
Early insights indicator report
**Nitrogen concentrations in
selected major rivers**
January-June 2024

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Early insights nitrogen concentration indicator in selected major rivers

Jan-Jun 2024

Overview

The purpose of this report is to provide an early insight into nitrogen concentrations in major rivers in Ireland on a 6-monthly basis, in advance of the more comprehensive annual water quality assessments which are published on an annual basis.

The report is based on the nitrate concentration data for 20 representative river monitoring sites which are situated at the most downstream monitoring locations on the major rivers around Ireland. A map of the locations of the sites and the catchments they represent is presented in Figure 1. This current report includes data for January to June 2024 inclusive. Comparisons are made with the same period in previous years for context. Analysis is also presented to demonstrate how representative these early insight indicator data when compared to data for the full national monitoring dataset which will be published in June 2025.

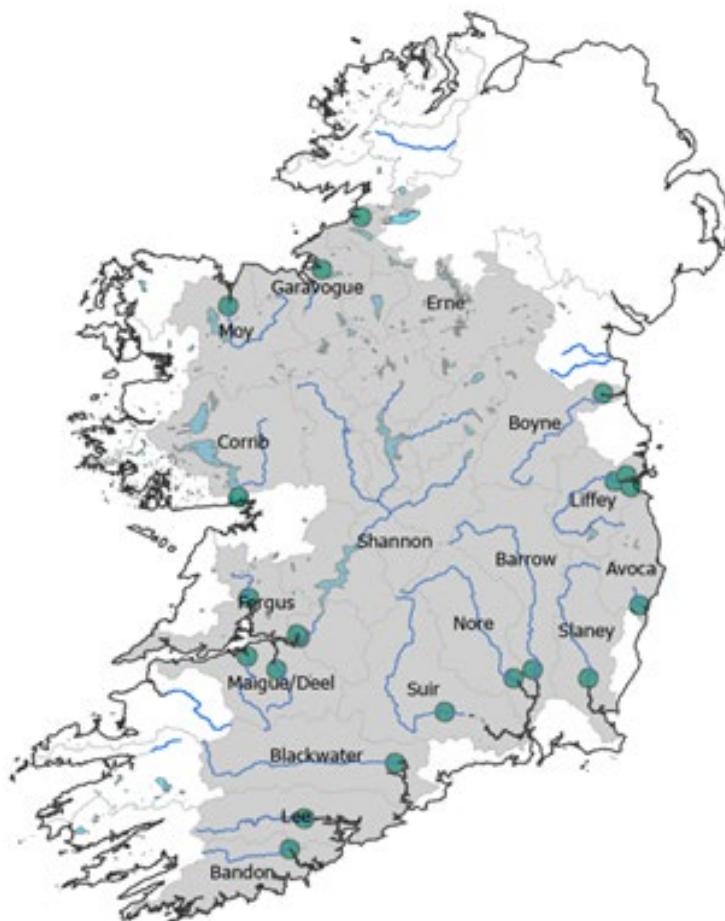


Figure 1. Location of the early insights nitrogen indicator monitoring stations and their catchments.

Early insight nitrogen concentration data at representative sites for Jan-Jun 2024

Figure 2 shows the average nitrogen concentrations for the period January to June for each year between 2016 and 2024, at the 20 representative sites. The data suggest that nitrogen concentrations in waters nationally have reduced in the first half of 2024 relative to other years, and that they are at the lowest they have been since 2016.

