Monitoring for Toxin Producing and Nuisance Microalgae in Northern Ireland Coastal Waters

Reporting Period 1st January 2019 - 31st December 2019

Final Report – Version 1

Pages 51

Quality statement: This report is a compilation of the information included on the reports provided daily/ weekly to FSANI and showing the results of the phytoplankton analyses undertaken on samples submitted by third parties. All results were quality checked and approved prior to release to FSANI and the results compiled in this report have been further checked against a copy of the original reports held on a central database. Information relating to the origin of the samples (place, date and time of collection) is as provided by sampling staff and has not undergone verification checks by AFBI.

Contents

Shellfish production waters: reporting period: 1st January 2019- 31st December 2019.

Summary

During the period of this report a total of 626 water samples were received and 625 reported to the customer (Food Standards Agency Northern Ireland (FSANI). Performance indicators set by the customer were met with 100% of samples reported within the stipulated time frame. As well as the four main target phytoplankton groups (*Alexandrium* spp., Dinophysiales (genera *Dinophysis and Phalacroma), Prorocentrum lima* and *Pseudo-nitzschia* spp. the samples collected during 2019 also contained other target species *Karenia mikimotoi*, *Prorocentrum cordatum, Noctiluca scintillans* and *Phaeocystis* spp.

Cells of the genus Alexandrium, a potential producer of PST's (Paralytic Shellfish Toxins), were recorded in 4 of the 7 areas monitored and were present in 2.4 % of samples analysed. The trigger level for Alexandrium spp. (≥ 40 cells L-1) was breached on only 2 occasions during the year with a maximum cell abundance of 120 cells L-1 recorded on 12th August in a sample from the Lough Foyle site, PA3 Wild fishery.

No official control shellfish flesh samples tested during the year contained levels above the regulatory value of 800µg STX/ Kg.

The trigger value for the species responsible for production of lipophilic toxins (includes some members of the Dinophysiales as well as Prorocentrum lima) is set at ≥ 100 cells L-1. Target species belonging to the Order Dinophysiales were recorded in all the monitored areas and were present in 21.7% of samples analysed. Occurrence ranged from 8.2% of Larne Lough samples to 36.6% of Belfast samples. The trigger level of ≥ 100 cells L-1 was breached on 52 occasions. A maximum cell abundance of 7340 cells L-1 was recorded in a sample from a Belfast Lough site (B20-AFFNI 53) on 29th July. Prorocentrum lima was recorded twice in 2019, both samples were from a Carlingford Lough site (C4-AFFNI 68) and were recorded at the limit of detection (20 cells L-1) on 28th January and 22nd July respectively.

Results from the Biotoxin Monitoring Programme showed that a small number of shellfish flesh samples, tested as part of the Official Control Programme, had lipophilic toxins above the regulatory limit set by the European Union. More details can be found in the AFBI Biotoxin Report for 2019.

The genus *Pseudo-nitzschia* contains species which have the potential to produce domoic acid. Cells of the genus were present in all 7 monitored areas and in 412 samples. Their presence ranged from 39.6% of Lough Foyle water samples to 81.6% of Killough water samples. Two samples breached the trigger level of

≥150,000 cells L^{-1} during 2019. Both samples were from Dundrum Bay on 1st April. A maximum abundance of 648,400 cells L^{-1} was recorded in the sample taken from the DB2-AFFNI 95B site.

No official control samples from the Biotoxin Monitoring Programme contained domoic acid above the regulatory level of 20 µg/g.

Other target species identified in water samples during 2019 were; *Karenia mikimotoi*, *Prorocentrum cordatum*, *Noctiluca scintillans* and *Phaeocystis* spp.

Introduction

Fisheries and Aquatic Ecosystems Branch of the Agri-Food and Biosciences Institute (AFBI) deliver the Official Control Phytoplankton Monitoring Programme for Northern Ireland on behalf of the competent authority, the Food Standards Agency (FSANI). A monitoring programme has been in place since mid-1993. This report presents the phytoplankton programme results for the period 1st January 2019– 31st December 2019.

A total of 626 water samples were received in 2019 although 625 samples were reported within the calendar year (one sample received on the final day of the calendar year was reported at the beginning of January 2020). Results in this report cover all 626 samples. Samples were examined by light microscopy and results reported within 3 working days of sample receipt.

Water samples were obtained from all the classified shellfish production areas in Northern Ireland which included five sea loughs as well as Dundrum Bay and Killough Harbour (Table 1 and Figure 1). Samples were screened for the presence of the toxin producing and nuisance microalgae listed in Table 2.

Sampling

FSANI are responsible for the logistics of the water sampling programme including delivery to the laboratory by designated sampling officers. Sampling officers were asked to take water samples as close to high tide as possible and to deliver these to AFBI for analysis as soon as possible, following the sampling and transport protocol issued by FSANI. Samples were generally taken on a fortnightly basis except for Belfast Lough where samples were taken weekly.

Laboratory procedures

Once received in the laboratory each preserved sample was given a unique identifying code and sample details were entered into a log book. A 50 ml subsample was then taken from each water sample and left to settle overnight in a sedimentation (Utermöhl) chamber (limit of detection of 20 cells L^{-1}). Samples were examined the next day using an inverted microscope. Each sample was screened for the target phytoplankton listed in Table 2 and the results reported to FSANI the same day. These procedures are based on those of the UK National Reference Laboratory (UKNRL). AFBI have maintained ISO17025 accreditation for the test method since 2012.

Results

The occurrence (as a percentage) and maximum abundance (in cells per litre) for the four most important taxon groups are reported by individual shellfish site (Table 3) and coastal area (Table 4). Positive results for *Alexandrium* spp., Dinophysiales, *Prorocentrum lima* and *Pseudo-nitzschia* spp. are reported in tabular form in Appendix 1.

Table 1. Shellfish production areas monitored for the presence of toxin producing and nuisance microalgae in water in 2019.

Coastal area	Site identification reference (SIR)
Lough Foyle	PA3-Wild fishery
Lough Foyle	PA4-Wild fishery
Larne Lough	L5-AFFNI 21B (until 15/10/19)
Larne Lough	L3-AFFNI 88
Belfast Lough	B1-AFFNI 55
Belfast Lough	B3-AFFNI 50
Belfast Lough	B12-AFFNI 54
Belfast Lough	B20-AFFNI 53
Strangford Lough	S2-AFFNI 42
Strangford Lough	S7-AFFNI 76
Killough	K1-AFFNI 18
Dundrum Bay	DB1-AFFNI 95A
Dundrum Bay	DB2-AFFNI 95B (until 14/10/19)
Carlingford Lough	C7-AFFNI 73
Carlingford Lough	C9-AFFNI 39
Carlingford Lough	C11-AFFNI 84
Carlingford Lough	C3-AFFNI 94
Carlingford Lough	C4-AFFNI 68
Carlingford Lough	NW-Wild fishery
Carlingford Lough	C1-AFFNI 27

Figure 1. Current sampling sites

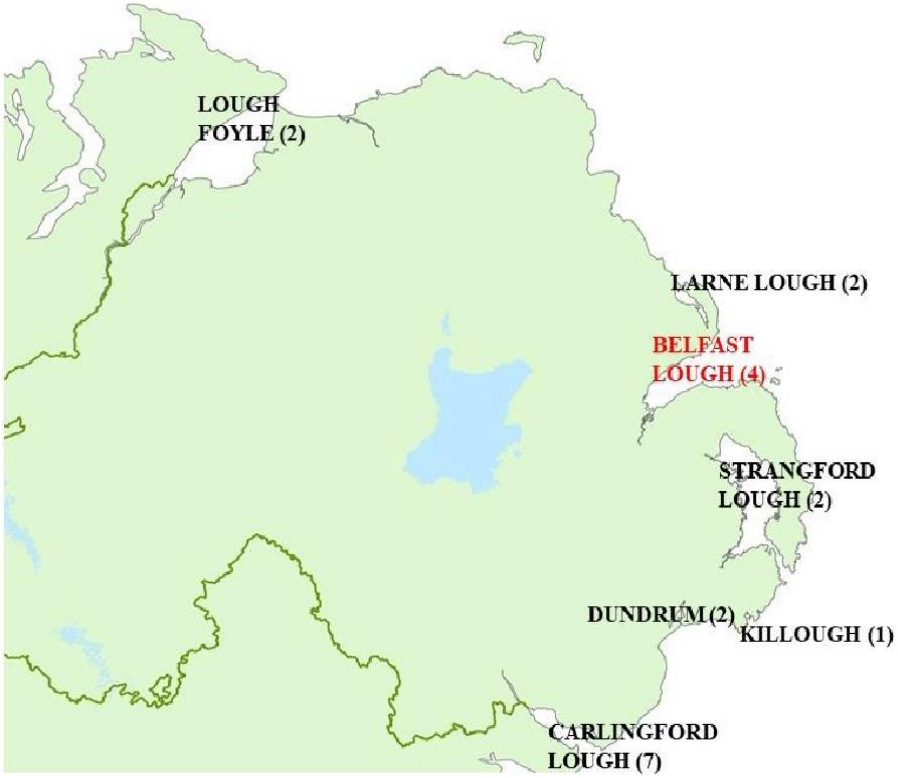


Table 2 – Monitored phytoplankton species.

Species	Toxin	Threshold value
Alexandrium spp.	Paralytic Shellfish Toxin (PST)	40 cells L^{-1}
Dinophysis acuminata	Diarrhetic Shellfish Toxin (DST)	100 cells L^{-1}
Dinophysis acuta	DST	100 cells L^{-1}
Dinophysis norvegica	DST	100 cells L^{-1}
Phalacroma rotundatum (previously known as Dinophysis rotundata)	DST	100 cells L^{-1}
Dinophysis spp.	DST	100 cells L^{-1}
Prorocentrum lima	DST	100 cells L^{-1}
Lingulodinium polyedrum	Yessotoxin (YTX)	None
Protoceratium reticulatum	YTX	None
Pseudo-nitzschia spp.	Amnesic Shellfish Toxin (AST)	150,000 cells L^{-1}
Prorocentrum cordatum	Hepatotoxins	None
Karenia mikimotoi	Toxic to fish (TTF)	None
Noctiluca scintillans	TTF	None
Phaeocystis spp.	Not known	None

Results by species

Alexandrium spp.

Cells of the potential paralytic shellfish toxin producer Alexandrium spp. were recorded in 4 of the 7 coastal areas monitored, the exceptions being Larne Lough, Strangford Lough and Killough (Figure 2A). Alexandrium spp. were present in 2.4% of all samples received, the lowest figure recorded since 2012. Cell abundance was low in all areas where *Alexandrium* spp. were recorded reaching a maximum of

120 cells L^{-1} on 12th August in a sample taken from the PA3 wild fishery site in Lough Foyle (Table 5).

No Paralytic Shellfish Toxins (PST's) were detected in shellfish tested as part of the Official Control Monitoring Programme during 2019.

Dinophysiales (includes *Dinophysis* and *Phalacroma* species)

Cells of the Dinophysiales order were present in all 7 coastal areas and in 21.7% of samples received, ranging from 8.2 % of Larne samples to 36.6% of Belfast samples (Table 4). The maximum cell abundance recorded in 2019 was 7,340 cells L^{-1} in water a sample taken from Belfast Lough (B20-AFFNI 53) on 29th July. The sample consisted almost entirely of the species *Dinophysis* acuminata, the most common of the Dinophysis species recorded in Northern Ireland waters.

Both Dundrum Bay sites were closed for a short time in August/early September due to the presence of Dinophysis Shellfish Toxins (DST's) in shellfish tissue above the set EU regulatory levels. More detailed information can be found in the 2019 Biotoxin Monitoring Report

Prorocentrum lima

The dinoflagellate *Prorocentrum lima* was recorded in only one of the twenty sites monitored in 2019. Site C4-AFFNI 68 in Carlingford lough recorded its presence in 7.4% of its samples (Table 3). A peak cell abundance of 20 cells L^{-1} was recorded on 28th January and again on 22nd July . This agrees with the historical pattern of its low abundance across all sites (Figure 4c).

Pseudo-nitzschia *spp.*

Members of the cosmopolitan diatom species *Pseudo-nitzschia* spp. are frequently recorded in Northern Ireland coastal waters. All monitored areas contained cells of this species ranging from 39.6% of Lough Foyle samples to 81.6 % of Dundrum Bay samples (Table 4). Two samples recorded cells above the threshold value of 150,000 cells L^{-1}. Both samples were taken on 1st April from the two monitored sites in Dundrum Bay. Site DB1-AFFNI 95A recorded a value of 453,200 cells L^{-1} and DB2-AFFNI 95B a value of 648,400 cells L^{-1}. The vast majority of cells in each sample were from the '*delicatissima*' complex.

No shellfish samples, tested as part of the Official Control Programme, contained domoic acid above the EU regulatory limit.

Other species

Other target species recorded as part of the Official Control Phytoplankton Monitoring Programme in 2019 included the ichthyotoxic species *Karenia mikimotoi* which was recorded in 21 samples and reached a maximum abundance of 6680 cells L^{-1} in a sample taken from PA3 Wild fishery site on the 12th August.

Prorocentrum cordatum was recorded on two occasions, in a sample from Belfast Lough on 13th May and Killough on 17th June. Both were recorded at 60 cells L^{-1}. The large dinoflagellate *Noctiluca scintillans* was recorded on two occasions during 2019 reaching a maximum abundance of 40 cells L^{-1} on 12th August in a sample from Carlingford Lough (C3-AFFNI 94). *Phaeocystis* spp., which has the ability to produce noxious, nuisance blooms, was recorded on only one occasion during the year. A maximum abundance of 600 cells L^{-1} was recorded in a sample from B12-AFFNI 54 on the 20th May.

Table 3. The total number of samples collected, their occurrence (presence of cells in sample as a percentage of the total number of samples analysed) and maximum abundance (cells L-1) from each site in 2019.

Sampling site	No. of samples received	No. of samples rejected	Alexandrium spp. occurrence	Alexandrium spp.* max abundance	Dinophysis spp.* occurrence	Dinophysis spp. max abundance	P.lima occurrence	P.lima max abundance	Pseudo-nitzschia spp. occurrence	Pseudo-nitzschia spp. max abundance
Lough Foyle PA3-Wild fishery	24	0	4.2	120	16.7	80	0	0	41.7	3,180
PA4-Wild fishery	24	0	4.2	20	16.7	80	0	0	37.5	2,660
Larne Lough										
L5-AFFNI 21B (until 15/10/19)	22	0	0	0	12.5	40	0	0	68.2	4,340
L3-AFFNI 88	27	0	0	0	0	0	0	0	59.3	3,980
Belfast Lough B1-AFFNI 55	52	0	3.8	20	36.5	1,900	0	0	80.8	19,380
B3-AFFNI 50	52	0	3.8	20	38.5	6,700	0	0	75	51,600
B12-AFFNI 54	52	0	3.8	20	44.2	3,400	0	0	75	38,800
B20-AFFNI 53	52	0	3.8	80	26.9	7,340	0	0	73.1	18,000
Strangford Lough S2-AFFNI 42	28	0	0	0	28.6	240	0	0	64.3	8,380
S7-AFFNI 76	28	0	0	0	7.1	240	0	0	64.3	5,320
Killough K1-AFFNI 18	27	0	0	0	25.9	320	0	0	81.5	108,800
Dundrum Bay DB1-AFFNI	27	0	0	0	11.1	40	0	0	70.4	453,200

Sampling site	No. of samples received	No. of samples rejected	Alexandrium spp. occurrence	Alexandrium spp.* max abundance	Dinophysis spp.* occurrence	Dinophysis spp. max abundance	P.lima occurrence	P.lima max abundance	Pseudo-nitzschia spp. occurrence	Pseudo-nitzschia spp. max abundance
21A										
DB2-AFFNI 95B (until 14/10/19)	22	0	4.5	20	40.9	140	0	0	95.5	648,400
Carlingford Lough C7-AFFNI 73	27	0	3.7	20	3.7	20	0	0	38.2	5,000
C9-AFFNI 39	27	0	0	0	11.1	40	0	0	63	18,100
C11-AFFNI 84	27	0	3.7	20	14.8	400	0	0	74.1	3,020
C3-AFFNI 94	27	0	0	0	11.1	80	0	0	38.2	17,460
C4-AFFNI 68	27	0	7.4	20	22.2	860	7.4	20	63	18,000
NW-Wild fishery	27	0	0	0	7.4	20	0	0	66.7	16,780
C1-AFFNI 27	27	0	0	0	0	0	0	0	29.6	2,400

626 samples received

0 samples rejected

625 samples reported

*Includes phalacroma rotundatum

Table 4. The total number of samples collected, their occurrence (presence of cells in sample as a percentage of the total number of samples analysed) and maximum abundance (cells L-1) from each lough in 2019.

