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PART 1/27

# 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


# Austria

Country staff working document
on the implementation of the Nitrates Directive

Period: 2020-2023

# Contents

# 1. KEY FINDINGS AND RECOMMENDATIONS

Austria 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 Austrian 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 Austria, the utilised agricultural area (UAA) accounts for 31% of the country's total land area, which is lower than the EU average (38%). The livestock density is 0.9 livestock units per hectare (LSU/ha) of UAA, which is higher than the EU average of 0.7 LSU/ha, and there are regional variations with livestock densities above 1 LSU/ha UAA in some regions. The gross nitrogen balance is 35 kg/ha UAA and the gross phosphorus balance is -1 kg/ha UAA in 2022-2023 ([5]).

### Monitoring network

For groundwater, the density of the monitoring network is around 23 stations per 1 000 km$^2$, which is higher than the EU average (8 stations). Compared to the previous reporting period, the density decreased by 2%.

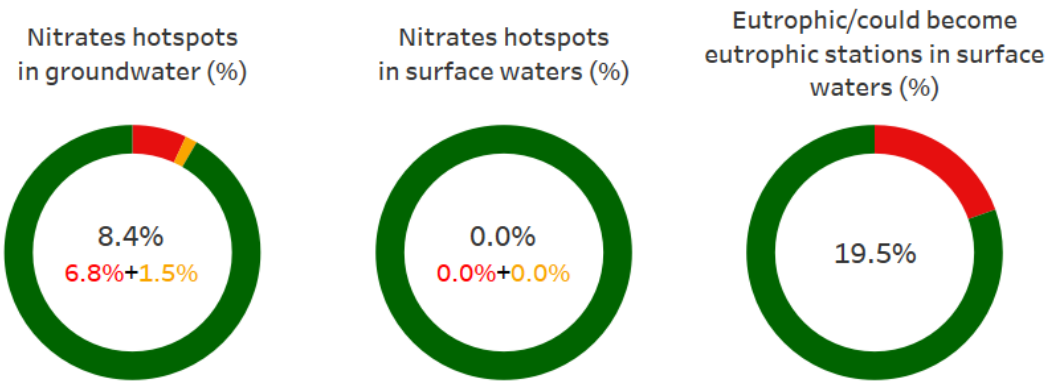
For surface freshwater, the density of the monitoring network is around 2 stations per 1 000 km$^2$, which is lower than the EU average (7 stations). Compared to the previous reporting period, the density remained stable. The monitoring network includes river stations and lake/water reservoir stations.

Austria is a landlocked country and therefore no saline surface waters are being monitored.

([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 tropic 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 ([6])

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**, 93.2% of monitoring points show nitrate concentrations below 50 mg/l.

Overall, 8.4% of monitoring points fall in two categories illustrated in Figure 1, i.e., they show nitrate concentrations ≥ 50 mg/l (6.8 %) or between 37.5 and 49.99 mg/l with an increasing trend (1.5%). Compared to the data reported in the previous reporting period, this represents a decrease of 0.9 percentage points (from 9.3% to 8.4%). The regions with the highest share are Vienna (22.7%), Burgenland (19.1%), and Lower Austria (17.4%).

Compared to the previous reporting period, the nitrate concentrations decreased in 31.3% of groundwater monitoring points and increased in 17.2%. Among points with nitrate concentration ≥ 50 mg/l, there was a similar number of points where nitrate concentrations decreased (46.9%) and increased (46.8%).

In **surface water**, 100% of monitoring points show nitrate concentrations below 50 mg/l and 80.5% are classified as non-eutrophic.

Therefore, none of the monitoring points show nitrate concentrations either ≥ 50 mg/l, or between 37.5 and 49.99 mg/l with an increasing trend as illustrated in Figure 1. Compared to the data reported in the previous reporting period, the share remained at 0%. 17% 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 17.2% of surface water monitoring points and increased in 1.6%.

The share of monitoring points reported as eutrophic/could become eutrophic is 19.5% as illustrated in Figure 1. This represents an increase of 0.7 percentage points (18.8% to 19.5%) compared to the data reported in the previous reporting period. The regions

([6]) The data reported by Austria for water quality (nitrate concentration) cover the period from July 2020 to June 2023 and all figures for water quality shown in this staff working document therefore refer to that period. Likewise, all references to the previous reporting period refer to period from July 2015 to June 2019.

with the highest share are Burgenland (63.6%), Lower Austria (46.4%) and Upper Austria (22.2%).

### Nitrate Vulnerable Zones

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

### Action Programme

During the reporting period, Austria modified its action programme, which is implemented throughout the entire country. Amendments include regulations on buffer zones near watercourses, manure storage facilities, autumn fertilisation for arable land, application limits, and extended record-keeping obligations. Even though Austria do not identify NVZ, areas with increased nitrate loads were identified and enhanced actions implemented.

## 1.2. Recommendations

- Review and where necessary reinforce measures to improve water quality
- 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

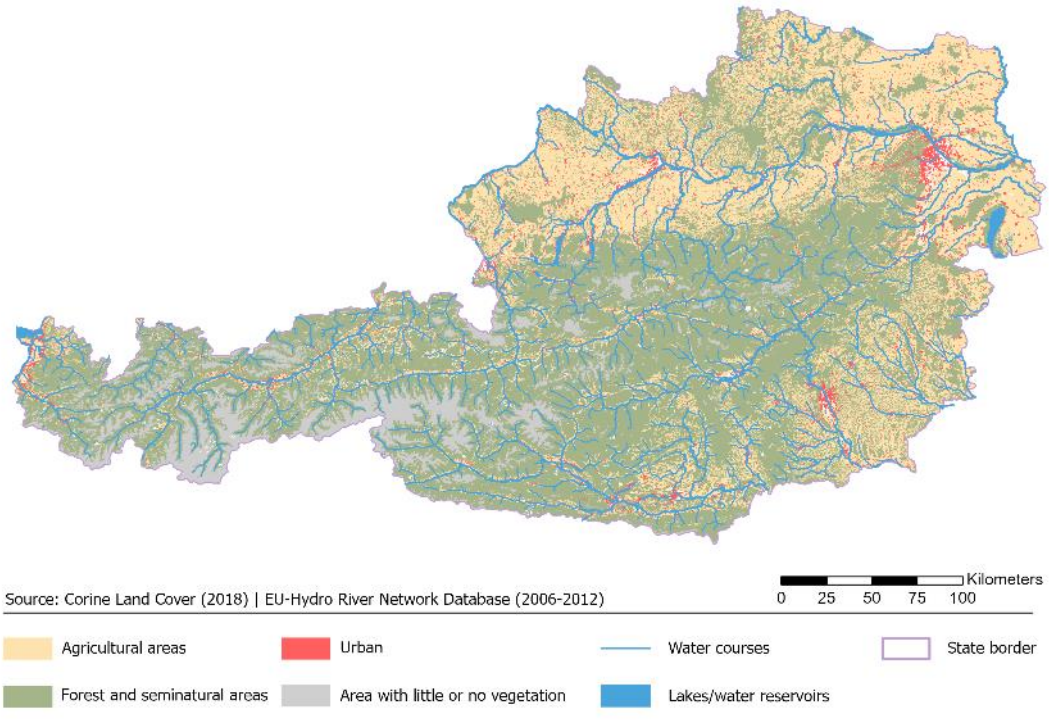
In Austria, crop production accounted for the largest portion of the agricultural sector's total output value at 45.4% in the reporting period 2020-2023. Animal production followed with 44.7%, and other outputs made up 9.9% ([7]). Additionally, the share of agricultural land used for organic farming increased from 23.5% in the reporting period 2016-2019 to 25.7% in the reporting period 2020-2023. ([8])

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 agriculture 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 Austria along with watercourses and lakes/water reservoirs.

Figure 2 – Land use distribution in Austria




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

The utilised agricultural area (UAA) in Austria covered 2.6 million hectares in 2023, making up 31.2% of the country's total land area. Arable land accounts for 51.4% of UAA, followed by permanent grassland at 46.0% and permanent crops at 2.6%.

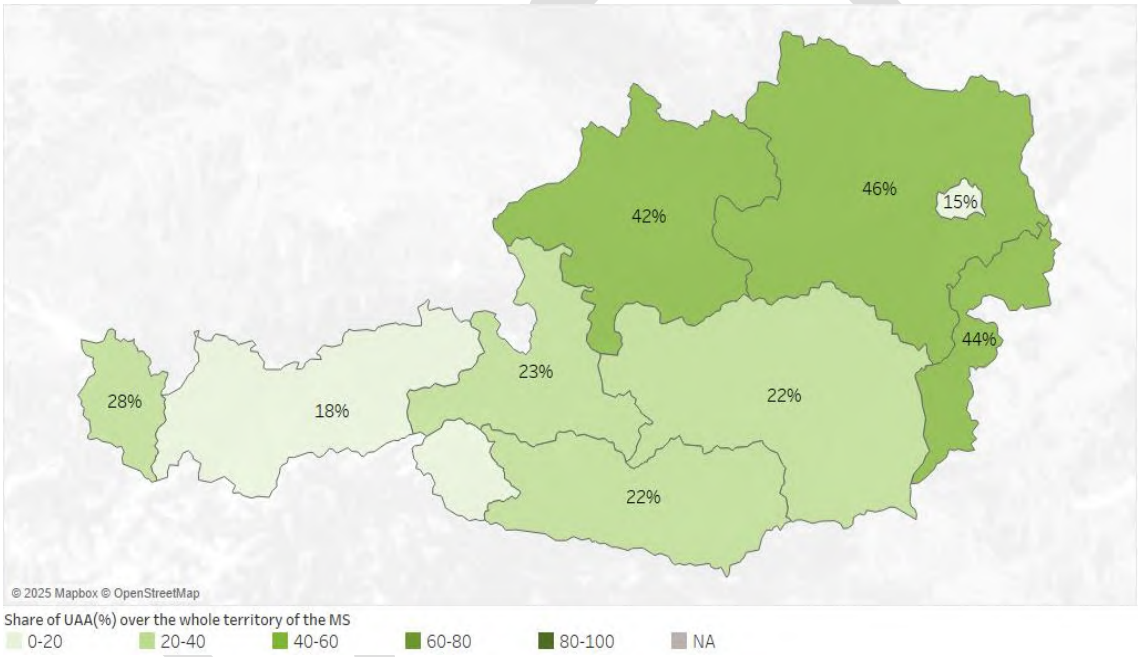
Table 1 – Evolution of the utilised agricultural area

| | 2010 | 2013 | 2016 | 2020 | 2023 |
|---|---|---|---|---|---|
| utilised agricultural area (1000 ha) | 2,878 | 2,727 | 2,670 | 2,603 | 2,572 |
| arable land (1000 ha) | 1,371 | 1,364 | 1,344 | 1,323 | 1,322 |
| permanent grassland (1000 ha) | 1,439 | 1,296 | 1,258 | 1,210 | 1,182 |
| permanent crops (1000 ha) | 65 | 65 | 67 | 68 | 66 |
| kitchen gardens (1000 ha) | 2 | 2 | 1 | 2 | 1 |

Source: Eurostat (ef_lus_main)

In 2020, the share of the UAA ranged from 46% in Lower Austria, to 15% in Vienna.