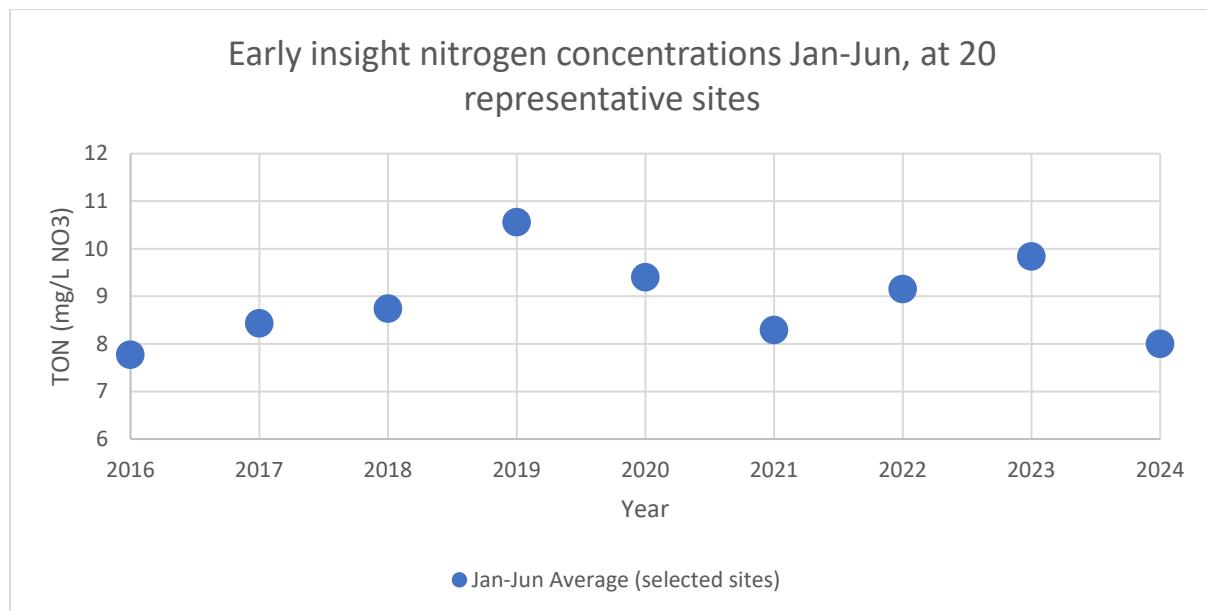


Figure 2. Early insight nitrogen concentrations for the Jan-Jun period of each year from 2016 to 2024 at 20 representative sites located around the country

Early insight nitrogen concentration data at representative sites inside and outside the Catchments of Concern

Successive EPA reports have identified that nitrate concentrations are too high in the east, southeast and south of the country and that there are a number of Catchments of Concern¹ in those areas where nitrate concentrations need to be reduced to improve water quality. Figure 3 compares the Jan-Jun nitrate concentrations at the early insight representative monitoring sites that are located inside the Catchments of Concern, with the equivalent data for catchments in the west and northwest of the country which are currently largely meeting their nitrogen targets.

The data show that while the overall trajectory of change over time is proportionally similar inside and outside the Catchments of Concern, there is a marked difference in the absolute nitrate concentrations between the two groups of sites, which reflects the differences in farm practices, soil types and climate conditions in these regions.

¹ <https://www.catchments.ie/assessment-of-the-catchments-that-need-reductions-in-nitrogen-concentrations-to-achieve-water-quality-objectives/>

Early insight nitrogen concentrations Jan-Jun, for representative sites inside and outside the Catchments of Concern

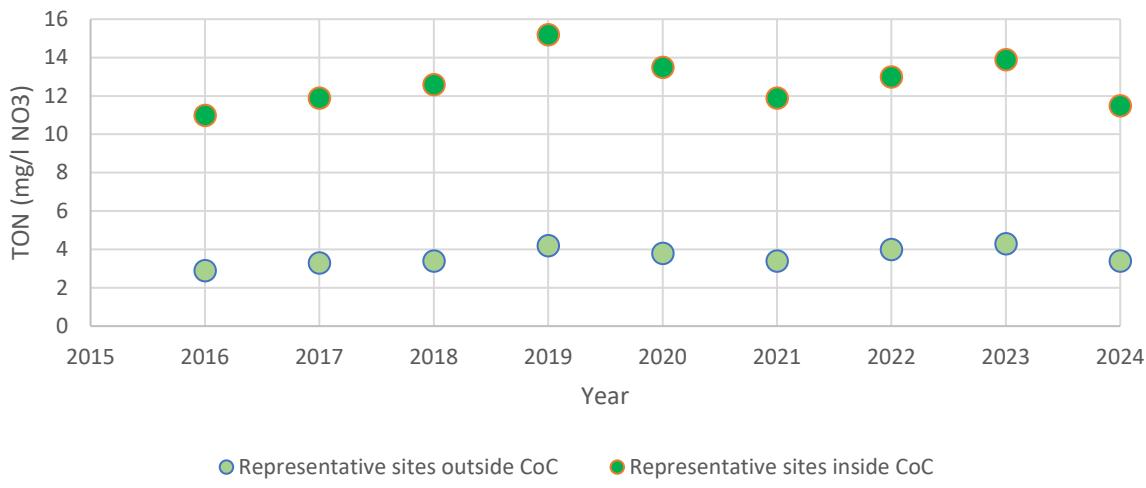


Figure 3. Early insight nitrogen concentrations for the Jan-Jun period of each year from 2016 to 2024, in major rivers inside the Catchments of Concern in the east, southeast and south where nitrate levels are too high, and in major rivers outside the Catchments of Concern in the west and northwest where the nitrogen targets are largely being met.

