Report on River Water Quality in County Louth 2013

Contents

1. Overview

This report provides an assessment of river water quality in County Louth in 2013. It should be read in conjunction with the other data and assessments provided in the Integrated Water Quality Assessment for the North Western and Neagh Bann River Basin Districts 2013.

The report is presented in the following sections:
(i) The first section provides a general assessment of the state of rivers in the county, with graphs showing trends in annual average ortho-phosphate and nitrate concentrations in the county since 1978.
(ii) The second section identifies the river sites for further investigation and the suspected causes of pollution. They were selected on the basis of having a Q value less than 4 (i.e. moderate or worse status), poor chemistry, or there were other significant pollution issues.
(iii) The third section provides a summary assessment of water quality for each river, having regard to the relevant Q values and WFD criteria for the four key physico-chemical parameters BOD, ammonia, ortho-phosphate and nitrate.
(iv) Sections four and five include long-term graphs for both ortho-phosphate and nitrate in Louth rivers. These are based on three year rolling means.
(v) Finally there are a set of maps which provide an indication of river water quality based on the four key physico-chemical parameters. These maps compare the annual average for each parameter at each river station against the relevant EQS.

2. General Assessment & Trends

Compared to the national picture, water quality in County Louth remains quite poor. In terms of biological Q Values, just 26% of river stations in the county are at least 'Good' status (Q value $\geq$ 4) compared with 65% nationally.

The general physico-chemical data suggests a similar level of water quality in 2013 compared to 2012. For ammonia and BOD, there was an increase in the percentage of stations whose annual mean exceeded the EQS for 'good' status while for ortho-phosphate and nitrate, there was a decrease in 2013 compared to 2012.

Parameter	2013 (%)	2012 (%)
Ammonia	39.1	26.1
ortho-phosphate	52.2	60.9
Nitrate	56.5	65.2
BOD	34.8	30.4

Table 1. % of River stations that exceeded the EQS for 'good' status for each parameter in 2013 compared to 2012.

River Name	River Code / Station Number
DEE	06D01-0710
WHITE (LOUTH)	06W01-0500
WHITE (LOUTH)	06W01-0400
MATTOCK	07M01-0300
BALLYMASCANLAN	06B02-0100

Table 2. River stations with the highest average ammonia concentration in 2013 (in decreasing order).

River Name	River Code / Station Number
TERMONFECKIN	06T01-0250
MATTOCK	07M01-0100
DEE	06D01-0710
WHITE (LOUTH)	06W01-0500
WHITE (LOUTH)	06W01-0400

Table 3. River stations with the highest average ortho-phosphate concentration in 2013 (in decreasing order).

River Name	River Code / Station Number
MATTOCK	07M01-0300
WHITE (LOUTH)	06W01-0500
WHITE (LOUTH)	06W01-0400
MATTOCK	07M01-0200
MATTOCK	07M01-0100

Table 4. River stations with the highest average nitrate concentration in 2013 (in decreasing order).

River Name	River Code / Station Number
WHITE (LOUTH)	06W01-0500
DEE	06D01-0710
MATTOCK	07M01-0200
DEE	06D01-0600
BALLYMASCANLAN	06B02-0100

Table 5. River stations with the highest average BOD concentration in 2013 (in decreasing order).

Overall ortho-phosphate levels in rivers in County Louth have fallen steadily since the mid to late 1990s but they still remain higher than they were in the late 1970s and early 1980s. The challenge of reducing levels still further remains a considerable one.

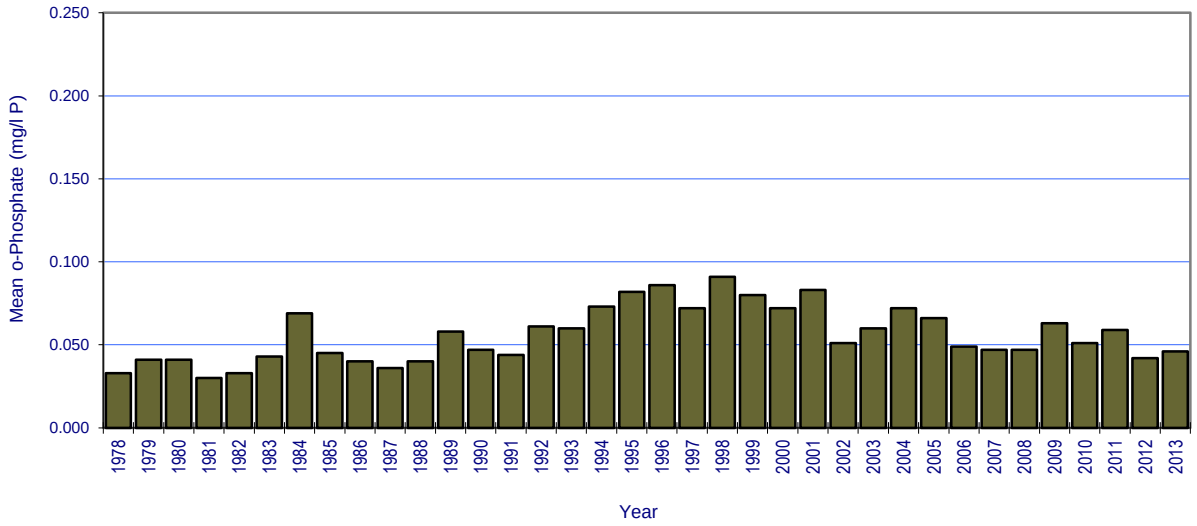


Fig 1. Annual average ortho-phosphate levels in Louth rivers 1978 – 2013.

The situation as regards long-term trends for nitrate is similar to that for ortho-phosphate though the fall in levels since the mid to late 1990s is less dramatic and indeed they have plateaued out over the last few years. Levels remain too high and like ortho-phosphate they are higher than they were in the late 1970s and early 1980s.

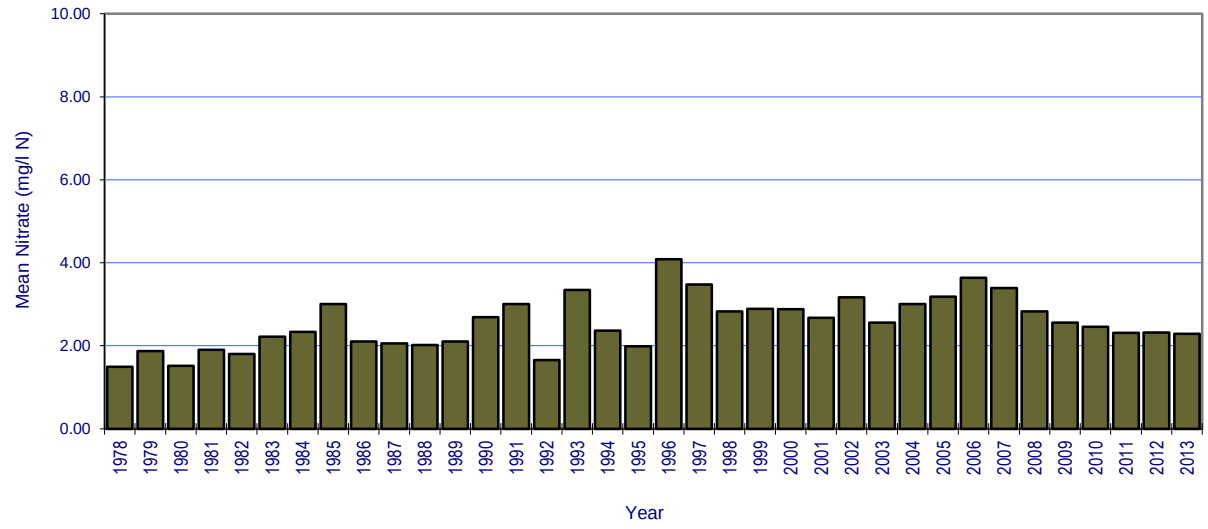


Fig 2. Annual average nitrate levels in Louth rivers 1978 – 2013.

Historically, ammonia levels in Louth rivers have been relatively low but there has been a general increase in levels since the mid 1990s.

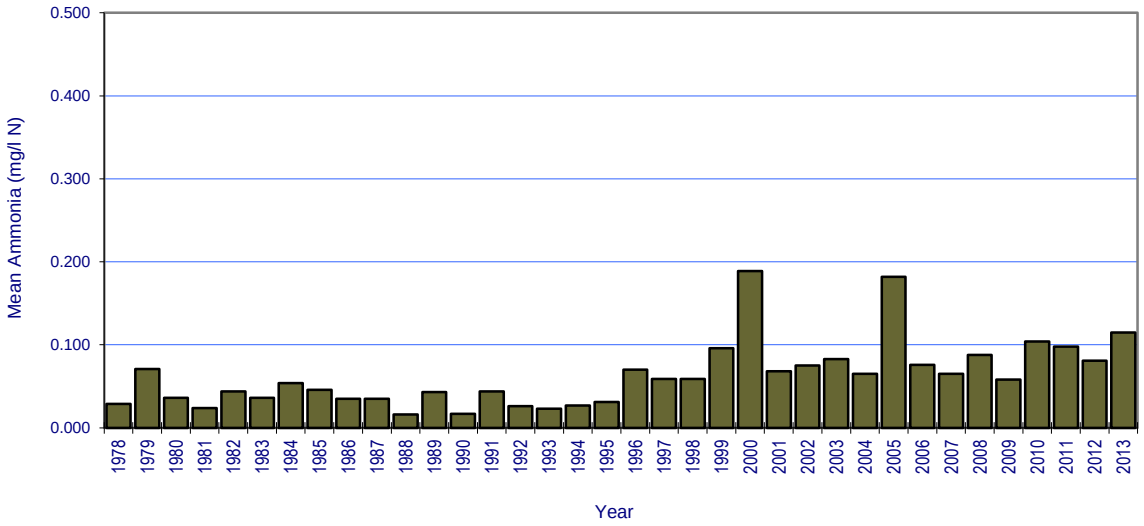


Fig 3. Annual average ammonia levels in Louth rivers 1978 – 2013.

3. Sites for Further Investigation

There are over 900 river sites of less than good status across the country – that is they have a biological Q value of 3-4 or less. There are currently 23 river stations in County Louth that have a Q value of 3-4 or less. These have been identified as sites requiring further work to bring the biological Q value up to at least 4. It is recommended that investigative monitoring is used where the precise cause of the pollution is not clearly known and where it is anticipated that such monitoring may ultimately help to identify measures that would improve the biological Q value. Table 6 lists all these sites along with the suspected causes and any relevant additional comments.

Louth is a predominantly rural county and diffuse pollution from agriculture as well as small point sources such as DWWTS and farmyards are significant contributory pressures in this area. In addition, discharges from wastewater treatment plants, storm water overflows and industrial discharges are the more predominant pollution sources in the more urbanised areas. It must be borne in mind that multiple pressures may impact on any given site. Further work is required also in order to better distinguish between the impacts of DWWTS and diffuse agricultural sources. The pathways by which pollutants reach water are similar for those emanating from DWWTS and from agricultural sources, whether farmyard or field. A new catchment index which will provide a relative risk weighting for individual catchments is currently under development.

The EPA is responsible for the licensing or certification of all discharges to the aquatic environment from sewerage systems owned, managed and operated by Irish Water. The licensing and certification authorisation process was introduced on a phased basis commencing on 14th December 2007 in accordance with the requirements of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007). Up to the end of 2013 there have been four certificates and one licence issued in County Louth. These were all issued prior to 2013.

It is apparent that diffuse agricultural pollution is a key pressure in County Louth. It has been identified as a contributory factor in 16 out of the 21 Sites for Further Investigation listed in table 6. The use of risk assessments such as the Small Stream Risk Score (SSRS) can be useful in tracking the causes of such pollution. Animal access to rivers as well as spreading of wastes produced by intensive animal rearing enterprises such as pigs and poultry operations are also issues that need to be addresses. Food Harvest 2020 has the potential to put further pressure on water quality in County Louth.