Figure 3 – Share of utilised agricultural area (UAA) at NUTS2 level in 2020 ([9])



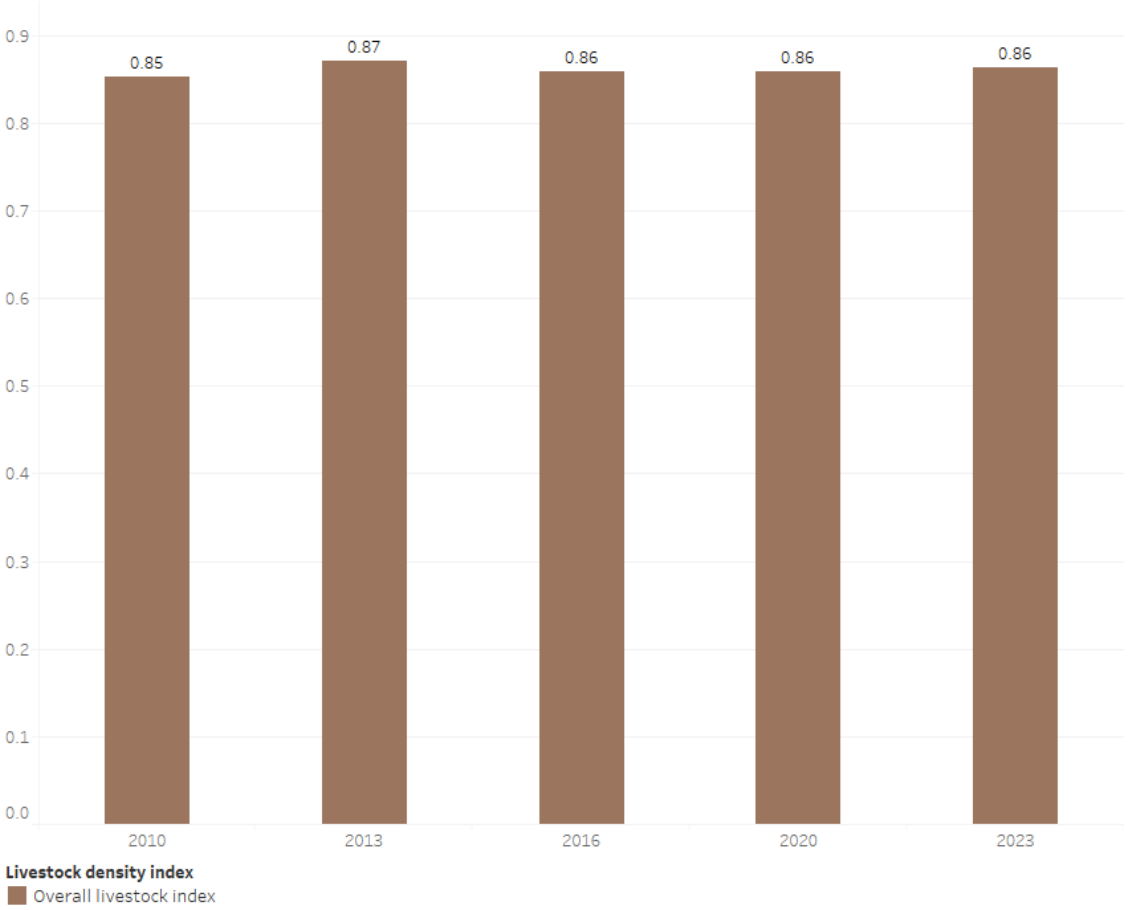

Source: Eurostat (ef_lus_main)

([9]) Latest available data.

## 2.2. Livestock density

In Austria the livestock density was 0.86 livestock units per hectare (LSU/ha) of UAA in 2023. The livestock density has remained stable since 2010.

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




Source: Eurostat (ef_fsi_lskds)

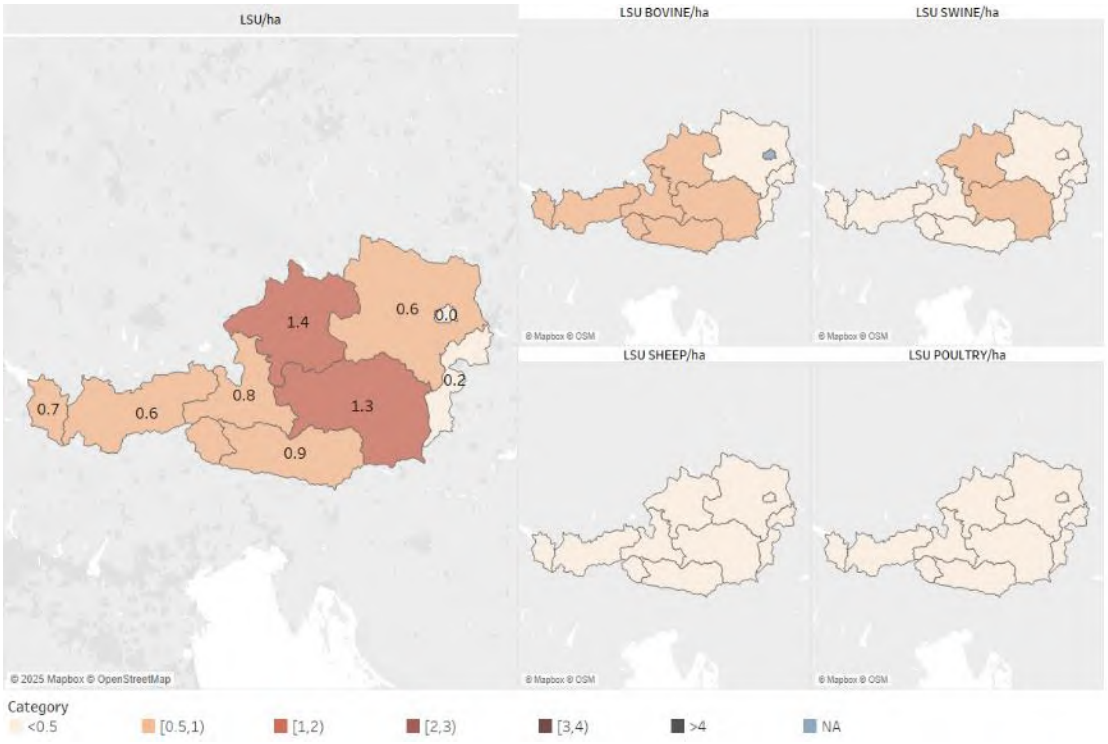
Table 2 – Evolution of the livestock numbers by animal type

| | 2007 | 2010 | 2013 | 2016 | 2020 | 2023 |
|---|---|---|---|---|---|---|
| live bovines (Million heads) | 2.00 | 2.01 | 1.96 | 1.95 | 1.86 | 1.84 |
| of which dairy cows (Million heads) | 0.52 | 0.53 | 0.53 | 0.54 | 0.52 | 0.54 |
| live pigs (Million heads) | 3.29 | 3.13 | 2.90 | 2.79 | 2.81 | 2.52 |
| live poultry (Million heads) | NA | 14.62 | 15.74 | 17.43 | 17.60 | NA |
| live sheep (Million heads) | NA | 0.34 | 0.36 | 0.38 | 0.39 | 0.39 |
| live goats (Million heads) | 0.06 | 0.07 | 0.07 | 0.08 | 0.09 | 0.10 |

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

There are regional variations, with livestock densities of 1.4 LSU/ha UAA in Upper Austria and 1.3 in Styria.

Figure 5 – Livestock density distribution by animal type (LSU/ha UAA) at NUTS2 level in 2020 ([10])




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

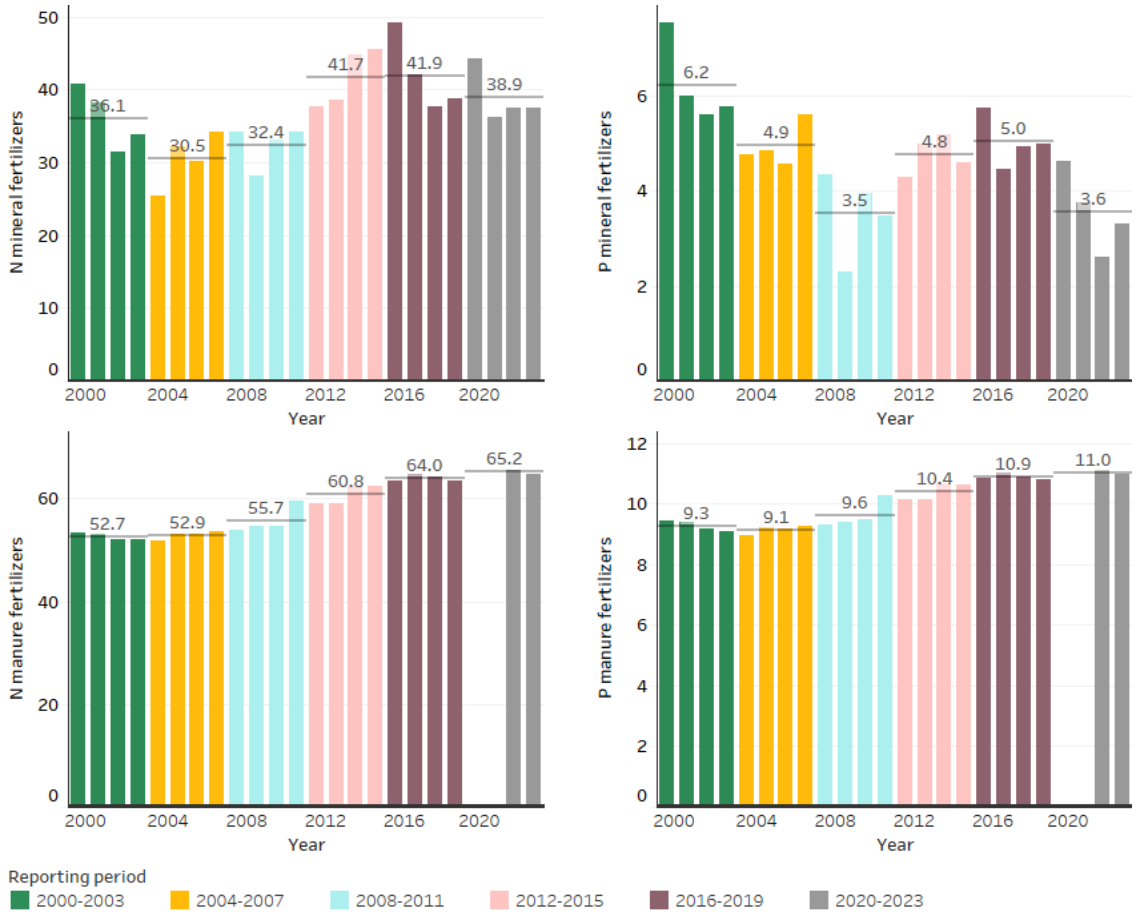
([10]) Latest available data.

## 2.3. Nitrogen and phosphorus fertiliser use

In Austria, the use of **nitrogen (N) fertilisers** was 38.9 kg/ha UAA for mineral fertilisers in 2020-2023 and 65.2 kg/ha UAA for manure fertilisers in 2022-2023. The use of mineral fertilisers has decreased by 3.0 kg/ha UAA and the use of manure fertilisers has increased by 1.2 kg/ha UAA since the previous reporting period

The use of **phosphorus (P) fertilisers** was 3.6 kg/ha UAA for mineral fertilisers in 2020-2023 and 11.0 kg/ha UAA for manure fertilisers in 2022-2023. The use of mineral fertilisers decreased by 1.4 kg/ha UAA since the last reporting period while the use of manure fertilisers has increased by 0.1 kg/ha UAA

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




Source: Eurostat (aei_pr_gnb)

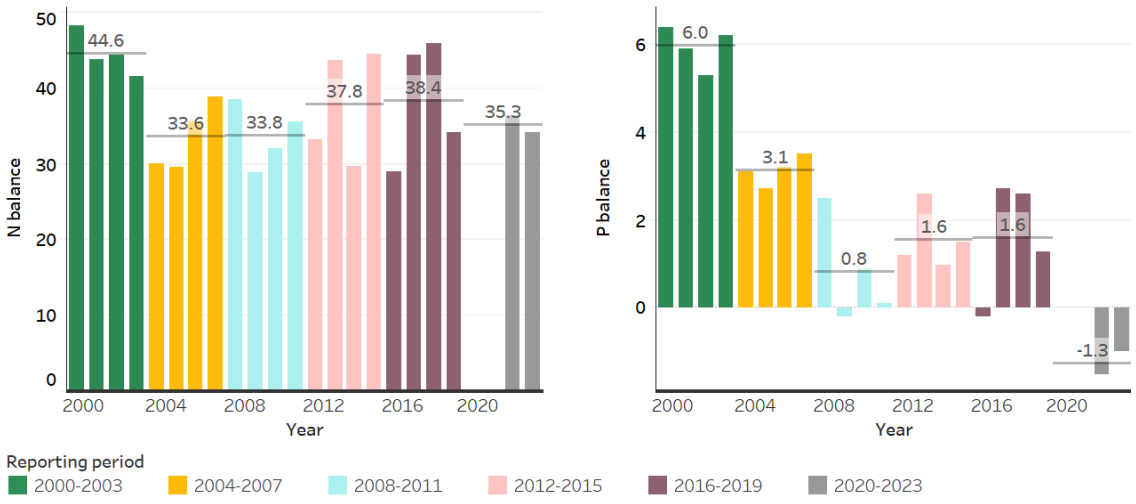
## 2.4. Nitrogen and phosphorus balance

The nitrogen balance ([11]) 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 Austria, the **gross nitrogen (N) balance** was 35.3 kg/ha UAA in 2022-2023. Since the previous reporting period it has decreased by 3.1 kg/ha UAA.

The gross **phosphorus (P) balance** was -1.3 kg/ha UAA in 2022-2023. Since the previous reporting period it has decreased by 2.9 kg/ha UAA

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




Source: Eurostat (aei_pr_gnb)

## 2.5. Nitrogen discharge to environment

Austria didn't provide numerical information on the nitrogen discharge from agriculture to the environment for the reporting period 2020-2023. The total nitrogen emissions into Austrian watercourses were calculated for the 2009-2014 monitoring period as 79.2 kilotonnes. On average, 86% of nitrogen emissions to the environment come from diffuse sources. At the time of reporting, the model results for nitrogen and phosphorus emissions (2015-2020 monitoring period) were being updated as part of the status analysis in preparation for the 2027 national water management plan.

