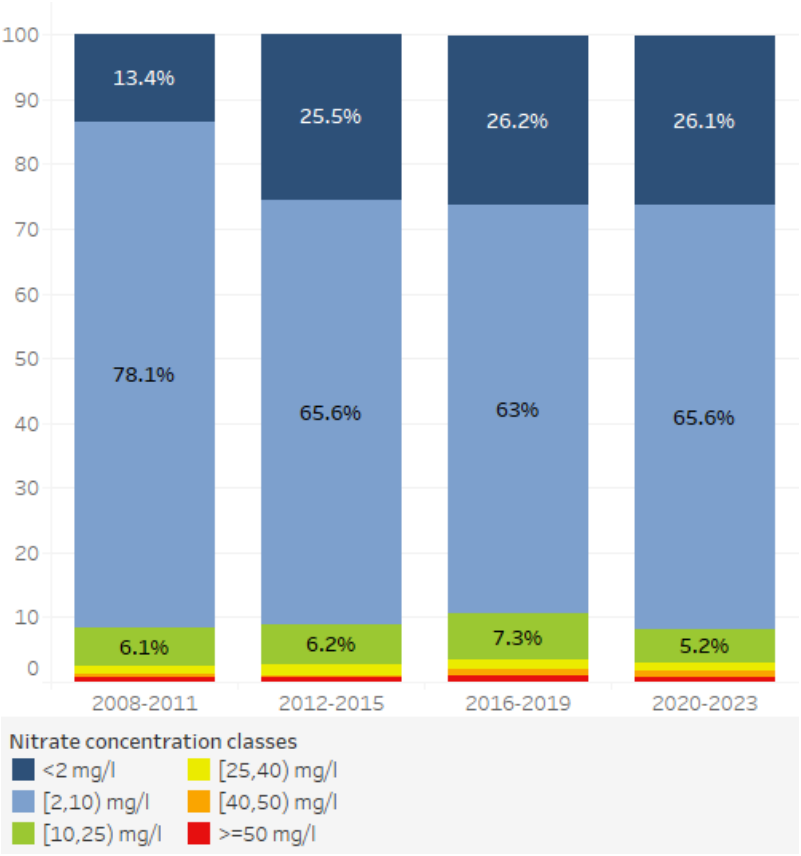
Figure 18 – Map of average annual mean nitrate concentrations in rivers and share of monitoring points by concentration class in the reporting period 2020-2023



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 previous reporting period, the share of monitoring points in rivers with concentrations ≥ 50 mg/l decreased from 0.9% to 0.8%. The graph below presents the shares of monitoring points per classes of nitrate concentration in the 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.

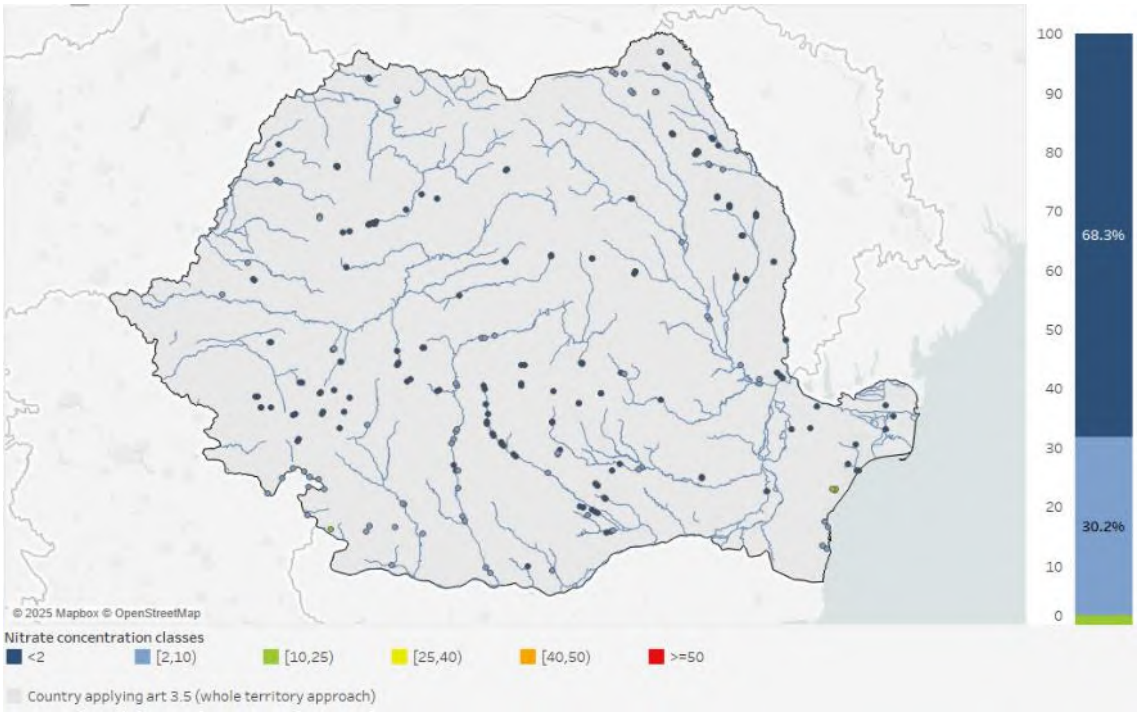
([18]) Average of annual mean values over the reporting period.

Lakes/water reservoirs

In Romania, none of the freshwater monitoring points in lakes/water reservoirs showed average nitrate concentration equal to or above the drinking water threshold of 50 mg/l, and at or above 25 mg/l, whereas 1.6% had concentrations between 10-24.99 mg/l, 30.2% in the class 2-9.99 mg/l and 68.3% 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



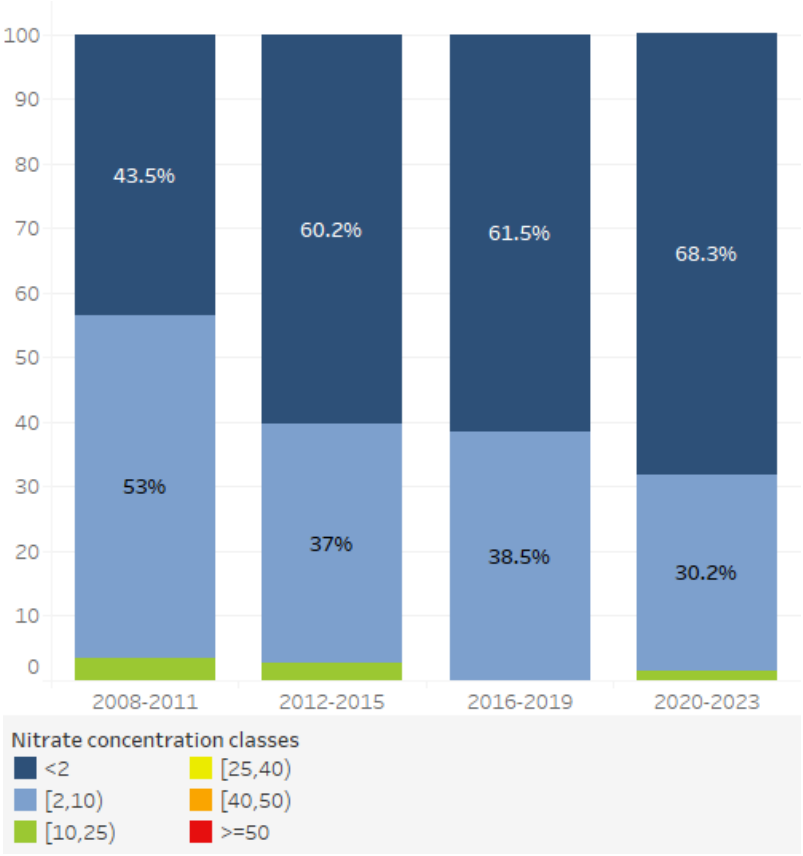
Note: In the map, monitoring points with higher values are plotted on top. In the graph, the percentages below 5% are not labelled.