The focus on domestic waste water treatment systems (DWWTS) has continued to increase in recent years. In 2013, a National Inspection Plan[1] for DWWTS was published in response to the European Court of Justice finding that Ireland had not met the legal obligation required by the 1975 Waste Framework Directive to regulate the waste water generated in our unsewered areas. Inspections commenced in 2013, starting with areas at greatest risk of damage to human health or the environment. In the period 01/07/2013 to 28/02/2014, 18 out of a target of 18 inspections (100%) had been carried out in County Louth. 11 of these inspections (61%) were deemed to be non-compliant.

River	Code	Location	Q Value	Year	Key Pressures	Comments
Ballymascanlon	06B02-0100	Jonesborough Br	3-4	2012	Cross border illegal oil activities; Jonesborough WWTP; storm water overflows	
Castletown	06C01-0050	Ballybinaby Br	3	2012	Diffuse agricultural influences; Mixed rural cross border influences as well as WWTP discharges.	
Castletown	06C01-0200	Ford's Bridge	3	2012	Diffuse agricultural and mixed rural influences.	
Castletown	06C01-0310	Weir d/s John's Br	3-4	2012	Diffuse agricultural and mixed rural influences.	
Dee	06C01-0670	1km u/s Ardee Br	3	2012	Diffuse agricultural and mixed rural influences.	
Dee	06C01-0680	Dawson's Br	3	2012	Urbanisation influences.	
Dee	06C01-0710	150 m d/s Old Rly Br (LHS)	3	2011	Diffuse agricultural influences; Ardee WWTP; Storm overflows.	Historic channelisation of the river.
Dee	06C01-1000	Br at Drumcar	3-4	2009	Diffuse agricultural influences.	Historic channelisation of the river.
Dee	06C01-1100	At Williamstown House	3	2012	Diffuse agricultural influences.	Historic channelisation of the river.
Flurry	06F02-0100	Flurry Br	3-4	2011	Diffuse agricultural influences; possible cross border oil activities.	
Flurry	06F02-0300	Curralhir Br	3-4	2011	Diffuse agricultural influences.	

River	Code	Location	Q Value	Year	Key Pressures	Comments
Glyde	06G02-0600	Br W of Mullacrew	3-4	2012	Diffuse agricultural influences.	
Glyde	06G02-0700	Tallanstown Br	3-4	2012	Urbanisation influences from village environs.	
Glyde	06G02-0900	Mapastown Br	3-4	2012	Diffuse agricultural influences.	
Glyde	06G02-1200	Castlebellingham Br	3-4	2012	Urbanisation influences from village environs.	
Glyde	06G02-1230	200 m d/s Castlebellingham Br	3-4	2012	Urbanisation influences from village environs.	
Mattock	07M01-0200	Wood Mill Br (u/s Devlins R Confl)	3-4	2012	Diffuse agricultural influences; point source WWTP discharges.	Cattle access noted as an issue in 2011. Low flows & water abstraction also impact.
Proules	06P01-0600	Br at Killanny	3-4	2012	Agricultural influences	
Termonfeckin	06T01-0250	Sandpit Br	3	2011	Diffuse agricultural influences.	Low flows also impact.
Termonfeckin	06T01-0400	Br in Termonfeckin	3	2011	Diffuse agricultural influences.	
White (Louth)	06W01-0200	Athclare Br	3	2011	Diffuse agricultural influences.	
White (Louth)	06W01-0400	500m d/s Dunleer Ry Br	3	2012	Urbanisation influences from village environs. Diffuse agricultural influences.	
White (Louth)	06W01-0500	Coneyburrow Br	3	2011	Diffuse agricultural influences.	Cattle access a major problem at this station.

Table 6. Sites for further investigation in County Louth.

4. 2013 Summary of River Water Quality in County Louth

These assessments are based on physico-chemical measurements made during 2013, and the most recent Q values and assessments of the river biologists.

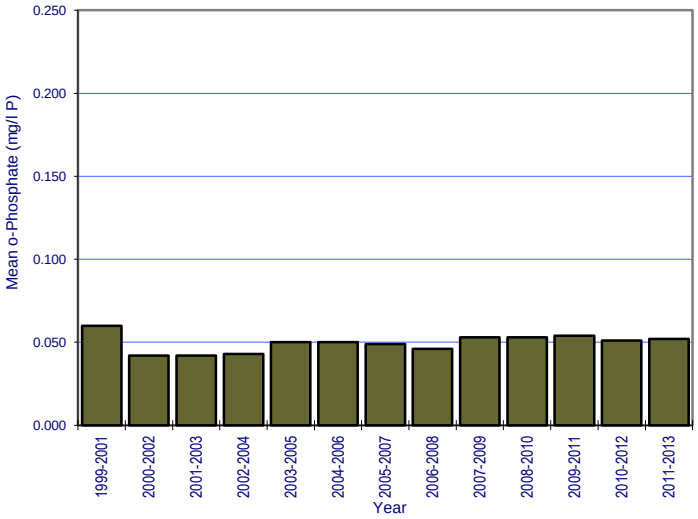
River	Remarks	Change from 2012
Ballymascanlon **06B02-0100 Q3-4 (2012)**	Tributary of the Flurry. Continuing evidence of intermittent pollution with elevated ammonia and ortho-phosphate levels observed on occasion. The improvement to moderate ecological condition recorded in 2009 and 2010 was maintained in 2012.	No significant change.
Big (Louth) **06B01-0100 Q4-5 (2011)** **06B01-0300 Q4-5 (2011)**	Physico-chemical monitoring carried out at station 0100. 2013 data continues to indicate satisfactory water quality. A welcome return to highly satisfactory ecological conditions was noted on the Big River when sampled in September 2011, a situation that was last observed in 1994.	No significant change in nutrient levels though general improvement in ecological conditions in 2011.
Castletown **06C01-0050 Q3 (2012)** **06C01-0200 Q3 (2012)** **06C01-0310 Q3-4 (2012)**	Physico-chemical monitoring carried out at station 0200 only. Slightly ortho-phosphate levels are evidence of continuing slight intermittent pollution. Continuing unsatisfactory conditions were observed at Ballybinaby Br. At Ford's Br, which was last assessed in 2006, a slight decline from moderate to poor ecological condition was recorded. At the Weir d/s of John's Br a slight decline from good to moderate ecological condition was recorded, reversing the improvement recorded at this site between 2006 and 2009.	Overall, no significant change from 2012.
Cully Water **06C02-0200 Q4 (2012)**	Tributary of the Kilcurry. Apart from slightly elevated ortho-phosphate and nitrate levels, 2013 physico-chemical data indicates satisfactory conditions. In September 2012, the macroinvertebrate fauna indicated continuing good ecological conditions.	Overall, no significant change from 2012.
Dee **06D01-0016 Q3-4 (2012)** **06D01-0035 Q3 (2012)** **06D01-0150 Q3 (2012)** **06D01-0200 Q3-4 (2012)** **06D01-0360 Q4 (2012)** **06D01-0600** **06D01-0670 Q3 (2012)** **06D01-0680 Q3 (2012)** **06D01-0710 Q3 (2011)** **06D01-1000 Q3 (2011)** **06D01-1100 Q3 (2012)**	Tributary of the Glyde. Physico-chemical monitoring indicates that water quality remains unsatisfactory with elevated nutrient levels observed on occasion at stations 0710, 1000 & 1100 in particular in 2013. The macroinvertebrate fauna indicated unsatisfactory conditions at all sites assessed on the River Dee in September 2012, with the exception of Rockfield Bridge (0360) where satisfactory ecological condition was recorded.	Increase in annual average ammonia and ortho-phosphate levels downstream of Ardee mainly due to the elevated levels observed in July.

Fane **06F01-0155 Q3 (2012)** **06F01-0200 Q3 (2012)** **06F01-0400 Q3 (2012)** **06F01-0500** **06F01-0650 Q4 (2012)** **06F01-0900 Q4 (2012)**	Enters the sea in Dundalk. Of the stations monitored, station 0900 is the only one in County Louth. ortho-phosphate levels are generally higher at this station than they are further upstream though they have been falling gradually since the mid-1990s. Other physico-chemical data indicates satisfactory water quality. In terms of ecological assessment, conditions are satisfactory.	Overall, no significant change observed.
Flurry **06F02-0100 Q3-4 (2011)** **06F02-0300 Q3-4 (2011)** **06F02-0700 Q4 (2011)**	Physico-chemical monitoring at station 0700 only where the 2013 data indicates satisfactory water quality. Despite a slight increase in 2009, ortho-phosphate levels have been relatively low at this station over the last ten years. A general improvement in ecological condition was noted in the Flurry in 2011, with the upper sites (0100 and 0300) now at moderate status and the upper site (0700) in good status.	No significant change observed.
Glyde **06G02-0100 Q3-4 (2012)** **06G02-0400 Q4 (2012)** **06G02-0500 Q4 (2012)** **06G02-0600 Q3-4 (2012)** **06G02-0700 Q3-4 (2012)** **06G02-0900 Q3-4 (2012)** **06G02-1200 Q3-4 (2012)** **06G02-1230 Q3-4 (2012)**	Enters the sea at Annagasson. Physico-chemical monitoring at stations 0700, 0900 & 1230 in County Louth. Elevated nitrate levels at stations 0900 & 1230 in particular in 2013 though levels have continued to fall over the last few years. Ammonia levels were elevated at station 1230 on occasion though overall significantly lower than 2012. Macroinvertebrate fauna indicated a general overall deterioration in the condition of the Glyde since 2009. Despite satisfactory ecological conditions recorded at all sites assessed in 2009, currently only the middle reaches of the river (Lagan Br (0400), Aclint Br (0500) and Br W Mullacrew (0600)) merited good ecological condition in 2012. Disappointingly, the other five sites were downgraded to moderate ecological condition.	Slight improvement in ammonia levels at station 1230, otherwise no significant change in physico-chemical levels. General drop in ecological conditions since 2009.