([11]) Gross nutrient balance (aei_pr_gnb)

# 3. NITRATE VULNERABLE ZONES

In line with Article 3 paragraph 5, Austria applies an action programme with mandatory measures throughout the entire national territory (whole country approach) since 1996 and is thus exempted from designating NVZ.

# 4. NITRATES IN GROUNDWATER

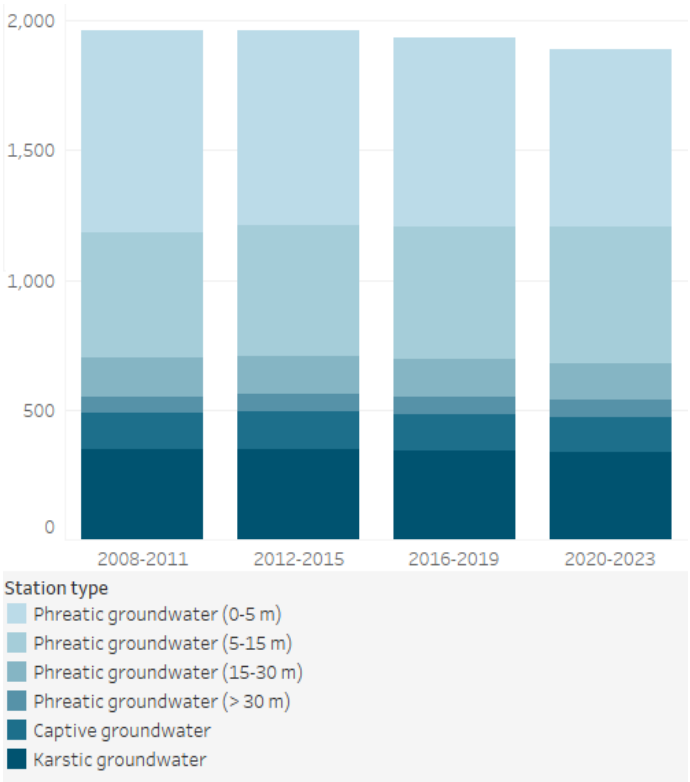
## 4.1. Monitoring of nitrate concentrations in groundwater

General monitoring of the chemical status of groundwater is carried out in all groundwater bodies to obtain a coherent and comprehensive overview of the chemical status of groundwater within each river basin district. At a national level, about half of the groundwater sampling sites in the monitoring network set up under the Water Status Monitoring Regulation are located in agricultural areas. The density of sampling sites is relatively higher for porous aquifers located in intensively farmed areas of Austria to take account of their higher load and risk potential. Sampling sites were included in the report if there is at least one value per year in 3 out of 4 years. Reporting period used for assessment was from 1 July 2019 to 30 June 2023.

During the reporting period 2020-2023 nitrate concentrations were reported at 1 890 groundwater monitoring points. The station density was 22.5 stations per 1 000 $km^2$.

The overall number of monitoring points decreased by 43 (2.2%) compared to the previous reporting period. Since 2008-2011 the total number of monitoring points has decreased slightly each 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 1 839 monitoring points, accounting for 97.3% of all points with measurements. The share of monitoring points with trends increased compared to the previous reporting period, which was 95.0% 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 ([12])

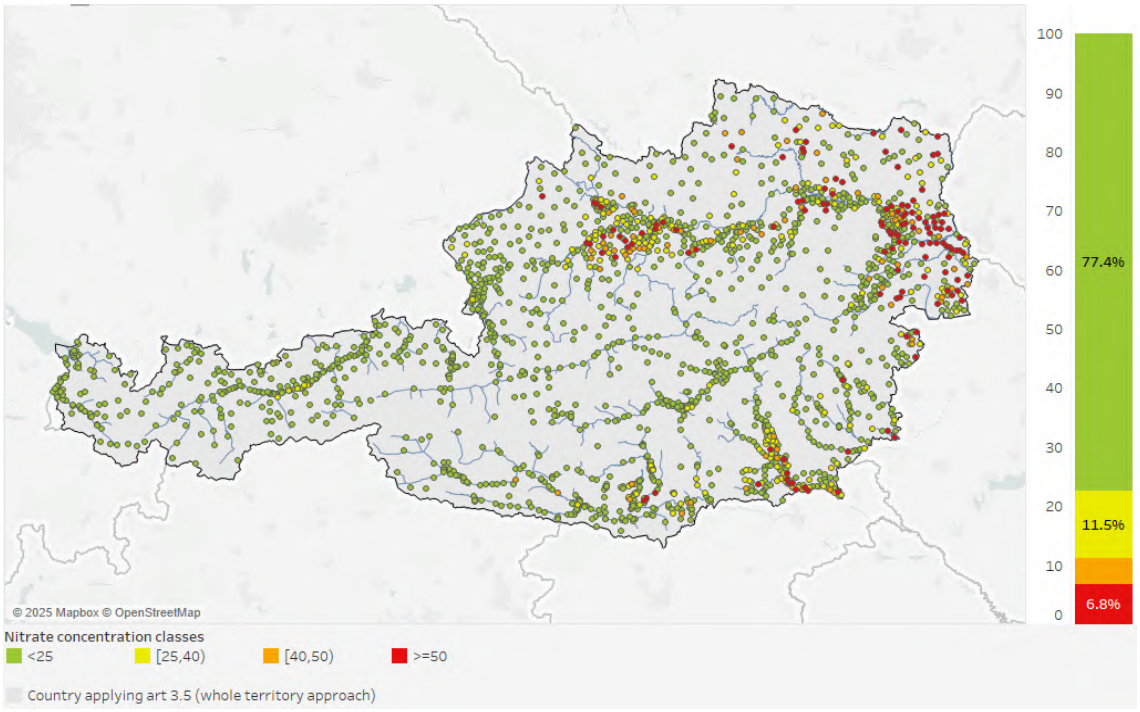
| | Stations with measurements | | | | Stations with trends | | | |
|---|---|---|---|---|---|---|---|---|
| Station type | 2008-2011 | 2012-2015 | 2016-2019 | 2020-2023 | 2008-2011 | 2012-2015 | 2016-2019 | 2020-2023 |
| Phreatic groundwater (0-5 m) | 780 | 754 | 726 | 687 | 705 | 732 | 694 | 670 |
| Phreatic groundwater (5-15 m) | 483 | 507 | 511 | 523 | 450 | 485 | 463 | 497 |
| Phreatic groundwater (15-30 m) | 152 | 143 | 144 | 142 | 135 | 140 | 133 | 139 |
| Phreatic groundwater (> 30 m) | 63 | 70 | 71 | 66 | 55 | 68 | 68 | 66 |
| Captive groundwater | 142 | 143 | 138 | 133 | 132 | 139 | 138 | 132 |
| Karstic groundwater | 345 | 348 | 343 | 339 | 247 | 342 | 341 | 335 |
| Not specified | | | | | | | | |
| Total | 1,965 | 1,965 | 1,933 | 1,890 | 1,724 | 1,906 | 1,837 | 1,839 |

[12]) Austria reported that monitoring was discontinued in 139 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 Austria, 6.8% of groundwater monitoring points showed average nitrate concentrations equal to or above the drinking water threshold of 50 mg/l, whereas 4.3% had concentrations between 40-49.99 mg/l, 11.5% showed concentrations between 25-39.99 mg/ and 77.4% 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.

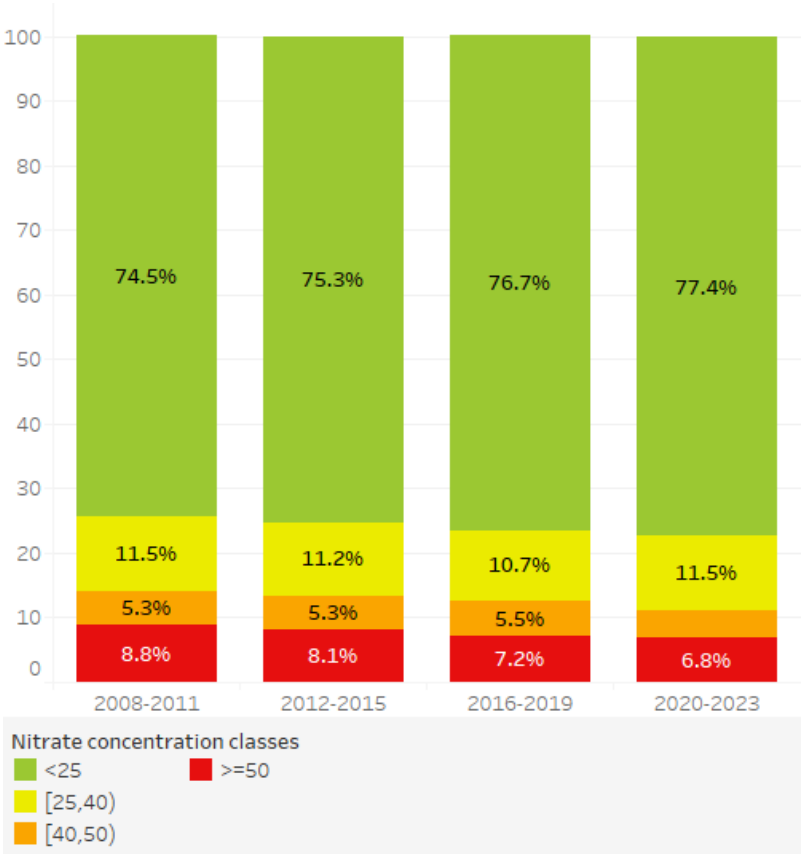
The station type category with the highest share of points with nitrate concentrations equal to or above threshold 50 mg/l was phreatic groundwaters at depth 5-15m with share of 10.9%, as shown in the table below.

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) | 687 | 36.3% | 78.0% | 11.5% | 3.8% | 6.7% |
| Phreatic groundwater (5-15 m) | 523 | 27.7% | 67.7% | 14.7% | 6.7% | 10.9% |
| Phreatic groundwater (15-30 m) | 142 | 7.5% | 67.6% | 16.9% | 7.7% | 7.7% |
| Phreatic groundwater (> 30 m) | 66 | 3.5% | 75.8% | 21.2% | 3.0% | |
| Captive groundwater | 133 | 7.0% | 70.7% | 13.5% | 5.3% | 10.5% |
| Karstic groundwater | 339 | 17.9% | 97.9% | 1.5% | 0.3% | 0.3% |
| Total | 1,890 | 100.0% | 77.4% | 11.5% | 4.3% | 6.8% |

Compared to the previous reporting period, the share of monitoring points with concentration ≥ 50 mg/l decreased from 7.2% to 6.8%. The graph below presents the share of monitoring points per classes of nitrate concentrations in the last four reporting periods. Overall, there was stable increase in the category <25 mg/l and decrease in the category ≥ 50mg/l over the current and past three reporting periods.

Figure 10 – Share of monitoring points in groundwater by class of nitrate concentration ([13]) in the current and previous reporting periods



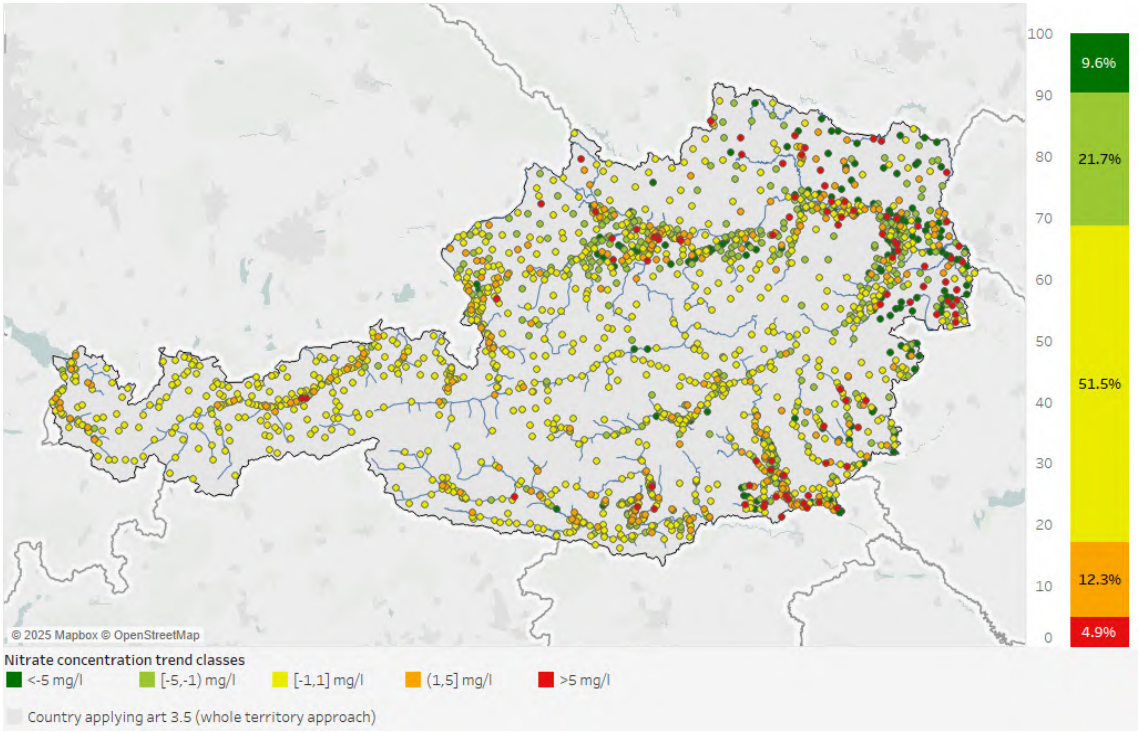

Note: The percentages below 5% are not labelled.