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	850	77.1%	26.1%	65.6%	5.2%	1.3%	0.9%	0.8%
Lakes/reservoirs	252	22.9%	68.3%	30.2%	1.6%			
Total	1,102	100.0%	35.8%	57.5%	4.4%	1.0%	0.7%	0.6%

Compared to the previous reporting period, the share of monitoring points in lakes/water reservoirs with concentration ≥ 50 mg/l remained at 00%. The graph below presents the shares of monitoring points per classes of nitrate concentration in the last four reporting periods. Over the past four reporting periods the share in class <2 mg/l has increased from 43.5% in 2008-2011 to 68.3% in 2020-2023.

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.

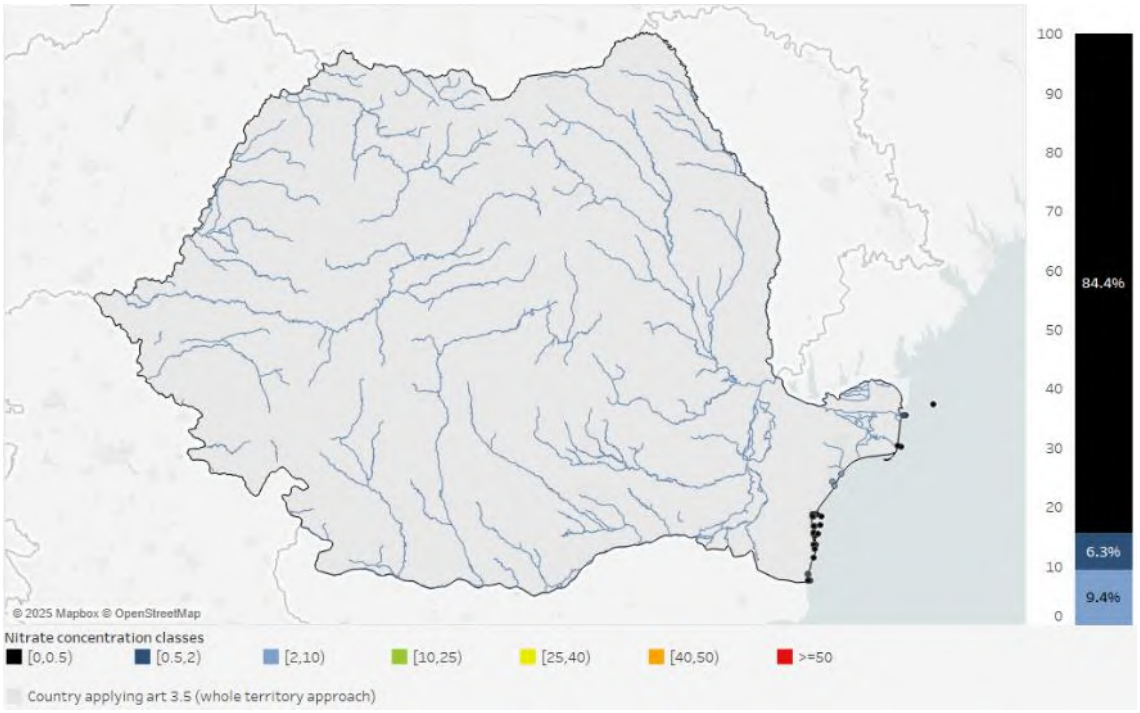
([19]) Average of annual mean values over the reporting period.

Saline waters ([20])

No points in saline waters monitoring points showed average nitrate concentrations ≥ 10 mg/l, 9.4% showed concentrations between 2-9.99 mg/l, 6.3% between 0.5-2 mg/l and 84.4% 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 Romania, none of the monitoring points showed average annual mean nitrate concentrations at or above 10 mg/l, 60.0% in the class 2-9.99 mg/l, 20.0% between 0.5-2 mg/l and 20.0% below 0.5 mg/l, as shown in the table below.

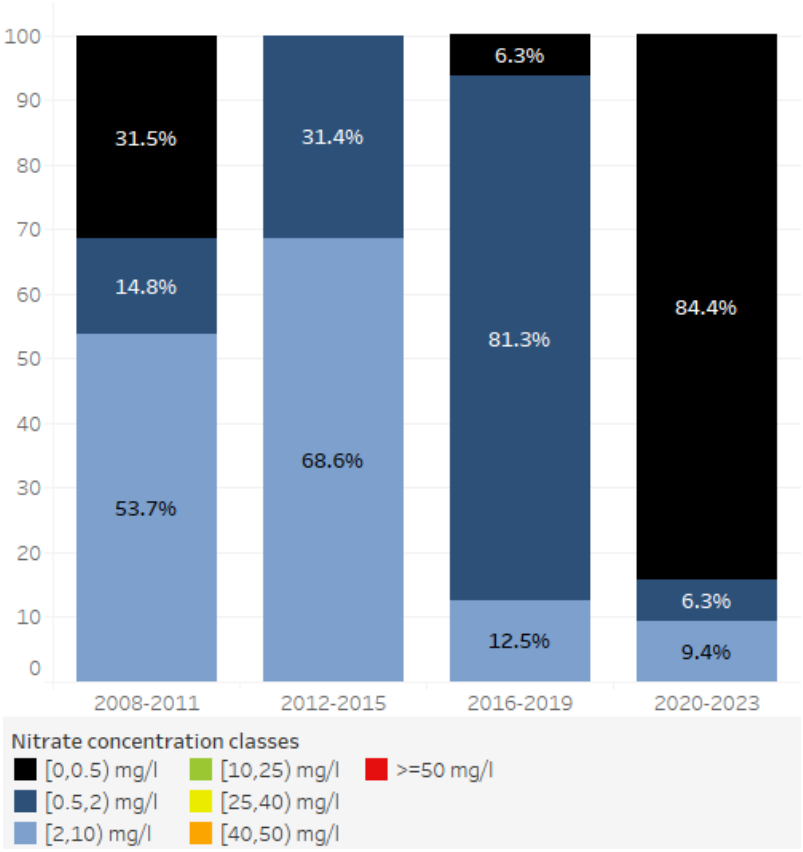
Table 8 – Share of saline water monitoring points by nitrate concentration class (mg/l) in the reporting period 2020-2023, categorised by station type

	Number of stations	% of Total	<0.5	[0.5,2)	[2,10)	[10,25)	[25,40)	[40,50)	>=50
Transitional water	5	15.6%	20.0%	20.0%	60.0%				
Coastal water	23	71.9%	95.7%	4.3%					
Marine water	4	12.5%	100.0%						
Total	32	100.0%	84.4%	6.3%	9.4%				

([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



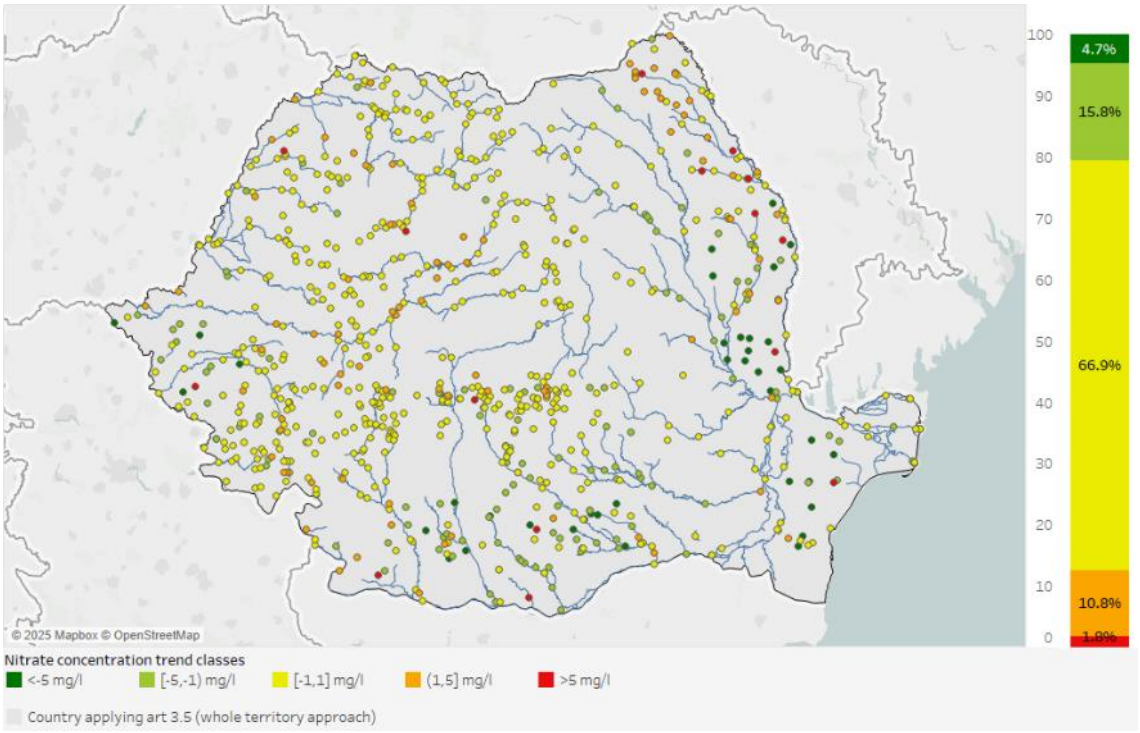
([21]) Average of annual mean values over the reporting period.