Sampling site	No of samples received	No. of samples rejected	Alexandrium spp. occurrence	Alexandrium spp. max abundance	Dinophysis spp.* occurrence	Dinophysis spp.* max abundance	P.lima occurrence	P.lima max abundance	Pseudo-nitzschia spp. occurrence	Pseudo-nitzschia spp. max abundance
Lough Foyle	48	0	4.2	120	16.7	80	0.0	0	39.6	3,180
Larne Lough	49	0	0.0	0	8.2	40	0.0	0	63.3	4,340
Belfast Lough	208	0	3.8	80	36.6	7,340	0.0	0	76.0	51,600
Strangford Lough	56	0	0.0	0	17.9	240	0.0	0	64.3	8,380
Killough	27	0	0.0	0	25.9	320	0.0	0	81.5	108,800
Dundrum Bay	49	0	2.0	20	24.5	140	0.0	0	81.6	648,400
Carlingford Lough	189	0	2.1	20	10.0	860	1.1	20	56.1	18,100

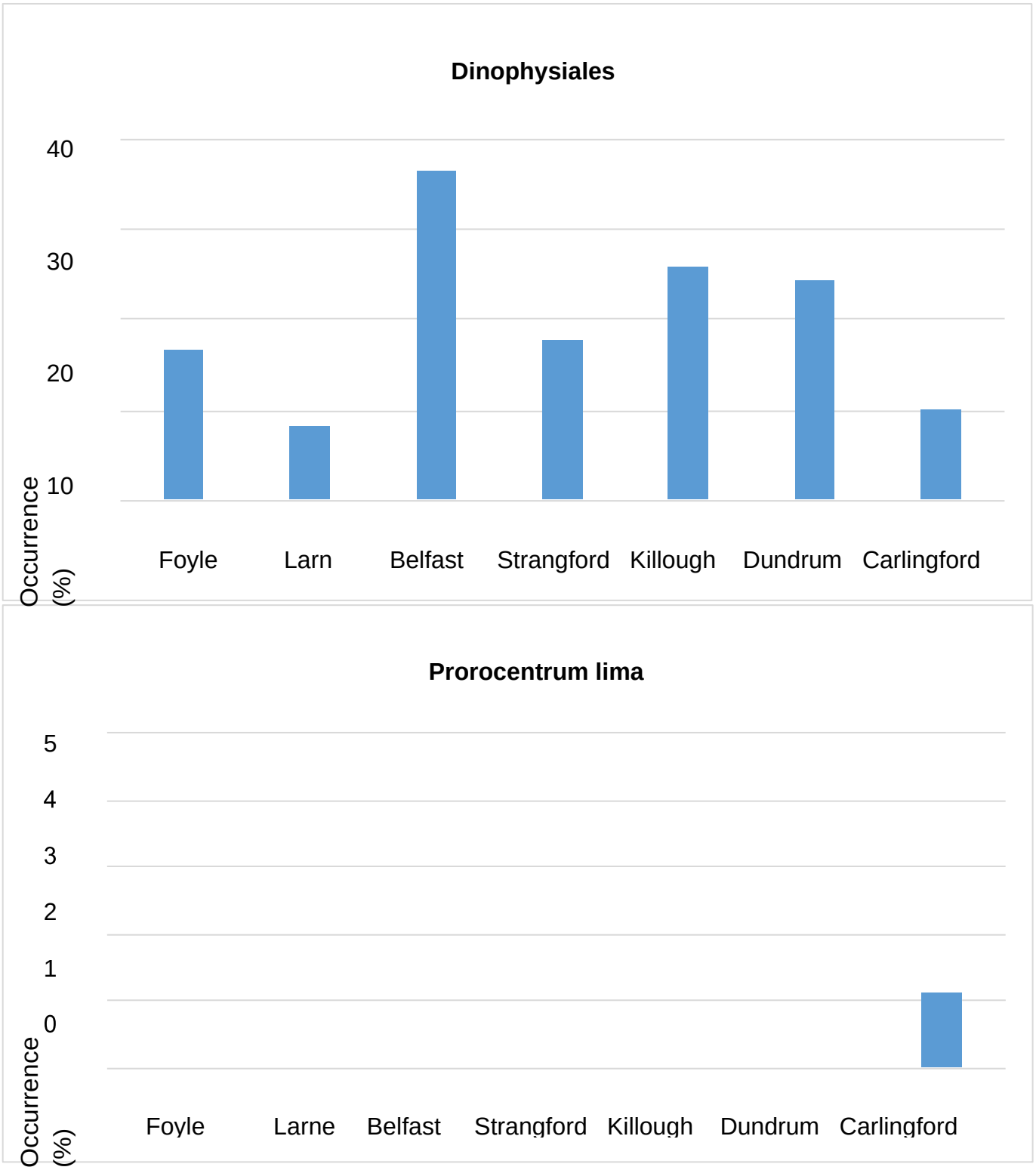
626 samples received

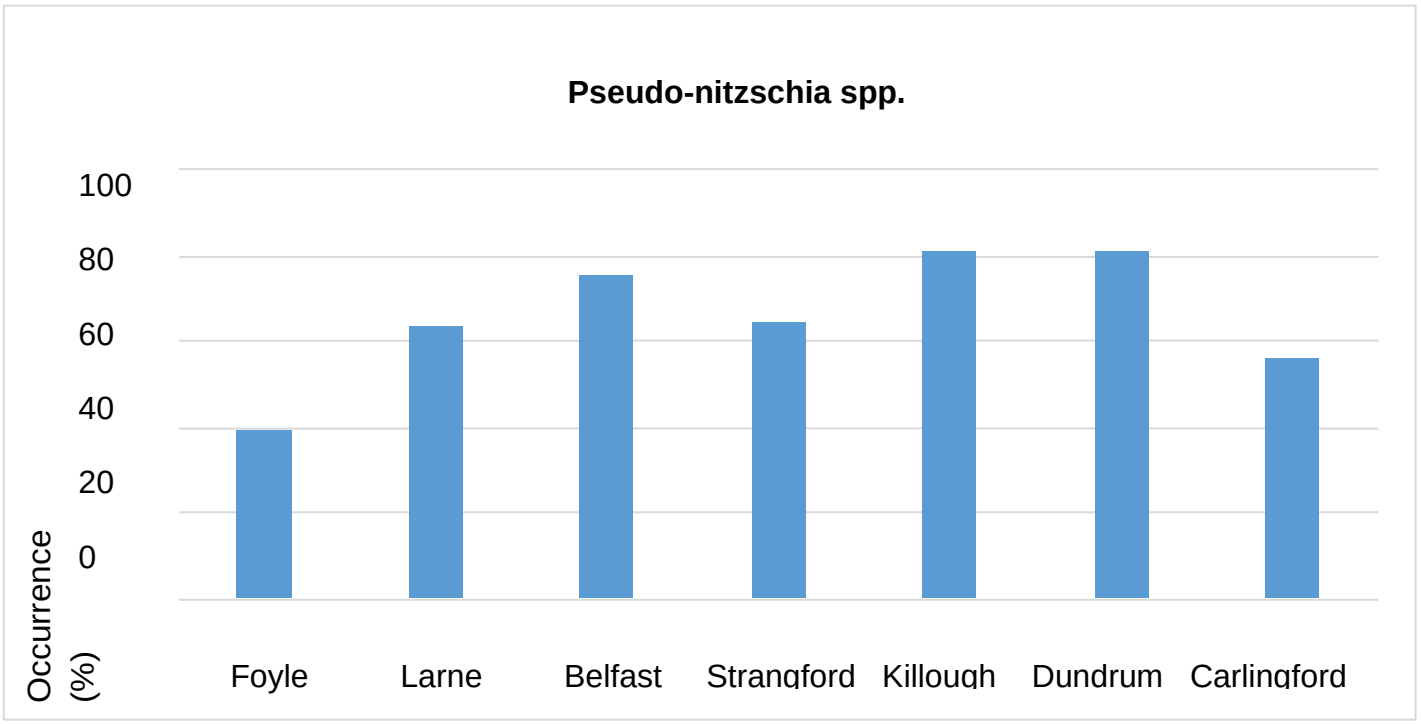
0 samples rejected

625 samples reported

*Includes phalacroma rotundatum

Figure 2. Occurrence (%) of the four major target organisms in 2019 (presence of cells in water samples as a percentage of the total number of samples reported for each area)




Pseudo-nitzschia spp.
100
80
60
40
20
0
Occurrence (%)
Foyle
Larne
Belfast
Strangford
Killough
Dundrum
Carlingford