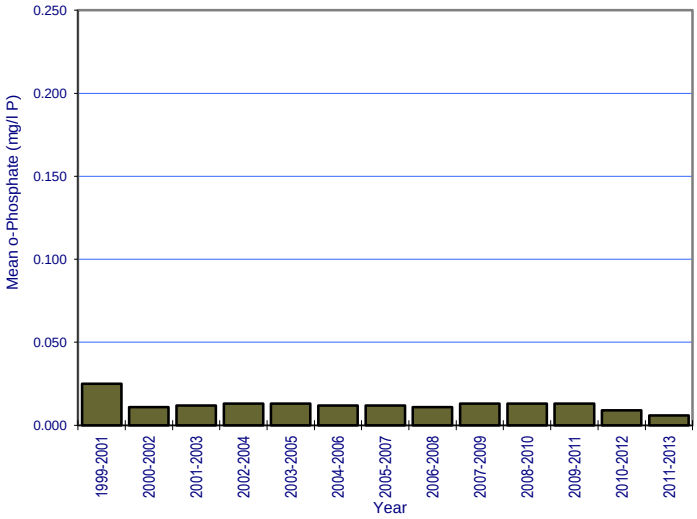
Mattock **07M01-0020 Q5 (2012)** **07M01-0050 Q3-4 (2012)** **07M01-0100 Q4* (2012)** **07M01-0200 Q3-4 (2012)** **07M01-0220 Q4 (2012)** **07M01-0300**	Tributary of the Boyne. Physico-chemical monitoring at stations 0100, 0200 & 0300. Annual average nutrient levels remain high at all stations (0300 in particular) though they have continued to fall very gradually in recent years. Satisfactory ecological conditions were noted at three of the five sites surveyed on the Mattock River in June 2012. The high diversity of pollution sensitive macroinvertebrate taxa indicated high ecological conditions in the upper reaches at Phoenixtown Bridge (0020) while good ecological conditions persist at Boyd's Bridge (0100) however excessive siltation was evident. Unsatisfactory moderate ecological conditions were noted at Collon (0050) and at Woodmill Bridge (0200). Good ecological conditions were noted in the lower reaches just downstream of the Devlins river confluence (0220) however signs of enrichment were evident with excessive siltation and algal growth noted.	No significant change from 2012.
Termonfeckin **06T01-0250 Q3 (2011)** **06T01-0400 Q3 (2011)**	Physico-chemical monitoring continued to be carried out at Sandpit Bridge (0250). 2013 data indicates that nutrient levels remain high though they have improved slightly since 2012. Continuing unsatisfactory ecological conditions recorded in the Termonfeckin stream in 2011, characterised by the dominance of pollution tolerant macroinvertebrate taxa.	Slight reduction in nutrient levels compared to 2012.
White (Louth) **06W01-0040** **06W01-0100 Q4 (2012)** **06W01-0200 Q3 (2011)** **06W01-0400 Q3 (2012)** **06W01-0500 Q3 (2011)**	Tributary of the Dee. Physico-chemical monitoring at all stations. Nutrient levels continued to be elevated on occasion in 2013, particularly at stations 0400 & 0500, consistent with intermittent pollution. Satisfactory ecological conditions were maintained in the upper reaches of the White River (New Br. 0100) in 2012. However, the lower reaches remain unsatisfactory, downstream of Dunleer Railway Bridge (0400).	Overall, no significant change observed.

5. Long-Term Trend Graphs – ortho-phosphate

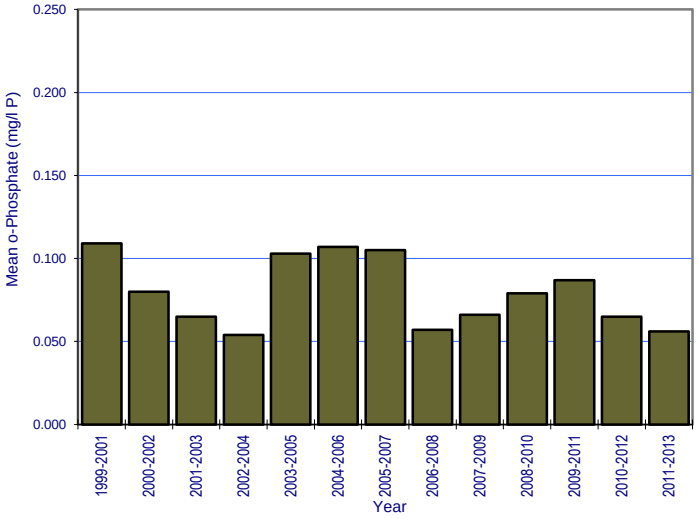
River: Ballymascanlon Station No.: 0100



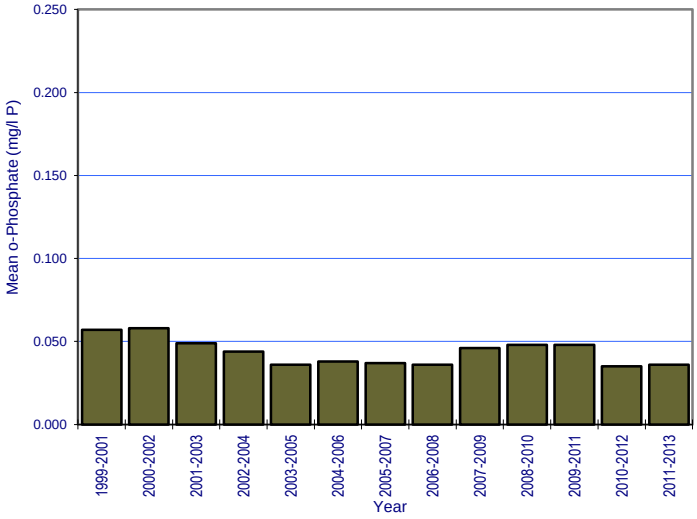
River: Big (Louth) Station No.: 0100



River: Castletown Station No.: 0200



River: Cully Water Station No.: 0200



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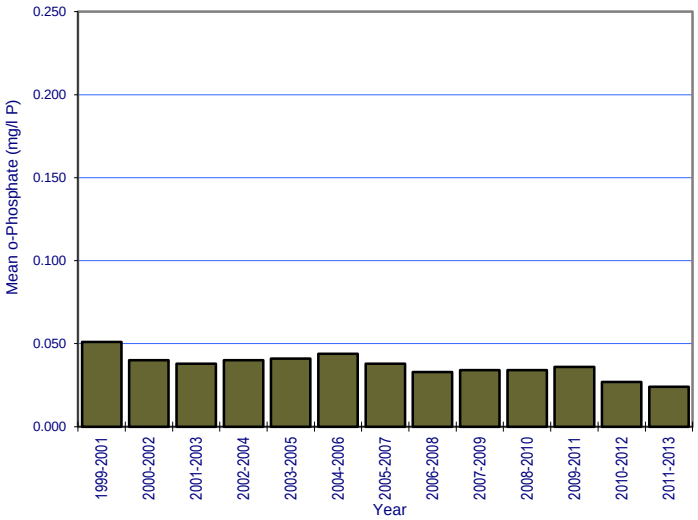

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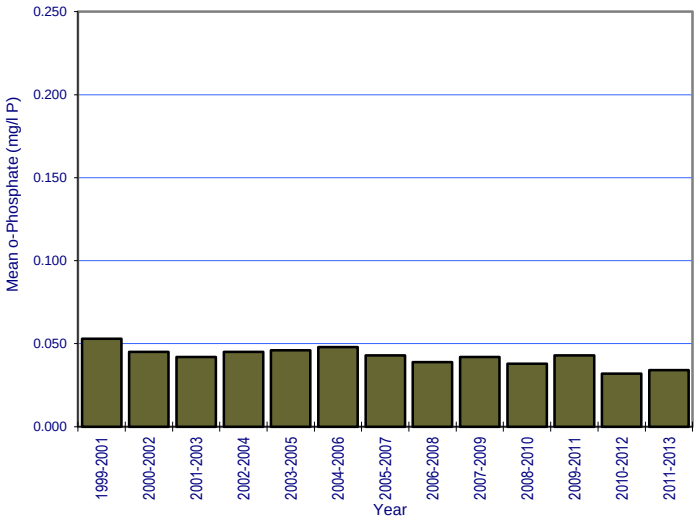

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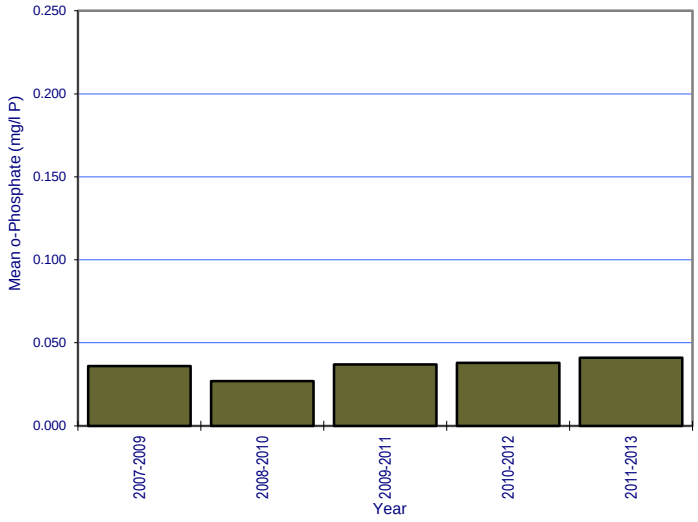

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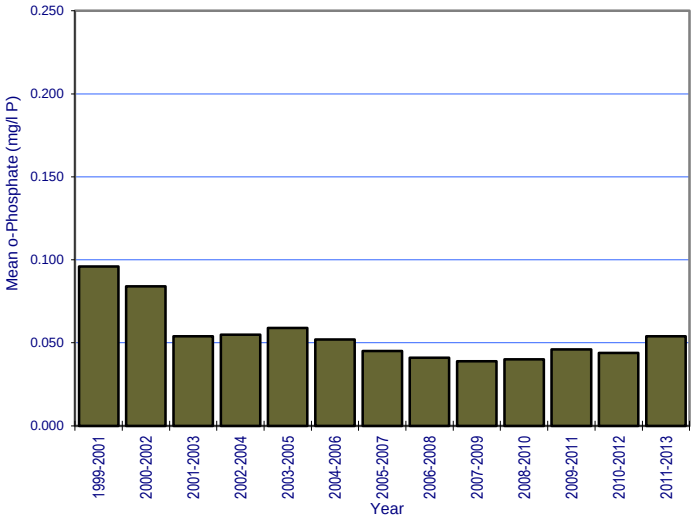

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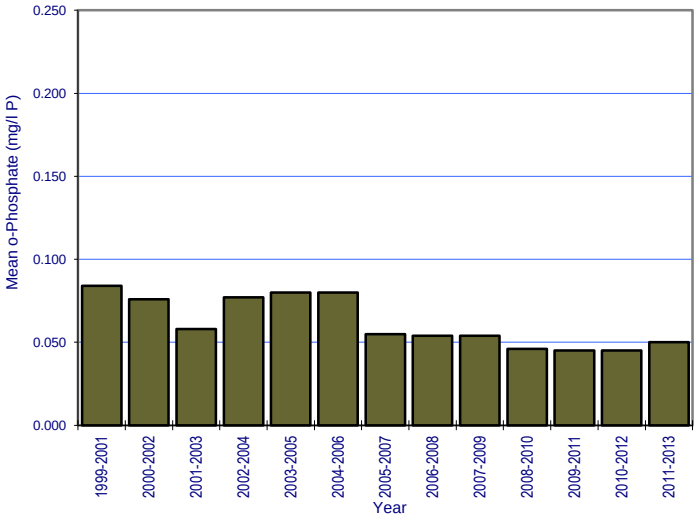