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 20.5% of monitoring points and an increase in 12.6%. For the remaining 66.9% 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 it is above 5 mg/l.

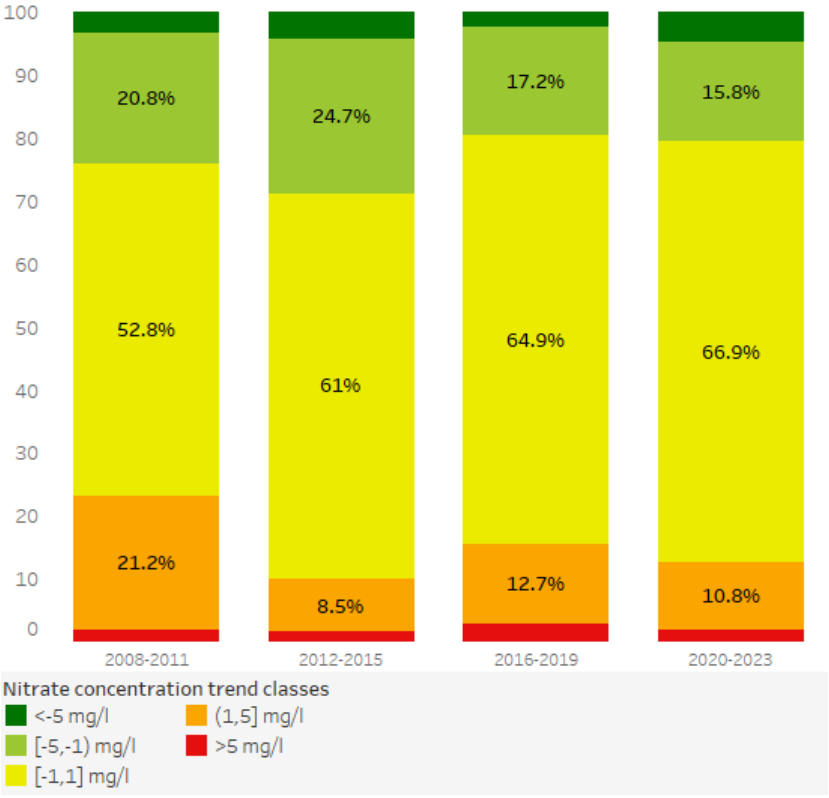
Figure 24 – Map of trends in average annual mean nitrate concentrations in rivers between the periods 2016-2019 and 2020-2023 and share of monitoring points by trend class



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

Compared to the previous reporting period, there is a higher share of monitoring points with decreasing nitrate concentrations (20.5% in the current reporting period compared to 19.7% in the previous reporting period) and a lower share of monitoring points with increasing nitrate concentrations (12.6% compared to 15.5%). 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



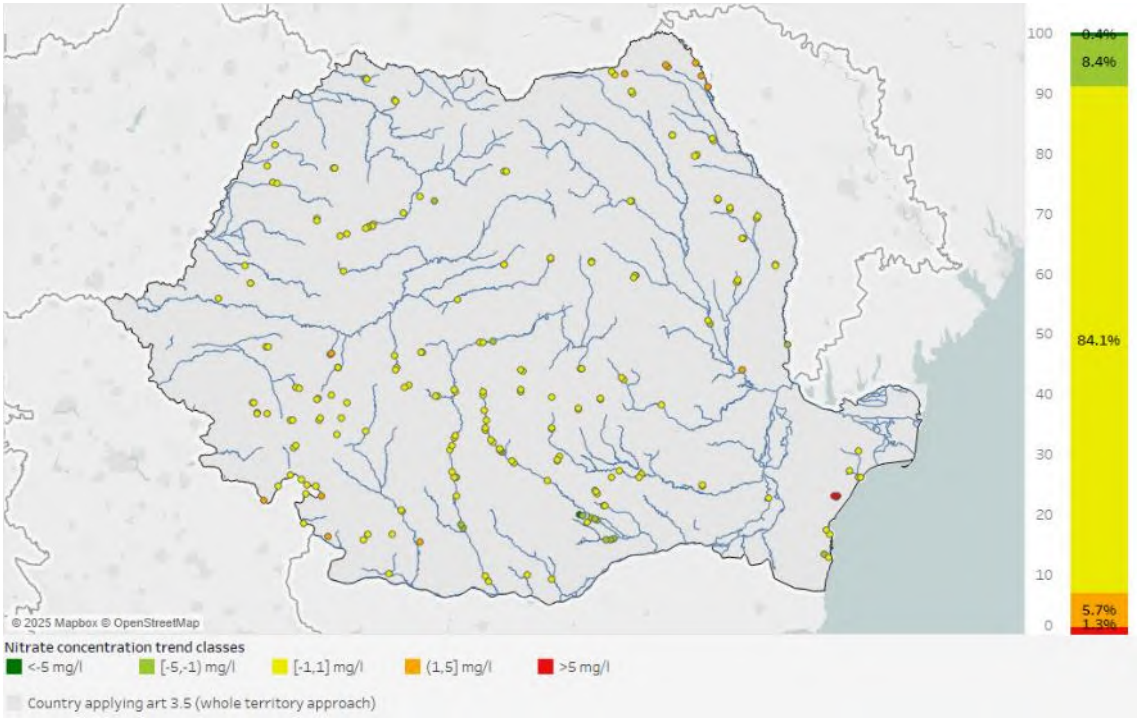
Note: The percentages below 5% are not labelled.

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

Lakes and water reservoirs

Compared to the last reporting period, there has been a decrease of nitrate concentrations in 8.8% of monitoring points and an increase in 7.0%. For the remaining 84.1% 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 it is 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



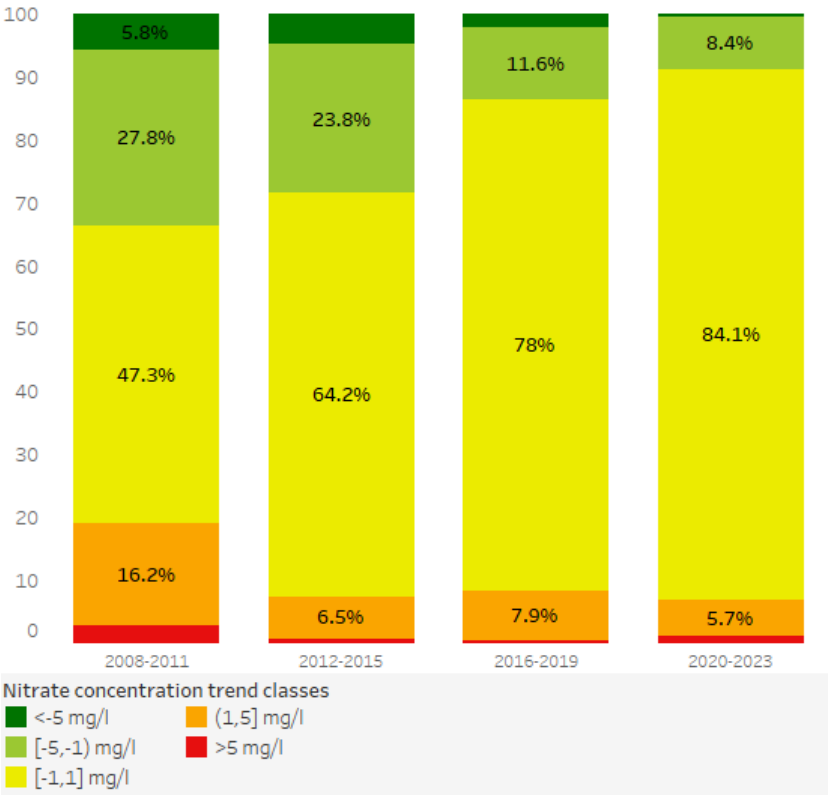
Note: In the map, monitoring points with higher values are plotted on top.

