RIVER BASIN MONITORING PLAN

# WATER FRAMEWORK DIRECTIVE 2<sup>ND</sup> CYCLE CLASSIFICATION SUMMARY

2015-2021

Coastal Water Body – North Channel 31/05/2015









# NORTH CHANNEL

Water body Information

- River Basin District: North Eastern
- Water body type: CW5
- Water body code : UKGBNI6NE030
- Water body characteristics: Euhaline, mesotidal, moderately exposed
- Water body area: 141.91 km<sup>2</sup>
- Heavily Modified Water Body: No
- 2021 Classification Objective: Good

2015 CLASSIFICA TION	GOOD	PASS/FAIL 2021 OBJECTIVE	PASS
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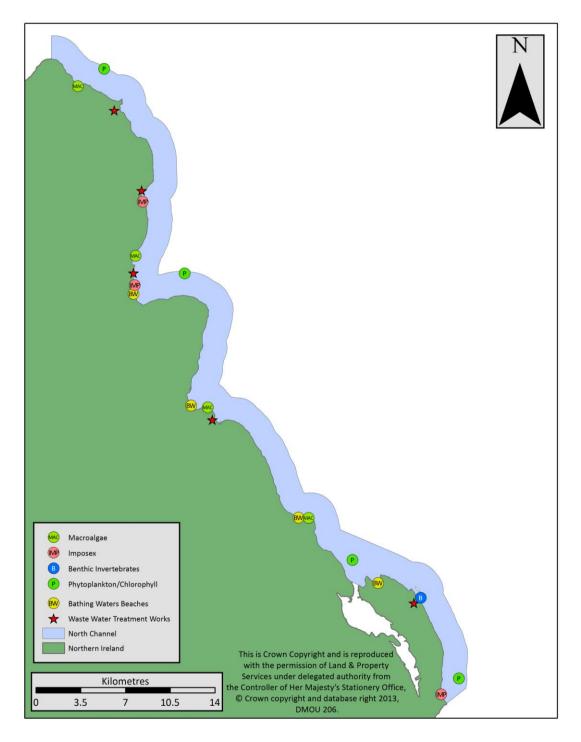


Figure 1: Waste water treatment pressures and monitoring points within North Channel (Coastal Water).

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Table 1: Parameters for which classification systems are available and have been used in this round of classification. Some biological assessment tools are not suitable for all water bodies due to habitat type.

Ecological Quality Elem	nent		
Main Element	Sub-Element	Applied	Comment
Phytoplankton	Biomass	✓	
	Elevated Taxa Count Index	×	
Macroalgae	Opportunistic Macroalgae	x	
(Seaweeds)	Reduced Species List	$\checkmark$	
Angiosperms	Seagrass	×	
	Saltmarsh	x	
Benthic Invertebrates	Infaunal Quality Index	$\checkmark$	
	Imposex	✓	
Physico-chemical	-Dissolved Oxygen	✓	
(Water)	-Nutrients	$\checkmark$	
	Specific Pollutants (Annex VIII substances)	×	
Hydromorphological	SEPA Rapid Designation	<ul> <li>✓</li> </ul>	
Quality Elements	TraC MIMAS	<b>√</b>	
Chemical Status	·	·	· ·
Priority Hazardous Substances	Annex X substances	X	

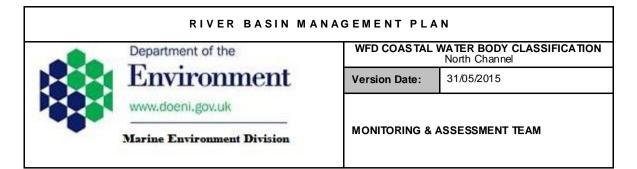


Table 2: Sampling frequency for each quality element

Monitoring Level: Surveillance

Quality Elements		Data years contributing to classification	No. of sites/samples
Biological			
Phytoplankton		2009-2010	4 sites 19 samples
Macroalgae	Reduced Species List	2011	4 sites 4 surveys
Benthic Invertebrates	Infaunal Quality Index	2010-2013	1 site 12 samples
	Imposex	2010-2013	3
Physico-chemical			
Nutrients		2010-2012, 2014	19 samples
Dissolved Oxygen (DO)		2010, 2012, 2014	25 samples
Other polluting substances (	Annex VIII)	ND	
Hydromorphology		2007	
Water chemistry			
(Annex X)		ND	