([13]) 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 31.3% of monitoring points and an increase in 17.2%. For the remaining 51.5% 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 5mg/l.

Figure 11 – Map of trends in average annual mean nitrate concentrations ([14]) 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.

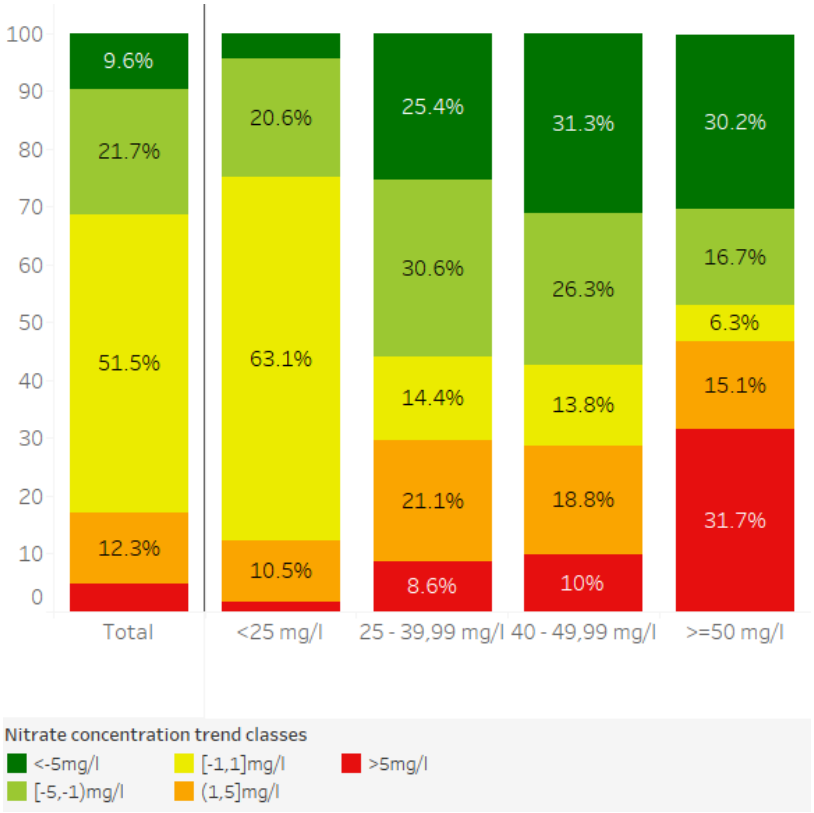
Table 5 – Share of groundwater monitoring points by trend class (mg/l) between the periods 2016-2019 and 2020-2023, categorised by station type

| | Total Number of Stations | % Total Number of Stations | <-5 | [-5,-1) | [-1,1] | (1,5] | >5 |
|---|---|---|---|---|---|---|---|
| Phreatic groundwater (0-5 m) | 670 | 36.4% | 11.9% | 22.1% | 45.1% | 15.1% | 5.8% |
| Phreatic groundwater (5-15 m) | 497 | 27.0% | 13.5% | 25.6% | 38.4% | 15.3% | 7.2% |
| Phreatic groundwater (15-30 m) | 139 | 7.6% | 9.4% | 30.2% | 43.9% | 14.4% | 2.2% |
| Phreatic groundwater (>30 m) | 66 | 3.6% | 4.5% | 33.3% | 51.5% | 10.6% | |
| Captive groundwater | 132 | 7.2% | 9.8% | 22% | 48.5% | 10.6% | 9.1% |
| Karstic groundwater | 335 | 18.2% | | 9.3% | 88.1% | 2.7% | |
| Total | 1,839 | 100.0% | 9.6% | 21.7% | 51.5% | 12.3% | 4.9% |

([14]) 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 50 mg/l), there has been an increase of nitrate concentration for 46.8% and a decrease for 46.9% 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) ([15])

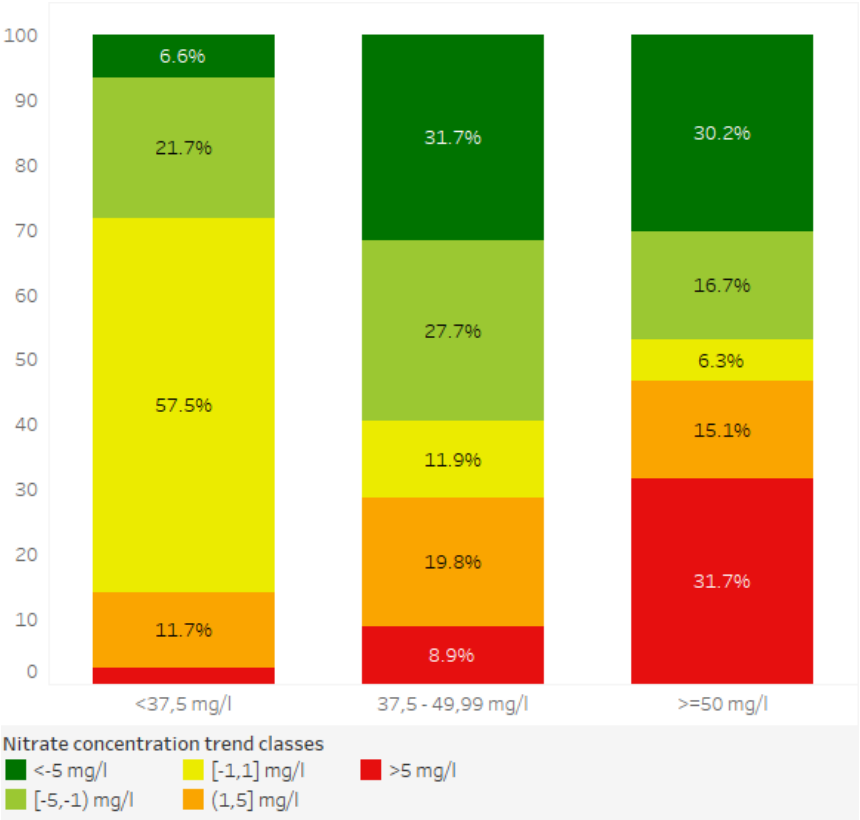



Note: The percentages below 5% are not labelled.

([15]) 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 28.7% and a decrease for 59.4% 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) ([16])

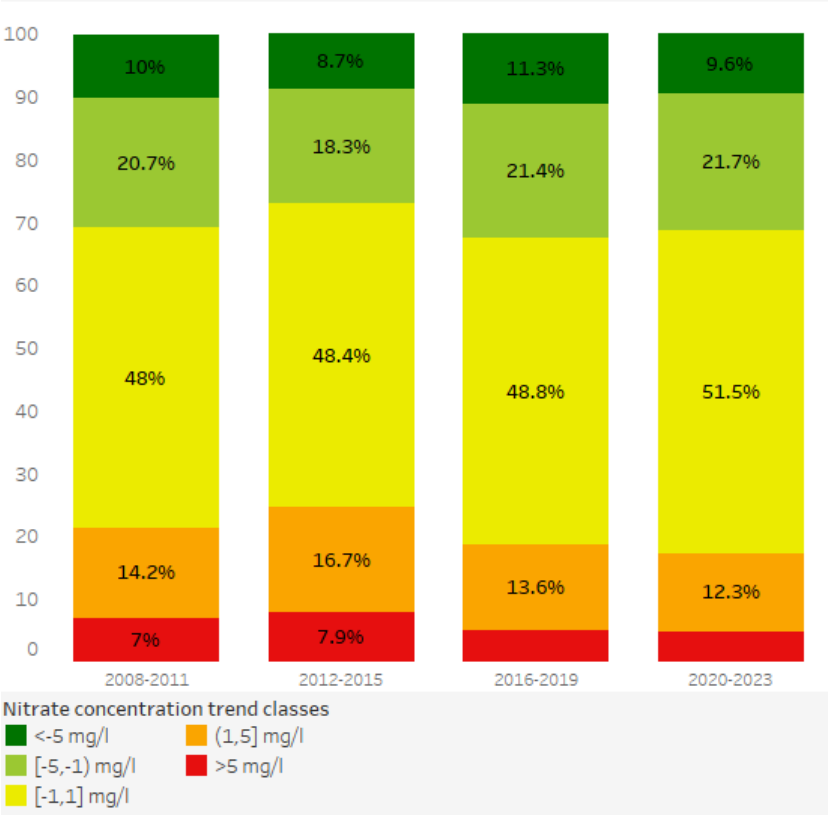



Note: The percentages below 5% are not labelled.

([16]) 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 (31.3% in the current reporting period compared to 32.7% in the previous reporting period) but also a lower share of monitoring points with increasing nitrate concentrations (17.2% compared to 18.5%). 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 14 – Share of groundwater monitoring points by class of nitrate concentration trend ([17]) in the current and previous reporting periods



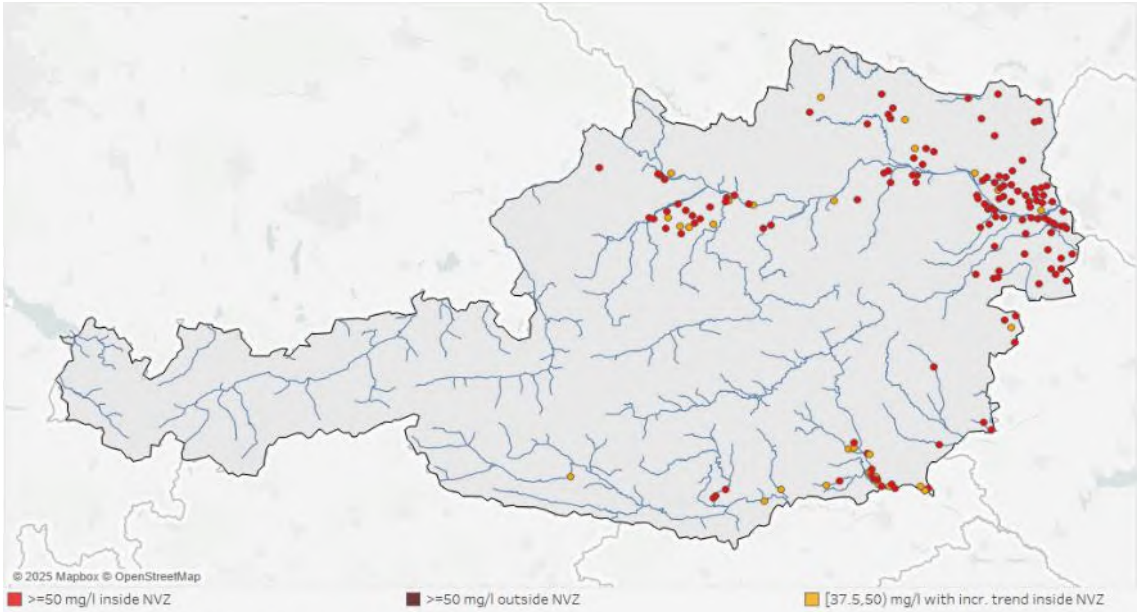

Note: The percentages below 5% are not labelled.

([17]) 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 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 Austria there are 158 groundwater nitrate pollution hotspots.