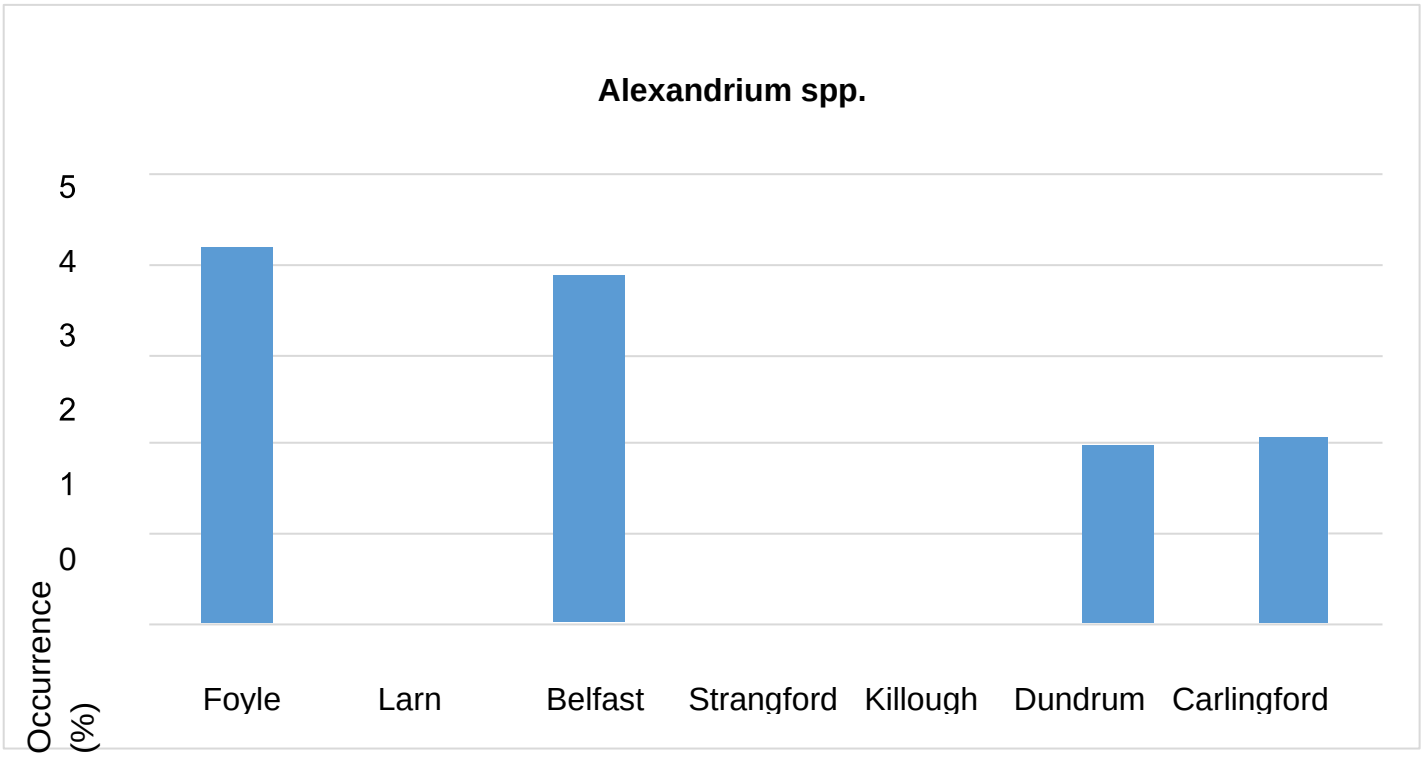
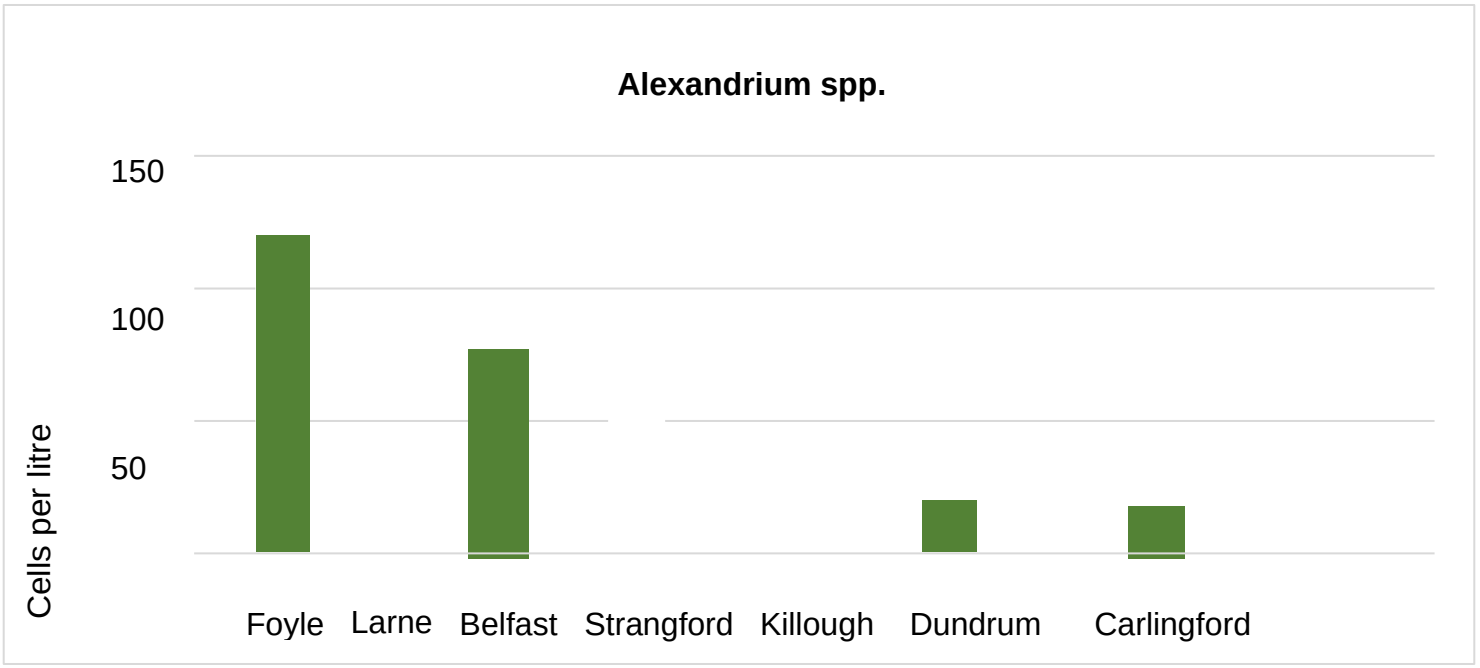
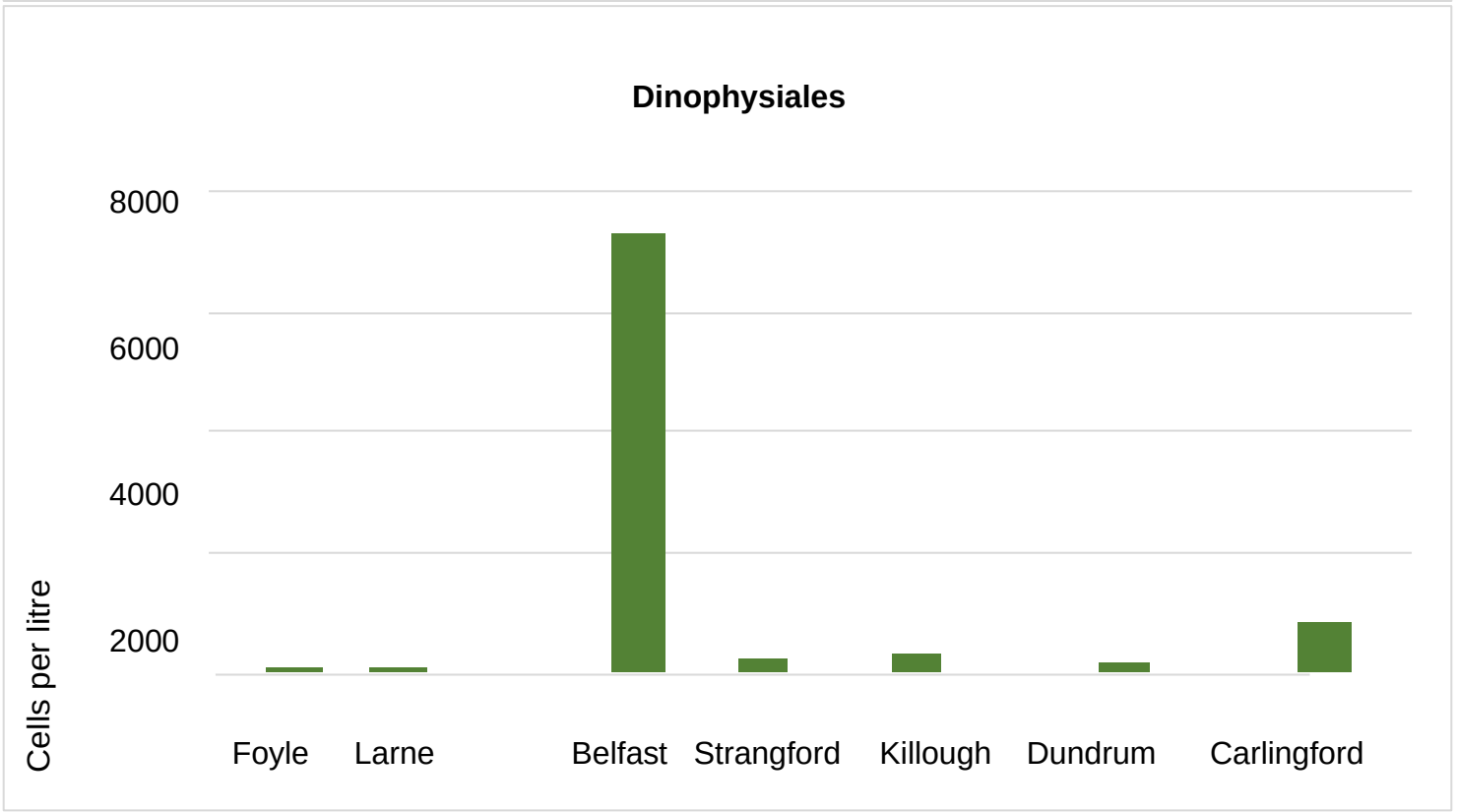
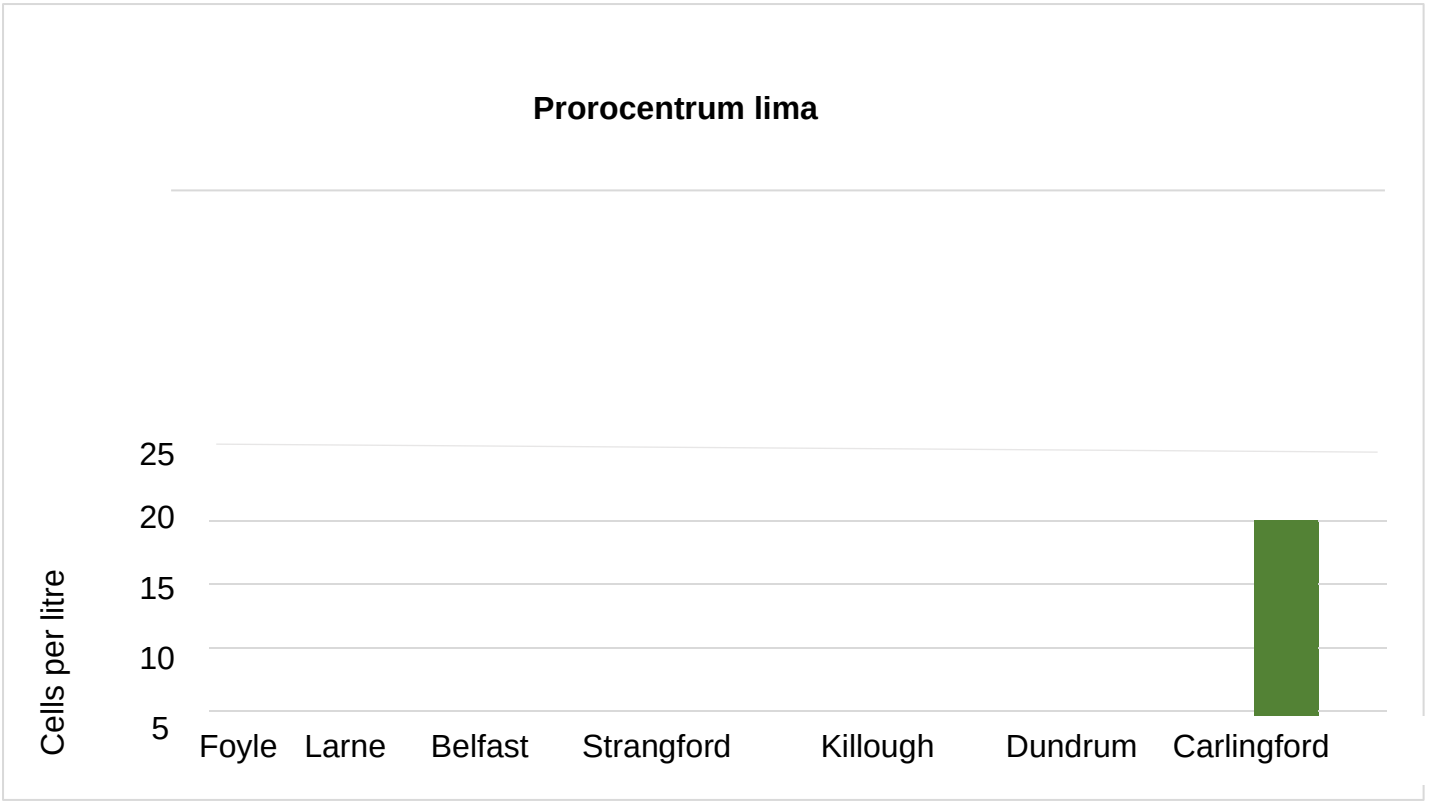

Alexandrium spp.
5
4
3
2
1
0
Occurrence (%)
Foyle
Larn
Belfast
Strangford
Killough
Dundrum
Carlingford

Figure 3. Maximum abundance (cells per litre) of the four major target groups in 2019 in water samples taken from each area






Prorocentrum lima
Cells per litre
25
20
15
10
5
Foyle
Larne
Belfast
Strangford
Killough
Dundrum
Carlingford

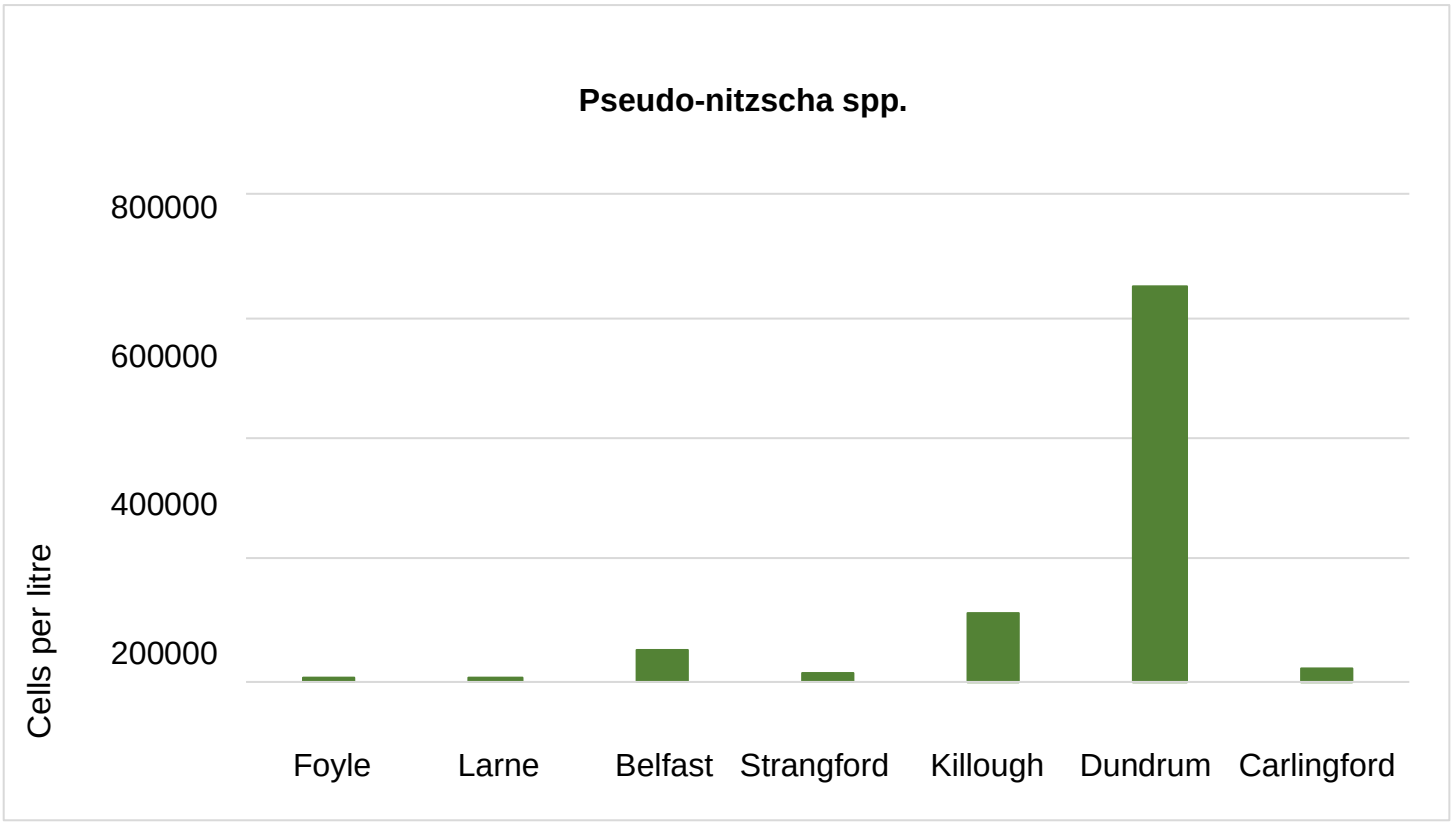
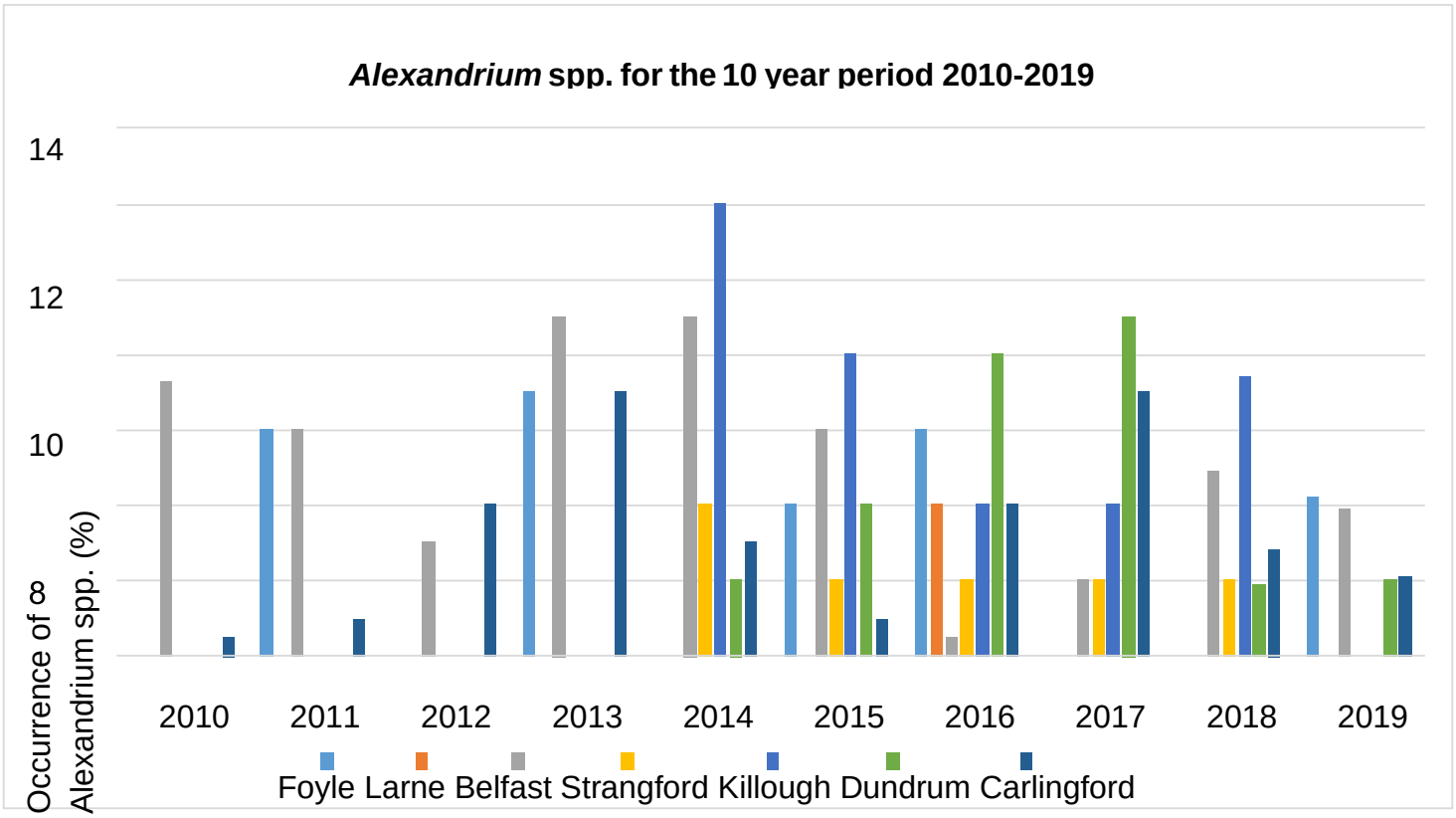

Pseudo-nitzscha spp.
Cells per litre
800000
600000
400000
200000
Foyle
Larne
Belfast
Strangford
Killough
Dundrum
Carlingford

Figure 4. Occurrence of the four major target organisms for period 2010-2019 (presence of cells in water samples as a % of the total number of samples reported for each sampling area in each year).