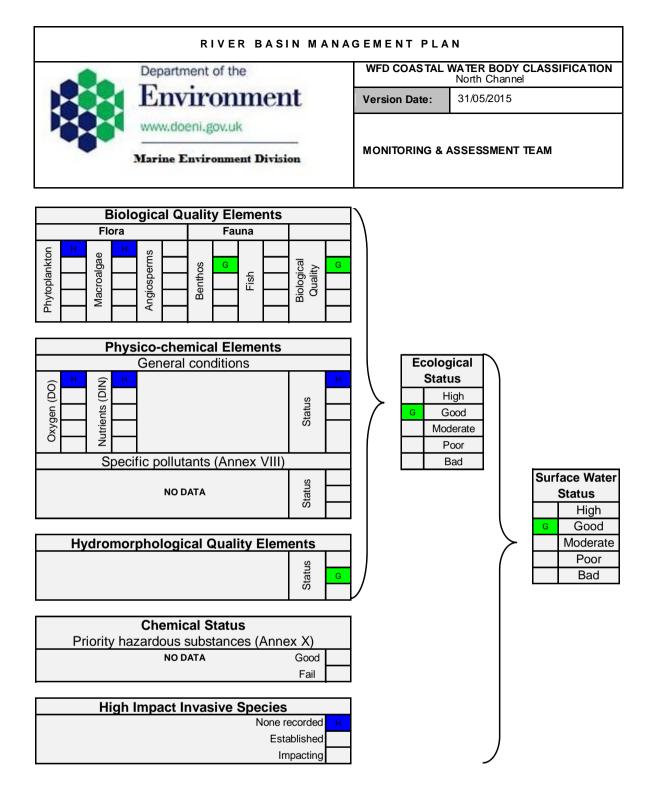


Figure 2: Overall classification of North Channel (Coastal Water)



# ANNEX A: Classification of Biological Quality Elements

#### QE: Phytoplankton

QE Phytoplankton assessment (+ data confidence):	HIGH (85.9%)		
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#### **Classification metrics:**

- 1. Chlorophyll biomass index (90%ile)
- 2. Elevated taxa count index: Not applied, insufficient data.
- 3. Seasonal succession: Not applied, insufficient data.

# 1. Chlorophyll Biomass Index

Data store: M:\Projects 14\Phycology 2014\MM14-14 Phytoplankton and Chlorophyll\classification 15\Coastal data\NORTH CHANNEL 2015 Copy.XLS

<u>M:\Projects 14\Phycology 2014\MM14-14 Phytoplankton and Chlorophyll\classification</u> <u>15\Coastal data\North Channel 90th Percentile.xls</u>

#### Data Availability (spot & continuous samples): spot (2009-2010) NIEA

Thresholds:

Water Ref.				Status		
Area		High	Good	Moderate	Poor	Bad
North/Irish	Chl µg l¹	<5	5-10	10-15	15-20	>20
Sea	EQR	0 -1.0	1.0-0.8	0.8-0.6	0.6-0.4	0.4-0.2

**Results:** 

90%ile	Status	EQR	Data Years	No.of Sites	No. of Samples	Data Confidence
0.92	HIGH	0.96	2009- 2010	4	19	86.5%

Data confidence: High 85.9%

Data analysed for Confidence of Classification using <u>M:\Projects 14\Phycology 2014\MM14-14 Phytoplankton and Chlorophyll\classification 15\2015CW Phytoplankton CoC tool v10 7 UKTAG.xls</u>

Low temporal trend as the site was only sampled in 2009 and 2010. Waterbody classification based on chlorophyll biomass only.