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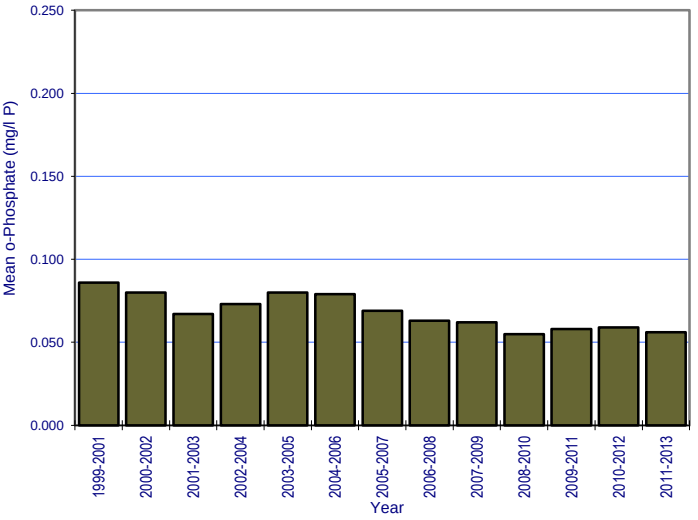
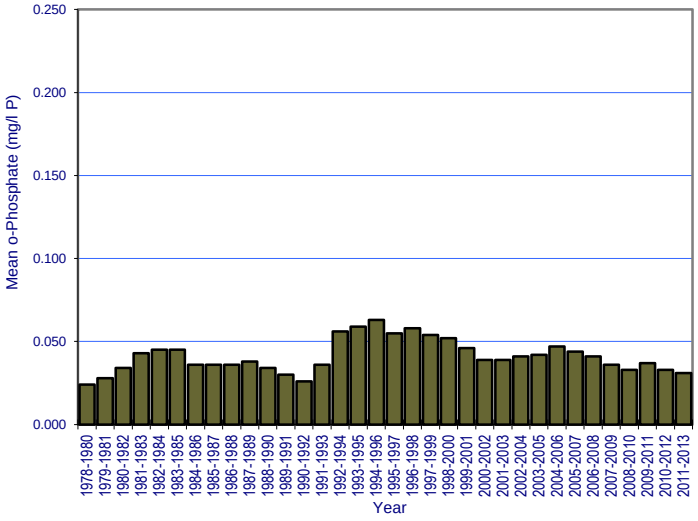
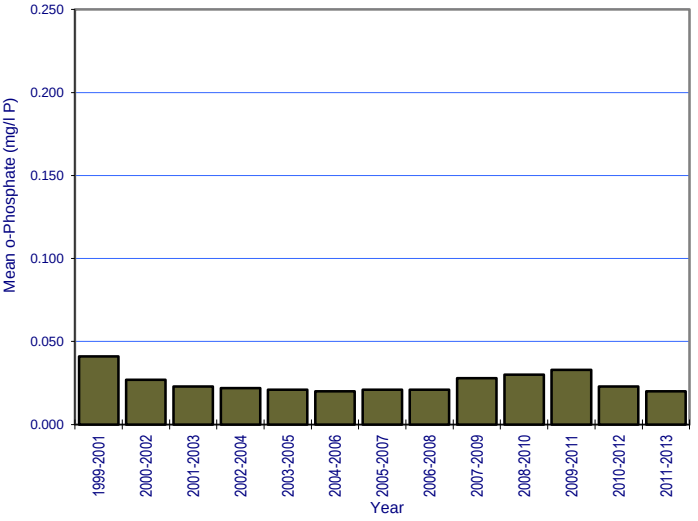


River: Fane Station No.: 0900



River: Flurry Station No.: 0700



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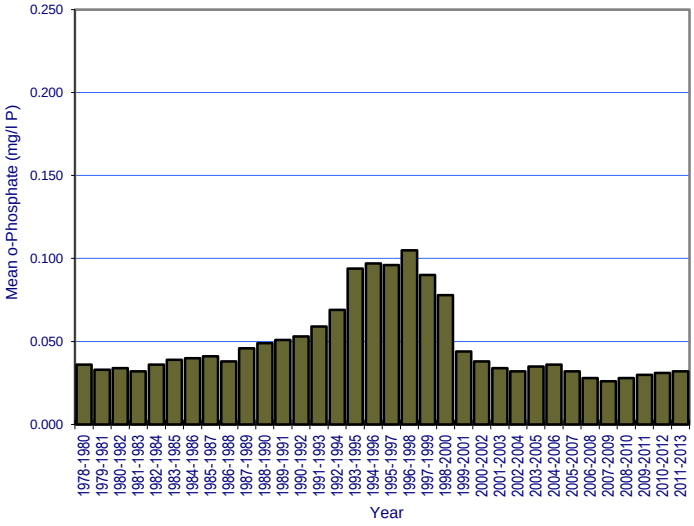

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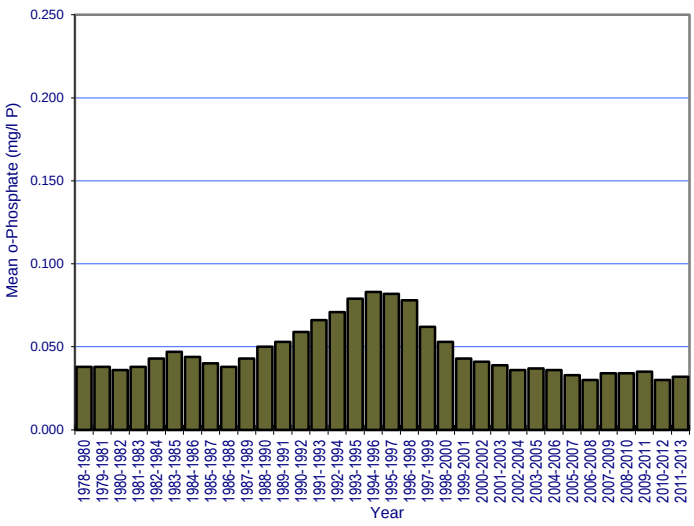
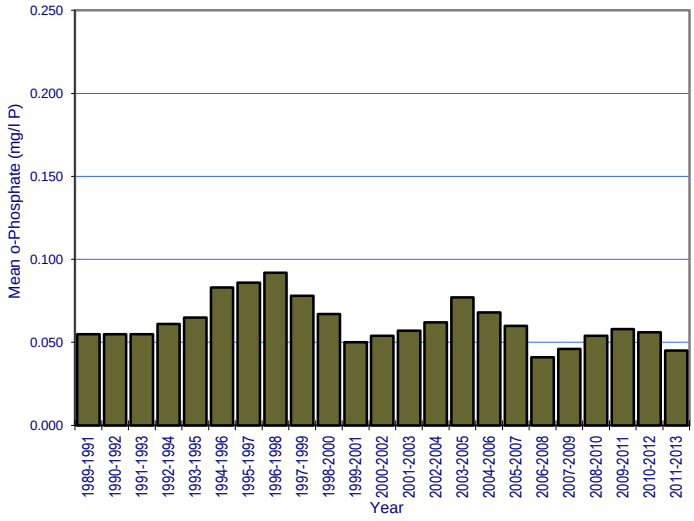


River: Glyde Station No.: 1230



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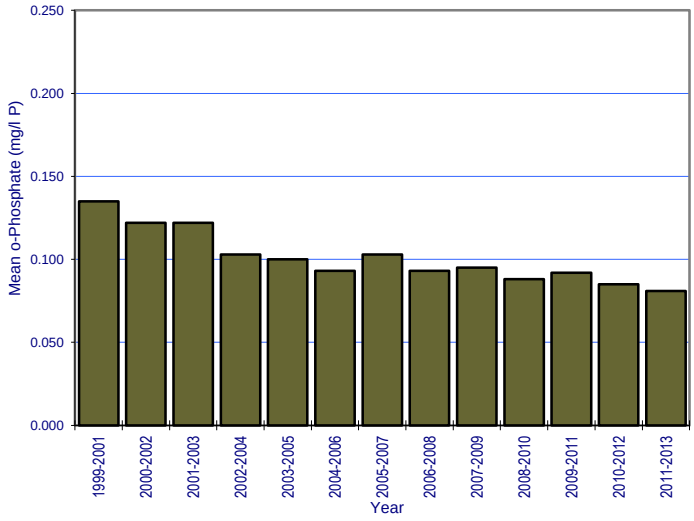

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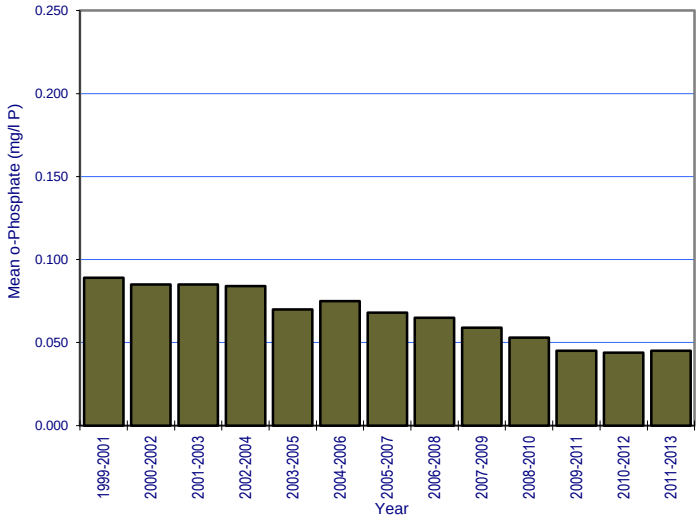

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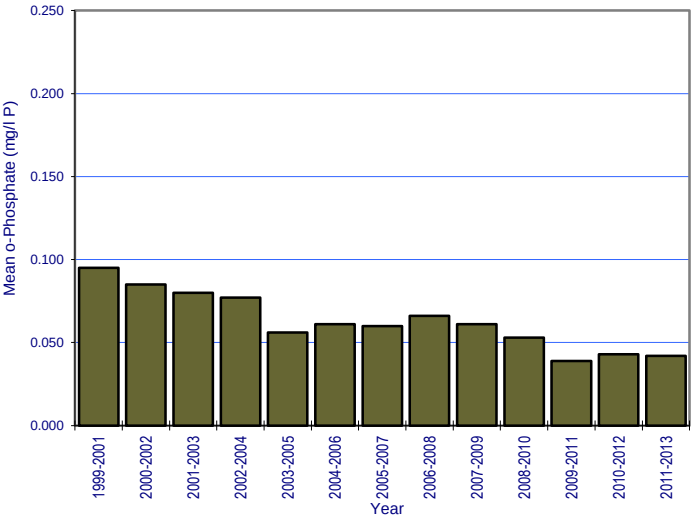
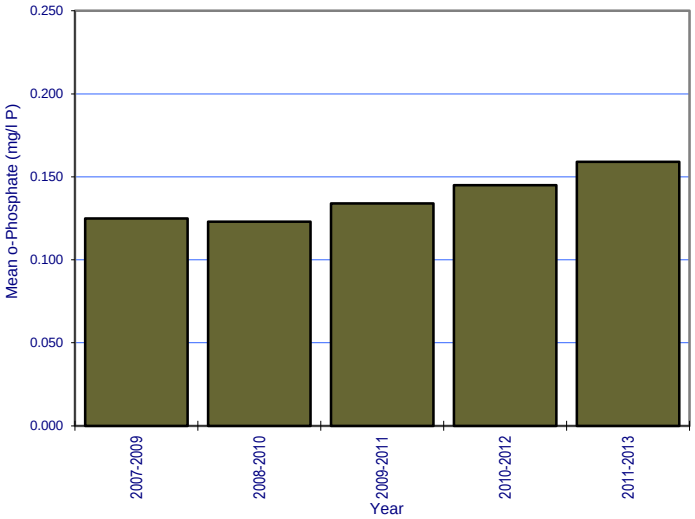


River: Termonfeckin Station No.: 0250



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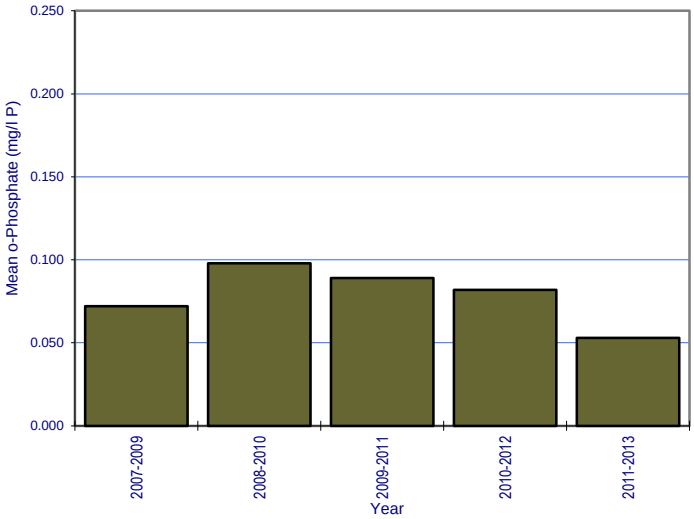