A



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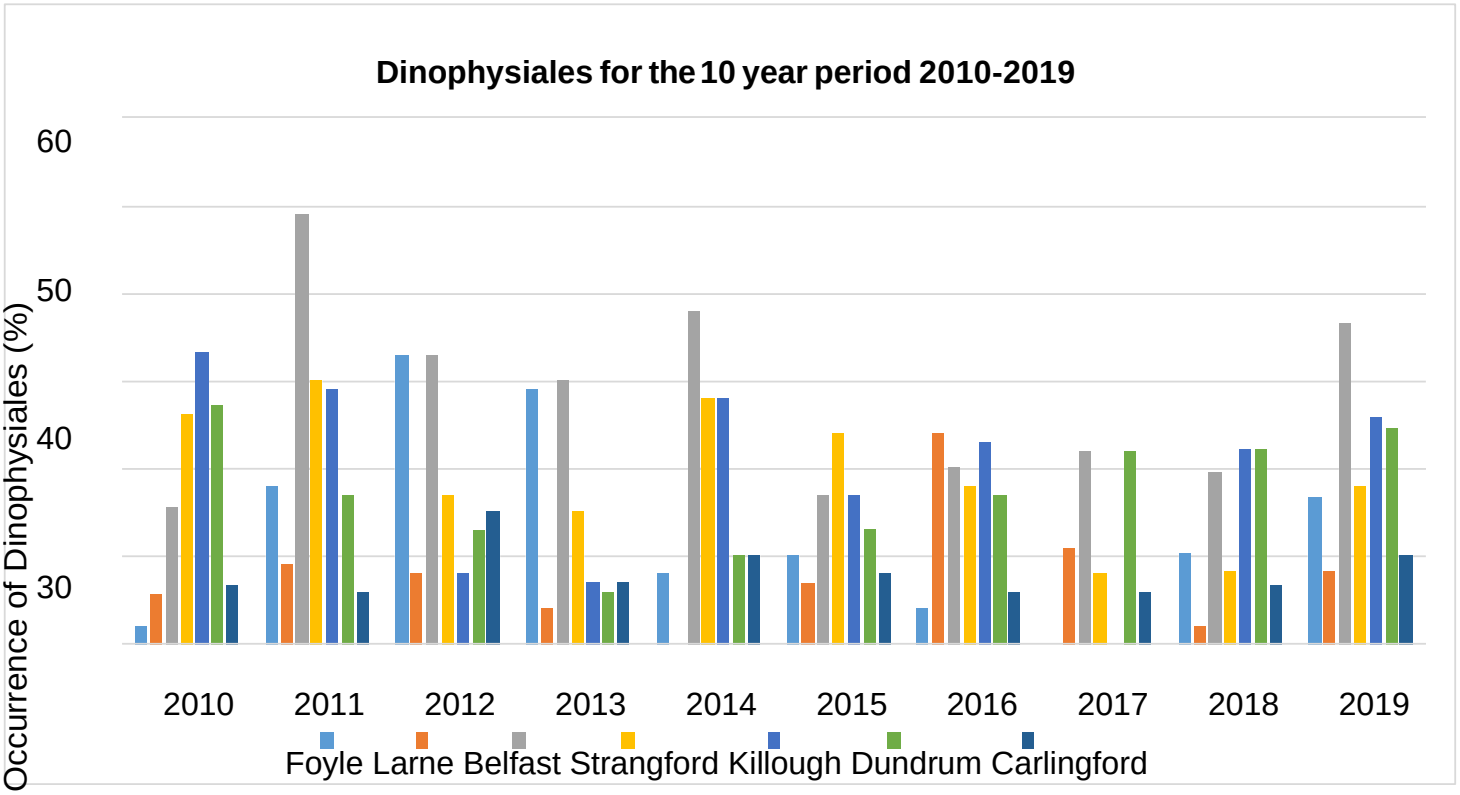

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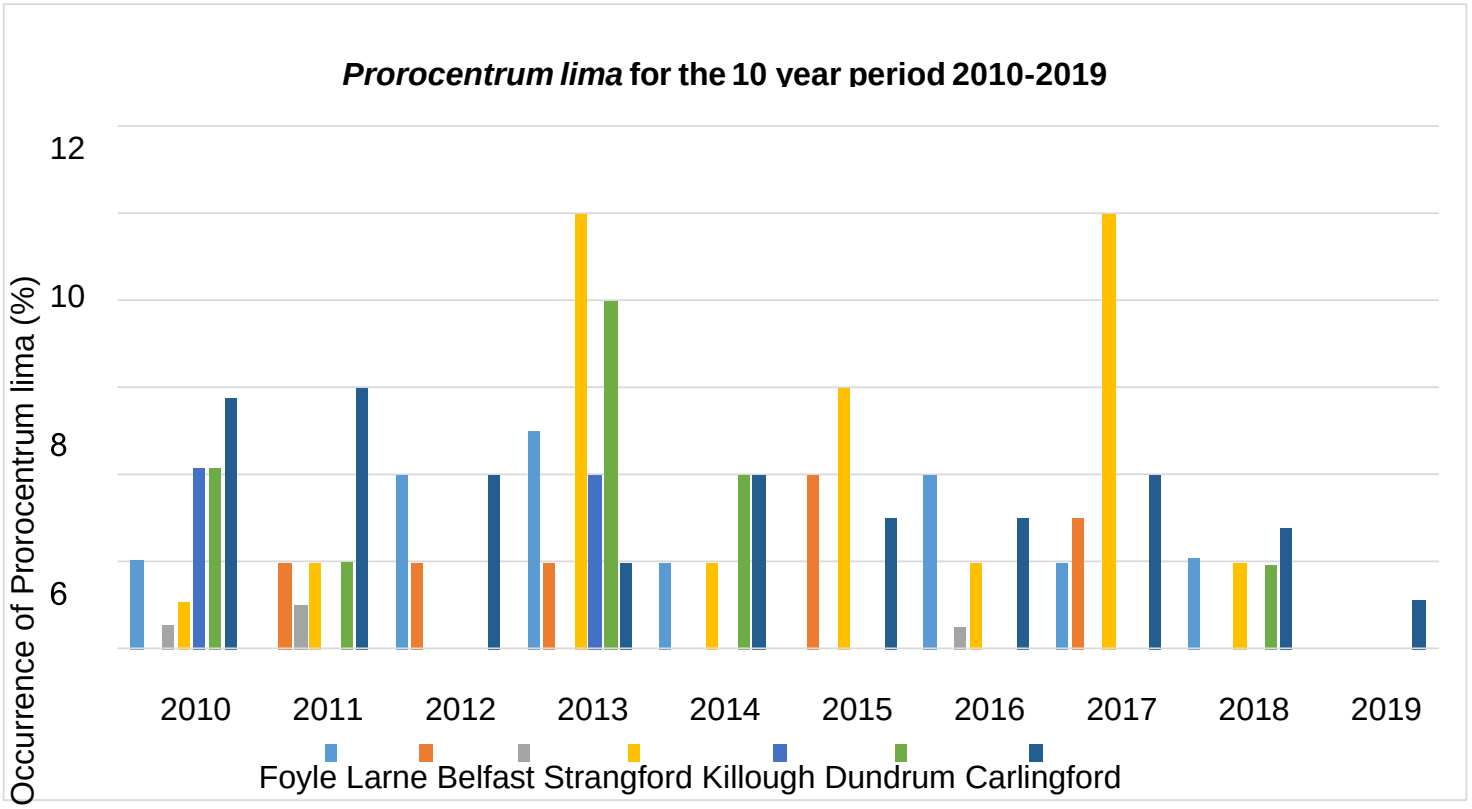
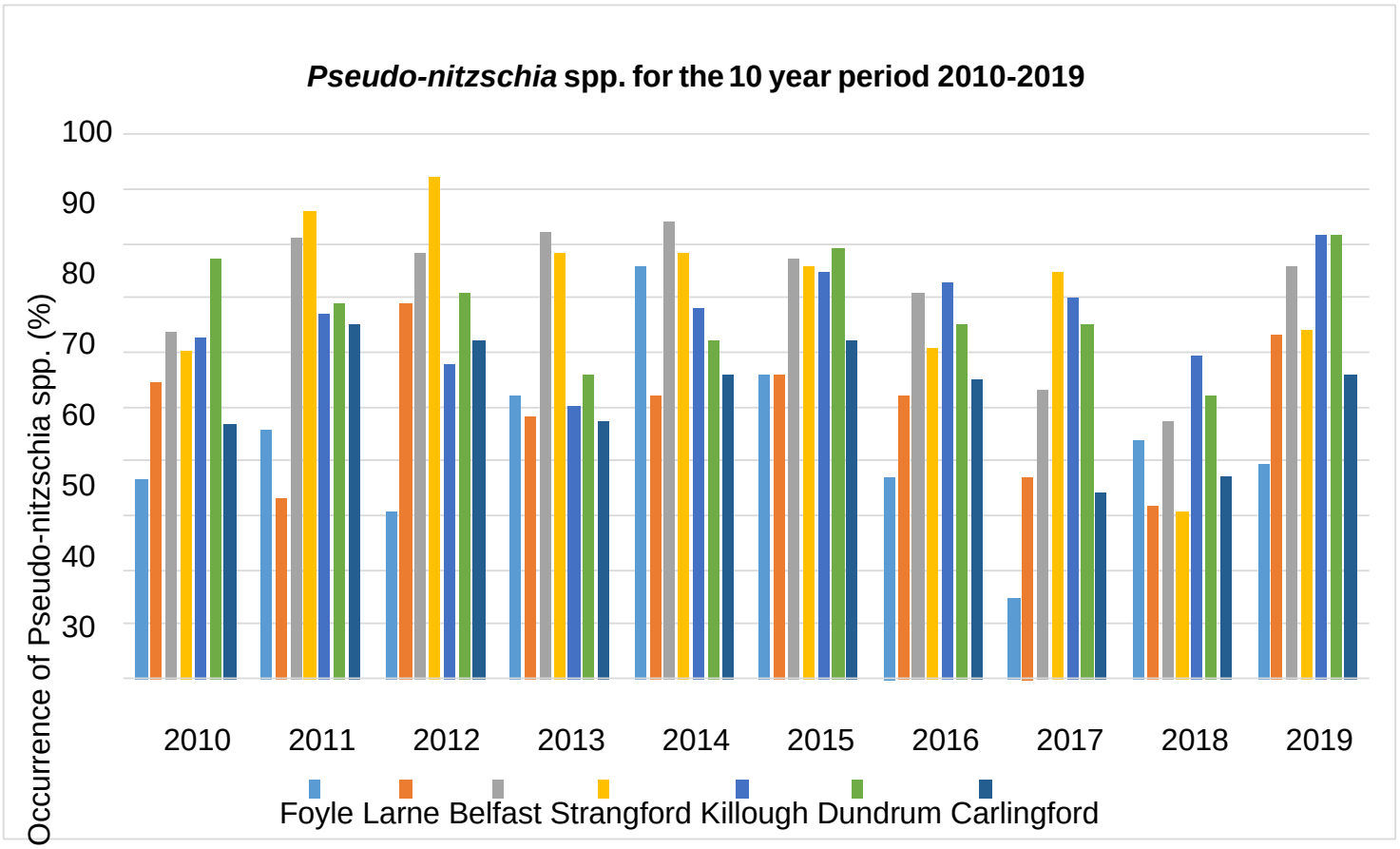

Prorocentrum lima for the 10 year period 2010-2019
Occurrence of Prorocentrum lima (%)
12
10
8
6
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Foyle Larne Belfast Strangford Killough Dundrum Carlingford

D


Pseudo-nitzschia spp. for the 10 year period 2010-2019
Occurrence of Pseudo-nitzschia spp. (%)
100
90
80
70
60
50
40
30
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Foyle Larne Belfast Strangford Killough Dundrum Carlingford

Results by area

Lough Foyle

Target species recorded from Lough Foyle in 2019 included; Alexandrium spp., Dinophysis acuminata, D.acuta, Dinophysis spp., Pseudo-nitzschia spp. and K.mikimotoi

A total of 48 samples were received and analysed from the two monitoring sites in Lough Foyle. *Alexandrium* spp. were recorded in two water samples received from Foyle in 2019 albeit abundance was low reaching a maximum of 120 cells L^{-1} in a sample from PA3 wild fishery on 12th August (Table 5). This is in keeping with the historically low levels of *Alexandrium* which have been recorded in the Lough (Figure 4A). Cells from the *Dinophysis* genus were recorded on eight occasions although abundance was low. A maximum abundance of 80 cells L^{-1} was recorded on two dates, from the PA4 Wild fishery site on 24th June and on 12th August from PA3 site (Table 7). No cells of *Prorocentrum lima* were detected in the 2019 samples received from the lough. *Pseudo-nitzschia* spp. were detected in 39.6% of samples reaching a maximum abundance of 3,180 cells L^{-1} in a sample taken on 9th September (PA3 Wild fishery site).

The only other target species recorded was *Karenia mikimotoi*. This dinoflagellate was recorded in 9 of the 48 samples received reaching a maximum abundance of 6,680 cells L^{-1} on 12th August in a sample from the PA3 site.

Larne Lough

The following target species were recorded in water samples from Larne Lough in 2019; *Dinophysis acuminata*, *D.acuta, Pseudo-nitzschia* spp. and *Karenia mikimotoi*.

A total of 49 samples were received from the two sites in Larne Lough. The L5 AFFNI 21B site was sampled up until 15th October after which it went into ‘dormancy status’ with phytoplankton and biotoxin testing suspended. The PST producer, Alexandrium spp. was not detected in any water samples from the lough taken as part of the Official Control Programme. This is in keeping with the historically low presence of this genus in the lough (Figure 4A). Cells of the *Dinophysis* genus were counted in 8.2% of samples from the lough but abundance was low. A maximum cell count of 40 cells L^{-1} was recorded in a sample from L5- AFFNI 21B on the 18th June. The period covered in this report saw the highest proportion of samples in the lough containing cells of the cosmopolitan diatom genus *Pseudo-nitzschia* spp. since 2012. However cell abundance was low recording a maximum of 4340 cells L^{-1} in a sample taken from L5 AFFNI 21B on 30th July (Table 7).

Karenia mikimotoi was the only other target species recorded in the lough. It was recorded on one occasion reaching a maximum abundance of 20 cells L^{-1} on 30th July in a sample from L3 AFFNI 88.

Belfast Lough

Target species recorded in water samples from Belfast Lough during the reporting period were as follows; *Alexandrium* spp., *D.acuminata*, *D.acuta, D.norvegica*, *Dinophysis* spp., *Prorocentrum cordatum*, *Pseudo- nitzschia* spp., *K.mikimotoi* and *Phaeocystis* spp.

Belfast Lough is an important shellfish production area in Northern Ireland. Its four Representative Monitoring Points (RMP's) were sampled weekly throughout 2019 with a total of 208 samples analysed. *Alexandrium* spp. were counted in 3.8% of samples (Table 5), this is similar to the percentage recorded in previous years where values have ranged from a low of 0.5% (2016) to 9.7% (2009) (Fig.4A). The maximum abundance recorded in 2019 was 80 cells L^{-1} in a water sample from B20-AFFNI 53 taken on the 19th August. Cells from the taxonomic order Dinophysiales have been recorded regularly over the past years in samples from Belfast Lough (Figure 4B). In 2019 they were present in 36.6% of samples (Table 4). This is the highest figure recorded since 2014 (Figure 4B).Temporal distribution of the genus within the lough was from late April until early November with cell numbers peaking at all sites in mid to late July. The maximum cell abundance recorded was 7,340 cells L^{-1} in a sample taken from B20-AFFNI 53 on 29th July. The majority of cells present in the sample were of the species *Dinophysis acuminata*. DST's were detected in shellfish from early June until early September, however, all results were below the EU regulatory limit of 160 µg/kg. Almost three quarters of samples contained cells of *Pseudo-nitzschia* spp (Table 4). This is

substantially increased from the previous year's figure of 47% and is similar to the figures recorded previous to 2018 (Figure 4D).

Other target species recorded included *Prorocentrum cordatum*, *Karenia mikimotoi* and *Phaeocystis* spp.. All three were only recorded on one occasion in the lough: Prorocentrum cordatum on 13th May (B20- AFFNI 53) at 60 cells L^{-1}, Karenia mikimotoi on 10th June (B12-AFFNI 54) at 20 cells L^{-1} and Phaeocystis spp. on 20th May at 600 cells L^{-1} (B12-AFFNI 54).