Background to the analysis

This analysis has been carried out using data from 20 representative locations at the most downstream monitored sites in 20 of the State's major river systems before they enter the transitional waters. These 20 representative sites have been selected for this analysis because:

- they are monitored on a monthly basis and therefore have more data available than many of the other monitoring sites in the Nitrates Directive Monitoring network, which makes them more suited to a 6-monthly assessment. The full Nitrates Directive Monitoring network comprises over 1500 sites across all waterbody types².
- as they are located at the downstream end of the large major river systems, they capture the majority of the national nitrogen load flowing to the marine environment. They are therefore representative of the nitrogen conditions nationally.
- the relatively small number of sites facilitates the additional manual data quality control procedures that need to be carried out in a timely manner outside of standard EPA processes.

The more comprehensive annual assessments of nitrogen and phosphorus concentrations for all waters are published annually for the preceding year. This report is based on data for 20 representative river monitoring sites and provides an early insight only in between the annual water quality reports.

Nitrogen concentration data can be downloaded from Catchments.ie for individual monitored waterbodies as soon as the data become available, which can range from weeks to months from the date the sample was taken, depending on the station.

² [Water-quality-monitoring-report-on-Nitrogen-and-Phosphorus-in-Irish-Waters-2023-for-publication.pdf](https://www.catchments.ie/Water-quality-monitoring-report-on-Nitrogen-and-Phosphorus-in-Irish-Waters-2023-for-publication.pdf)

Comparability of data from these 20 representative sites with data from the full national monitoring network

To provide context for this report, an analysis has been carried out to demonstrate (a) how representative the data for these 20 sites are compared to data for the full national dataset, and (b) how representative the data for the first 6 months of a given year are, relative to the whole year of data. This analysis is presented in Appendix 1. Based on historical relationships between datasets, it is considered that the first 6 months of nitrogen data for the early insights representative sites provides a useful early indication of the likely national picture over the full year. A full assessment will be presented in the annual report which will be published in 2025.

Conclusion

The evidence suggests that early insight nitrogen concentrations at the 20 representative sites, for the first 6 months of 2024, have reduced compared to the same period in previous years. An analysis shows that this is likely to be representative of what happens nationally over the full year. A full assessment of the 2024 annual nitrogen concentration data will be published in 2025. The next 6-monthly update for the early insight indicator will be published in Q1 of 2025.

Appendix 1

How representative are the 20 early insights indicator sites compared to the full national nitrates monitoring dataset?

Figure 4 demonstrates how representative the 20 early insight indicator sites are compared to the full national nitrates monitoring dataset. The data show that the annual average nitrogen concentration data at the representative sites generally track with the same trajectory as the annual average concentrations from the full national monitoring dataset, although they are typically slightly higher (up to 5%) overall. The representative sites therefore present a slightly more pessimistic view of nitrate concentrations than the full national monitoring network, but overall they are considered to be broadly representative.