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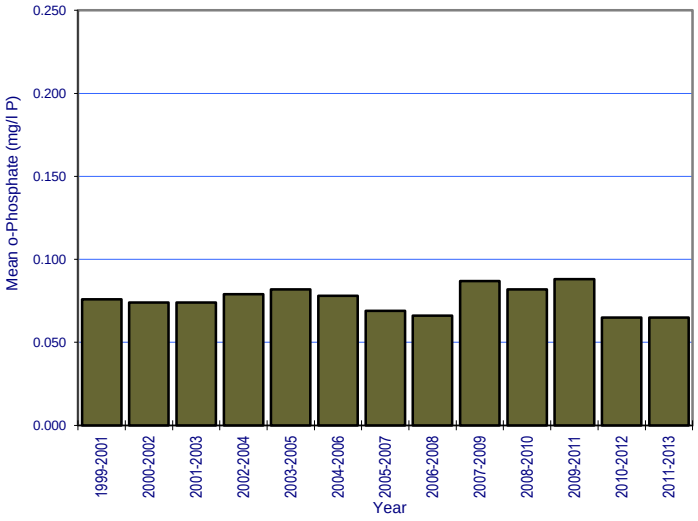
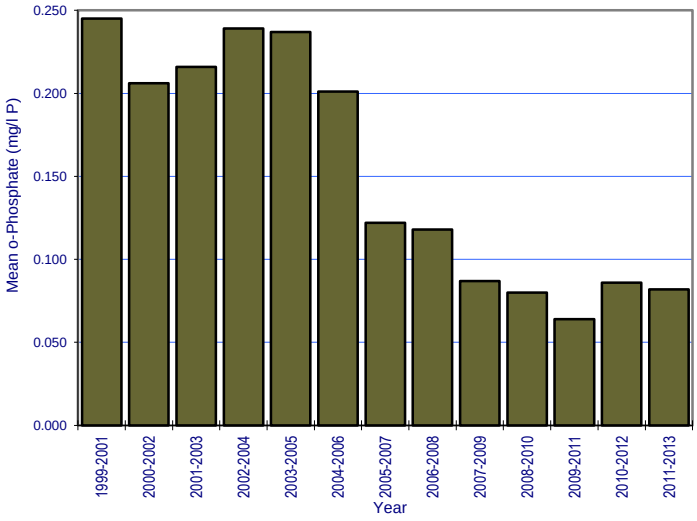
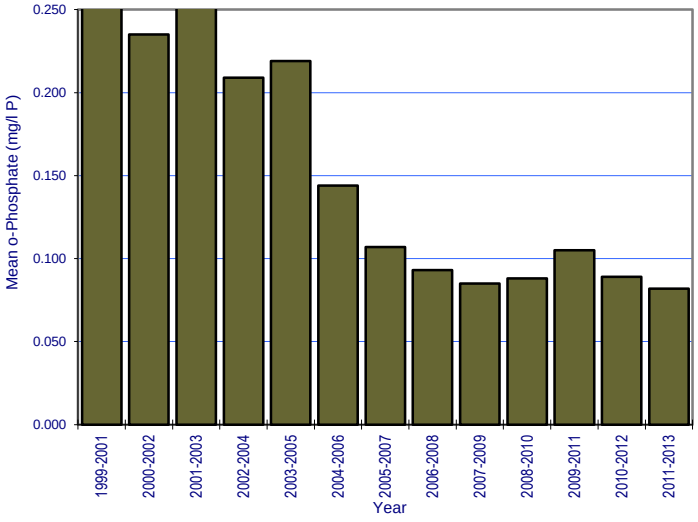