Strangford Lough

Target species recorded from Strangford Lough during the year included; *D.acuminata*, *D.acuta, Phalacroma rotundatum, Dinophysis* spp., *Pseudo-nitzschia* spp. and *Karenia mikimotoi*.

Alexandrium spp. was not detected in any samples received during 2019. Dinophysiales were present in 17.9% an increase on the 8% of samples recorded in 2018 and also in 2017. A maximum cell abundance of 240 cells L^{-1} was recorded on two occasions Firstly in a sample from S2-AFFNI 42 on 28th April and again in a sample from S7-AFFNI 76 on 10th June (Table 7). *Pseudo-nitschia* were present in 64.3% of samples a considerable increase in the value recorded the previous year of 30.6% and more in keeping with the values recorded pre 2018 (Figure 4D). Cell abundance was relatively low reaching a maximum of 8,380 cells L^{-1} in a sample from S2-AFFNI 42 on 31st March (Table 8). *Karenia mikimotoi* was the only other target species recorded in the 2019 water samples. It was present in four samples and reached a maximum abundance of 20 cells L^{-1} on four occasions; 15th July, 26th August and 8th September (S2 AFFNI 42) and 29th July (S7-AFFNI 76).

Killough

The following target species were recorded from Killough waters during 2019; Dinophysis acuminata, D.acuta, Prorocentrum cordatum, Pseudo-nitzschia spp. and Karenia mikimotoi.

Alexandrium spp. was not recorded in samples received during 2019. This was the first year since 2013 that it had not been recorded (Figure 4A). Cells of the Dinophysiales order were recorded in 25.9% of samples and reached a maximum abundance of 320 cells L^{-1} on 16th July. *Pseudo-nitzschia* spp. was recorded in 81.5% of samples with a maximum cell abundance of 108,800 cells L^{-1} recorded on the 27th August.

Two other target organisms were recorded in Killough samples during the year*; Karenia mikimotoi* was recorded on one occasion reaching a maximum abundance of 20 cells L^{-1}on 16th July and *Prorocentrum cordatum* was recorded at 60 cells L^{-1} on 17th June.

Dundrum Bay

Target species present in Dundrum Bay included; *Alexandrium* spp., *D.acuminata* and *Pseudo-nitzschia* spp.

Two sites were sampled in the bay up until 14/10/19 when the DB2-AFFNI 95B site was put into 'dormancy status' with phytoplankton and biotoxin testing suspended due to inactivity on the site.

Alexandrium spp. was present in 2 % of samples (Table 4), a figure similar to that of the 1.9% recorded in the previous year (Figure 4A). A maximum abundance of 20 cells L^{-1} was recorded in a water sample from the DB2-AFFNI 95B site on 16th July. *Dinophysis acuminata* was the only species of the *Dinophysis* genus recorded in official control samples, reaching a maximum of 140 cells L^{-1} on 1st July in a sample from DB2- AFFNI 95B*.* This is in sharp contrast to the previous year when *Dinophysis acuminata, Dinophysis acuta, D.norvegica* and *Dinophysis* spp. were all present in water samples from the bay.

Pseudo-nitzschia spp. was present in 81.6% of samples (Table 4). The trigger value of 150,000 cells L^{-1} was breached twice with both Dundrum sites recording values above this on 1st April. The DB1-AFFNI 95A site recorded a value of 453,200 cells L^{-1} and the DB2-AFFNI 95B site a value of 648,400 cells L^{-1}. Both samples were made up mainly of cells from the 'delicatissima' complex.

No other target species were recorded during 2019.

Carlingford Lough

Target species recorded in Carlingford Lough during 2019 were; Alexandrium spp., D.acuminata, D.acuta, D.norvegica, Dinophysis spp., P.lima, Pseudo-nitzschia spp., K.mikimotoi and N.scintillans.

Alexandrium spp. was recorded in 2.1% of the water samples received from Carlingford Lough in 2019 a figure similar to the 2.8% recorded the previous year. Cell abundance was low with a maximum abundance of 20 cells L^{-1} recorded on the 7th May (C4-AFFNI 68), 22nd July (C11-AFFNI

84) and 6th August (C4-AFFNI 68 and C7-AFFNI 73) respectively. Members of the Dinophysiales order were present in 10% of samples

(Table 4). A peak cell abundance of 860 cells L^{-1} was recorded in a water sample from the C4-AFFNI 68 site on 22nd July (Table 7).

P.lima occurred in a small number of samples (1.1%) with a maximum of 20 cells L^{-1} recorded on two occasions, both from the C4-AFFNI 68 site. Spatial variability of *Pseudo-nitzschia* spp. within the lough ranged from 29.6 % in samples from C1-AFFNI 27 to 74.1 % in samples from C11-AFFNI 84 (Table 3). A maximum cell abundance of 18,100 cells L^{-1} was recorded on 27th August in a sample taken from C9-AFFNI 39 (Table 8).

K.mikimotoi was recorded on 5 occasions, reaching a maximum abundance of 120 cells L^{-1} on 21st October (C9-AFFNI 39). *Noctiluca scintillans* was recorded on 2 occasions reaching a maximum abundance of 40 cells L^{-1} on 12th August in a water sample from C3-AFFNI 94.

Appendix 1

Table 5 Positive occurrences of Alexandrium spp. (cells L-1) in 2019

System ID	Region	Site ID ref	Report no.	Collection date	Alexandrium spp.
phy1900227	Carlingford	C4-AFFNI 68	phy19-19b	07/05/2019	20
phy1900281	Belfast	B1-AFFNI 55	phy19-24a	10/06/2019	20
phy1900346	Dundrum	DB2- AFFNI 95B	phy19-29a	16/07/2019	20
phy1900365	Carlingford	C11- AFFNI 84	phy19-30b	22/07/2019	20
phy1900385	Carlingford	C4-AFFNI 68	phy19-32b	06/08/2019	20
phy1900386	Carlingford	C7-AFFNI 73	phy19-32b	06/08/2019	20
phy1900393	Belfast	B1-AFFNI 55	phy19-33a	12/08/2019	20
phy1900394	Belfast	B3-AFFNI 50	phy19-33a	12/08/2019	20
phy1900396	Belfast	B20- AFFNI 53	phy19-33a	12/08/2019	20
phy1900404	Foyle	PA3-wild fishery	phy19-33c	12/08/2019	120
phy1900411	Belfast	B3-AFFNI 50	phy19-34a	19/08/2019	20
phy1900412	Belfast	B12- AFFNI 54	phy19-34a	19/08/2019	20
phy1900413	Belfast	B20- AFFNI 53	phy19-34a	19/08/2019	80
phy1900431	Foyle	PA4-wild fishery	phy19-35b	27/08/2019	20
phy1900445	Belfast	B12- AFFNI 54	phy19-37a	09/09/2019	20

Table 6 Positive occurrences of Prorocentrum lima (cells L-1) in 2019

System ID	Region	Site ID ref	Report no	Collection date	Prorocentrum lima
phy1900053	Carlingford	C4-AFFNI 68	phy19-05b	28/01/2019	20
phy1900362	Carlingford	C4-AFFNI 68	phy19-30b	22/07/2019	20

Table 7 Positive occurrences of Dinophysiales in 2019

Abbreviations in table

- Da – *Dinophysis acuminata*
- Dacuta – *Dinophysis acuta*
- Dn – *Dinophysis norvegica*
- Pr – *Phalacroma rotundatum*
- Din. – *Dinophysis* spp. not identified to species level

System ID	Region	Site ID ref	Report No	Collection date	Da	Dacuta	Dn	Pr	Din	Tot. Din
phy1900113	Strangford	S2-AFFNI 42	phy19-10a	03/03/2019	20	0	0	0	0	20
phy1900184	Dundrum	DB2-AFFNI 95B	phy19-16a	15/04/2019	20	0	0	0	0	20
phy1900205	Belfast	B3-AFFNI 50	phy19-18a	29/04/2019	20	0	0	0	0	20
phy1900208	Strangford	S2-AFFNI 42	phy19-18a	28/04/2019	240	0	0	0	0	240
phy1900221	Killough	K1-AFFNI 18	phy19-19a	07/05/2019	20	0	0	0	0	20
phy1900227	Carlingford	C4-AFFNI 68	phy19-19b	07/05/2019	20	0	0	0	0	20
phy1900233	Belfast	B1-AFFNI 55	phy19-20a	13/05/2019	20	0	0	0	0	20
phy1900235	Belfast	B12-AFFNI 54	phy19-20a	13/05/2019	20	0	0	0	0	20
phy1900241	Belfast	B1-AFFNI 55	phy19-21a	20/05/2019	20	0	0	0	0	20
phy1900243	Belfast	B12-AFFNI 54	phy19-21a	20/05/2019	20	0	0	0	20	40
phy1900247	Dundrum	DB2-AFFNI 95B	phy19-21a	20/05/2019	40	0	0	0	0	40
phy1900252	Carlingford	C7-AFFNI 73	phy19-21b	22/05/2019	20	0	0	0	0	20

System ID	Region	Site ID ref	Report No	Collection date	Da	Dacu ta	Dn	Pr	Din	Tot. Din
phy1900253	Carlingford	C9-AFFNI 39	phy19-21b	22/05/2019	20	0	0	0	0	20
phy1900257	Belfast	B1-AFFNI 55	phy19-22a	28/05/2019	0	0	0	0	60	60
phy1900258	Belfast	B3-AFFNI 50	phy19-22a	28/05/2019	40	0	0	0	0	40
phy1900259	Belfast	B12-AFFNI 54	phy19-22a	28/05/2019	80	0	0	0	0	80
phy1900260	Belfast	B20-AFFNI 53	phy19-22a	28/05/2019	280	0	0	0	0	280
phy1900266	Carlingford	C11-AFFNI 84	phy19-22b	28/05/2019	20	0	0	0	0	20
phy1900267	Carlingford	NW-wild fishery	phy19-22b	28/05/2019	20	0	0	0	0	20
phy1900268	Foyle	PA3-wild fishery	phy19-22b	28/05/2019	20	0	0	0	0	20
phy1900269	Foyle	PA4-wild fishery	phy19-22b	28/05/2019	20	0	0	0	20	40
phy1900274	Killough	K1-AFFNI 18	phy19-23a	03/06/2019	60	0	0	0	0	60
phy1900276	Dundrum	DB2-AFFNI 95B	phy19-23a	03/06/2019	80	0	0	0	0	80
phy1900277	Belfast	B1-AFFNI 55	phy19-23b	04/06/2019	340	0	0	0	0	340
phy1900278	Belfast	B3-AFFNI 50	phy19-23b	04/06/2019	40	0	0	0	0	40
phy1900279	Belfast	B12-AFFNI 54	phy19-23b	04/06/2019	560	0	0	0	0	560

System ID	Region	Site ID ref	Report No	Collection date	Da	Dacu ta	Dn	Pr	Din	Tot. Din
phy1900280	Belfast	B20-AFFNI 53	phy19-23b	04/06/2019	140	0	0	0	0	140
phy1900281	Belfast	B1-AFFNI 55	phy19-24a	10/06/2019	160	0	0	0	40	200
phy1900282	Belfast	B3-AFFNI 50	phy19-24a	10/06/2019	20	0	0	0	0	20
phy1900283	Belfast	B12-AFFNI 54	phy19-24a	10/06/2019	340	0	0	0	60	400
phy1900284	Belfast	B20-AFFNI 53	phy19-24a	10/06/2019	200	0	0	0	0	200
phy1900285	Strangford	S2-AFFNI 42	phy19-24a	09/06/2019	160	0	0	0	40	200
phy1900286	Strangford	S7-AFFNI 76	phy19-24a	10/06/2019	180	20	0	40	0	240
phy1900291	Carlingford	C9-AFFNI 39	phy19-24b	10/06/2019	40	0	0	0	0	40
phy1900296	Killough	K1-AFFNI 18	phy19-25a	17/06/2019	260	0	0	0	0	260
phy1900298	Dundrum	DB2-AFFNI 95B	phy19-25a	17/06/2019	20	0	0	0	0	20
phy1900299	Belfast	B1-AFFNI 55	phy19-25a	17/06/2019	160	0	0	0	0	160
phy1900300	Belfast	B3-AFFNI 50	phy19-25a	17/06/2019	860	0	0	0	80	940
phy1900301	Belfast	B20-AFFNI 53	phy19-25a	17/06/2019	120	0	0	0	0	120
phy1900302	Belfast	B12-AFFNI 54	phy19-25a	17/06/2019	1540	0	0	0	60	1600
phy1900303	Strangford	S2-AFFNI 42	phy19-25a	16/06/2019	60	0	0	0	0	60

System ID	Region	Site ID ref	Report No	Collection date	Da	Dacu ta	Dn	Pr	Din	Tot. Din
phy1900306	Larne	L5-AFFNI 21B	phy19-25b	18/06/2019	40	0	0	0	0	40
phy1900308	Belfast	B3-AFFNI 50	phy19-26a	24/06/2019	460	0	0	0	0	460
phy1900309	Belfast	B12-AFFNI 54	phy19-26a	24/06/2019	420	0	0	0	0	420
phy1900310	Belfast	B20-AFFNI 53	phy19-26a	24/06/2019	520	0	60	0	40	620
phy1900317	Carlingford	NW-wild fishery	phy19-26b	24/06/2019	20	0	0	0	0	20
phy1900318	Foyle	PA3-wild fishery	phy19-26b	24/06/2019	60	0	0	0	0	60
phy1900319	Foyle	PA4-wild fishery	phy19-26b	24/06/2019	80	0	0	0	0	80
phy1900320	Belfast	B1-AFFNI 55	phy19-27a	01/07/2019	300	0	0	0	0	300
phy1900321	Belfast	B3-AFFNI 50	phy19-27a	01/07/2019	620	0	0	0	20	640
phy1900322	Belfast	B12-AFFNI 54	phy19-27a	01/07/2019	1060	0	0	0	60	1120
phy1900323	Belfast	B20-AFFNI 53	phy19-27a	01/07/2019	1200	0	0	0	0	1200
phy1900324	Killough	K1-AFFNI 18	phy19-27a	01/07/2019	140	20	0	0	0	160
phy1900326	Dundrum	DB2-AFFNI 95B	phy19-27a	01/07/2019	140	0	0	0	0	140
phy1900327	Strangford	S2-AFFNI 42	phy19-27a	30/06/2019	60	0	0	0	0	60

System ID	Region	Site ID ref	Report No	Collection date	Da	Dacu ta	Dn	Pr	Din	Tot. Din
phy1900331	Belfast	B1-AFFNI 55	phy19-28a	08/07/2019	80	0	0	0	0	80
phy1900332	Belfast	B3-AFFNI 50	phy19-28a	08/07/2019	4200	0	0	0	200	4400
phy1900333	Belfast	B12-AFFNI 54	phy19-28a	08/07/2019	2700	0	0	0	240	2940
phy1900334	Belfast	B20-AFFNI 53	phy19-28a	08/07/2019	500	20	0	0	40	560
phy1900336	Carlingford	C3-AFFNI 94	phy19-28b	08/07/2019	20	0	0	0	0	20
phy1900337	Carlingford	C4-AFFNI 68	phy19-28b	08/07/2019	20	0	0	0	0	20
phy1900343	Foyle	PA4-wild fishery	phy19-28b	08/07/2019	20	0	0	0	0	20
phy1900344	Killough	K1-AFFNI 18	phy19-29a	16/07/2019	260	60	0	0	0	320
phy1900345	Dundrum	DB1-AFFNI 95A	phy19-29a	16/07/2019	20	0	0	0	0	20
phy1900347	Belfast	B1-AFFNI 55	phy19-29a	16/07/2019	1020	0	0	0	40	1060
phy1900348	Belfast	B3-AFFNI 50	phy19-29a	16/07/2019	6620	0	0	0	80	6700
phy1900349	Belfast	B12-AFFNI 54	phy19-29a	16/07/2019	1620	0	0	0	0	1620
phy1900350	Belfast	B20-AFFNI 53	phy19-29a	16/07/2019	700	0	0	0	0	700
phy1900351	Strangford	S2-AFFNI 42	phy19-29b	15/07/2019	80	40	0	0	0	120
phy1900354	Larne	L5-AFFNI 21B	phy19-29b	17/07/2019	0	20	0	0	0	20