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# QE: Macroalgae

QE macroalgal assessment (+ data confidence): HIGH (99.8%)
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# Classification tools:

Reduced species list (RSL), Macroalgal Blooming Tool – not applicable Angiosperms – Tool not applicable

- 1. Reduced Species list
- Data Availability (classification): 2011, 4 sites
- Data Store: <u>M:\Projects 14\Phycology 2014\MM14-12 Intertidal Rocky</u> <u>Shore\FSL-RSL Classification update 2015 (09-14)Datasheet.xls</u>

# Boundaries:

	Quality Status	Bad	Poor	Moderate	Good	High
Parameter s	Sub-metric quality status	0.0 – 0.2	0.21 – 0.4	0.41 – 0.6	0.61 – 0.8	0.81 – 1.0
Species richr	ness (adj. for shore)	0 – 3	3 – 10	10 – 20	20 – 34	34 – 68
Proportion of	Chlorophyta (% G)	80 – 100	45 – 80	30 – 45	20 – 30	0 – 20
	Rhodophyta (% R)	0 – 10	10 – 25	25 – 35	35 – 45	45 – 100
(ESG)	atus Group ratio	0.0 – 0.2	0.2 – 0.4	0.4 – 0.6	0.6 – 0.8	0.8 – 1.2
Proportion of opp)	opportunists (%	50 – 100	35 – 50	25 – 35	15 – 25	0 – 15

#### **Results:**

ſ		Sub-Metric EQR							RSL	
	Shore	Shore desc.	Sp. richness	Adj. Sp. Richness	% G	% R	ESG	% Орр	EQR	Status
	Murlough Bay 2011	16	54	50.22	16.67	53.70	1.08	11.11	0.851	HIGH
	Port Vinegar 2011	18	60	48.00	15.00	50.00	1.14	10.00	0.864	HIGH
	Ballygally Point 2011	12	55	66.55	14.55	50.91	1.04	10.91	0.870	HIGH
	Straidkelly Point 2011	15	49	49.00	18.37	44.90	1.04	12.24	0.827	HIGH
								Mean	0.853 ±0.019	HIGH



#### Macroalgae (cont'd)

#### Confidence of Classification: High (99.8%)

- Data analysed for Confidence of Class using <u>M:\Projects 14\Phycology 2014\MM14-12 Intertidal Rocky Shore\PIRATES v04 Class update 2015 (09-14) for UKTAG.xls</u>
- Standard Deviation (±) is included with the mean EQR.
- Data QA (expert team).
- WFD specific data (reduced species list completed; full species list carried out on 1 site).
- Four shores (good spatial coverage) over one year (poor temporal trend assessment).

Alien taxa: None found

#### QE: Angiosperms - Tool not applicable

Database QA'd (Good)

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# **QE: Benthic Invertebrates**

Classification tools:	1. Infaunal Quality Index (IQI) 2. Imposex tool (VDSI)
<i>1. IQI (UKTAG v01 20140228)</i> Water body IQI assessment:	Good (Low)
WFD surveillance monitoring:	

- Data store: ... North Channel water body/North Channel Water Body 08-13 fauna data 1 mm.xlsx
- Benthic invertebrates . Database
- **Supporting Parameters** Set
- Digital images
- Data Availability (classification): 3 reps, 1 site, 4 years , Day Grab, 1 mm sieve, n=12.
- Boundaries (Intercalibrated NEAGIG): •

Sample analysis QA'd through NMBAQC (Good)

No specific WFD data (3single points with reps)

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QE benthic invertebrate assessment (+ Data confidence):

Class	Bad	Poor	Moderate	Good	High
IQI	>0.0 ≤0.24	≥0.24 <0.44	≥0.44 <0.64	≥0.64 <0.75	≥0.75

#### Results

Year	Survey	Station	n	Annual Mean	Annual ± S.D	Status
2010	FEPA (3)	SDCS	3	0.75	0.05	High
2011	FEPA (3)	SDCS	3	0.71	0.03	Good
2012	FEPA (3)	SDCS	3	0.75	0.03	High
2013	FEPA (3)	SDCS	3	0.77	0.06	High
2014	FEPA (3)	SDCS	-	-	-	-
2015	FEPA (3)	SDCS	-	-	-	-
Ove	Overall 6 year waterbody means			0.74 (0.70*)	0.04	Good

#### Data confidence:

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Low

Water Quality Data

AMAP Project folder

# ow)

GOOD (L)

UNICORN (NMMT)



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# 2. VDSI (Nucella lapillus)

Waterbody VDSI assessment:



- Data store: <u>..\..\.\BIOEFFECTS\Imposex 2013\Report\IMPOSEX MASTER</u>
   DATA SHEET TEMPLATE.xIs
- Data availability: 2004/2007/2010/2013 NI survey