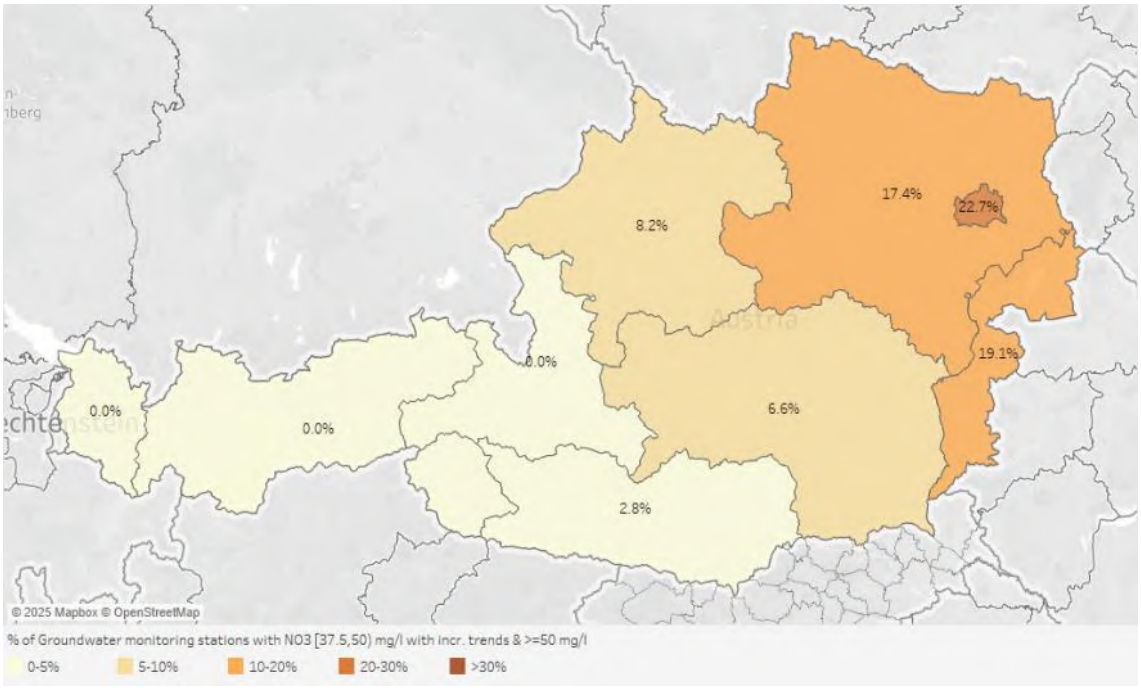
Figure 15 – Groundwater nitrate pollution hotspots




| | inside NVZ | outside NVZ | Total |
|---|---|---|---|
| Groundwater [37.5,50) with incr. trend | 29 | | 29 |
| >=50 | 129 | | 129 |
| Total | 158 | | 158 |

The NUTS2 regions with the highest share of hotspots are Vienna (22.7%), Burgenland (19.1%), and Lower Austria (17.4%).

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



# 5. NITRATES IN SURFACE WATERS

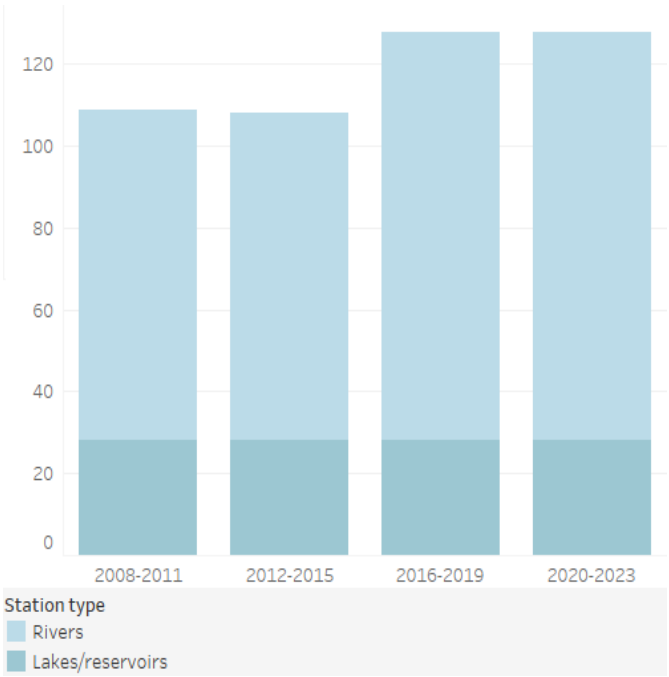
## 5.1. Monitoring of nitrate concentrations in surface waters

Austria maintains three types of monitoring stations including Surveillance, Operative and Investigative monitoring, all with a different aim. The surveillance network covers all major rivers and lakes across Austria and basic physical and chemical parameters are measured on an ongoing monthly basis. Operative monitoring of watercourses is carried out at temporary sampling sites measuring only parameters for which there is a risk of a target not being met or that are used as an indicator of that risk. All lakes with an area larger than 1 $km^2$ were monitored four times a year. There are no saline waters in Austria. Reporting period used for assessment was from 1 July 2019 to 30 June 2023 and only sampling sites with at least one nitrate-measurement per year over a minimum of three years were taken into account in the assessment.

During the reporting period 2020-2023 nitrate concentrations were reported at 128 surface water monitoring points. Among these, 78.1% were in rivers and 21.9% were in lakes or reservoirs. The freshwater monitoring points density was 1.5 stations per 1 000 $km^2$.

The overall number of monitoring points remained stable compared to the previous reporting period. From 2012-2015 to 2016-2019 the total number of monitoring stations increased mainly through the addition of river monitoring points. 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 all 128 monitoring points with measurements. The share of monitoring points with trends increased compared to the previous reporting period (79.7% 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 ([18])

| | 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 | 81 | 80 | 100 | 100 | 75 | 79 | 74 | 100 |
| Lakes/reservoirs | 28 | 28 | 28 | 28 | 25 | 28 | 28 | 28 |
| Total | 109 | 108 | 128 | 128 | 100 | 107 | 102 | 128 |

([18]) Austria reported that monitoring wasn't discontinued in any monitoring point. relative to the previous reporting period.

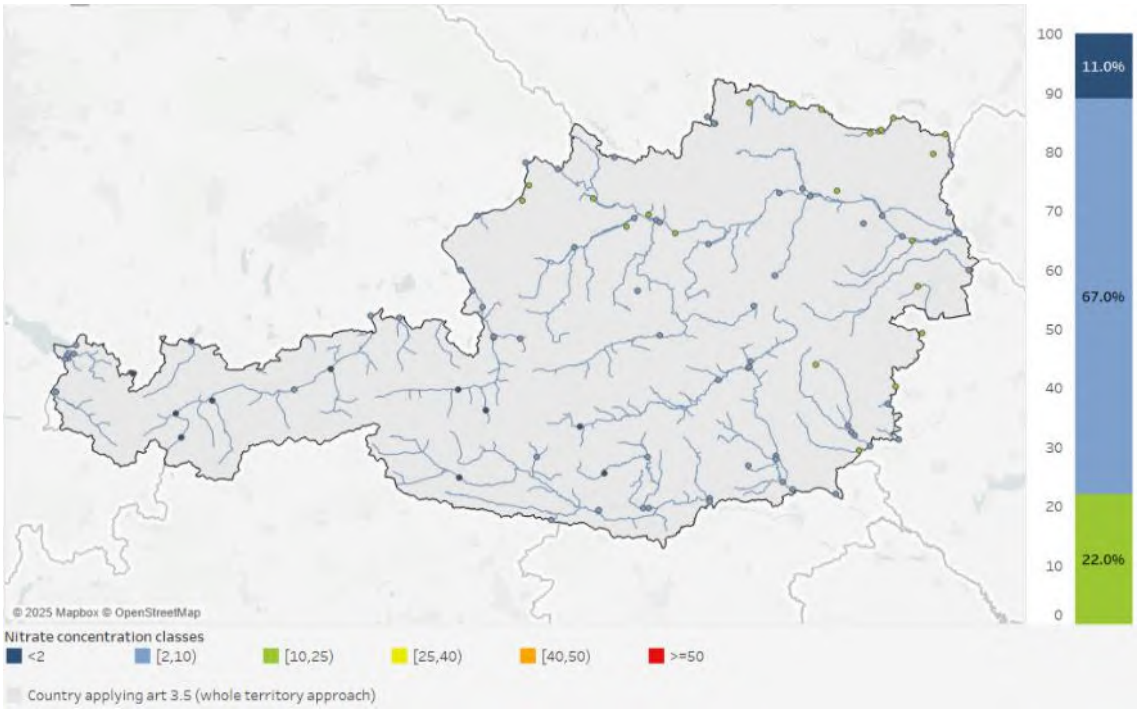
## 5.2. Nitrate concentrations in surface waters

### Rivers

In Austria, none of the monitoring points in rivers showed average nitrate concentrations equal to or above the drinking water threshold of 50 mg/l, and at or above 25 mg/l whereas 22.0% had concentrations between 10-24.99 mg/l, 67.0% in the class 2-9.99 mg/l and 11.0% 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 even in lower concentration classes.

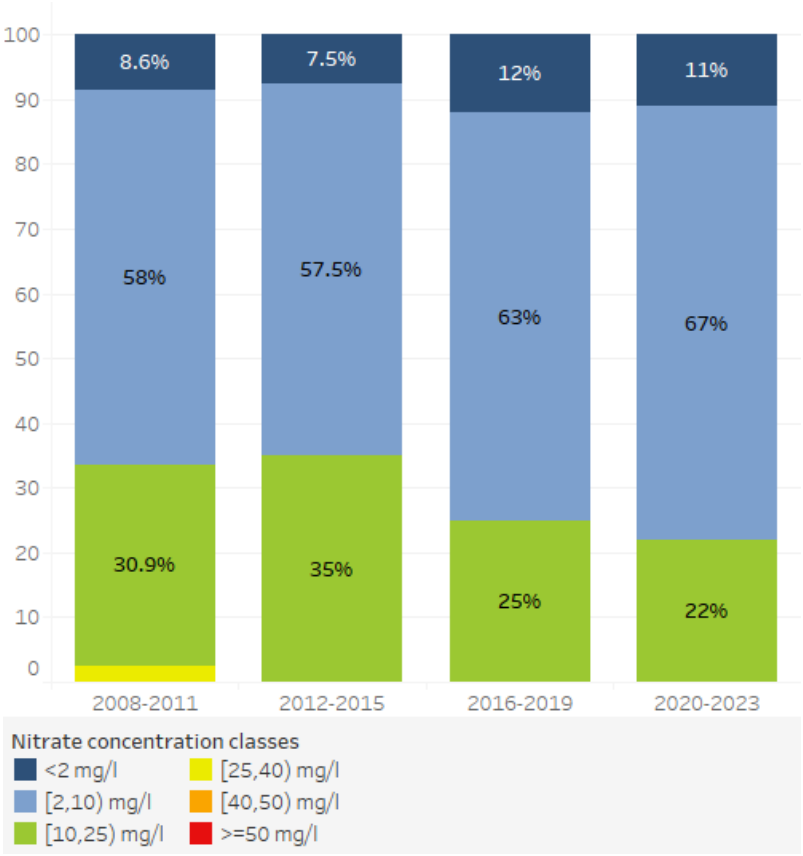
Figure 18 – Map of average annual mean nitrate concentrations in rivers and share of monitoring points by concentration class in the reporting period 2020-2023




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

Compared to the previous reporting period, the share of monitoring points in rivers with concentrations ≥ 50 mg/l remained at 0%. The graph below presents the shares of monitoring points per classes of nitrate concentration in the last four reporting periods. Since 2012-2015, there has been an increase in the share of classes <10 mg/l.

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




Note: The percentages below 5% are not labelled.