System ID	Region	Site ID ref	Report No	Collection date	Da	Dacu ta	Dn	Pr	Din	Tot. Din
phy1900355	Belfast	B1-AFFNI 55	phy19-30a	22/07/2019	780	0	0	0	100	880
phy1900356	Belfast	B3-AFFNI 50	phy19-30a	22/07/2019	1260	0	0	0	60	1320
phy1900357	Belfast	B12-AFFNI 54	phy19-30a	22/07/2019	3320	0	0	0	80	3400
phy1900358	Belfast	B20-AFFNI 53	phy19-30a	22/07/2019	160	0	0	0	0	160
phy1900362	Carlingford	C4-AFFNI 68	phy19-30b	22/07/2019	760	40	40	0	20	860
phy1900365	Carlingford	C11-AFFNI 84	phy19-30b	22/07/2019	280	100	0	0	20	400
phy1900368	Killough	K1-AFFNI 18	phy19-31a	29/07/2019	20	0	0	0	0	20
phy1900372	Strangford	S7-AFFNI 76	phy19-31a	29/07/2019	60	40	0	0	0	100
phy1900373	Belfast	B1-AFFNI 55	phy19-31a	29/07/2019	1900	0	0	0	0	1900
phy1900374	Belfast	B3-AFFNI 50	phy19-31a	29/07/2019	4340	0	20	0	20	4380
phy1900375	Belfast	B12-AFFNI 54	phy19-31a	29/07/2019	2160	0	0	0	0	2160
phy1900376	Belfast	B20-AFFNI 53	phy19-31a	29/07/2019	7240	0	0	0	100	7340
phy1900377	Larne	L3-AFFNI 88	phy19-31b	30/07/2019	40	0	0	0	0	40
phy1900378	Larne	L5-AFFNI 21B	phy19-31b	30/07/2019	20	0	0	0	0	20
phy1900379	Belfast	B1-AFFNI 55	phy19-32a	05/08/2019	60	0	0	0	0	60
phy1900380	Belfast	B3-AFFNI 50	phy19-32a	05/08/2019	940	0	0	0	0	940

System ID	Region	Site ID ref	Report No	Collection date	Da	Dacu ta	Dn	Pr	Din	Tot. Din
phy1900381	Belfast	B12-AFFNI 54	phy19-32a	05/08/2019	1000	0	0	0	0	1000
phy1900382	Belfast	B20-AFFNI 53	phy19-32a	05/08/2019	40	0	0	0	0	40
phy1900385	Carlingford	C4-AFFNI 68	phy19-32b	06/08/2019	120	20	0	0	0	140
phy1900388	Carlingford	C11-AFFNI 84	phy19-32b	06/08/2019	60	20	0	0	0	80
phy1900391	Dundrum	DB1-AFFNI 95A	phy19-33a	12/08/2019	20	0	0	0	0	20
phy1900392	Dundrum	DB2-AFFNI 95B	phy19-33a	12/08/2019	20	0	0	0	0	20
phy1900393	Belfast	B1-AFFNI 55	phy19-33a	12/08/2019	240	0	0	0	0	240
phy1900394	Belfast	B3-AFFNI 50	phy19-33a	12/08/2019	100	0	0	0	0	100
phy1900395	Belfast	B12-AFFNI 54	phy19-33a	12/08/2019	100	0	0	0	0	100
phy1900396	Belfast	B20-AFFNI 53	phy19-33a	12/08/2019	20	0	0	0	0	20
phy1900399	Carlingford	C3-AFFNI 94	phy19-33b	12/08/2019	80	0	0	0	0	80
phy1900400	Carlingford	C4-AFFNI 68	phy19-33b	12/08/2019	40	20	0	0	0	60
phy1900403	Carlingford	C11-AFFNI 84	phy19-33b	12/08/2019	60	20	0	0	0	80
phy1900404	Foyle	PA3-wild fishery	phy19-33c	12/08/2019	80	0	0	0	0	80
phy1900408	Strangford	S2-AFFNI 42	phy19-33b	12/08/2019	20	0	0	0	0	20

System ID	Region	Site ID ref	Report No	Collection date	Da	Dacuta	Dn	Pr	Din	Tot. Din
phy1900410	Belfast	B1-AFFNI 55	phy19-34a	19/08/2019	20	0	0	0	0	20
phy1900412	Belfast	B12-AFFNI 54	phy19-34a	19/08/2019	60	0	0	0	20	80
phy1900414	Killough	K1-AFFNI 18	phy19-35a	27/08/2019	40	0	0	0	0	40
phy1900416	Dundrum	DB2-AFFNI 95B	phy19-35a	27/08/2019	20	0	0	0	0	20
phy1900419	Belfast	B12-AFFNI 54	phy19-35b	27/08/2019	200	0	0	0	0	200
phy1900424	Carlingford	C3-AFFNI 94	phy19-35b	27/08/2019	20	0	0	0	40	60
phy1900425	Carlingford	C4-AFFNI 68	phy19-35b	27/08/2019	40	20	0	0	0	60
phy1900427	Carlingford	C9-AFFNI 39	phy19-35b	27/08/2019	40	0	0	0	0	40
phy1900430	Foyle	PA3-wild fishery	phy19-35b	27/08/2019	40	0	0	0	0	40
phy1900431	Foyle	PA4-wild fishery	phy19-35b	27/08/2019	0	20	0	0	0	20
phy1900434	Belfast	B1-AFFNI 55	phy19-36a	02/09/2019	80	0	0	0	0	80
phy1900435	Belfast	B3-AFFNI 50	phy19-36a	02/09/2019	20	0	0	0	0	20
phy1900436	Belfast	B12-AFFNI 54	phy19-36a	02/09/2019	80	0	0	0	0	80
phy1900439	Dundrum	DB1-AFFNI 95A	phy19-36a	02/09/2019	40	0	0	0	0	40

System ID	Region	Site ID ref	Report No	Collection date	Da	Dacu ta	Dn	Pr	Din	Tot. Din
phy1900443	Belfast	B1-AFFNI 55	phy19-37a	09/09/2019	20	20	0	0	0	40
phy1900444	Belfast	B3-AFFNI 50	phy19-37a	09/09/2019	100	0	0	0	40	140
phy1900445	Belfast	B12-AFFNI 54	phy19-37a	09/09/2019	60	0	0	0	0	60
phy1900459	Belfast	B3-AFFNI 50	phy19-38a	16/09/2019	20	0	0	0	0	20
phy1900460	Belfast	B12-AFFNI 54	phy19-38a	16/09/2019	40	0	0	0	0	40
phy1900461	Belfast	B20-AFFNI 53	phy19-38a	16/09/2019	20	0	0	0	0	20
phy1900464	Dundrum	DB2-AFFNI 95B	phy19-38a	16/09/2019	20	0	0	0	0	20
phy1900469	Belfast	B12-AFFNI 54	phy19-39a	23/09/2019	20	0	0	0	0	20
phy1900483	Belfast	B3-AFFNI 50	phy19-40a	30/09/2019	20	0	0	0	0	20
phy1900484	Belfast	B12-AFFNI 54	phy19-40b	30/09/2019	20	0	0	0	0	20
phy1900488	Dundrum	DB2-AFFNI 95B	phy19-40a	30/09/2019	20	0	0	0	0	20
phy1900492	Belfast	B3-AFFNI 50	phy19-41a	07/10/2019	40	0	0	0	0	40
phy1900493	Belfast	B12-AFFNI 54	phy19-41a	07/10/2019	60	0	0	0	0	60
phy1900506	Belfast	B1-AFFNI 55	phy19-42a	14/10/2019	20	0	0	0	0	20
phy1900528	Strangford	S2-AFFNI 42	phy19-43b	22/10/2019	20	0	0	0	0	20

System ID	Region	Site ID ref	Report No	Collection date	Da	Dacu ta	Dn	Pr	Din	Tot. Din
phy1900533	Belfast	B3-AFFNI 50	phy19-44a	28/10/2019	20	0	0	0	0	20
phy1900534	Belfast	B12-AFFNI 54	phy19-44a	28/10/2019	20	0	0	0	0	20
phy1900535	Belfast	B20-AFFNI 53	phy19-44a	28/10/2019	20	0	0	0	0	20
phy1900537	Belfast	B1-AFFNI 55	phy19-45a	03/11/2019	20	0	0	0	0	20
phy1900538	Belfast	B3-AFFNI 50	phy19-45a	03/11/2019	40	0	0	0	0	40
phy1900559	Belfast	B1-AFFNI 55	phy19-47a	18/11/2019	20	0	0	0	0	20

Table 8 Positive occurrences of *Pseusdo-nitzschia* spp. in 2019

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
phy1900001	Belfast	B1-AFFNI 55	phy19-01a	31/12/2018	80
phy1900002	Belfast	B3-AFFNI 50	phy19-01a	31/12/2018	80
phy1900004	Belfast	B20- AFFNI 53	phy19-01a	31/12/2018	80
phy1900005	Killough	K1-AFFNI 18	phy19-01a	02/01/2019	120
phy1900006	Dundrum	DB1- AFFNI 95A	phy19-01a	02/01/2019	400
phy1900009	Strangford	S7-AFFNI 76	phy19-01a	02/01/2019	500
phy1900016	Carlingford	NW-wild fishery	phy19-01b	02/01/2019	160
phy1900017	Belfast	B1-AFFNI 55	phy19-02a	07/01/2019	80
phy1900018	Belfast	B3-AFFNI 50	phy19-02a	07/01/2019	940
phy1900019	Belfast	B12- AFFNI 54	phy19-02a	07/01/2019	580
phy1900020	Belfast	B20- AFFNI 53	phy19-02a	07/01/2019	160
phy1900023	Belfast	B1-AFFNI 55	phy19-03a	14/01/2019	1000
phy1900024	Belfast	B3-AFFNI 50	phy19-03a	14/01/2019	600
phy1900025	Belfast	B12- AFFNI 54	phy19-03a	14/01/2019	340
phy1900026	Belfast	B20- AFFNI 53	phy19-03a	14/01/2019	440
phy1900038	Killough	K1-AFFNI 18	phy19-04a	21/01/2019	80
phy1900039	Dundrum	DB1- AFFNI 95A	phy19-04a	21/01/2019	660
phy1900040	Dundrum	DB2- AFFNI 95B	phy19-04a	21/01/2019	820
phy1900041	Belfast	B1-AFFNI 55	phy19-04a	21/01/2019	1320
phy1900042	Belfast	B3-AFFNI 50	phy19-04a	21/01/2019	1040
phy1900043	Belfast	B12- AFFNI 54	phy19-04a	21/01/2019	1360
phy1900044	Belfast	B20- AFFNI 53	phy19-04a	21/01/2019	420
phy1900047	Belfast	B1-AFFNI 55	phy19-	28/01/2019	80

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
			05a		
phy1900048	Belfast	B3-AFFNI 50	phy19-05a	28/01/2019	880
phy1900049	Belfast	B12- AFFNI 54	phy19-05a	28/01/2019	580
phy1900050	Belfast	B20- AFFNI 53	phy19-05a	28/01/2019	280
phy1900056	Carlingford	C11- AFFNI 84	phy19-05b	28/01/2019	60
phy1900061	Strangford	S7-AFFNI 76	phy19-05b	29/01/2019	120
phy1900062	Killough	K1-AFFNI 18	phy19-06a	04/02/2019	280
phy1900064	Dundrum	DB2- AFFNI 95B	phy19-06a	04/02/2019	120
phy1900065	Belfast	B1-AFFNI 55	phy19-06a	04/02/2019	720
phy1900066	Belfast	B3-AFFNI 50	phy19-06a	04/02/2019	540
phy1900067	Belfast	B12- AFFNI 54	phy19-06a	04/02/2019	1320
phy1900068	Belfast	B20- AFFNI 53	phy19-06a	04/02/2019	680
phy1900069	Strangford	S2-AFFNI 42	phy19-06a	03/02/2019	2060
phy1900070	Strangford	S7-AFFNI 76	phy19-06a	04/02/2019	80
phy1900071	Larne	L3-AFFNI 88	phy19-06b	05/02/2019	40
phy1900073	Belfast	B1-AFFNI 55	phy19-07a	11/02/2019	840
phy1900074	Belfast	B3-AFFNI 50	phy19-07a	11/02/2019	2180
phy1900075	Belfast	B12- AFFNI 54	phy19-07a	11/02/2019	1600
phy1900076	Belfast	B20- AFFNI 53	phy19-07a	11/02/2019	140
phy1900077	Carlingford	C1-AFFNI 27	phy19-07b	11/02/2019	120
phy1900079	Carlingford	C4-AFFNI 68	phy19-07b	11/02/2019	2180
phy1900080	Carlingford	C7-AFFNI 73	phy19-07b	11/02/2019	140
phy1900081	Carlingford	C9-AFFNI 39	phy19-07b	11/02/2019	1180
phy1900082	Carlingford	C11- AFFNI 84	phy19-07b	11/02/2019	1200

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
phy1900083	Carlingford	NW-wild fishery	phy19-07b	11/02/2019	780
phy1900085	Foyle	PA4-wild fishery	phy19-07b	11/02/2019	140
phy1900086	Killough	K1-AFFNI 18	phy19-08a	18/02/2019	940
phy1900087	Dundrum	DB1-AFFNI 95A	phy19-08a	18/02/2019	200
phy1900088	Dundrum	DB2- AFFNI 95B	phy19-08a	18/02/2019	80
phy1900089	Belfast	B1-AFFNI 55	phy19-08a	18/02/2019	1280
phy1900090	Belfast	B3-AFFNI 50	phy19-08a	18/02/2019	1020
phy1900091	Belfast	B12- AFFNI 54	phy19-08a	18/02/2019	3740
phy1900092	Belfast	B20- AFFNI 53	phy19-08a	18/02/2019	620
phy1900093	Strangford	S2-AFFNI 42	phy19-08a	17/02/2019	220
phy1900094	Strangford	S7-AFFNI 76	phy19-08a	18/02/2019	1260
phy1900095	Larne	L3-AFFNI 88	phy19-08b	19/02/2019	220
phy1900097	Belfast	B1-AFFNI 55	phy19-09a	25/02/2019	3700
phy1900098	Belfast	B3-AFFNI 50	phy19-09a	25/02/2019	2980
phy1900099	Belfast	B12- AFFNI 54	phy19-09a	25/02/2019	1960
phy1900100	Belfast	B20- AFFNI 53	phy19-09a	25/02/2019	2260
phy1900102	Carlingford	C3-AFFNI 94	phy19-09b	25/02/2019	400
phy1900103	Carlingford	C4-AFFNI 68	phy19-09b	25/02/2019	700
phy1900104	Carlingford	C7-AFFNI 73	phy19-09b	25/02/2019	260
phy1900105	Carlingford	C9-AFFNI 39	phy19-09b	25/02/2019	500
phy1900106	Carlingford	C11- AFFNI 84	phy19-09b	25/02/2019	620
phy1900108	Foyle	PA3-wild fishery	phy19-09b	25/02/2019	160
phy1900109	Foyle	PA4-wild fishery	phy19-09b	25/02/2019	180
phy1900110	Killough	K1-AFFNI 18	phy19-	04/03/2019	8260