# Boundaries:

Class	High	
VDSI	≥0.3 to <4.0	<0.3
EQR	≥0.34 to	≥0.95
EQR	<0.95	≥0.95

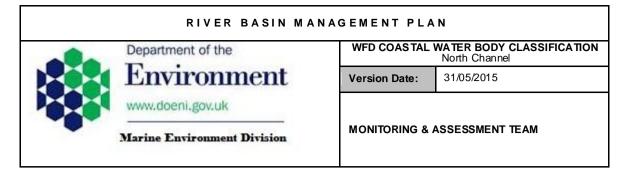
#### **Results:**

Year	Shore	VDSI	EQR	Status
2013	Cloughfin Port	0.00	1.00	High
2013	Cushendun	0.00	1.00	High
2013	Redbay	0.07	0.99	High
	Mean	0.02		High

# Data confidence:

- Sample analysis QA through QUASIMEME (High)
- ≥3 sites (High)

High



# ANNEX B: Classification of physico-chemical Quality Elements: General

#### QE: Dissolved Oxygen

Dissolved oxygen (+ data confidence):	HIGH (100%)	
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Classification tools: Comparison of 5% ile against reference standards

- Data Availability: 2010, 2012, 2014
- Data Store: .....DO Classification 2012\Shortcut to DO FIELD VALUES 2006 -2010.Ink
- Data Availability (spot & continuous samples): Spot

#### Thresholds:

WFD Status	Marine 5%ile	Objectives
HIGH	≥5.7 mg/L	All life stages of salmonids and transitional fish
GOOD	≥4.0 <5.7 mg/L	Presence of salmonids and transitional fish
MODERATE	≥2.4 <4.0 mg/L	Most life stages of non-salmonid adults
POOR	≥1.6 <2.4 mg/L	Presence of non-salmonids, poor survival of salmonids
BAD	<1.6 mg/L	No salmonids present, marginal survival of resident species

#### **Results:**

5% ile DO (mg/L)	Status	Data years	Data Quality	No. of daily averages	Data Coverage (proportion of possible months with data*)
8.06	HIGH	2010,2012 , 2014	**	25	23.3%

\* Proportion of possible months for which data are available



# **QE: Nutrients – N regulation**

QE N regulation assessment (+ Data confidence):	HIGH (100%)	

- Data store:...Coastal WB inc AFBI 15.xls
- Data Availability:
- Data Source (spot & continuous samples):

2010 to 2012/2014 DIN & salinity (Nov to Feb) spot and continuous

Thresholds:

Area	Salinity range	DIN (uM) Winter mean H	DIN (uM) Winter mean G	DIN (uM) Winter mean M
Coastal	30-34.5	<12	12-18	18+
(at salinity 32)				

**Results:** 

Mean Winter DIN (uM) (Avg DIN)*	Winter DIN Daily average (n)	No.of samples (n)	No. of sites	Data Years	Data Quality	Status
7.54		19		2010- 2011, 2012/201 4	Database not yet QA'd	HIGH

\*Average DIN used as r<sup>2</sup> value of regression model is less than 0.75

Data confidence source: ... CofCDINth.xIsx

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# ANNEX C: Classification of physico-chemical quality elements: Specific Pollutants (Annex VIII)

Specific pollutants assessment (+data confidence)	NO DATA	

Classification tools: Comparison with EQS levels.

Data availability: No Data



# ANNEX D: Hydromorphological quality elements

Overall hydromorphology assessment	в	

Classification tools:

1. TRaC Hydromorphology metrics

2. MIMAS



# ANNEX E: Chemical Status – Annex X Chemicals

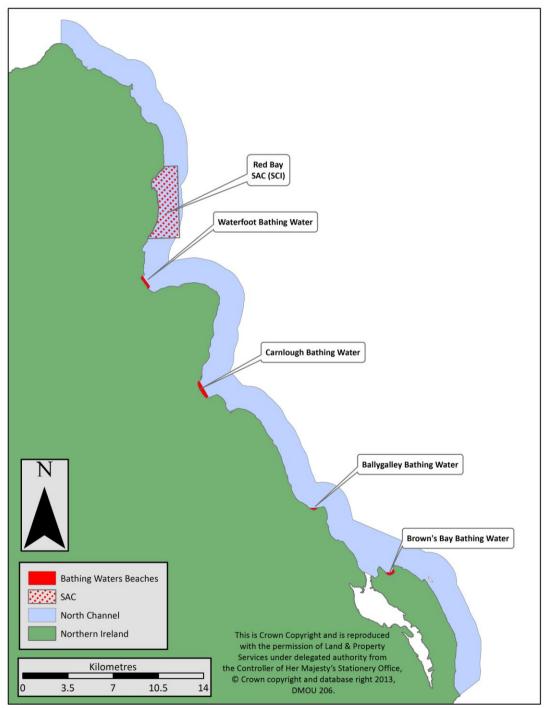
Priority hazardous substances	(+data confidence)	NO DATA	