Table 9 – Share of freshwater monitoring points by trend class (mg/l), categorised by station type

	Total Number of Stations	% Total Number of Stations	<-5	[-5,-1)	[-1,1]	(1,5]	>5
River	830	78.5%	4.7%	15.8%	66.9%	10.8%	1.8%
Lake/Reservoir	227	21.5%	0.4%	8.4%	84.1%	5.7%	1.3%
Total	1,057	100.0%	3.8%	14.2%	70.6%	9.7%	1.7%

Compared to the previous reporting period, there is lower share of monitoring points with decreasing nitrate concentrations (8.8% in the current reporting period compared to 13.7% in the previous reporting period) but also a lower share of monitoring points with increasing nitrate concentrations (7.0% compared to 8.3%). 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



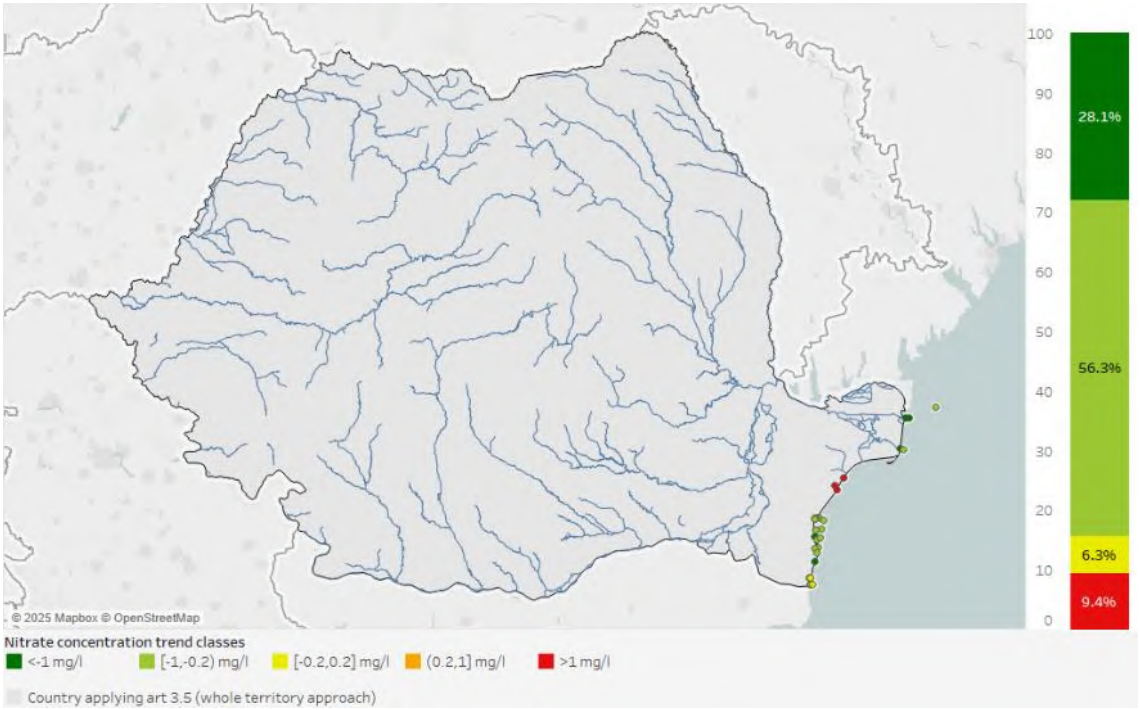
Note: The percentages below 5% are not labelled.

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

Saline waters

Compared to the last reporting period, there has been a decrease of nitrate concentrations in 84.4% of monitoring points and an increase in 9.4%. For the remaining 6.3% there was no significant change. The increase or decrease can be categorised as weak if it is between 0.2 and 1 mg/l, and as strong if it is 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



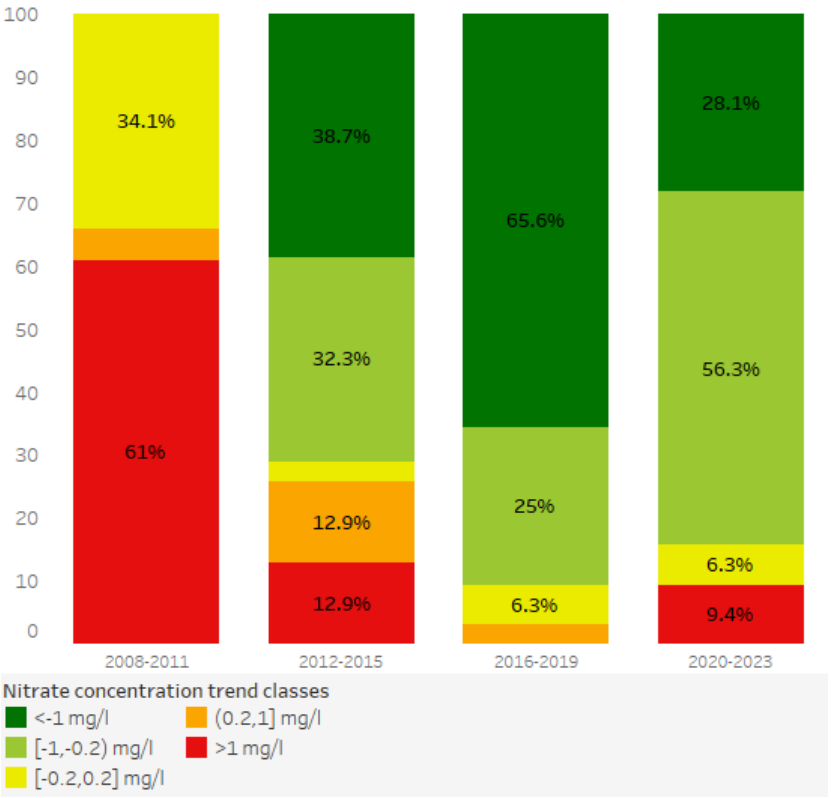
Note: In the map, monitoring points with higher values are plotted on top.

Table 10 – Share of saline water monitoring points by trend class (mg/l), 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	5	15.6%	40%				60%
Coastal water	23	71.9%	26.1%	69.6%	4.3%		
Marine water	4	12.5%	25%	50%	25%		
Total	32	100.0%	28.1%	56.3%	6.3%		9.4%

Compared to the previous reporting period, there is lower share of monitoring points with decrease of nitrate concentrations (84.4% in the current reporting period compared to 90.6% in the previous reporting period) and higher share of monitoring points with increase of nitrate concentrations (9.4% compared to 3.1%). 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



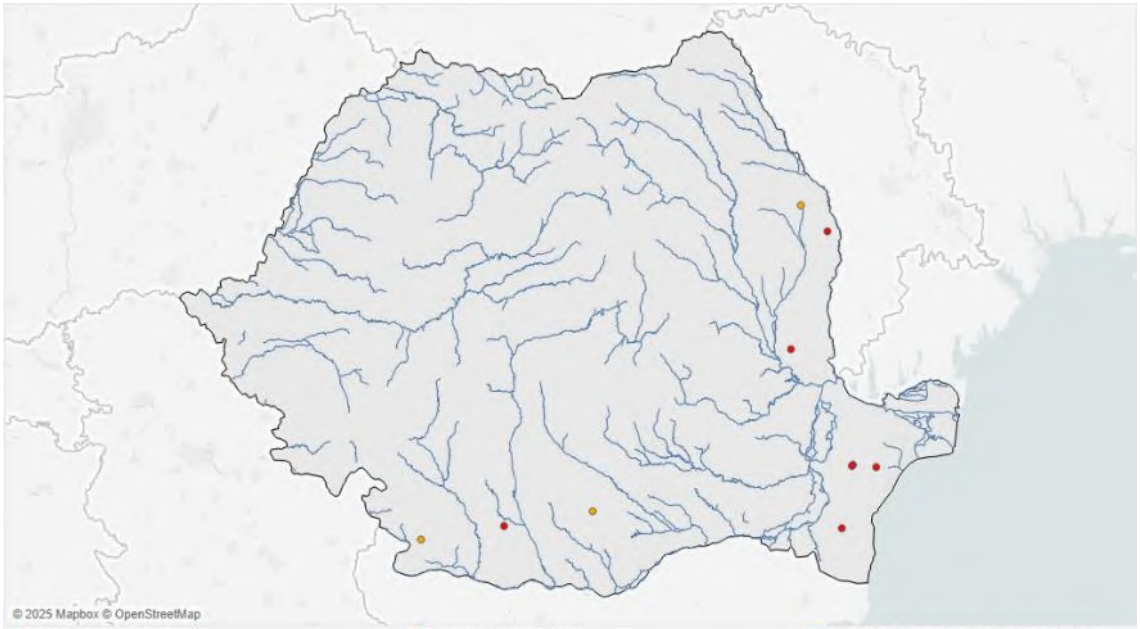
Note: The percentages below 5% are not labelled.