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
			10a		
phy1900111	Dundrum	DB1- AFFNI 95A	phy19-10a	04/03/2019	1200
phy1900112	Dundrum	DB2- AFFNI 95B	phy19-10a	04/03/2019	2420
phy1900113	Strangford	S2-AFFNI 42	phy19-10a	03/03/2019	520
phy1900114	Strangford	S7-AFFNI 76	phy19-10a	04/03/2019	1540
phy1900115	Belfast	B1-AFFNI 55	phy19-10a	04/03/2019	4720
phy1900116	Belfast	B3-AFFNI 50	phy19-10a	04/03/2019	8100
phy1900117	Belfast	B12- AFFNI 54	phy19-10a	04/03/2019	7600
phy1900118	Belfast	B20- AFFNI 53	phy19-10a	04/03/2019	3840
phy1900121	Belfast	B1-AFFNI 55	phy19-11a	11/03/2019	3080
phy1900122	Belfast	B3-AFFNI 50	phy19-11a	11/03/2019	6800
phy1900123	Belfast	B12- AFFNI 54	phy19-11a	11/03/2019	7140
phy1900124	Belfast	B20- AFFNI 53	phy19-11a	11/03/2019	4480
phy1900125	Foyle	PA3-wild fishery	phy19-11b	11/03/2019	80
phy1900129	Carlingford	C4-AFFNI 68	phy19-11b	11/03/2019	260
phy1900132	Carlingford	C11- AFFNI 84	phy19-11b	11/03/2019	520
phy1900133	Carlingford	NW-wild fishery	phy19-11b	11/03/2019	2480
phy1900134	Killough	K1-AFFNI 18	phy19-12a	19/03/2019	2440
phy1900135	Dundrum	DB1- AFFNI 95A	phy19-12a	19/03/2019	4400
phy1900136	Dundrum	DB2- AFFNI 95B	phy19-12a	19/03/2019	7240
phy1900137	Strangford	S2-AFFNI 42	phy19-12a	18/03/2019	520
phy1900138	Strangford	S7-AFFNI 76	phy19-12a	19/03/2019	2320
phy1900139	Belfast	B1-AFFNI 55	phy19-12a	19/03/2019	2000

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
phy1900140	Belfast	B3-AFFNI 50	phy19-12a	19/03/2019	4080
phy1900141	Belfast	B12- AFFNI 54	phy19-12a	19/03/2019	6100
phy1900142	Belfast	B20- AFFNI 53	phy19-12a	19/03/2019	5780
phy1900143	Larne	L3-AFFNI 88	phy19-12b	20/03/2019	1020
phy1900144	Larne	L5-AFFNI 21B	phy19-12b	20/03/2019	1240
phy1900145	Belfast	B1-AFFNI 55	phy19-13a	25/03/2019	3520
phy1900146	Belfast	B3-AFFNI 50	phy19-13a	25/03/2019	5360
phy1900147	Belfast	B12- AFFNI 54	phy19-13a	25/03/2019	16480
phy1900148	Belfast	B20- AFFNI 53	phy19-13a	25/03/2019	4600
phy1900149	Carlingford	C1-AFFNI 27	phy19-13b	25/03/2019	760
phy1900150	Carlingford	C3-AFFNI 94	phy19-13b	25/03/2019	1980
phy1900151	Carlingford	C4-AFFNI 68	phy19-13b	25/03/2019	140
phy1900152	Carlingford	C7-AFFNI 73	phy19-13b	25/03/2019	40
phy1900153	Carlingford	C9-AFFNI 39	phy19-13b	25/03/2019	1240
phy1900154	Carlingford	C11- AFFNI 84	phy19-13b	25/03/2019	1100
phy1900155	Carlingford	NW-wild fishery	phy19-13b	25/03/2019	380
phy1900158	Strangford	S2-AFFNI 42	phy19-14a	31/03/2019	8380
phy1900159	Strangford	S7-AFFNI 76	phy19-14a	01/04/2019	5320
phy1900160	Belfast	B1-AFFNI 55	phy19-14a	01/04/2019	11000
phy1900161	Belfast	B3-AFFNI 50	phy19-14a	01/04/2019	13640
phy1900162	Belfast	B12- AFFNI 54	phy19-14a	01/04/2019	12920
phy1900163	Belfast	B20- AFFNI 53	phy19-14a	01/04/2019	2020
phy1900164	Killough	K1-AFFNI 18	phy19-14a	01/04/2019	2020
phy1900165	Dundrum	DB1- AFFNI 95A	phy19-14b	01/04/2019	453200

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
phy1900166	Dundrum	DB2- AFFNI 95B	phy19-14b	01/04/2019	648400
phy1900168	Larne	L5-AFFNI 21B	phy19-14b	02/04/2019	140
phy1900169	Belfast	B1-AFFNI 55	phy19-15a	07/04/2019	1020
phy1900170	Belfast	B3-AFFNI 50	phy19-15a	07/04/2019	1400
phy1900171	Belfast	B12- AFFNI 54	phy19-15a	07/04/2019	440
phy1900172	Belfast	B20- AFFNI 53	phy19-15a	07/04/2019	260
phy1900174	Carlingford	C3-AFFNI 94	phy19-15b	08/04/2019	1140
phy1900175	Carlingford	C4-AFFNI 68	phy19-15b	08/04/2019	1920
phy1900176	Carlingford	C7-AFFNI 73	phy19-15b	08/04/2019	440
phy1900177	Carlingford	C9-AFFNI 39	phy19-15b	08/04/2019	2340
phy1900178	Carlingford	C11- AFFNI 84	phy19-15b	08/04/2019	1260
phy1900179	Carlingford	NW-wild fishery	phy19-15b	08/04/2019	1480
phy1900180	Foyle	PA3-wild fishery	phy19-15b	08/04/2019	400
phy1900181	Foyle	PA4-wild fishery	phy19-15b	08/04/2019	140
phy1900182	Killough	K1-AFFNI 18	phy19-16a	15/04/2019	720
phy1900184	Dundrum	DB2- AFFNI 95B	phy19-16a	15/04/2019	740
phy1900185	Larne	L3-AFFNI 88	phy19-16a	15/04/2019	1800
phy1900186	Larne	L5-AFFNI 21B	phy19-16a	15/04/2019	1700
phy1900187	Strangford	S2-AFFNI 42	phy19-16a	14/04/2019	1060
phy1900188	Strangford	S7-AFFNI 76	phy19-16a	15/04/2019	420
phy1900193	Carlingford	C11- AFFNI 84	phy19-17a	23/04/2019	1140
phy1900194	Carlingford	C9-AFFNI 39	phy19-17a	23/04/2019	1000
phy1900195	Carlingford	C7-AFFNI 73	phy19-17a	23/04/2019	340
phy1900196	Carlingford	C4-AFFNI 68	phy19-	23/04/2019	4800

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
			17a		
phy1900197	Carlingford	C3-AFFNI 94	phy19-17a	23/04/2019	3760
phy1900198	Carlingford	C1-AFFNI 27	phy19-17a	23/04/2019	80
phy1900199	Carlingford	NW-wild fishery	phy19-17a	23/04/2019	2460
phy1900200	Belfast	B1-AFFNI 55	phy19-17b	24/04/2019	80
phy1900202	Belfast	B12- AFFNI 54	phy19-17b	24/04/2019	220
phy1900203	Belfast	B20- AFFNI 53	phy19-17b	24/04/2019	1920
phy1900204	Belfast	B1-AFFNI 55	phy19-18a	29/04/2019	1240
phy1900205	Belfast	B3-AFFNI 50	phy19-18a	29/04/2019	1460
phy1900206	Belfast	B12- AFFNI 54	phy19-18a	29/04/2019	2360
phy1900207	Belfast	B20- AFFNI 53	phy19-18a	29/04/2019	1960
phy1900208	Strangford	S2-AFFNI 42	phy19-18a	28/04/2019	520
phy1900209	Strangford	S7-AFFNI 76	phy19-18b	29/04/2019	620
phy1900210	Killough	K1-AFFNI 18	phy19-18b	29/04/2019	1820
phy1900211	Dundrum	DB1- AFFNI 95A	phy19-18b	29/04/2019	100
phy1900212	Dundrum	DB2- AFFNI 95B	phy19-18b	29/04/2019	240
phy1900213	Foyle	PA3-wild fishery	phy19-18b	29/04/2019	180
phy1900215	Larne	L3-AFFNI 88	phy19-18b	30/04/2019	3980
phy1900216	Larne	L5-AFFNI 21B	phy19-18b	30/04/2019	3660
phy1900217	Belfast	B1-AFFNI 55	phy19-19a	07/05/2019	500
phy1900218	Belfast	B3-AFFNI 50	phy19-19a	07/05/2019	60
phy1900219	Belfast	B12- AFFNI 54	phy19-19a	07/05/2019	40
phy1900221	Killough	K1-AFFNI 18	phy19-19a	07/05/2019	820

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
phy1900223	Dundrum	DB2- AFFNI 95B	phy19-19a	07/05/2019	880
phy1900224	Carlingford	NW-wild fishery	phy19-19b	07/05/2019	60
phy1900226	Carlingford	C3-AFFNI 94	phy19-19b	07/05/2019	100
phy1900227	Carlingford	C4-AFFNI 68	phy19-19b	07/05/2019	80
phy1900229	Carlingford	C9-AFFNI 39	phy1900229	07/05/2019	160
phy1900230	Carlingford	C11- AFFNI 84	phy19-19b	07/05/2019	40
PHY1900231	Strangford	S2-AFFNI 42	phy19-20a	12/05/2019	1260
phy1900232	Strangford	S7-AFFNI 76	phy19-20a	13/05/2019	160
phy1900234	Belfast	B3-AFFNI 50	phy19-20a	13/05/2019	320
phy1900236	Belfast	B20- AFFNI 53	phy19-20a	13/05/2019	420
phy1900239	Larne	L3-AFFNI 88	phy19-20b	14/05/2019	1080
phy1900240	Larne	L5-AFFNI 21B	phy19-20b	14/05/2019	1100
phy1900241	Belfast	B1-AFFNI 55	phy19-21a	20/05/2019	780
phy1900242	Belfast	B3-AFFNI 50	phy19-21a	20/05/2019	680
phy1900243	Belfast	B12- AFFNI 54	phy19-21a	20/05/2019	1920
phy1900244	Belfast	B20- AFFNI 53	phy19-21a	20/05/2019	240
phy1900245	Killough	K1-AFFNI 18	phy19-21a	20/05/2019	460
phy1900246	Dundrum	DB1- AFFNI 95A	phy19-21a	20/05/2019	120
phy1900247	Dundrum	DB2- AFFNI 95B	phy19-21a	20/05/2019	60
phy1900248	Carlingford	NW-wild fishery	phy19-21b	22/05/2019	120
phy1900250	Carlingford	C3-AFFNI 94	phy19-21b	22/05/2019	80
phy1900251	Carlingford	C4-AFFNI 68	phy19-21b	22/05/2019	900
phy1900252	Carlingford	C7-AFFNI 73	phy19-21b	22/05/2019	200

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
phy1900253	Carlingford	C9-AFFNI 39	phy19-21b	22/05/2019	80
phy1900254	Carlingford	C11- AFFNI 84	phy19-21b	22/05/2019	420
phy1900255	Strangford	S2-AFFNI 42	phy19-22a	27/05/2019	40
phy1900257	Belfast	B1-AFFNI 55	phy19-22a	28/05/2019	1200
phy1900259	Belfast	B12- AFFNI 54	phy19-22a	28/05/2019	740
phy1900260	Belfast	B20- AFFNI 53	phy19-22a	28/05/2019	440
phy1900262	Carlingford	C3-AFFNI 94	phy19-22b	28/05/2019	280
phy1900263	Carlingford	C4-AFFNI 68	phy19-22b	28/05/2019	2000
phy1900264	Carlingford	C7-AFFNI 73	phy19-22b	28/05/2019	120
phy1900265	Carlingford	C9-AFFNI 39	phy19-22b	28/05/2019	260
phy1900266	Carlingford	C11- AFFNI 84	phy19-22b	28/05/2019	160
phy1900267	Carlingford	NW-wild fishery	phy19-22b	28/05/2019	360
phy1900269	Foyle	PA4-wild fishery	phy19-22b	28/05/2019	40
phy1900270	Larne	L3-AFFNI 88	phy19-22b	29/05/2019	300
phy1900271	Larne	L5-AFFNI 21B	phy19-22b	29/05/2019	780
phy1900272	Larne	L3-AFFNI 88	phy19-23a	03/06/2019	1640
phy1900273	Larne	L5-AFFNI 21B	phy19-23a	03/06/2019	720
phy1900274	Killough	K1-AFFNI 18	phy19-23a	03/06/2019	1000
phy1900276	Dundrum	DB2- AFFNI 95B	phy19-23a	03/06/2019	540
phy1900277	Belfast	B1-AFFNI 55	phy19-23b	04/06/2019	4720
phy1900278	Belfast	B3-AFFNI 50	phy19-23b	04/06/2019	5980
phy1900279	Belfast	B12- AFFNI 54	phy19-23b	04/06/2019	10880
phy1900280	Belfast	B20- AFFNI 53	phy19-23b	04/06/2019	11640
phy1900281	Belfast	B1-AFFNI 55	phy19-24a	10/06/2019	5600

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
phy1900282	Belfast	B3-AFFNI 50	phy19-24a	10/06/2019	17660
phy1900283	Belfast	B12- AFFNI 54	phy19-24a	10/06/2019	18240
phy1900284	Belfast	B20- AFFNI 53	phy19-24a	10/06/2019	4340
phy1900285	Strangford	S2-AFFNI 42	phy19-24a	09/06/2019	5020
phy1900286	Strangford	S7-AFFNI 76	phy19-24a	10/06/2019	440
phy1900289	Carlingford	C4-AFFNI 68	phy19-24b	10/06/2019	680
phy1900290	Carlingford	C7-AFFNI 73	phy19-24b	10/06/2019	180
phy1900291	Carlingford	C9-AFFNI 39	phy19-24b	10/06/2019	620
phy1900292	Carlingford	C11- AFFNI 84	phy19-24b	10/06/2019	780
phy1900293	Carlingford	NW-wild fishery	phy19-24b	10/06/2019	460
phy1900294	Foyle	PA3-wild fishery	phy19-24b	10/06/2019	800
phy1900295	Foyle	PA4-wild fishery	phy19-24b	10/06/2019	380
phy1900296	Killough	K1-AFFNI 18	phy19-25a	17/06/2019	1520
phy1900297	Dundrum	DB1- AFFNI 95A	phy19-25a	17/06/2019	380
phy1900298	Dundrum	DB2- AFFNI 95B	phy19-25a	17/06/2019	8000
phy1900299	Belfast	B1-AFFNI 55	phy19-25a	17/06/2019	2120
phy1900300	Belfast	B3-AFFNI 50	phy19-25a	17/06/2019	2100
phy1900301	Belfast	B20- AFFNI 53	phy19-25a	17/06/2019	3640
phy1900302	Belfast	B12- AFFNI 54	phy19-25a	17/06/2019	5200
phy1900303	Strangford	S2-AFFNI 42	phy19-25a	16/06/2019	1080
phy1900304	Strangford	S7-AFFNI 76	phy19-25a	17/06/2019	1080
phy1900305	Larne	L3-AFFNI 88	phy19-25b	18/06/2019	420
phy1900306	Larne	L5-AFFNI 21B	phy19-25b	18/06/2019	440
phy1900307	Belfast	B1-AFFNI 55	phy19-	24/06/2019	1020

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
			26a		
phy1900308	Belfast	B3-AFFNI 50	phy19-26a	24/06/2019	5640
phy1900309	Belfast	B12- AFFNI 54	phy19-26a	24/06/2019	5880
phy1900310	Belfast	B20- AFFNI 53	phy19-26a	24/06/2019	4460
phy1900311	Carlingford	C1-AFFNI 27	phy19-26b	24/06/2019	620
phy1900312	Carlingford	C3-AFFNI 94	phy19-26b	24/06/2019	760
phy1900313	Carlingford	C4-AFFNI 68	phy19-26b	24/06/2019	1660
phy1900314	Carlingford	C7-AFFNI 73	phy19-26b	24/06/2019	440
phy1900315	Carlingford	C9-AFFNI 39	phy19-26b	24/06/2019	300
phy1900316	Carlingford	C11- AFFNI 84	phy19-26b	24/06/2019	760
phy1900317	Carlingford	NW-wild fishery	phy19-26b	24/06/2019	1280
phy1900320	Belfast	B1-AFFNI 55	phy19-27a	01/07/2019	19380
phy1900321	Belfast	B3-AFFNI 50	phy19-27a	01/07/2019	51600
phy1900322	Belfast	B12- AFFNI 54	phy19-27a	01/07/2019	38800
phy1900323	Belfast	B20- AFFNI 53	phy19-27a	01/07/2019	18000
phy1900324	Killough	K1-AFFNI 18	phy19-27a	01/07/2019	1320
phy1900326	Dundrum	DB2- AFFNI 95B	phy19-27a	01/07/2019	1120
phy1900327	Strangford	S2-AFFNI 42	phy19-27a	30/06/2019	700
phy1900328	Strangford	S7-AFFNI 76	phy19-27a	01/07/2019	400
phy1900330	Larne	L5-AFFNI 21B	phy19-27b	02/07/2019	120
phy1900331	Belfast	B1-AFFNI 55	phy19-28a	08/07/2019	16560
phy1900332	Belfast	B3-AFFNI 50	phy19-28a	08/07/2019	48000
phy1900333	Belfast	B12- AFFNI 54	phy19-28a	08/07/2019	16440
phy1900334	Belfast	B20- AFFNI 53	phy19-28a	08/07/2019	3320