River: White (Louth) Station No.: 0400

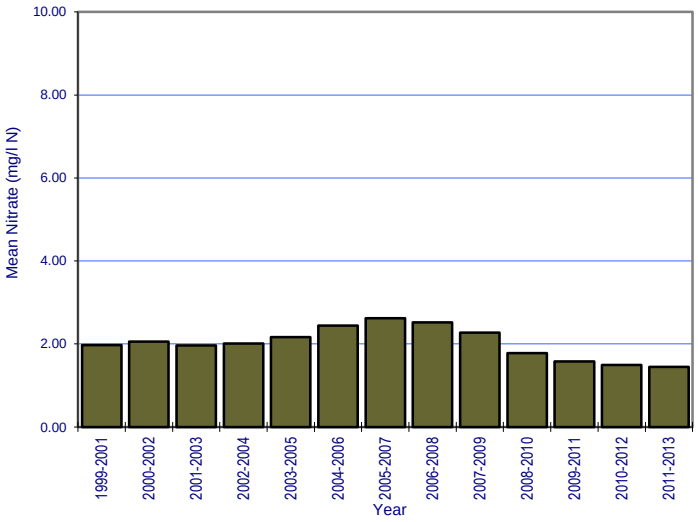


River: White (Louth) Station No.: 0500

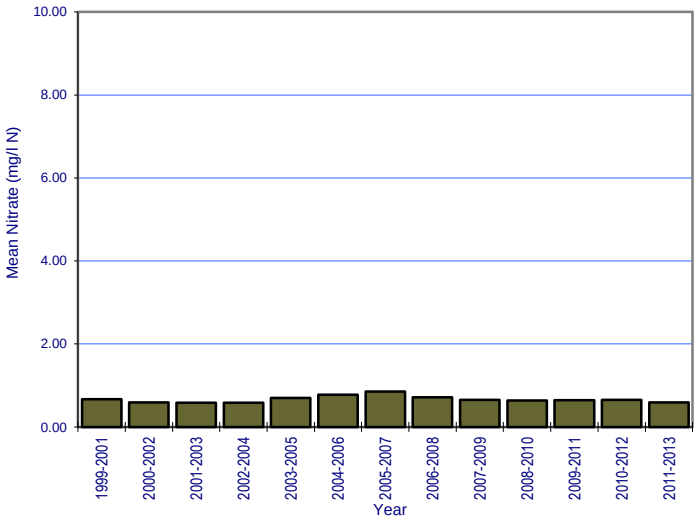


6. Long-Term Trend Graphs – Nitrate

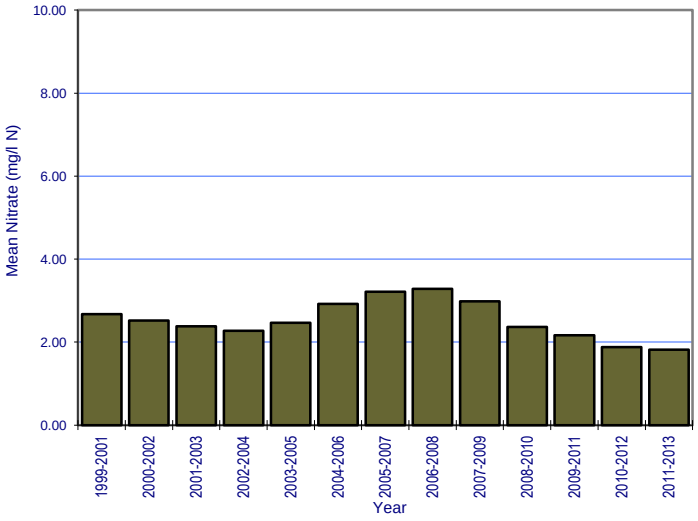
River: Ballymascanlon Station No.: 0100



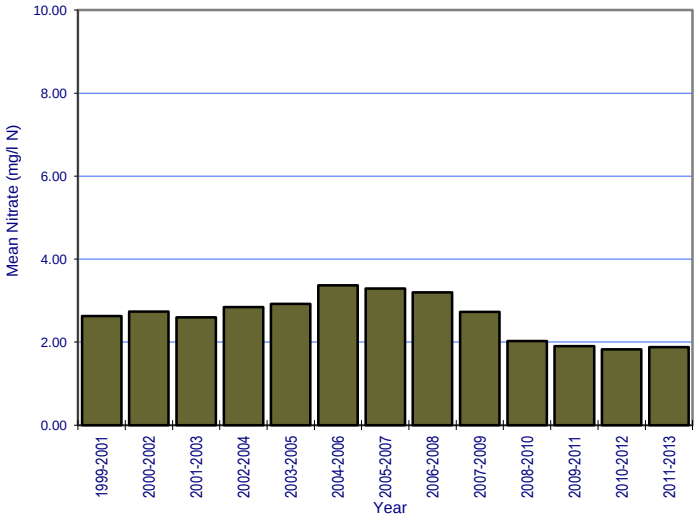
River: Big (Louth) Station No.: 0100



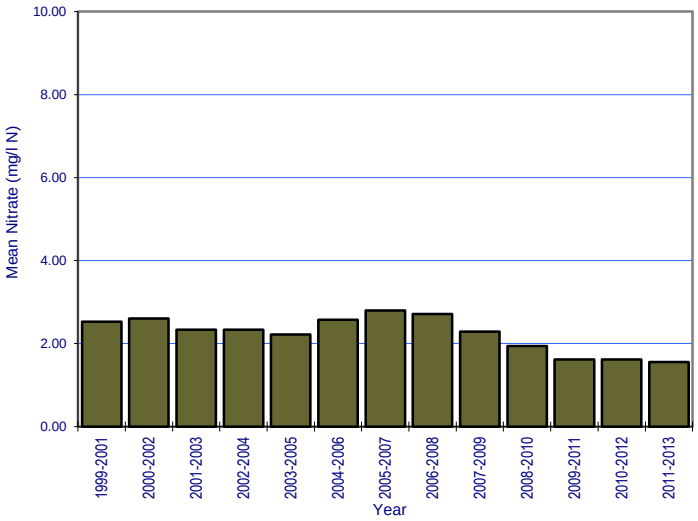
River: Castletown Station No.: 0200



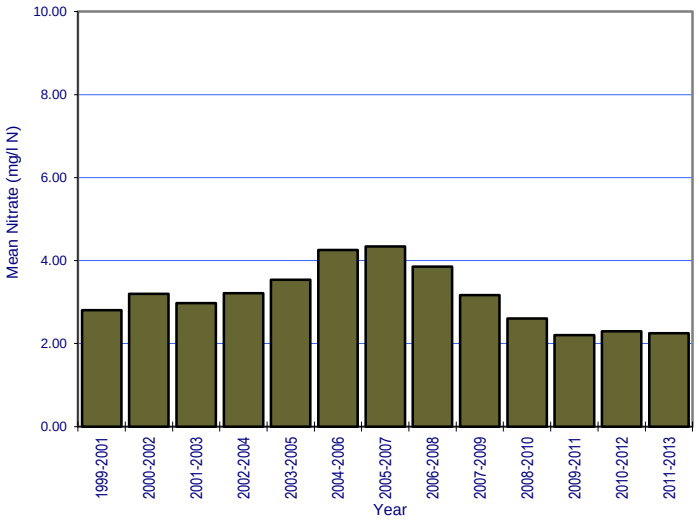
River: Cully Water Station No.: 0200



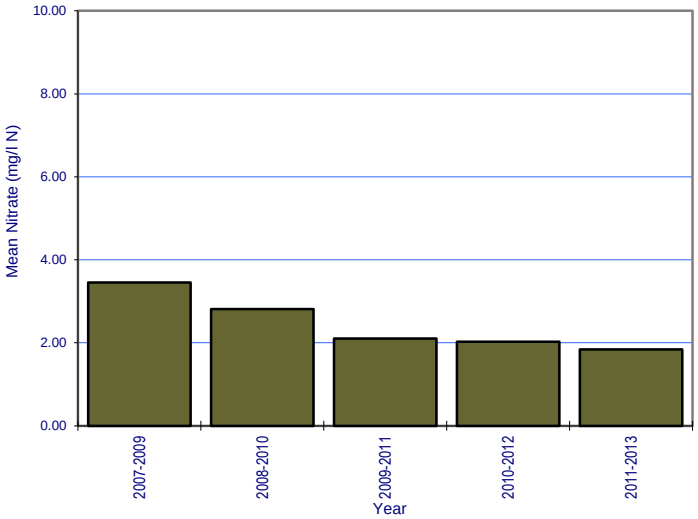
River: Dee Station No.: 0600



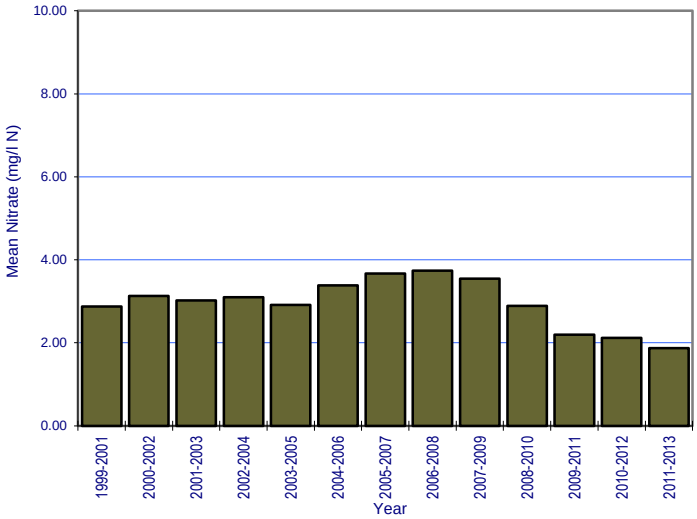
River: Dee Station No.: 0670



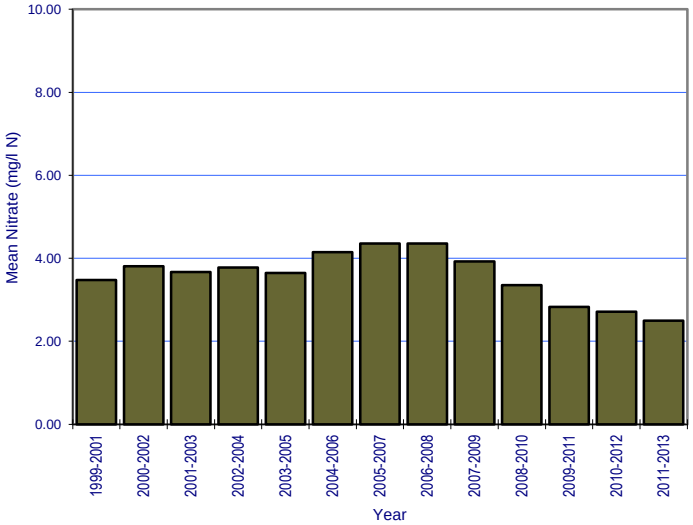
River: Dee Station No.: 0680



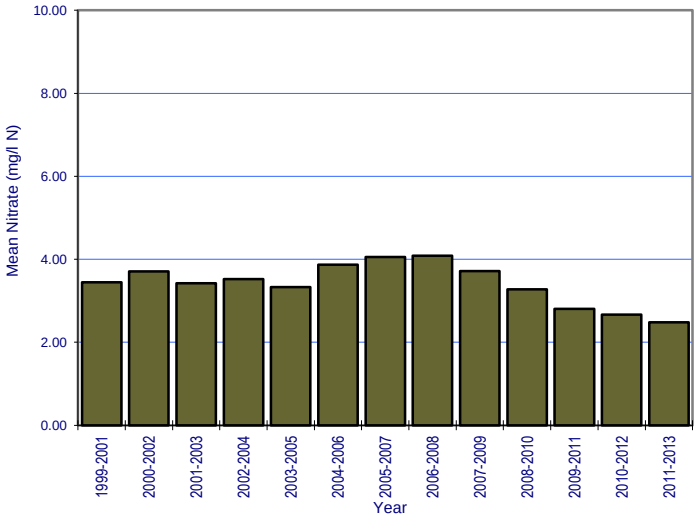
River: Dee Station No.: 0710



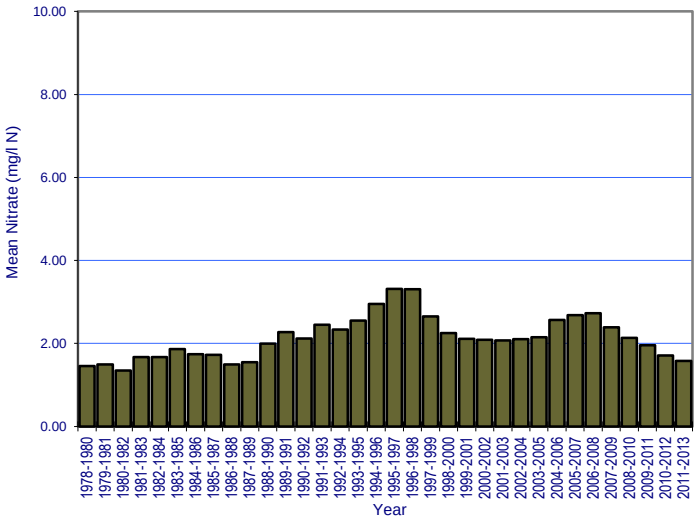
River: Dee Station No.: 1000



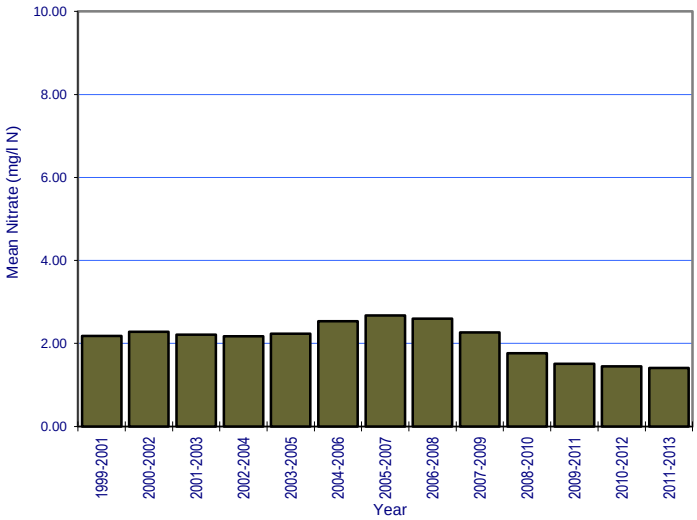
River: Dee Station No.: 1100