([24]) Change in average annual mean nitrate concentrations compared 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 10 surface water nitrate pollution hotspots.

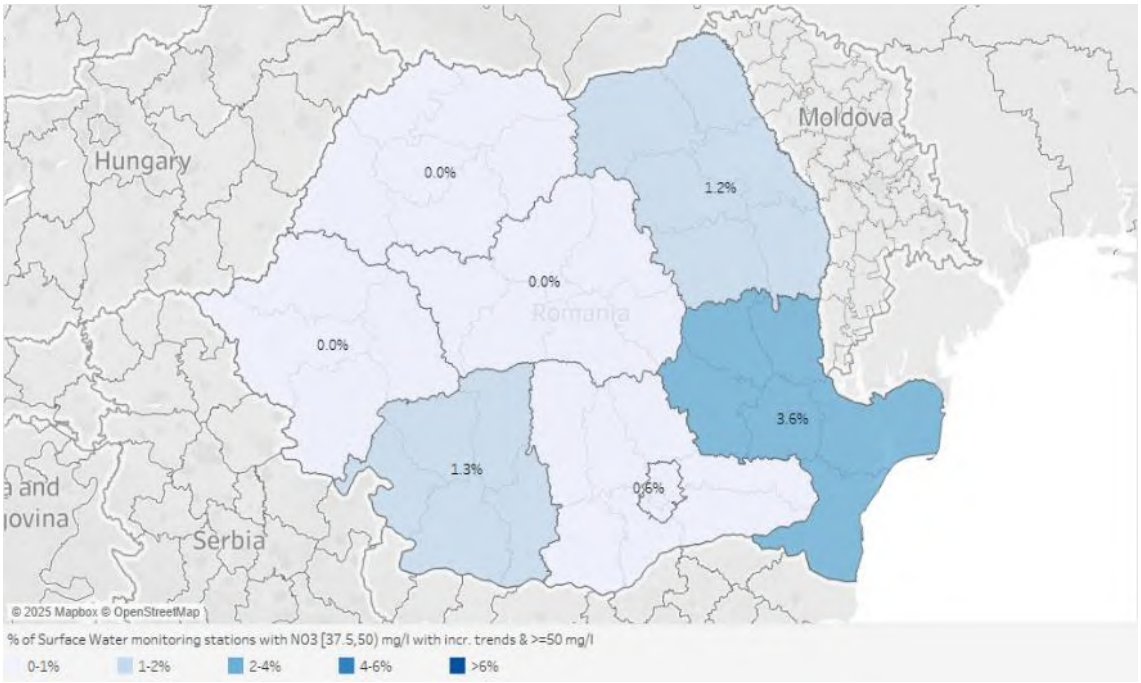
Figure 30 – Surface water nitrate pollution hotspots



		inside NVZ	outside NVZ	Total
Rivers	[37.5,50) with incr. trend	3		3
	>=50	7		7
Lakes/reservoirs	[37.5,50) with incr. trend			
	>=50			
Total		10		10

The regions with the highest share of hotspots are Sud-Est (3.6%), Sud-Vest Oltenia (1.3%) and Nord-Est (1.2%).

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 monitoring network is managed by the National Administration “Romanian Waters”.

During the reporting period 2020-2023 trophic status was reported at 1 134 monitoring points. Among these, 75.0% were in rivers, 22.2% were in lakes or reservoirs, and 2.4% were in saline waters. The station density of monitoring points, where trophic status was assessed equals to 4.8 stations per 1 000 km^2.

The overall number of freshwater monitoring points decreased by 39 (3.4%), and number of saline water monitoring points remained stable compared to the previous reporting period. Since 2012-2015 the total number of monitoring points has been decreasing steadily.

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

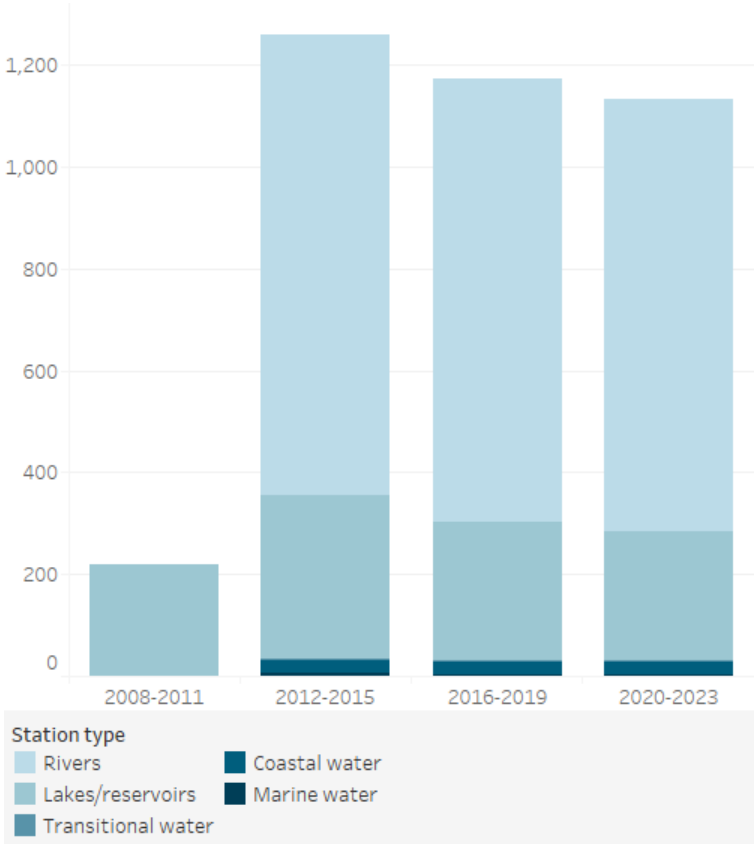


Table 11 – Number of monitoring points reporting trophic status by station type ([25])

Station type	Stations with trophic status			
	2008-2011	2012-2015	2016-2019	2020-2023
Rivers		905	871	850
Lakes/reservoirs	219	319	270	252
Transitional water		5	5	5
Coastal water		25	23	23
Marine water		5	4	4
Total	219	1,259	1,173	1,134

6.2. Methodology for the assessment of trophic status

Romania developed an overall classification and assessment system for the trophic status of water bodies in line with the requirements of the Water Framework Directive which is presented in Annex 6.1 of the 2021 updated National Management Plan. The parameters considered in the assessment process are biological elements (phytoplankton, benthic invertebrates, phytobenthos), nutrients (total phosphorus, phosphates, total nitrogen, nitrates), dissolved oxygen, organic substances (measured by BOD5 and COD-Cr) and transparency (Secchi disk).