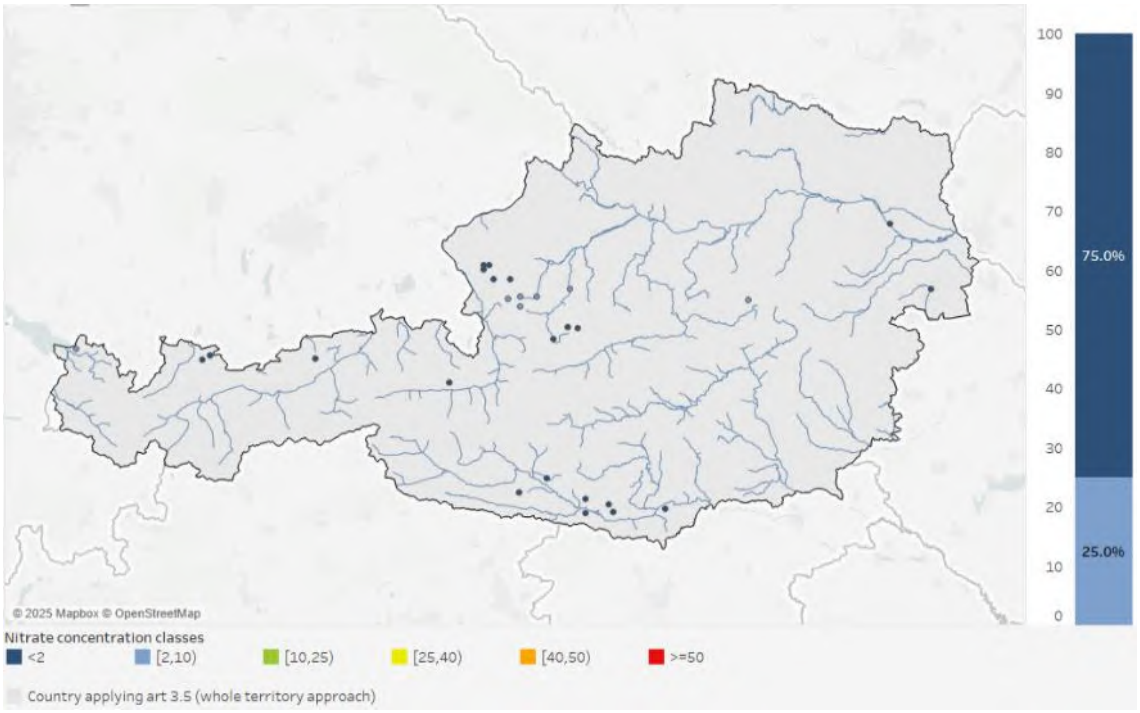
([19]) Average of annual mean values over the reporting period.

## Lakes/water reservoirs

In Austria, none of the freshwater monitoring points in lakes/water reservoirs showed average nitrate concentrations equal to or above the drinking water threshold of 50 mg/l, and at or above 10 mg/l, whereas 25.0% had concentrations between 2-9.99 mg/l and 75.0% 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



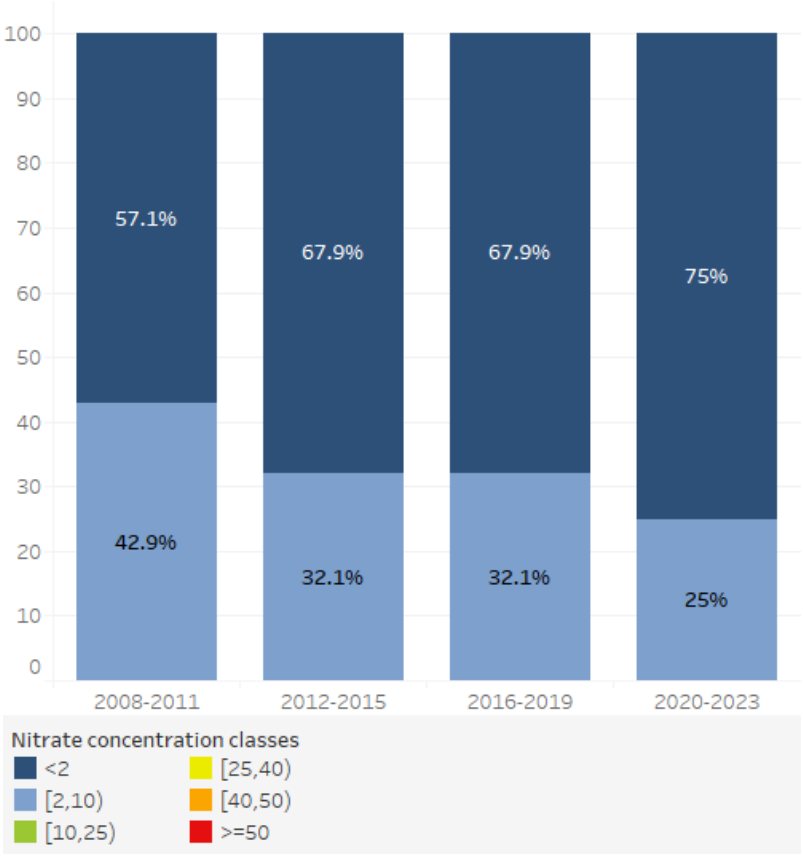

In the map, monitoring points with higher values are plotted on top.

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 | 100 | 78.1% | 11.0% | 67.0% | 22.0% | | | |
| Lakes/reservoirs | 28 | 21.9% | 75.0% | 25.0% | | | | |
| Total | 128 | 100.0% | 25.0% | 57.8% | 17.2% | | | |

Compared to 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 the last four reporting periods. Since 2008-2011 the share in class <2 mg/l has steadily increased from 57.1% to 75.0% in 2020-2023.

Figure 21 – Share of monitoring points in lakes/water reservoirs by class of nitrate concentration ([20]) in the current and previous reporting periods



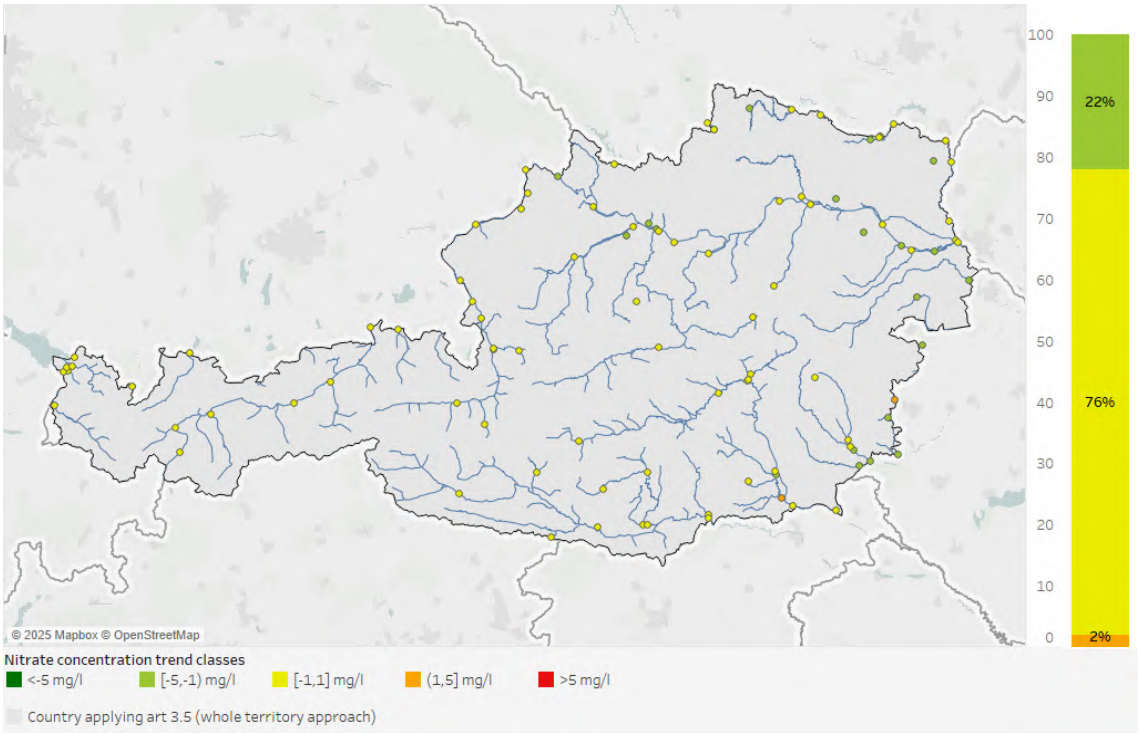

([20]) Average of annual mean values over the reporting period.

## 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 22.0% of monitoring points and an increase in 2.0%. For the remaining 76.0% 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.

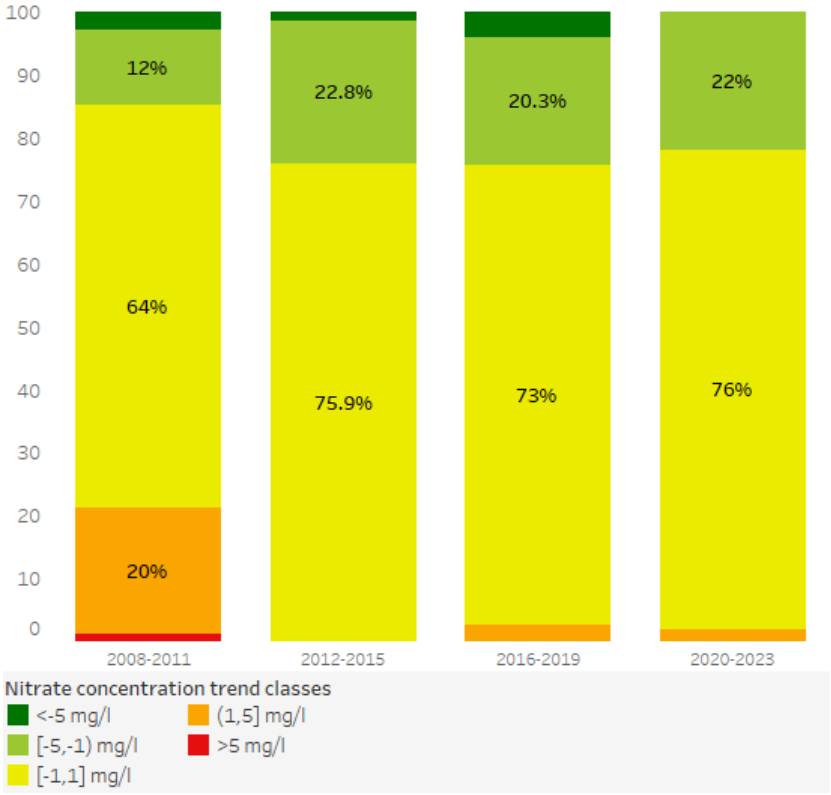
Figure 22 – Map of trends in average annual mean nitrate concentrations in rivers between the periods 2016-2019 and 2020-2023 and share of monitoring points by trend class




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

Compared to the previous reporting period, there is a lower share of monitoring points with decreasing nitrate concentrations (22.0% in the current reporting period compared to 24.4% in the previous reporting period compared) but also a lower share of monitoring points with increasing nitrate concentrations (2.0% compared to 2.7%). 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 23 – Share of monitoring points in rivers by class of nitrate concentration trend ([21]) in the current and previous reporting periods



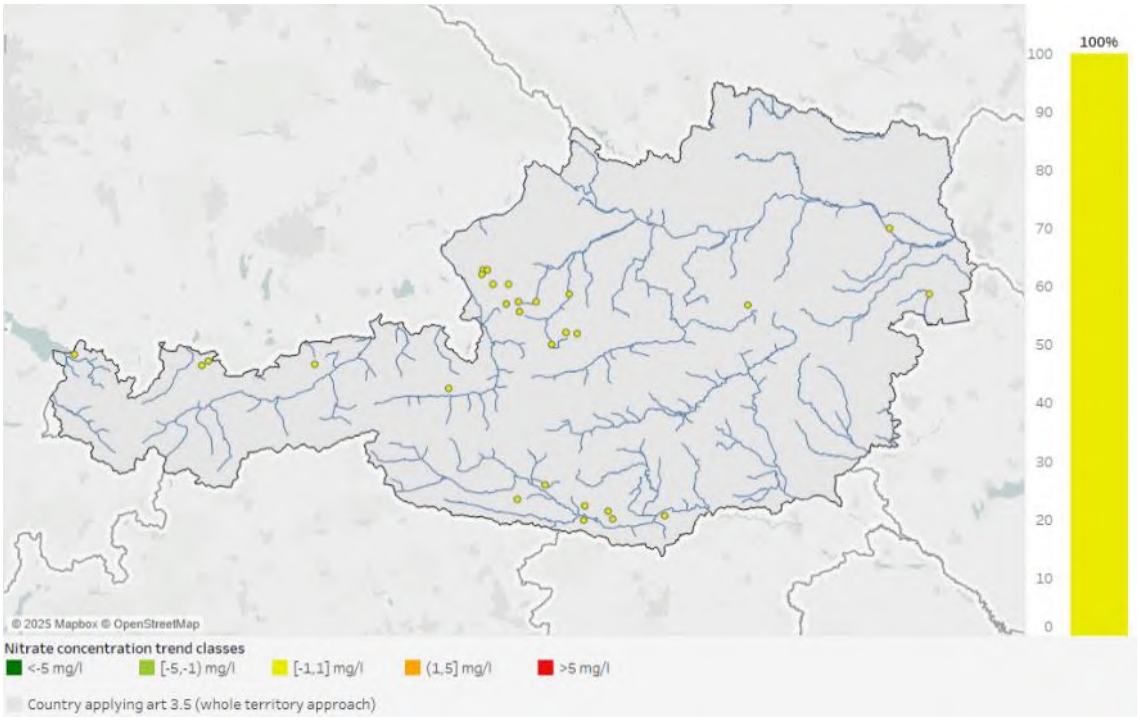

Note: The percentages below 5% are not labelled.