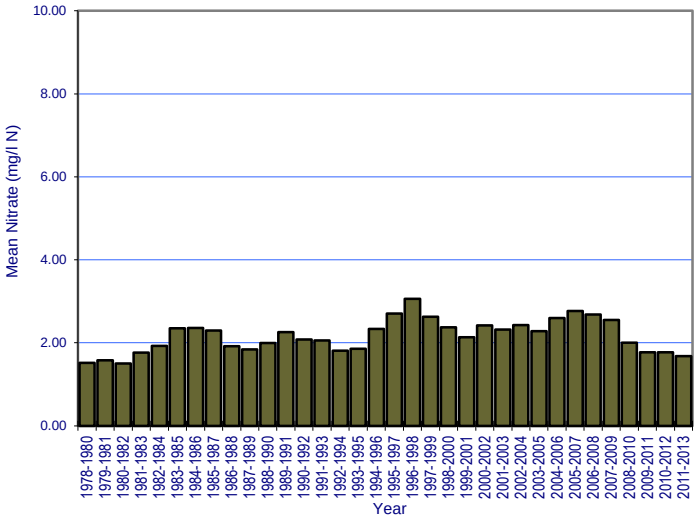
River: Fane Station No.: 0900



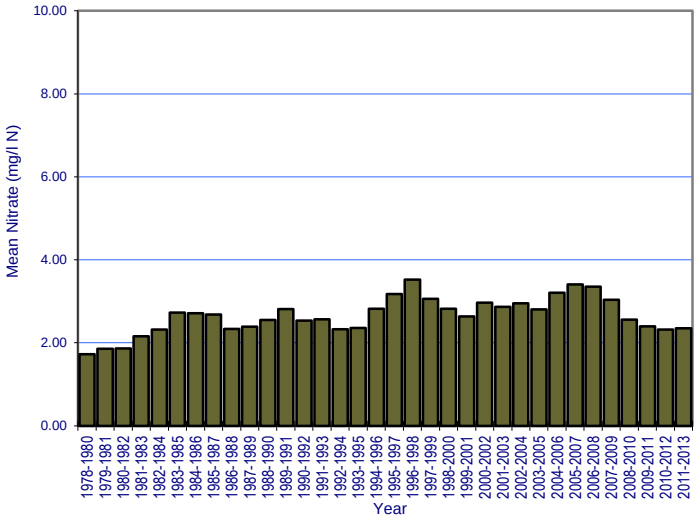
River: Flurry Station No.: 0700



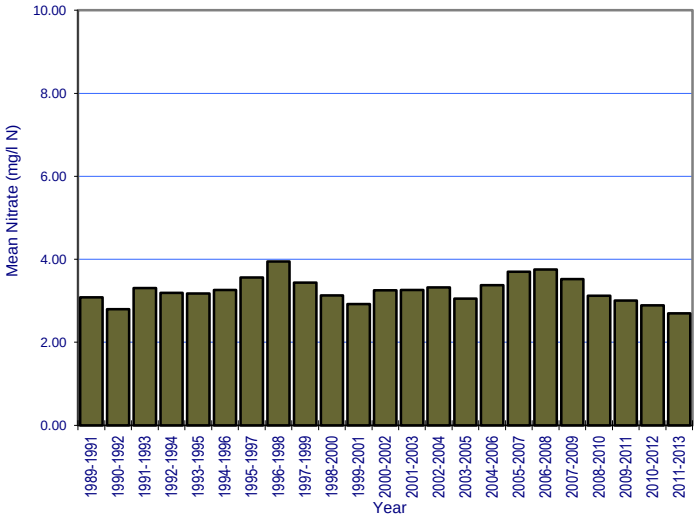
River: Glyde Station No.: 0700



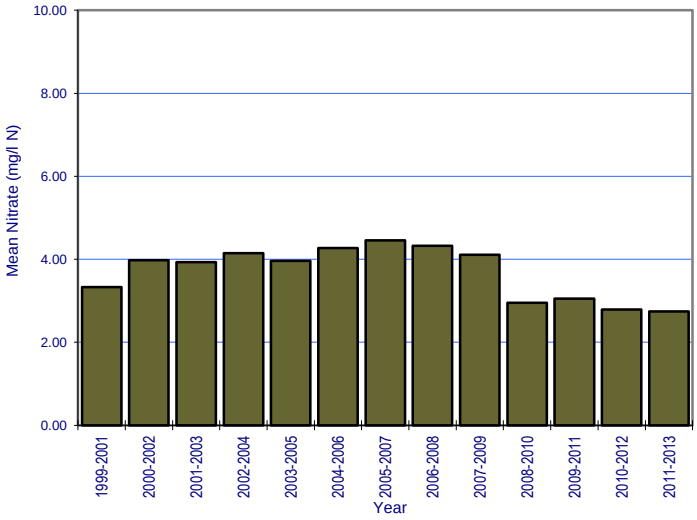
River: Glyde Station No.: 0900



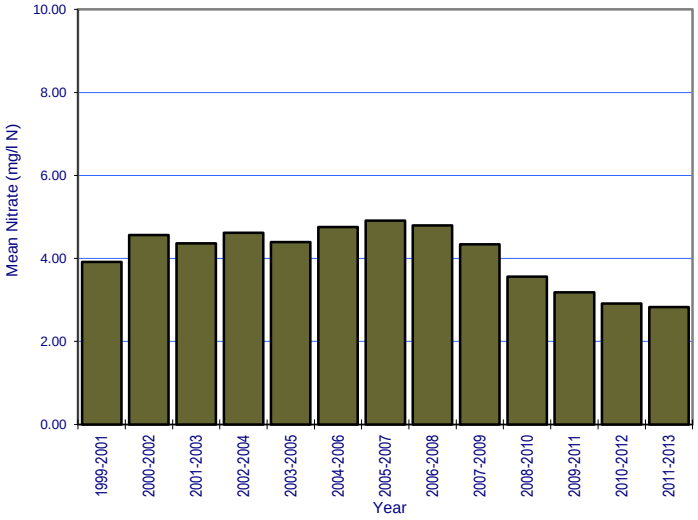
River: Glyde Station No.: 1230



River: Mattock Station No.: 0100



River: Mattock Station No.: 0200



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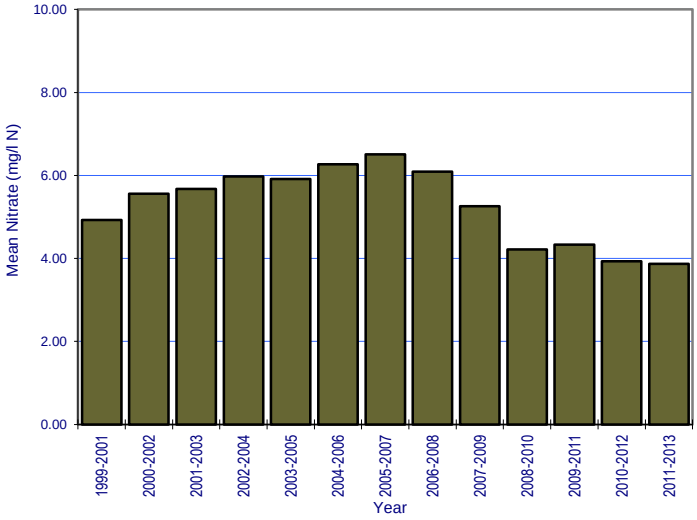
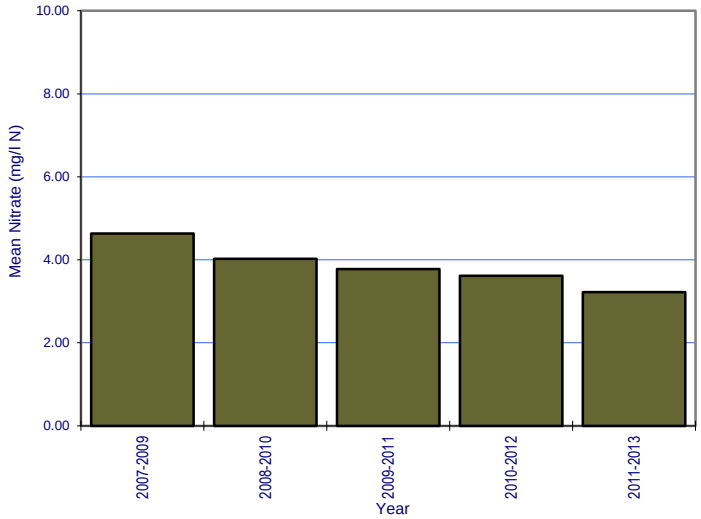
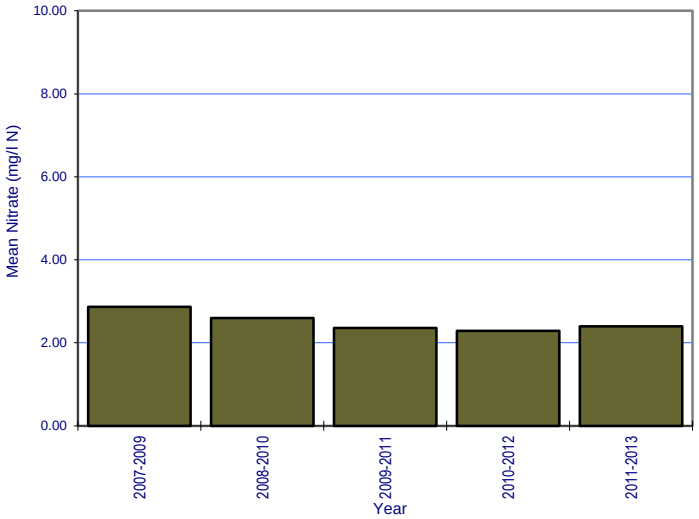


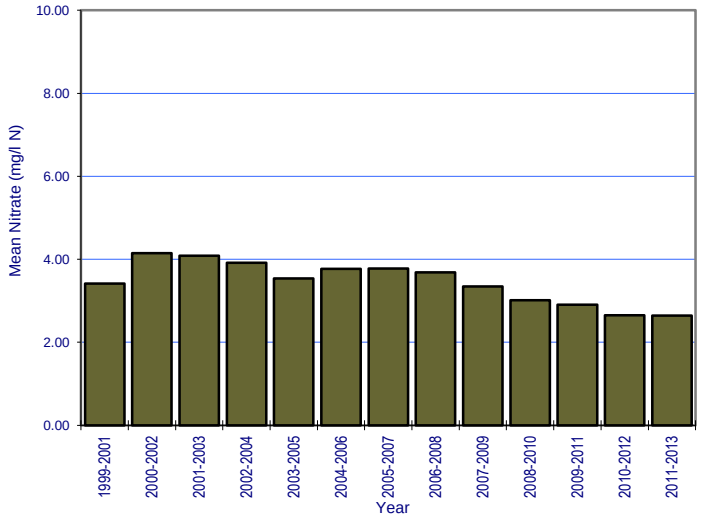
River: Termonfeckin **Station No.: 0250**



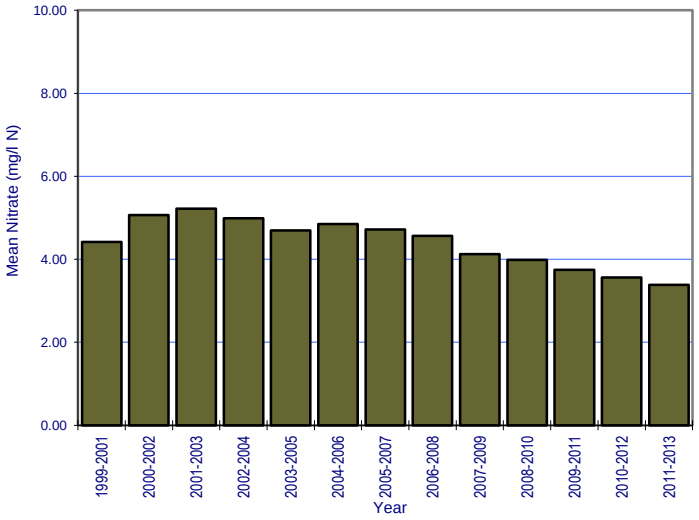
River: White (Louth) **Station No.: 0040**



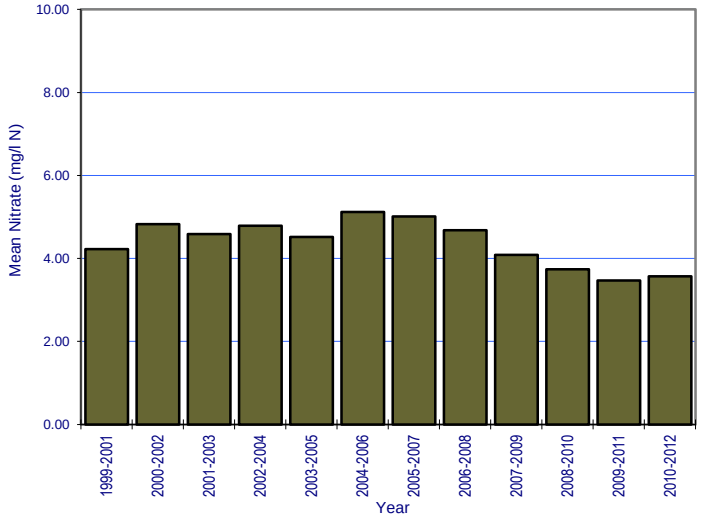
River: White (Louth) **Station No.: 0100**



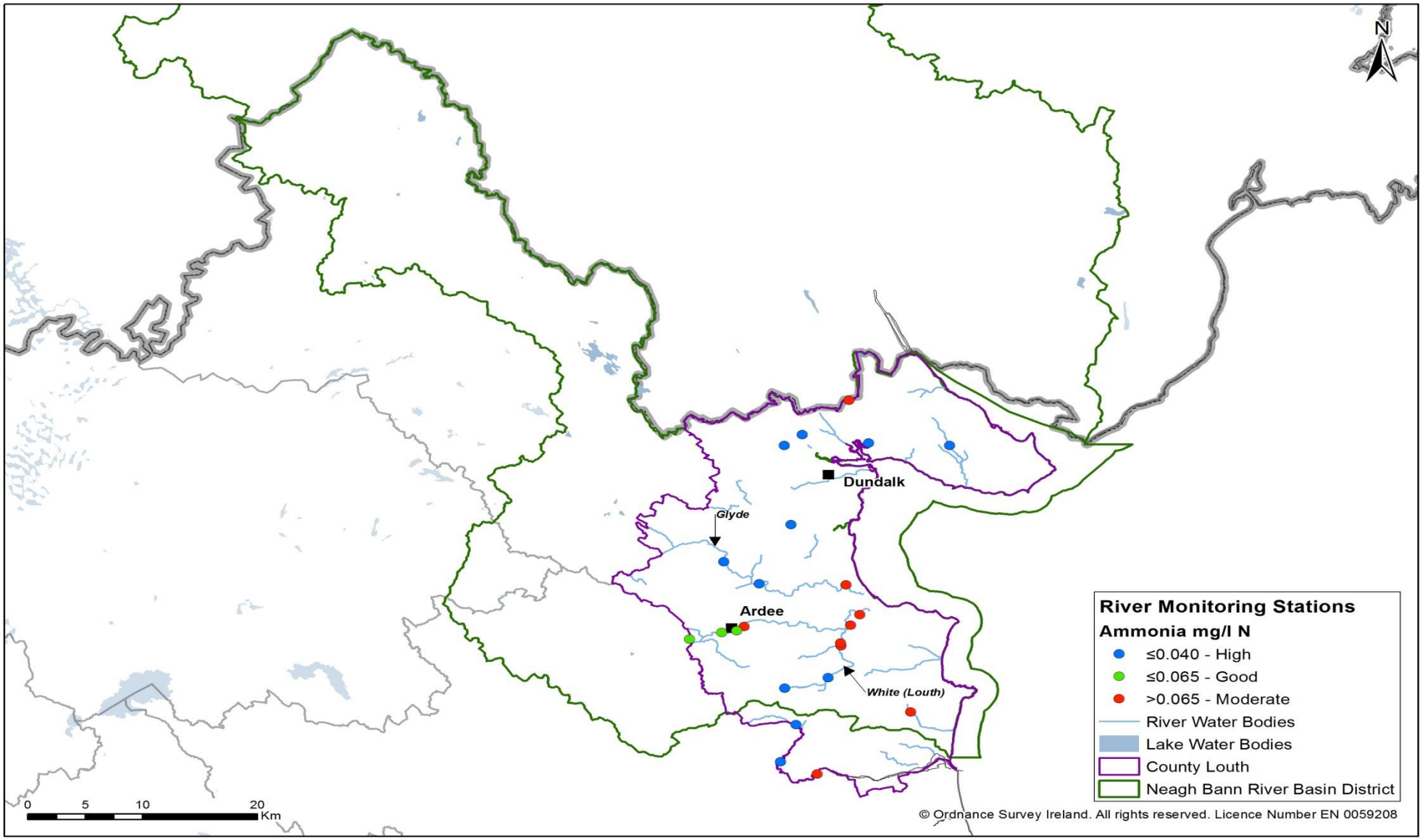
River: White (Louth) **Station No.: 0400**