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

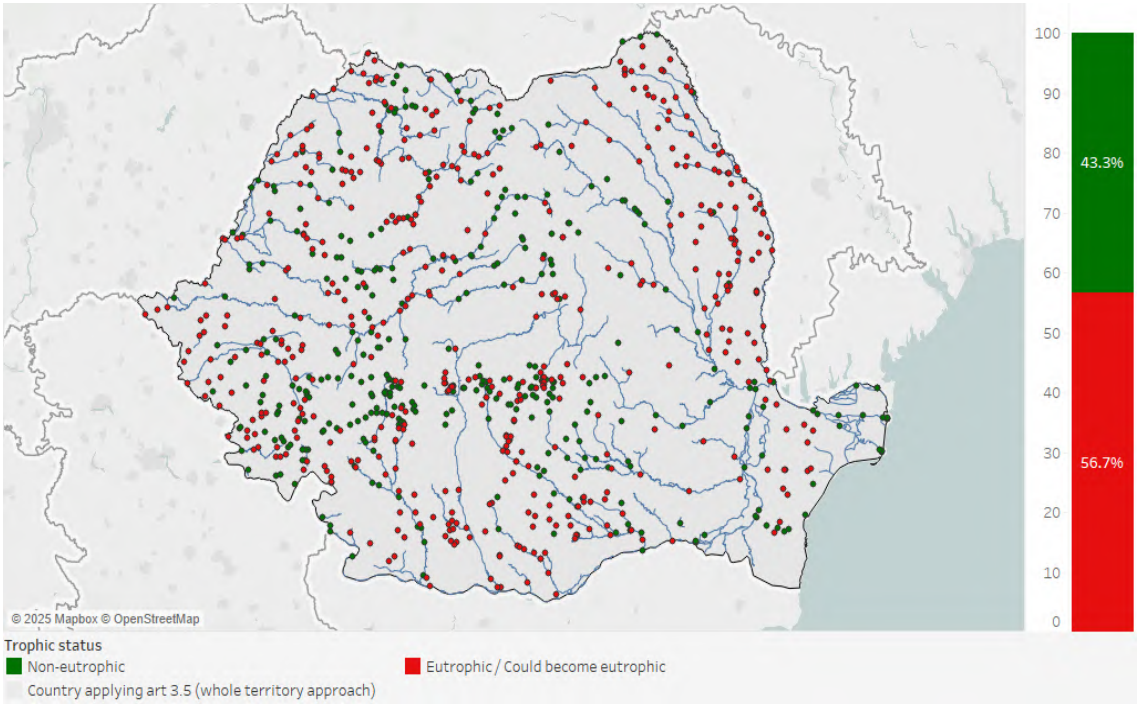
([25]) Romania reported that monitoring was discontinued in 69 monitoring points relative to the previous reporting period. Discontinuation may be due to nitrate concentrations below 25 mg/l, change in station code or type, or other specific reasons.

6.3. Eutrophication of surface waters

Rivers

56.7% of monitoring points in rivers were eutrophic and could become eutrophic. The figure below shows the shares in respective classes in a graph and spatial distribution in the map.

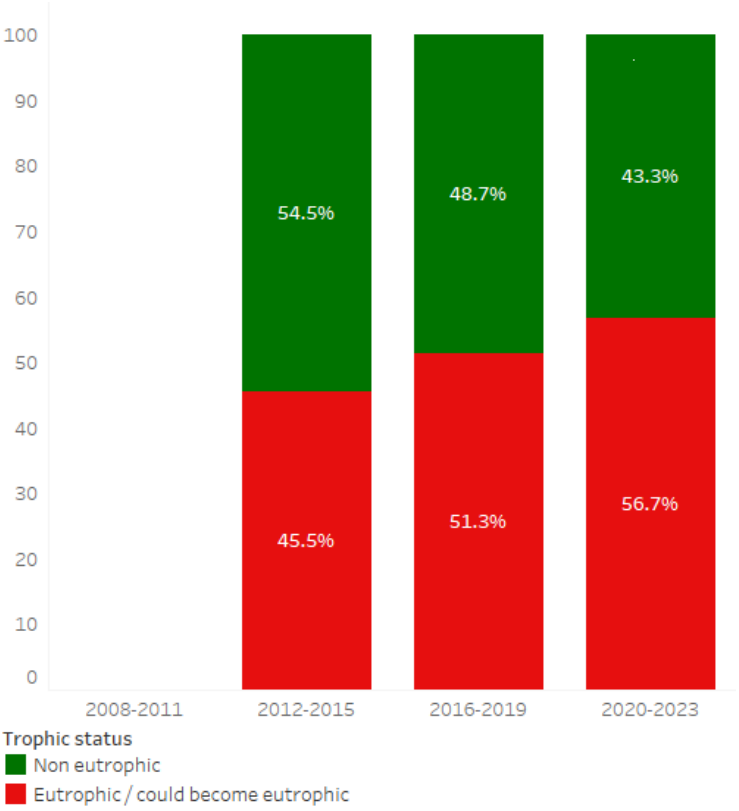
Figure 33 – Map of trophic status in rivers and share of monitoring points by trophic class in the reporting period 2020-2023



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

Compared to the previous reporting period, the share of eutrophic and could become eutrophic monitoring points increased from 51.3% to 56.7%. The graph below presents the shares of monitoring points according to their trophic status in the last four reporting periods. In 2008-2011 no trophic status was assessed.

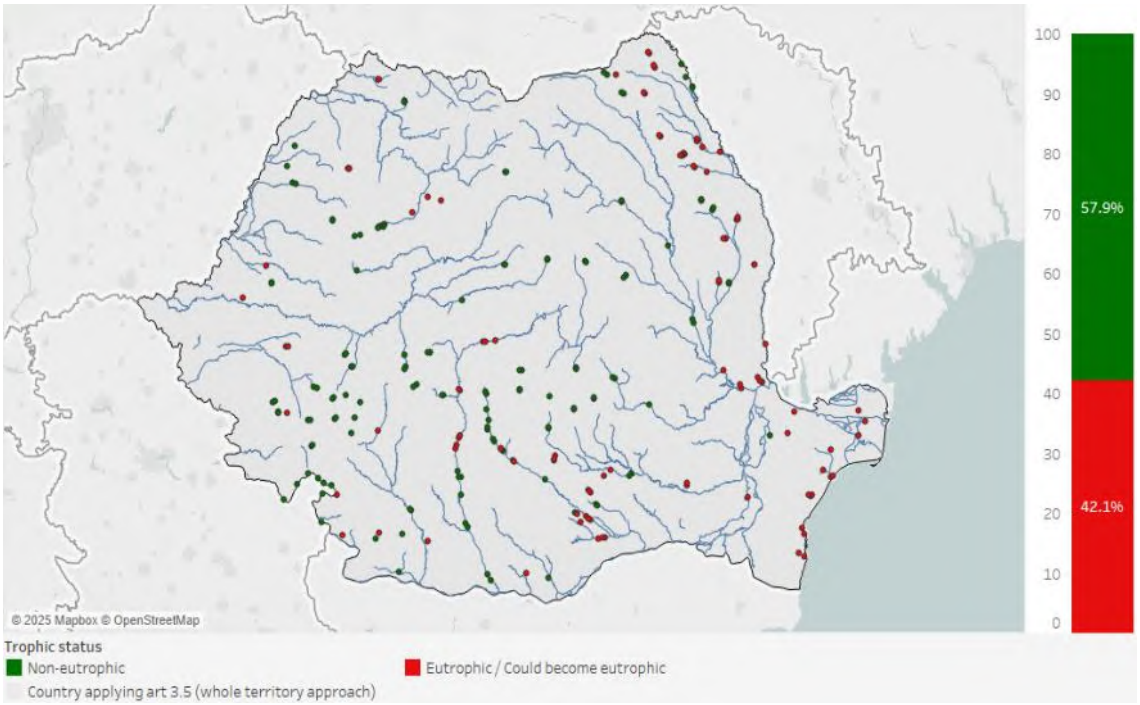
Figure 34 – Share of monitoring points in rivers by class of trophic status in the current and previous reporting periods



Lakes and water reservoirs

42.1% of monitoring points in lakes/water reservoirs were eutrophic and 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