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

## Lakes and water reservoirs

Compared to the last reporting period, there has been no decrease or increase of nitrate concentrations in any of the monitoring points. 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 lakes/water reservoirs between the periods 2016-2019 and 2020-2023 and share of monitoring points by trend class



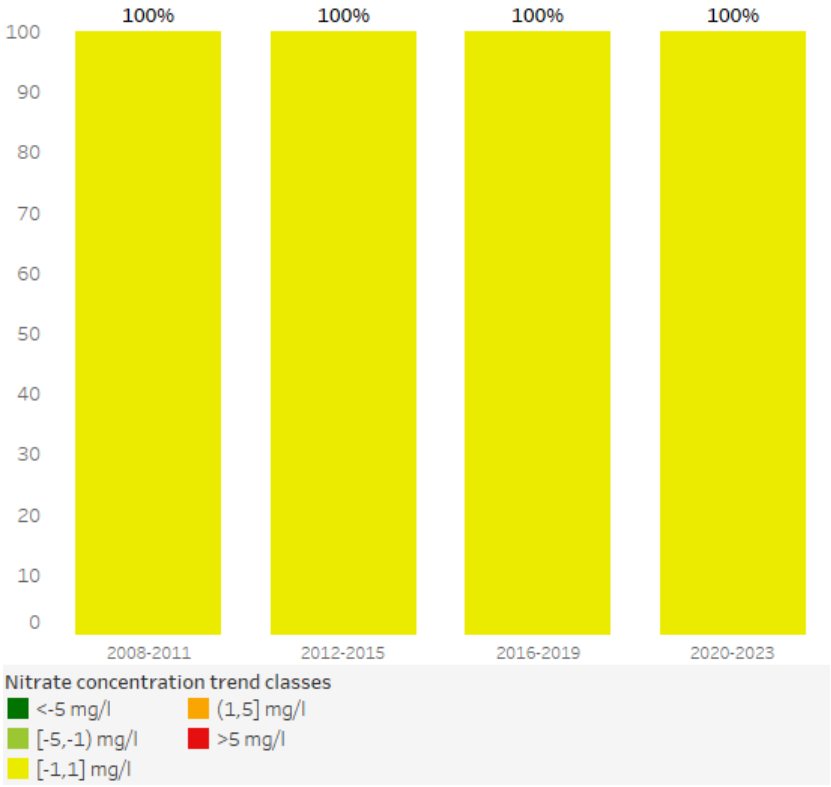

Note: In the map, monitoring points with higher values are plotted on top.

Table 8 – 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 | 100 | 78.1% | | 22% | 76% | 2% | |
| Lake/Reservoir | 28 | 21.9% | | | 100% | | |
| Total | 128 | 100.0% | | 17.2% | 81.3% | 1.6% | |

Compared to the previous reporting period, the share of monitoring points with decreasing nitrate concentrations and the share of monitoring points with increasing nitrate concentrations remained the same (0%). 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 lakes/water reservoirs by class of nitrate concentration trend ([22]) in the current and previous reporting periods




([22]) 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 no surface water nitrate pollution hotspots.

# 6. EUTROPHICATION OF SURFACE WATERS

## 6.1. Monitoring of trophic status in surface waters

During the reporting period 2020-2023 trophic status was reported at 128 monitoring points. Among these, 78.1% were in rivers, and 21.9% were in lakes or reservoirs. The station density of monitoring points, where trophic status was assessed equals to 1.5 stations per 1 000 $km^2$.

The overall number of freshwater monitoring points remained the same. The total number of monitoring points has increased from 2008-2011 to 2016-2019, mainly due to the addition of river monitoring points.

Figure 26 – Evolution in surface water monitoring network (number of points with trophic status reported)

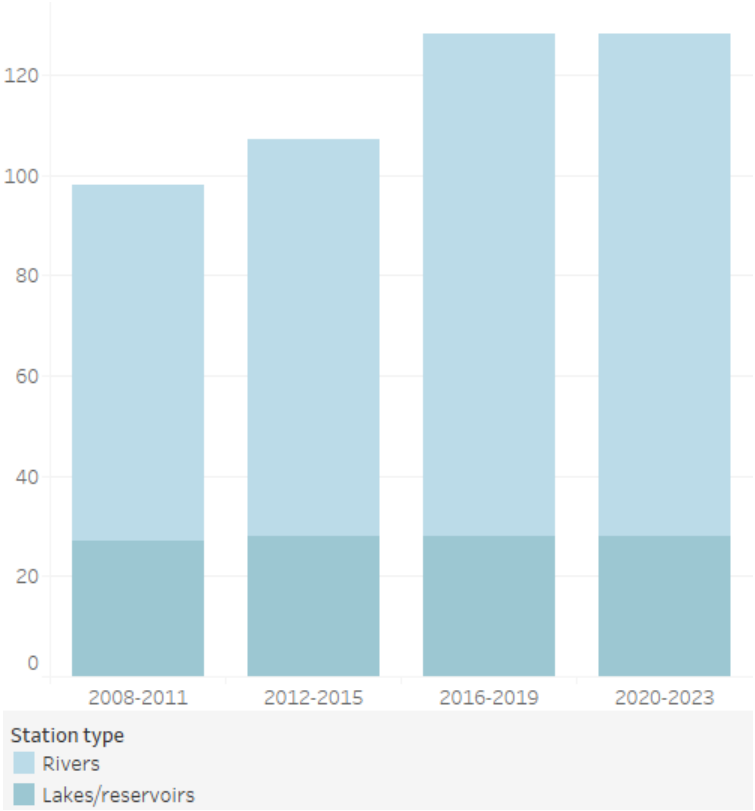


Table 9 – Number of monitoring points reporting trophic status by station type ([23])

| | Stations With Trophic Status | | | |
|---|---|---|---|---|
| Station type | 2008-2011 | 2012-2015 | 2016-2019 | 2020-2023 |
| Rivers | 71 | 79 | 100 | 100 |
| Lakes/reservoirs | 27 | 28 | 28 | 28 |
| Total | 98 | 107 | 128 | 128 |

## 6.2. Methodology for the assessment of trophic status

As in the previous reporting period to characterise the trophic state of water bodies and assess eutrophication, biological quality elements (phytobenthos for rivers, phytoplankton for lakes) were used. The phytobenthos quality element is measured at the surveillance monitoring sampling sites at regular intervals of 3 years.

In addition to the phytoplankton biological quality element, mean and maximum concentrations of nitrate and phosphorus for the reporting period were determined as well. Mean nitrate and phosphorus values were calculated as volume-weighted mean values.

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

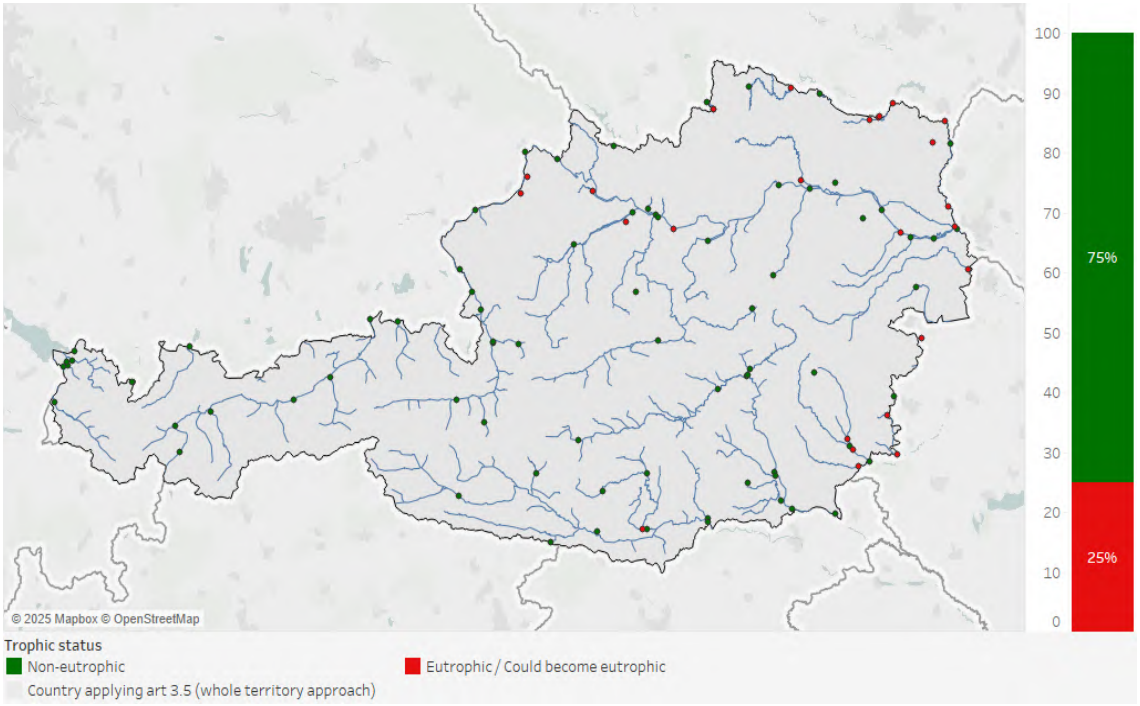
([23]) Austria reported that monitoring wasn't discontinued in any monitoring point relative to the previous reporting period.

## 6.3. Eutrophication of surface waters

### Rivers

25.0% of monitoring points in rivers were eutrophic/could become eutrophic. The figure below reflects that the shares in respective classes in a graph and spatial distribution in the map.

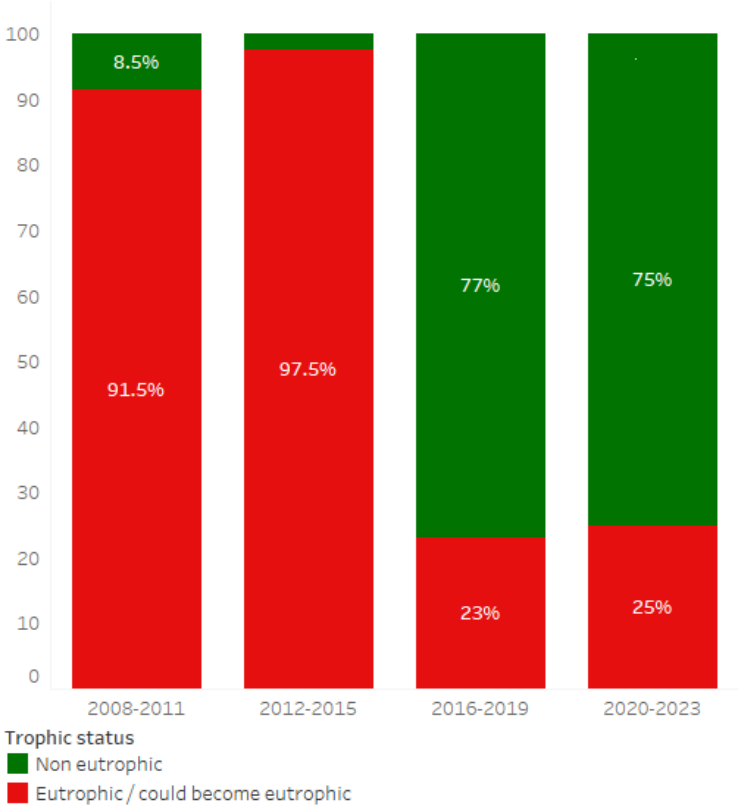
Figure 27 – Map of trophic status in rivers and share of monitoring points by trophic class in the reporting period 2020-2023




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

Compared to the previous reporting period, the share of eutrophic/could become eutrophic monitoring points increased from 23.0% to 25.0%. The graph below presents the shares of monitoring points according to their trophic status in the last four reporting periods. For the reporting periods 2008-2011 and 2012-2015 the assessment of the trophic state was reported differently than for the periods 2016-2019 and 2020-2023.