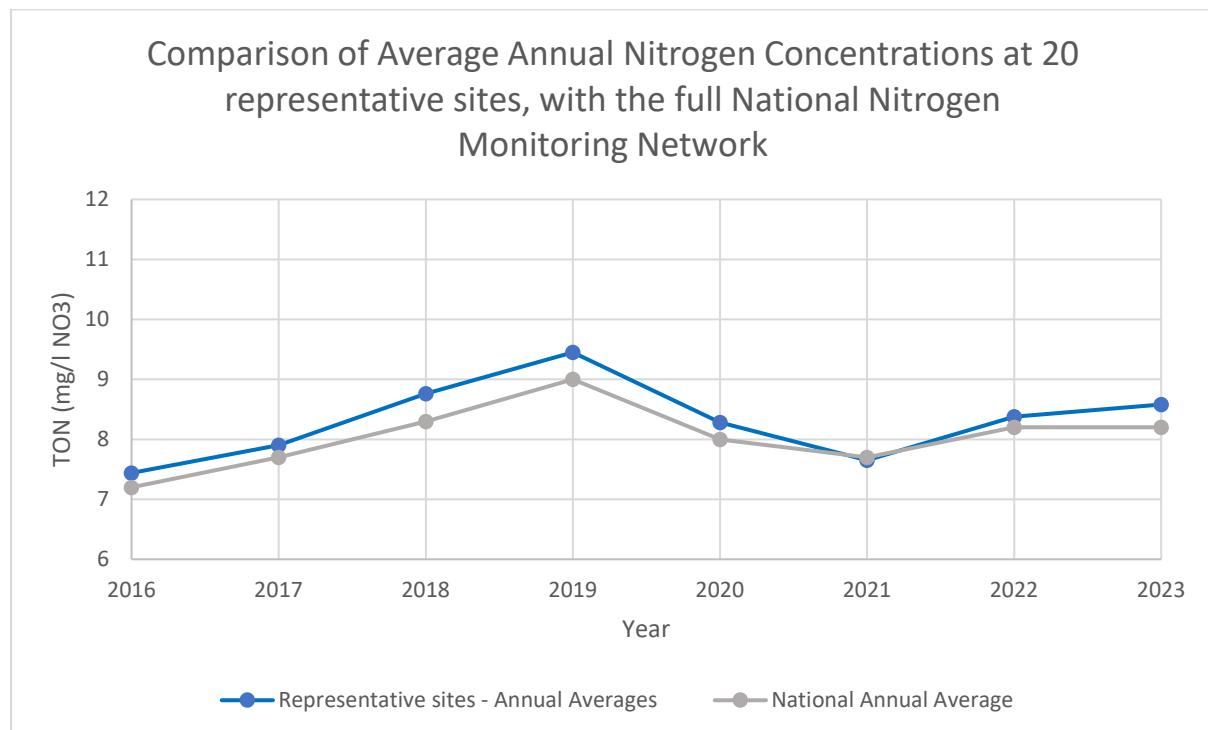


Figure 4. Comparison of the annual average nitrogen concentrations at the 20 representative sites compared to the national monitoring network, from 2016-2023.

How representative are the data for the first 6 months of the year, in comparison to the whole year, at the 20 representative sites?

Figure 5 demonstrates how representative the data for the first 6 months of a given year are at the representative sites, relative to the 12-month dataset at the same sites. The data show that the concentrations during the first 6 months of each year largely track with the same trajectory as the annual averages, although once again, at slightly higher concentrations (up to 15%) overall. The data for the first 6-months of the year therefore show a slightly more pessimistic outlook than the annual average. The data for the first 6 months of 2024 are also included for reference.

Comparison of the Jan-Jun nitrogen concentrations compared to the annual average concentrations, at 20 representative sites

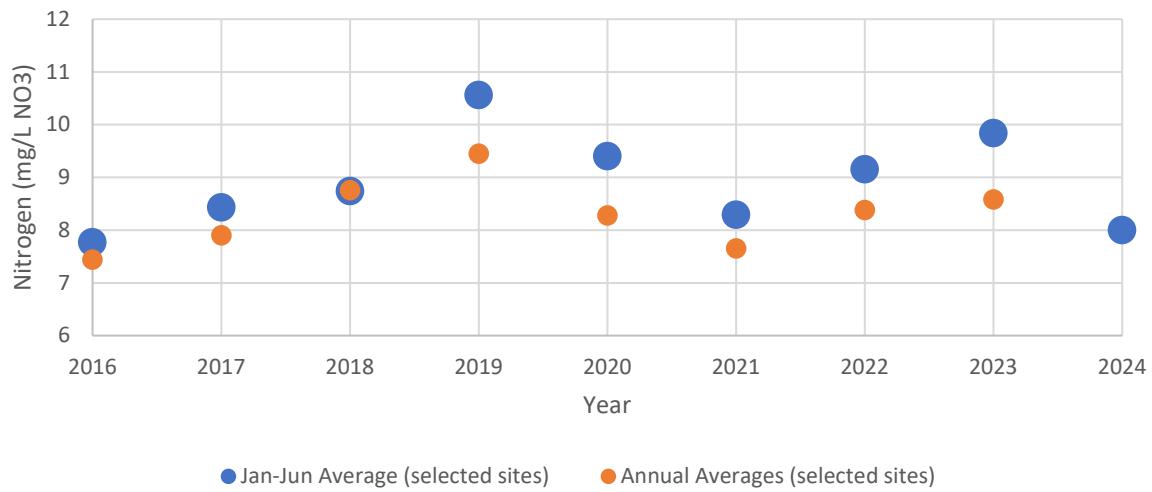


Figure 5. Comparison of the average nitrogen concentrations for the period Jan-Jun and the annual average concentrations, at the 20 representative sites.

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