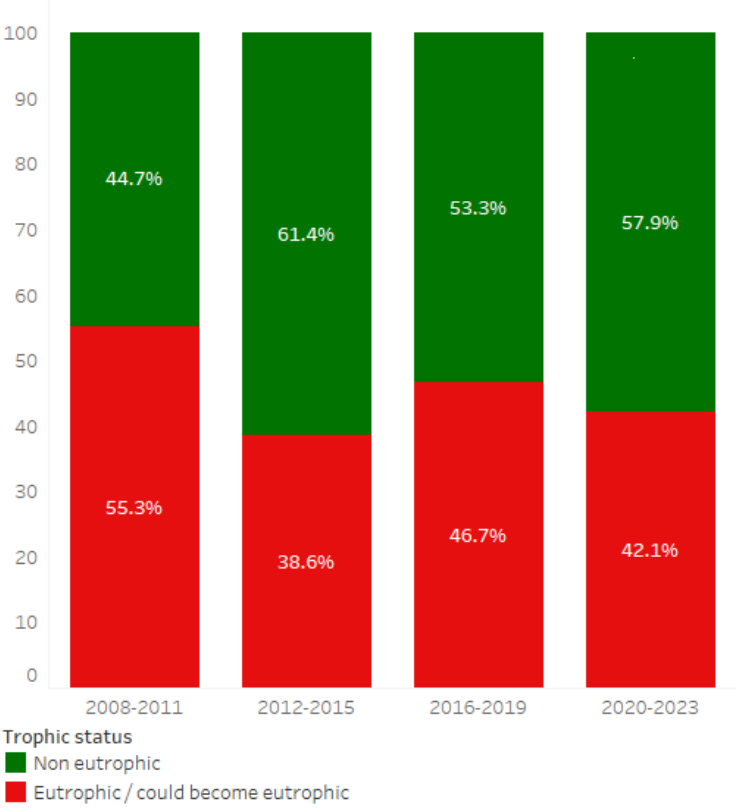
Note: In the map, eutrophic/could become eutrophic monitoring points are plotted on top.

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	850	77.1%	43.3%	56.7%
Lakes/reservoirs	252	22.9%	57.9%	42.1%
Total	1,102	100.0%	46.6%	53.4%

Compared to the previous reporting period, the share of eutrophic and could become eutrophic monitoring points decreased from 46.7% to 42.1%. The graph below presents the shares of monitoring points according to their trophic status in the last four reporting periods.

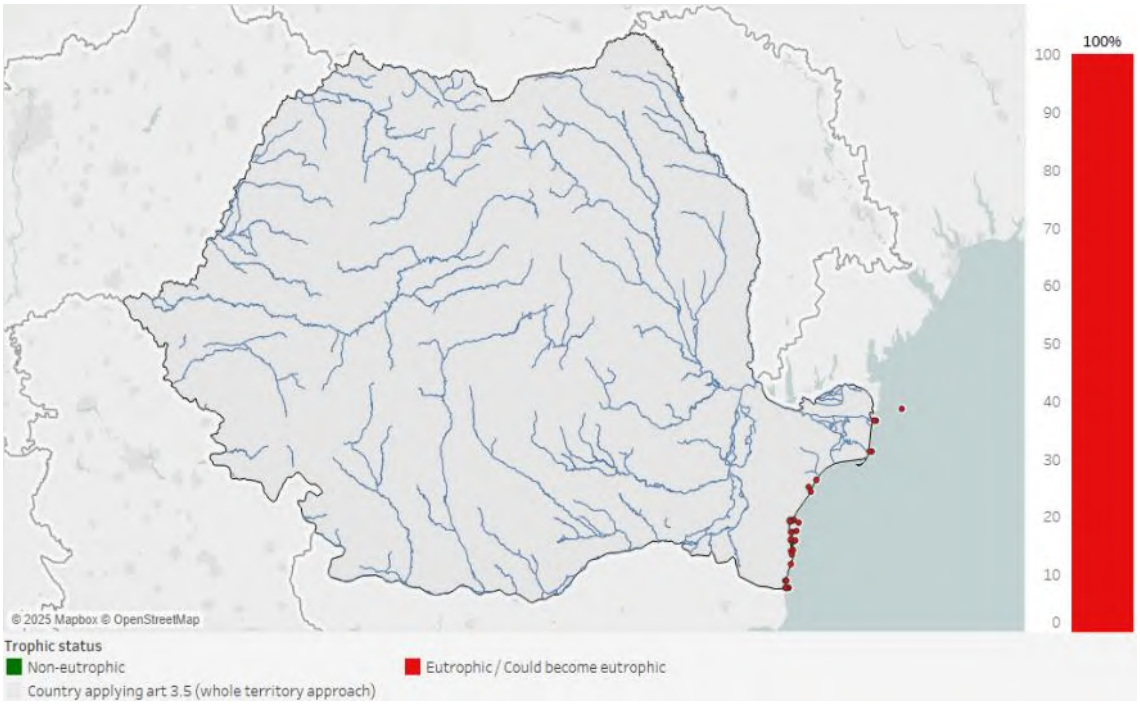
Figure 36 – Share of monitoring points in lakes/water reservoirs by class of trophic status in the current and previous reporting periods



Saline waters

All saline water monitoring points were eutrophic and 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.

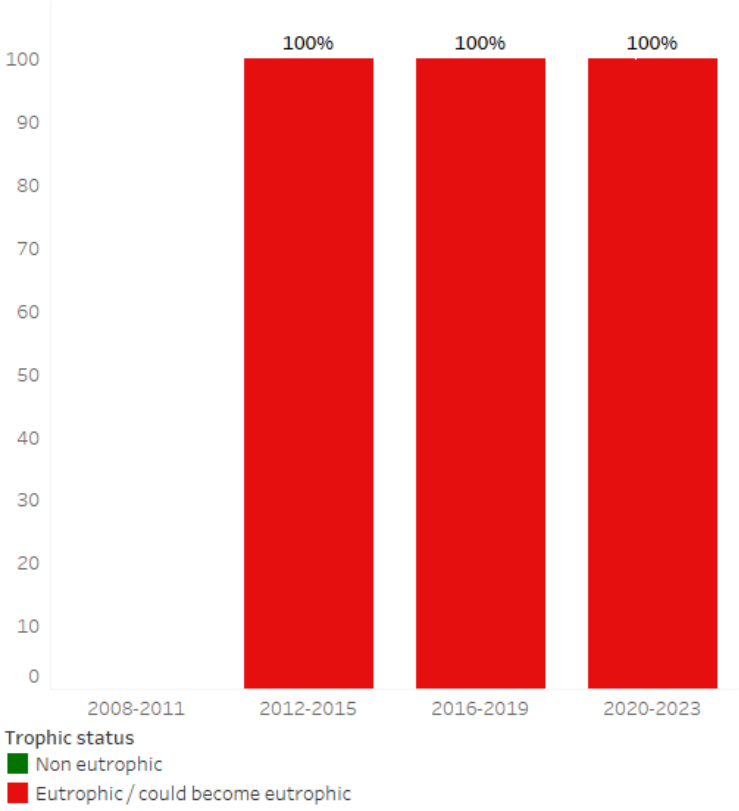
It is relevant to look separately at different types of saline waters (transitional, coastal and marine). As in Romania all monitoring points were eutrophic/could become eutrophic, also all monitoring points in different types of waters were eutrophic/could become eutrophic as shown in the table below.

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	5	15.6%		100.0%
Coastal water	23	71.9%		100.0%
Marine water	4	12.5%		100.0%
Total	32	100.0%		100.0%

Compared to 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. The share of eutrophic/could become eutrophic has remained at 100% since 2012-2015. In 2008-2011 no trophic status was reported.