Figure 28 – Share of monitoring points in rivers by class of trophic status in the current and previous reporting periods

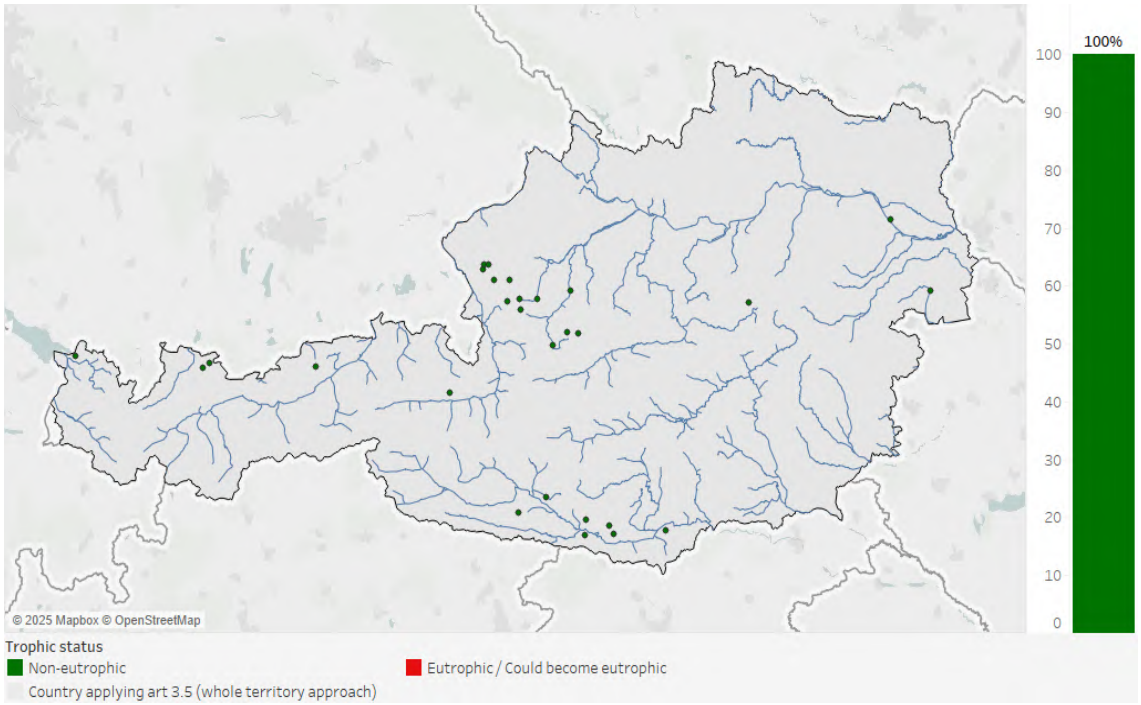



Note: The percentages below 5% are not labelled.

## Lakes and water reservoirs

No 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 29 – Map of trophic status in lakes/water reservoirs and share of monitoring points by trophic class in the reporting period 2020-2023



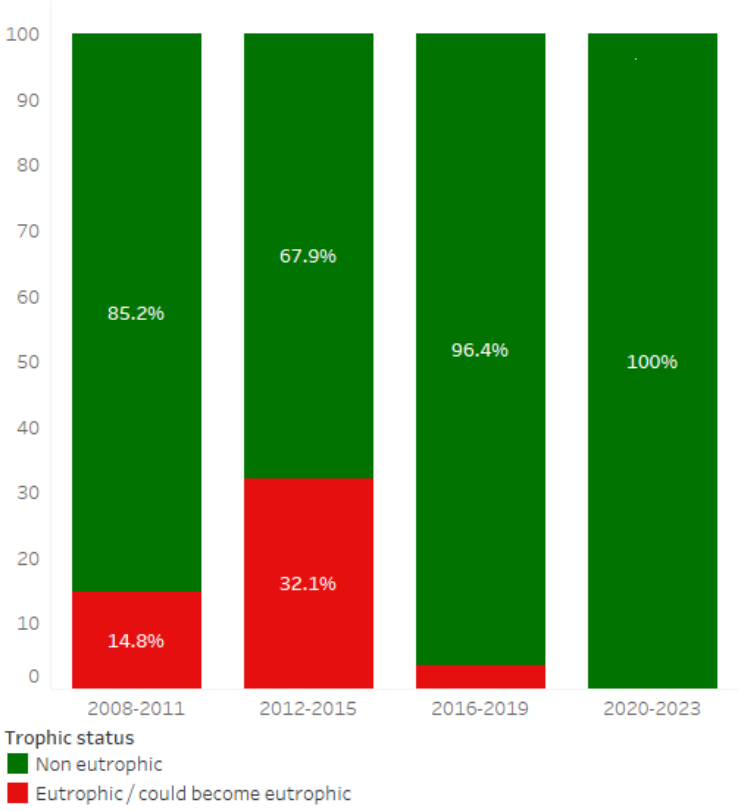

Note: In the map, eutrophic/could become eutrophic monitoring points are plotted on top.

Table 10 – 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 | 100 | 78.1% | 75.0% | 25.0% |
| Lakes/reservoirs | 28 | 21.9% | 100.0% | |
| Total | 128 | 100.0% | 80.5% | 19.5% |

Compared to the previous reporting period, the share of eutrophic/could become eutrophic monitoring points decreased from 3.6% to 0%. The graph below presents the shares of monitoring points according to their trophic status in the last four reporting periods. For the reporting periods 2008-2011 and 2012-2015 the assessment of the trophic state was reported differently than for the periods 2016-2019 and 2020-2023.

Figure 30 – Share of monitoring points in lakes/water reservoirs by class of trophic status in the current and previous reporting periods-

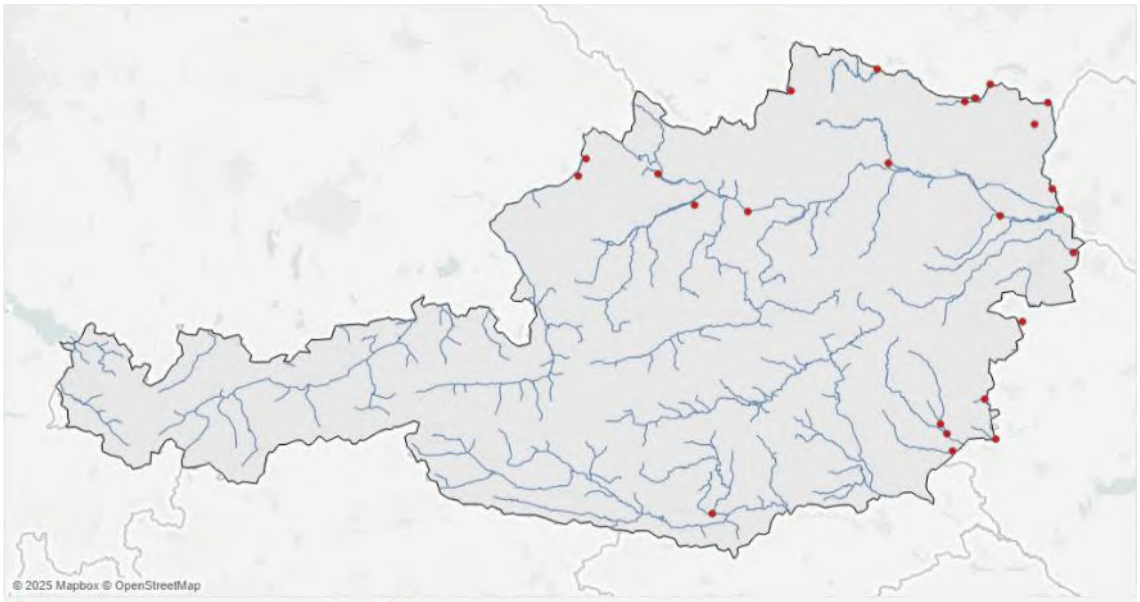



Note: The percentages below 5% are not labelled.

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

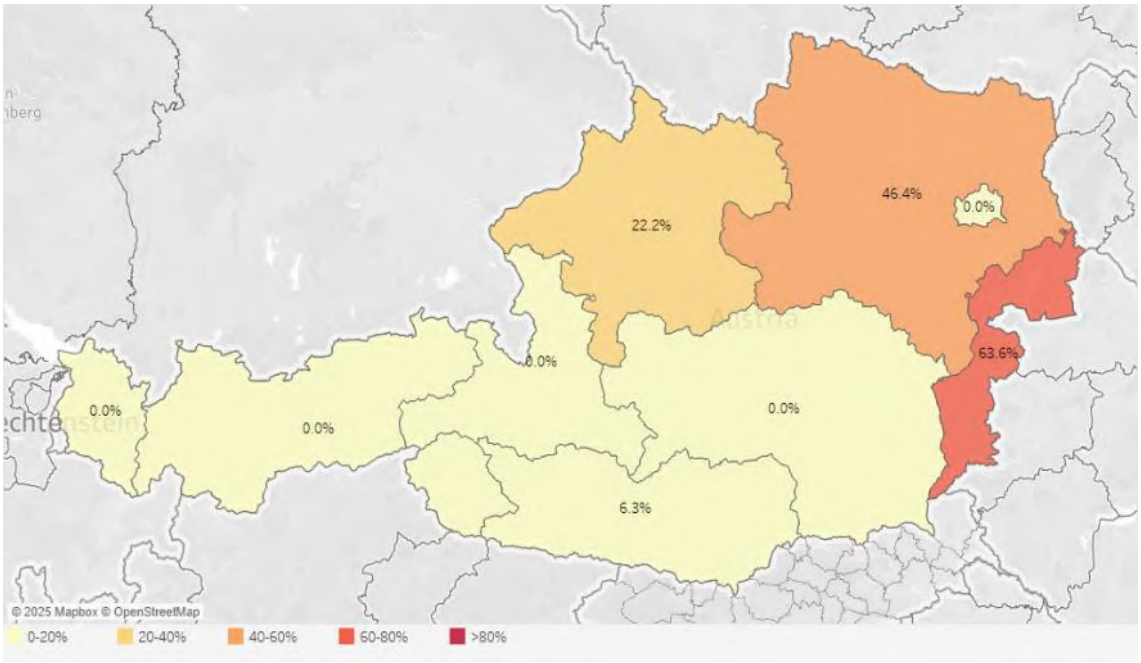
Figure 31 – Eutrophic/could become eutrophic monitoring points




| | inside NVZ | Total |
|---|---|---|
| Rivers | 25 | 25 |
| Total | 25 | 25 |

The highest share of the hotspots is in Burgenland (63.6%), Lower Austria (46.4%) and Upper Austria (22.2%).

Figure 32 – 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 first action programme dates from 1999 and has since been updated multiple times. The current action programme of Austria is published in the Federal Law Gazette (BGBl. II Nr. 495/2022). It entered into force on 01.01.2023. It is the sixth action programme and is implemented throughout the whole country. Some areas with a higher nitrate load or increased load risk requiring enhanced actions have been designated. In 2024, two amendments were introduced as described by BGBl. II Nr. 198/2024 and BGBl. II Nr. 277/2024. These amendments introduced some minor changes such as some new definitions and specifications on the fertiliser prohibition period. The Code of Good Agricultural Practices (CGAP) has been incorporated into the Austrian action programme.

The action programme adopted in 2023 introduced changes to the requirements regarding the autumn fertilisation on arable land as well the prohibition period. In particular, it removed the possibility of a temporary change in the prohibition periods. The application limits have been strengthened by taking into account new N input factors and a minimum soil nitrogen content upon the calculation of the fertiliser dose, and by introducing fertiliser limits in vineyards. The record keeping obligation was extended and a specification was introduced ensuring that manure storage on farms must always take place on sealed areas and that the leachate must be collected in technically sealed storage rooms. The action programme also introduced the obligation of a buffer strip of

3 meters covered with plants all year round next to water bodies, and a shorter maximum permitted incorporation period. Additional changes applicable to areas with an increased risk include: lower fertiliser limits for arable crops and for vineyards, additional rules on record keeping obligations and carrying out a nitrogen balance that includes an impact-related annual nitrogen balance after harvest.

A consolidated overview of the action programme currently in force is provided in a separate document ([24]).

## 7.2. Controls

Compliance with the requirements of the action programme is monitored by the Water Supervisory Authority (Gewässeraufsicht) and by Agrarmarkt Austria as conditionally controls under the CAP. Controls include both administrative and on-site checks. For at least 1 % of the holdings, compliance with the requirements of the nitrates action programme is checked on site (3 612 on-site checks during the period 2020-2023). Most cases of non-compliance (6.8 % of the controls) concerned the manure storage requirement, due to no or insufficient capacity for storage of farm manure or due to a missing leak-proof certificate. In 5.0 % of the controls, non-compliance was found on the rules for field stacks: the distance from surface water was not respected, there was insufficient preliminary storage, or the field stack was not re-sited or emptied on time. The third main type of non-compliance (3.1 % of the controls) concerned record keeping, in particular the nitrogen documentation, with unavailable or incomplete records for the holding as a whole and/or for individual crops. Other types of non-compliance were detected in less than 2.0 % of the controls. The implementation report does not elaborate on the main difficulties encountered in the implementation of the measures of the action programme.

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

# 8. WATER QUALITY OUTLOOK

It is expected that nitrate loads can fall further, in particular in areas that currently have high nitrate concentrations, thanks to the measures taken. In most porous aquifers, however, it will take some time for the expected decline to become apparent due to the long retention times in groundwater. The favourable conditions reported so far in large parts of Austria, where nitrate concentrations have been comparatively low and stable for years, are expected to continue.

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of the European Union