Classification tools: Comparison with EQS levels.

Annex X: Overall Compliance	No Data
Annex X: Pass/Fail	No Data

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Protected areas within North Channel (Coastal Waters).

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The following Protected Areas are situated either wholly or partly within the North Channel water body:

# Natura 2000 sites (Habitats Directive and Birds Directive):

Site Name	2014 Condition Status	Designated Water Dependant habitat/species	Feature(s) not meeting objective	Reason for not meeting objective
Red Bay SCI	Favourable	Sandbanks slightly covered by seawater at all times which are composed of maerl, sub- fossil maerl, coarse sands, gravels and cobbles.	None	n/a

#### Bathing Waters Directive Beaches:

Beach	2011-2014 Revised Bathing Waters Classification
Waterfoot	Good
Carnlough	Sufficient
Ballygally	Good
Brown's Bay	Good



# ANNEX G: High Impact Invasive Species

# QE High Impact Invasive Species assessment HIGH

# Ecoregion 17 Marine High Impact Invasive Species List

Phylum	Species	Р	Ε	Ι	Record
Chordata	Didemnum spp.				
Chordata	Styela clava				
Crustacea	Eriocheir sinensis				
Mollusca	Crassostrea gigas				
Mollusca	Crepidula fornicata				
Phaeophyceae	Sargassum muticum				
Angiosperms	Spartina anglica				

P=Present; E= Established; I= Impacting

NB Established populations of high impact species automatically downgrade overall surface water classification from 'high' to 'good'.

Record should be inputted as follows. PO= personal observation outside of surveys; W= WFD survey; M= museum / institute records.

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# GLOSSARY

	GLOSSARY
AFBI	Agri-Food and Biosciences Institute (under contract to NIEA)
AMBI	AZTI Marine Biotic Index
Annex X	Annex 10 Priority Hazardous Substances
Annex VIII	Annex 8 Specific Pollutants
Article 5	Characterisation, typology, pressures and impacts analysis
ASSI	Area of Special Scientific Interest
DIN	Dissolved Inorganic Nitrogen
DO	Dissolved Oxygen
EQR	Ecological Quality Ratio
EQS	Ecological Quality Status
EUNIS	European Nature Information System
FSL	Full Species List
GEP	Good Ecological Potential
<sub>G</sub> H	Good/High
H/G/M/P/B	High/Good/Moderate/Poor/Bad (Classification Status)
H/M/L	High/Medium/Low (Confidence)
HMWB	Heavily Modified Water Body
IQI	Infaunal Quality Index
IRBD	International River Basin District
LOD	Limit of Detection
MBT	Macroalgal Blooming Tool
MEP	Macroalgar Blooming Tool Moderate Ecological Potential
NB	•
ND	Neagh Bann No data
NE	
	North Eastern
	North Eastern Atlantic Geographical Intercalibration Group
	Northern Ireland Environment Agency
N-regs	Nitrogen Regulation
NVZ	Nitrate Vulnerable Zone
NW Dhuring show	North Western
Physico-chem	Physical and chemical monitoring
RSL	Reduced Species List
SAC	Special Area of Conservation
SEPA	Scottish Environment Protection Agency
SPA	Special Protected Area
TNA	Tool Not Applicable
TraC MImAS	Transitional and Coastal Morphology Impact Assessment System
TUD	Tool Under Development
UKAS	United Kingdom Accreditation Service
UKTAG	United Kingdom Technical Advisory Group for Water Framework Directive
UNICORN	Database for marine organisms.
UWWTD	Urban Waste Water Treatment Directive (91/271/EEC)
VDSI	Vas Deferens Sequence Index
WFD	Water Framework Directive

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