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
phy1900336	Carlingford	C3-AFFNI 94	phy19-28b	08/07/2019	420
phy1900337	Carlingford	C4-AFFNI 68	phy19-28b	08/07/2019	860
phy1900338	Carlingford	C7-AFFNI 73	phy19-28b	08/07/2019	120
phy1900339	Carlingford	C9-AFFNI 39	phy19-28b	08/07/2019	540
phy1900340	Carlingford	C11- AFFNI 84	phy19-28b	08/07/2019	3020
phy1900344	Killough	K1-AFFNI 18	phy19-29a	16/07/2019	4040
phy1900345	Dundrum	DB1- AFFNI 95A	phy19-29a	16/07/2019	1140
phy1900346	Dundrum	DB2- AFFNI 95B	phy19-29a	16/07/2019	37800
phy1900347	Belfast	B1-AFFNI 55	phy19-29a	16/07/2019	8000
phy1900348	Belfast	B3-AFFNI 50	phy19-29a	16/07/2019	1540
phy1900349	Belfast	B12- AFFNI 54	phy19-29a	16/07/2019	1200
phy1900350	Belfast	B20- AFFNI 53	phy19-29a	16/07/2019	1380
phy1900351	Strangford	S2-AFFNI 42	phy19-29b	15/07/2019	1200
phy1900352	Strangford	S7-AFFNI 76	phy19-29b	16/07/2019	920
phy1900353	Larne	L3-AFFNI 88	phy19-29b	17/07/2019	780
phy1900354	Larne	L5-AFFNI 21B	phy19-29b	17/07/2019	100
phy1900355	Belfast	B1-AFFNI 55	phy19-30a	22/07/2019	1880
phy1900356	Belfast	B3-AFFNI 50	phy19-30a	22/07/2019	840
phy1900357	Belfast	B12- AFFNI 54	phy19-30a	22/07/2019	560
phy1900358	Belfast	B20- AFFNI 53	phy19-30a	22/07/2019	320
phy1900359	Carlingford	NW-wild fishery	phy19-30b	22/07/2019	160
phy1900362	Carlingford	C4-AFFNI 68	phy19-30b	22/07/2019	180
phy1900365	Carlingford	C11- AFFNI 84	phy19-30b	22/07/2019	1880
phy1900368	Killough	K1-AFFNI 18	phy19-	29/07/2019	38360

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
			31a		
phy1900369	Dundrum	DB1- AFFNI 95A	phy19-31a	29/07/2019	600
phy1900370	Dundrum	DB2- AFFNI 95B	phy19-31a	29/07/2019	36120
phy1900371	Strangford	S2-AFFNI 42	phy19-31a	29/07/2019	2360
phy1900372	Strangford	S7-AFFNI 76	phy19-31a	29/07/2019	2360
phy1900373	Belfast	B1-AFFNI 55	phy19-31a	29/07/2019	1720
phy1900374	Belfast	B3-AFFNI 50	phy19-31a	29/07/2019	440
phy1900375	Belfast	B12- AFFNI 54	phy19-31a	29/07/2019	1280
phy1900376	Belfast	B20- AFFNI 53	phy19-31a	29/07/2019	2600
phy1900377	Larne	L3-AFFNI 88	phy19-31b	30/07/2019	2960
phy1900378	Larne	L5-AFFNI 21B	phy19-31b	30/07/2019	4340
phy1900379	Belfast	B1-AFFNI 55	phy19-32a	05/08/2019	3100
phy1900380	Belfast	B3-AFFNI 50	phy19-32a	05/08/2019	1320
phy1900381	Belfast	B12- AFFNI 54	phy19-32a	05/08/2019	1120
phy1900382	Belfast	B20- AFFNI 53	phy19-32a	05/08/2019	1220
phy1900385	Carlingford	C4-AFFNI 68	phy19-32b	06/08/2019	2300
phy1900387	Carlingford	C9-AFFNI 39	phy19-32b	06/08/2019	2000
phy1900388	Carlingford	C11- AFFNI 84	phy19-32b	06/08/2019	520
phy1900389	Carlingford	NW-wild fishery	phy19-32b	06/08/2019	620
phy1900390	Killough	K1-AFFNI 18	phy19-33a	12/08/2019	1160
phy1900391	Dundrum	DB1- AFFNI 95A	phy19-33a	12/08/2019	520
phy1900392	Dundrum	DB2- AFFNI 95B	phy19-33a	12/08/2019	7460
phy1900393	Belfast	B1-AFFNI 55	phy19-33a	12/08/2019	740

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
phy1900394	Belfast	B3-AFFNI 50	phy19-33a	12/08/2019	800
phy1900395	Belfast	B12- AFFNI 54	phy19-33a	12/08/2019	900
phy1900397	Carlingford	NW-wild fishery	phy19-33b	12/08/2019	6280
phy1900398	Carlingford	C1-AFFNI 27	phy19-33b	12/08/2019	2400
phy1900399	Carlingford	C3-AFFNI 94	phy19-33b	12/08/2019	8000
phy1900400	Carlingford	C4-AFFNI 68	phy19-33b	12/08/2019	3780
phy1900401	Carlingford	C7-AFFNI 73	phy19-33b	12/08/2019	200
phy1900402	Carlingford	C9-AFFNI 39	phy19-33b	12/08/2019	700
phy1900403	Carlingford	C11- AFFNI 84	phy19-33b	12/08/2019	400
phy1900404	Foyle	PA3-wild fishery	phy19-33c	12/08/2019	780
phy1900405	Foyle	PA4-wild fishery	phy19-33c	12/08/2019	1020
phy1900406	Larne	L3-AFFNI 88	phy19-33b	13/08/2019	1840
phy1900407	Larne	L5-AFFNI 21B	phy19-33b	13/08/2019	1880
phy1900408	Strangford	S2-AFFNI 42	phy19-33b	12/08/2019	120
phy1900410	Belfast	B1-AFFNI 55	phy19-34a	19/08/2019	1760
phy1900411	Belfast	B3-AFFNI 50	phy19-34a	19/08/2019	5500
phy1900412	Belfast	B12- AFFNI 54	phy19-34a	19/08/2019	11280
phy1900413	Belfast	B20- AFFNI 53	phy19-34a	19/08/2019	4780
phy1900414	Killough	K1-AFFNI 18	phy19-35a	27/08/2019	108800
phy1900415	Dundrum	DB1- AFFNI 95A	phy19-35a	27/08/2019	1420
phy1900416	Dundrum	DB2- AFFNI 95B	phy19-35a	27/08/2019	6280
phy1900417	Belfast	B1-AFFNI 55	phy19-35b	27/08/2019	2100
phy1900418	Belfast	B3-AFFNI 50	phy19-35b	27/08/2019	1400
phy1900419	Belfast	B12- AFFNI	phy19-	27/08/2019	300

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
		54	35b		
phy1900420	Belfast	B20- AFFNI 53	phy19-35b	27/08/2019	660
phy1900421	Strangford	S2-AFFNI 42	phy19-35b	26/08/2019	720
phy1900423	Carlingford	C1-AFFNI 27	phy19-35b	27/08/2019	420
phy1900424	Carlingford	C3-AFFNI 94	phy19-35b	27/08/2019	17460
phy1900425	Carlingford	C4-AFFNI 68	phy19-35b	27/08/2019	18000
phy1900426	Carlingford	C7-AFFNI 73	phy19-35b	27/08/2019	5000
phy1900427	Carlingford	C9-AFFNI 39	phy19-35b	27/08/2019	18100
phy1900428	Carlingford	C11- AFFNI 84	phy19-35b	27/08/2019	960
phy1900429	Carlingford	NW-wild fishery	phy19-35b	27/08/2019	16780
phy1900430	Foyle	PA3-wild fishery	phy19-35b	27/08/2019	880
phy1900431	Foyle	PA4-wild fishery	phy19-35b	27/08/2019	1720
phy1900432	Larne	L3-AFFNI 88	phy19-35b	28/08/2019	580
phy1900433	Larne	L5-AFFNI 21B	phy19-35b	28/08/2019	380
phy1900434	Belfast	B1-AFFNI 55	phy19-36a	02/09/2019	320
phy1900436	Belfast	B12- AFFNI 54	phy19-36a	02/09/2019	80
phy1900438	Killough	K1-AFFNI 18	phy19-36a	02/09/2019	2180
phy1900439	Dundrum	DB1- AFFNI 95A	phy19-36a	02/09/2019	6180
phy1900440	Dundrum	DB2- AFFNI 95B	phy19-36a	02/09/2019	60000
phy1900441	Strangford	S2-AFFNI 42	phy19-37a	08/09/2019	840
phy1900442	Strangford	S7-AFFNI 76	phy19-37a	09/09/2019	660
phy1900443	Belfast	B1-AFFNI 55	phy19-37a	09/09/2019	40
phy1900444	Belfast	B3-AFFNI 50	phy19-37a	09/09/2019	120
phy1900446	Belfast	B20- AFFNI 53	phy19-37a	09/09/2019	40

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
phy1900447	Carlingford	C1-AFFNI 27	phy19-37b	09/09/2019	240
phy1900448	Carlingford	C3-AFFNI 94	phy19-37b	09/09/2019	100
phy1900450	Carlingford	C7-AFFNI 73	phy19-37b	09/09/2019	80
phy1900451	Carlingford	C9-AFFNI 39	phy19-37b	09/09/2019	180
phy1900452	Carlingford	C11- AFFNI 84	phy19-37b	09/09/2019	840
phy1900454	Foyle	PA3-wild fishery	phy19-37c	09/09/2019	3180
phy1900455	Foyle	PA4-wild fishery	phy19-37c	09/09/2019	2660
phy1900456	Larne	L3-AFFNI 88	phy19-37c	10/09/2019	1120
phy1900457	Larne	L5-AFFNI 21B	phy19-37c	10/09/2019	180
phy1900458	Belfast	B1-AFFNI 55	phy19-38a	16/09/2019	300
phy1900459	Belfast	B3-AFFNI 50	phy19-38a	16/09/2019	160
phy1900460	Belfast	B12- AFFNI 54	phy19-38a	16/09/2019	40
phy1900462	Killough	K1-AFFNI 18	phy19-38a	16/09/2019	680
phy1900463	Dundrum	DB1- AFFNI 95A	phy19-38a	16/09/2019	300
phy1900464	Dundrum	DB2- AFFNI 95B	phy19-38a	16/09/2019	2900
phy1900466	Larne	L5-AFFNI 21B	phy19-38b	17/09/2019	360
phy1900468	Belfast	B3-AFFNI 50	phy19-39a	23/09/2019	240
phy1900469	Belfast	B12- AFFNI 54	phy19-39a	23/09/2019	1220
phy1900470	Belfast	B20- AFFNI 53	phy19-39a	23/09/2019	180
phy1900472	Carlingford	C3-AFFNI 94	phy19-39b	23/09/2019	280
phy1900473	Carlingford	C4-AFFNI 68	phy19-39b	23/09/2019	160
phy1900475	Carlingford	C9-AFFNI 39	phy19-39b	23/09/2019	980
phy1900476	Carlingford	C11- AFFNI 84	phy19-39b	23/09/2019	160
phy1900477	Carlingford	NW-wild	phy19-	23/09/2019	1180

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
		fishery	39b		
phy1900478	Foyle	PA3-wild fishery	phy19-39b	23/09/2019	1220
phy1900479	Foyle	PA4-wild fishery	phy19-39b	23/09/2019	2140
phy1900482	Belfast	B1-AFFNI 55	phy19-40a	30/09/2019	80
phy1900483	Belfast	B3-AFFNI 50	phy19-40a	30/09/2019	1840
phy1900484	Belfast	B12- AFFNI 54	phy19-40b	30/09/2019	1140
phy1900485	Belfast	B20- AFFNI 53	phy19-40a	30/09/2019	60
phy1900486	Killough	K1-AFFNI 18	phy19-40a	30/09/2019	240
phy1900487	Dundrum	DB1- AFFNI 95A	phy19-40a	30/09/2019	2680
phy1900488	Dundrum	DB2- AFFNI 95B	phy19-40a	30/09/2019	3240
phy1900489	Larne	L3-AFFNI 88	phy19-40b	01/10/2019	400
phy1900491	Belfast	B1-AFFNI 55	phy19-41a	07/10/2019	240
phy1900492	Belfast	B3-AFFNI 50	phy19-41a	07/10/2019	320
phy1900494	Belfast	B20- AFFNI 53	phy19-41a	07/10/2019	40
phy1900502	Carlingford	C11- AFFNI 84	phy19-41b	07/10/2019	240
phy1900508	Belfast	B12- AFFNI 54	phy19-42a	14/10/2019	80
phy1900509	Belfast	B20- AFFNI 53	phy19-42a	14/10/2019	40
phy1900511	Dundrum	DB1- AFFNI 95A	phy19-42a	14/10/2019	300
phy1900512	Dundrum	DB2- AFFNI 95B	phy19-42a	14/10/2019	300
phy1900515	Belfast	B1-AFFNI 55	phy19-43a	21/10/2019	140
phy1900516	Belfast	B3-AFFNI 50	phy19-43a	21/10/2019	180
phy1900523	Carlingford	C9-AFFNI 39	phy19-43b	21/10/2019	80
phy1900525	Carlingford	NW-wild fishery	phy19-43b	21/10/2019	760

System ID	Region	Site ID ref	Report No.	Collection date	Pseudo-nitzschia spp.
phy1900530	Killough	K1-AFFNI 18	phy19-44a	28/10/2019	500
phy1900531	Dundrum	DB1- AFFNI 95A	phy19-44a	28/10/2019	400
phy1900533	Belfast	B3-AFFNI 50	phy19-44a	28/10/2019	60
phy1900534	Belfast	B12- AFFNI 54	phy19-44a	28/10/2019	40
phy1900536	Larne	L3-AFFNI 88	phy19-44b	29/10/2019	120
phy1900541	Carlingford	C1-AFFNI 27	phy19-45b	04/11/2019	360
phy1900552	Belfast	B1-AFFNI 55	phy19-46a	11/11/2019	140
phy1900554	Belfast	B12- AFFNI 54	phy19-46a	11/11/2019	120
phy1900570	Dundrum	DB1- AFFNI 95A	phy19-48a	25/11/2019	140
phy1900591	Carlingford	NW-wild fishery	phy19-49b	02/12/2019	80
phy1900592	Strangford	S2-AFFNI 42	phy19-49b	02/12/2019	120
phy1900593	Strangford	S7-AFFNI 76	phy19-49b	03/12/2019	360
phy1900599	Belfast	B20- AFFNI 53	phy19-50a	09/12/2019	240
phy1900600	Foyle	PA3-wild fishery	phy19-50b	09/12/2019	160
phy1900603	Belfast	B1-AFFNI 55	phy19-51a	16/12/2019	160
phy1900620	Belfast	B1-AFFNI 55	phy20-01a	30/12/2019	80
phy1900625	Strangford	S7-AFFNI 76	phy20-01a	30/12/2019	80