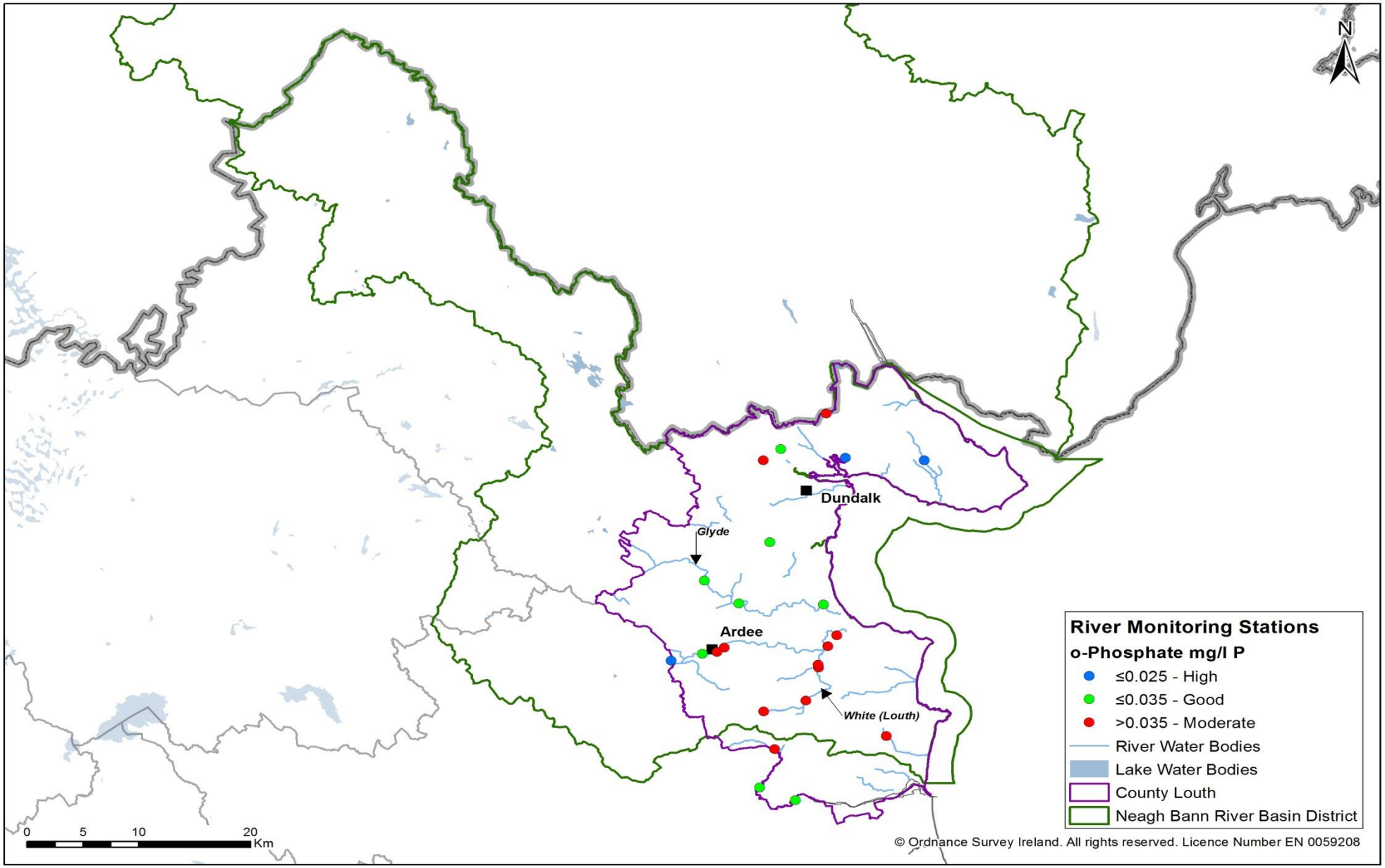
River: White (Louth) **Station No.: 0500**



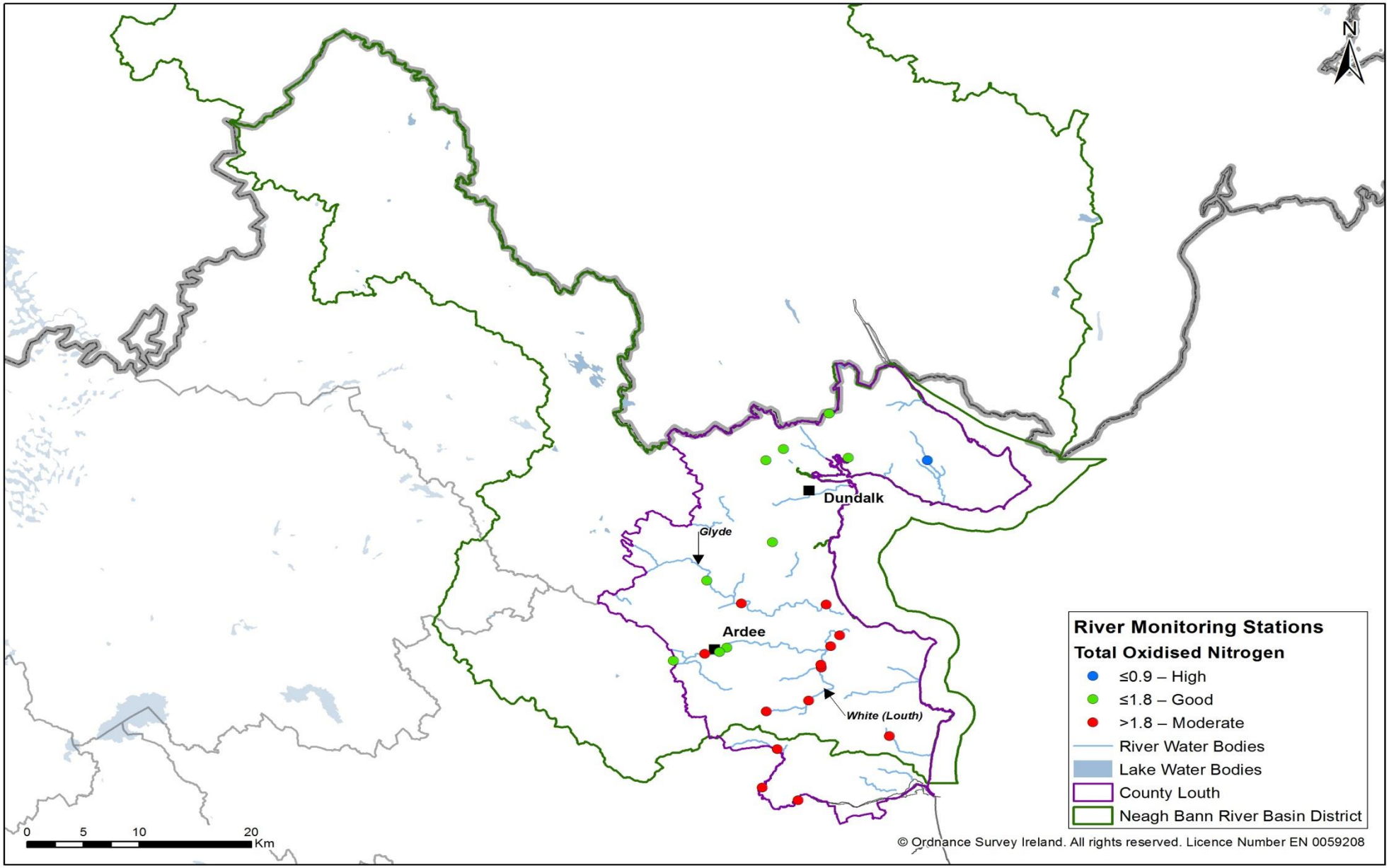
7. Maps



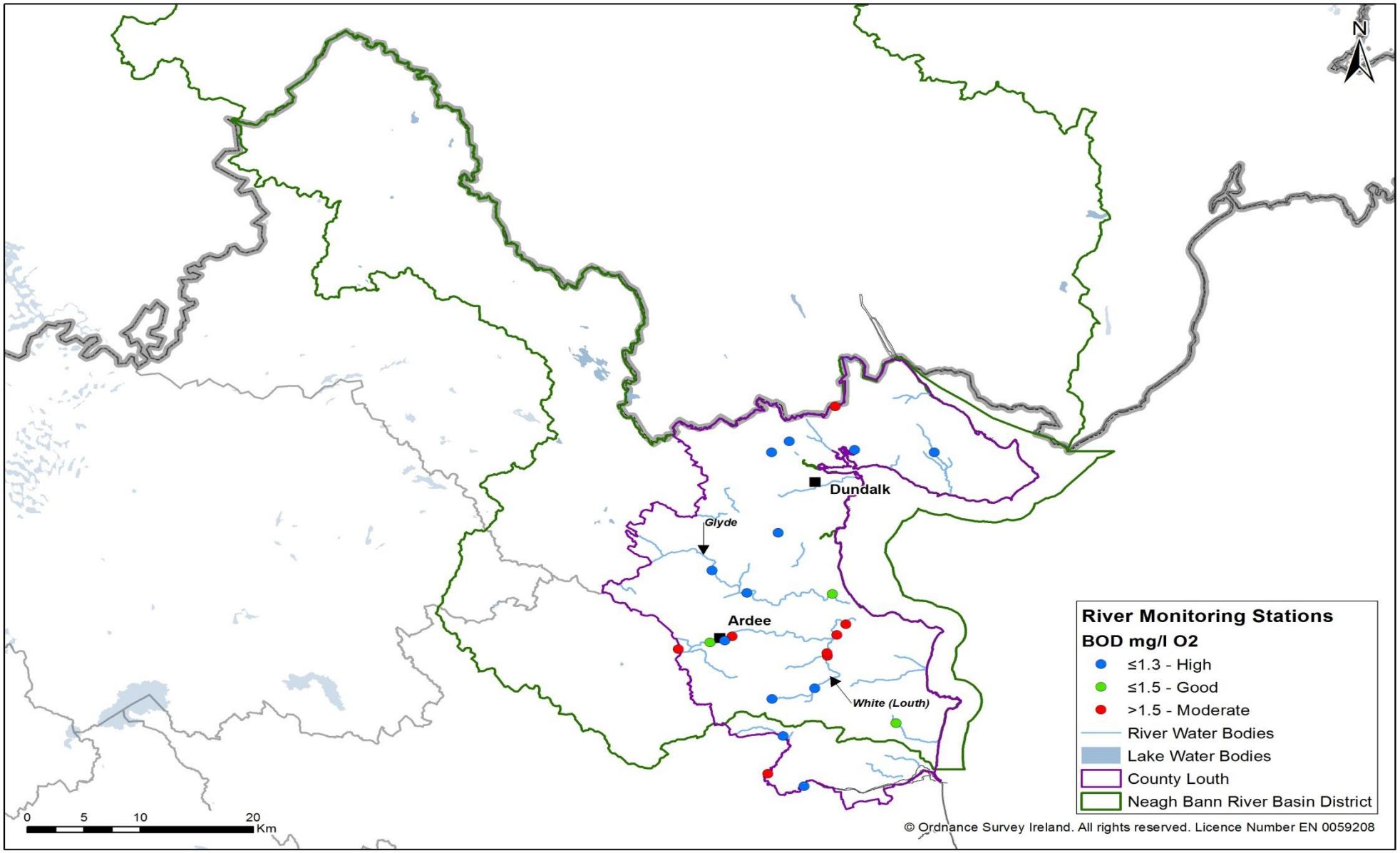
Map 1. Average ammonia in Louth rivers in 2013.



Map 2. Average ortho-phosphate in Louth rivers in 2013.



Map 3. Average nitrate in Louth rivers in 2013.



Map 4. Average BOD in Louth rivers in 2013.