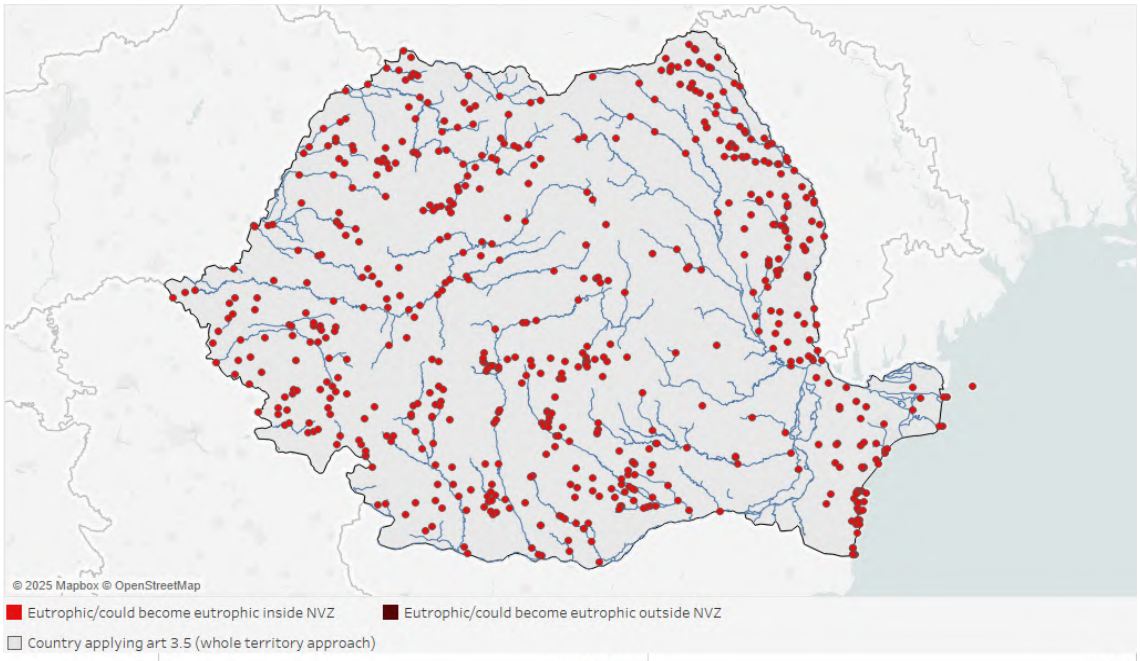
Figure 38 – Share of monitoring points in saline waters by class of trophic status in the current and previous reporting periods



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 620 surface water monitoring points which were reported eutrophic/could become eutrophic.

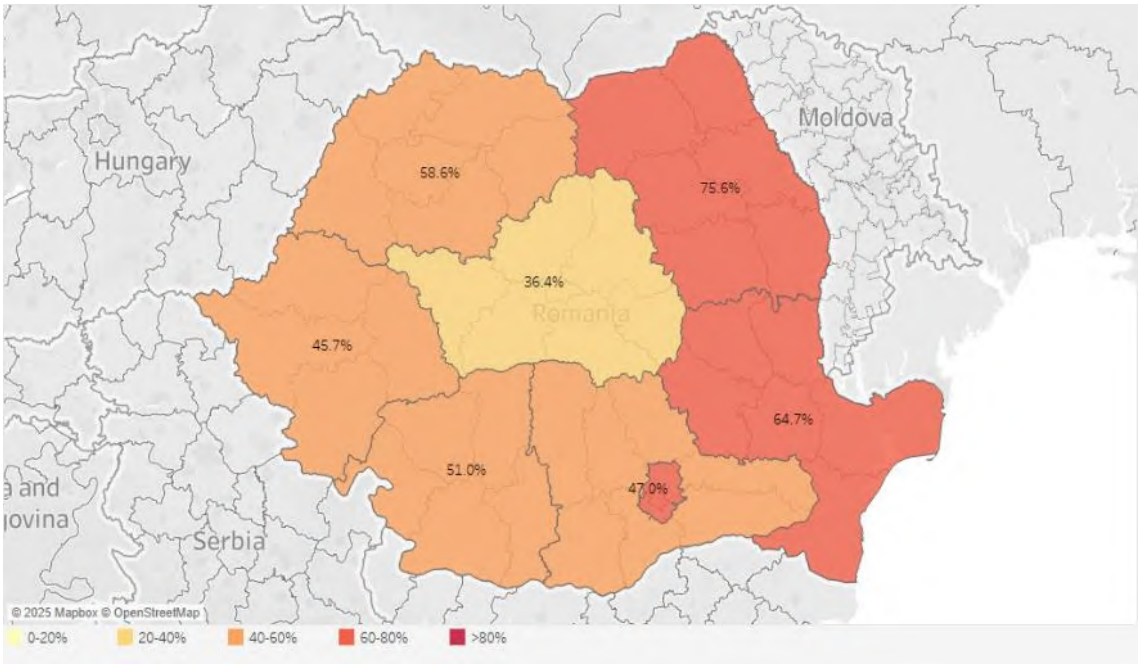
Figure 39 – Eutrophic/could become eutrophic monitoring points



	inside NVZ	Total
Rivers	482	482
Lakes	106	106
Transitional water	5	5
Coastal water	23	23
Marine water	4	4
Total	620	620

The regions with the highest share of hotspots are Nord-Est (75.6%), București-Ilfov (73.3%) and Sud-Est (64.7%).

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

The Romanian code of good agricultural practices (CGAP) was first adopted in 2003, before Romania's accession in 2007. The CGAP was then updated in 2005, 2015 and lastly in 2021 through the order OM 333/165/2021, repealing Order No. 1182/1270/2005.

Romania transposed the Nitrates Directive into national legislation and officially began implementing it in 2001 as part of the EU pre-accession negotiations. The first Romanian action programme was prepared in 2007 and has been revised three times since then. In 2007 and 2010 the measures in the action programme were mandatory only to the designated vulnerable and potentially vulnerable nitrate zones. After 2013 the action programme became mandatory for the whole territory of Romania and therefore for all farmers. The latest version of the action programme was approved in August 2021 by the joint ministerial order OM 333/165/2021.

The main amendments in the action programme in the period 2020-2023 included: a change (shortening) of the fertiliser prohibition period, simplified and more ambitious standards for the application of chemical fertilisers, an increase in the cut-off value of slope percentage at which the maximum amount of mineral nitrogen is differentiated, the introduction of clear rules on construction materials for manure storage, a larger distance between silos of green feed and water courses, wider buffer strips near water courses,

the addition of farm wastewater to the legal provisions and the reduction of the period during which records have to be kept.

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

7.2. Controls

As set out in the action programme, the National Environmental Guard is responsible for controlling its implementation through the County Commissariats and the County Agriculture Directorates. In addition, the Payments and Intervention Agency for Agriculture (APIA) controls the compliance with the Nitrates Directive through control of the conditionality rules linked to area-related payments to farmers under the CAP.

Between 2020 and 2023, APIA audited a total of 52 701 farms. Highest rates of non-compliance concerned measures on manure storage and storage capacity (6.5%). Non-compliance with other measures ranged between 0 and 1.2%.

The Romanian national report considers that the limited farm size (most farms are subsistent and semi-subsistent) and the limited economic strength of farms in Romania hamper farmers' ability to build their own storage or enough storage and sees this as an important reason for the higher non-compliance with the measure concerning manure storage. Other reported reasons for non-compliance with the action programme are the advanced age and lack of professional training of the farmers, as well as the poor technical equipment on small and medium-sized farms. The national report also mentions that the rigidity of the fertiliser prohibition periods is a challenge in view of the weather unpredictability caused by climate change.

Difficulties in the implementation of the measures include the lack of sufficient funds for public institutions to implement the Nitrates Directive and an insufficient number of experts to provide advice to farmers.

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

8. WATER QUALITY OUTLOOK

Romania used the MONERIS model to estimate future nutrient emissions, focusing on nitrogen and phosphorus emissions from agricultural, urban and natural sources. The model includes various pathways for these emissions, including atmospheric deposits, surface runoff, soil erosion, drainage runoff, and subsurface runoff.

For nitrogen, total emissions are calculated at approximately 89 040 tonnes per year, with diffuse sources accounting for a significant 83.7% of these emissions. Subsurface runoff is responsible for about 56% of nitrogen emissions. Phosphorus emissions are estimated to around 6 564 tonnes per year, with diffuse pollution contributing 76.8%. Soil erosion and sediment transport are major pathways, comprising 31.6% of phosphorus emissions.

To apply the model, five scenarios were developed including a baseline scenario with measures implemented according to related regulations and directives. The model forecasts a reduction in agricultural nitrate emissions by 2027. The decrease quantifies from a share of 35% to 28.2% of total nitrogen emissions. Agricultural phosphorus emissions may decrease from a share of 46.3% to 44.4% compared to the 2015-2018 reference period. Other vision scenarios predict lower or higher shares, but all scenarios predict a reduction of the share of agricultural nitrogen and phosphorus emissions to the overall emissions in Romania by 2027.

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