RIVER BASIN MONITORING PLAN

WATER FRAMEWORK DIRECTIVE 1ST CYCLE CLASSIFICATION SUMMARY

2009-2015

Coastal Water Body – Carlingford Lough

31/05/2015

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RIVER BASIN MANAGEMENT PLAN		
Department of the Environment www.doeni.gov.uk Marine Environment Division	WFD COASTAL WATER BODY CLASSIFICATION Carlingford Lough	
	Version Date:	31/05/2015
	MONITORING & ASSESSMENT TEAM	

CARLINGFORD LOUGH

Water body Information

- River Basin District: NBIRBD
- Water Body Code: UKGBNI6NB030
- Water body type: CW8
- Water body characteristics: Euhaline, mesotidal, sheltered
- Water body area: 48.66 km^2
- Heavily Modified Water Body: No
- 2015 Classification Objective: Moderate

FINAL CLASSIFICATION	**MODERATE**	*PASS/FAIL 2015 OBJECTIVE*	**PASS**

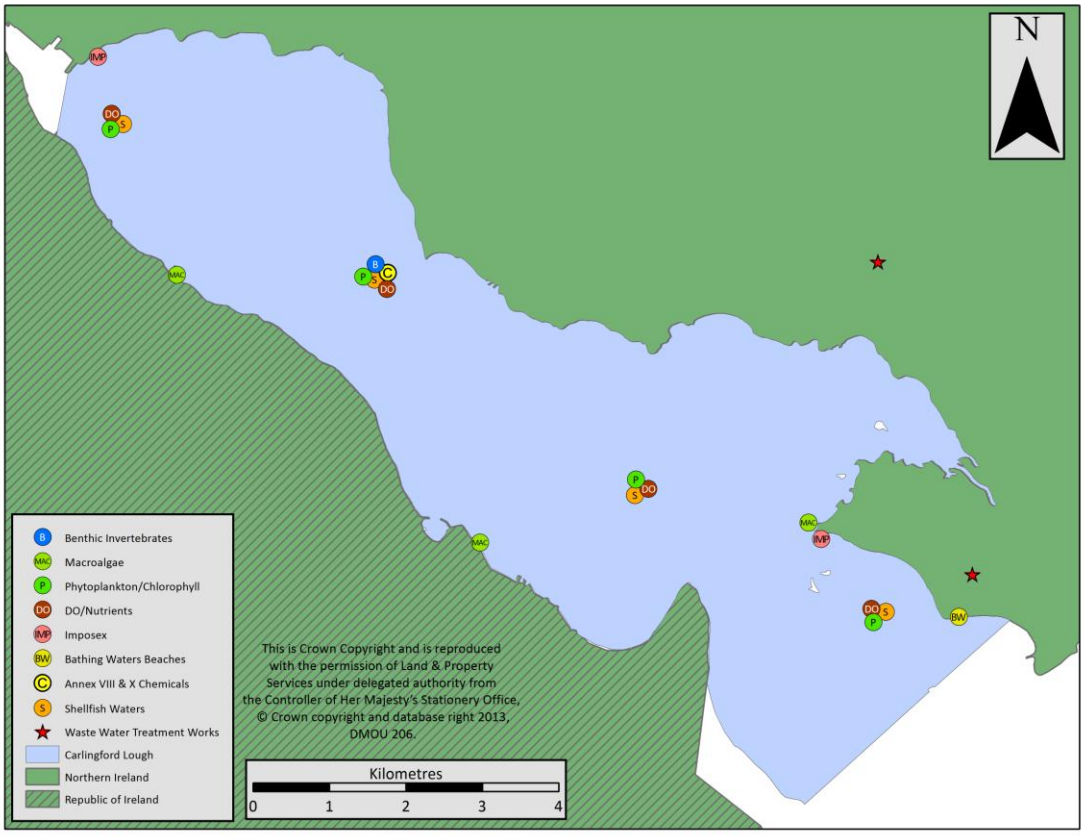

Figure 1: Waste water treatment pressures and monitoring points within Carlingford Lough (Coastal Water).

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 Element			
Main Element	***Sub-Element***	***Applied***	***Comment***
Phytoplankton	Biomass	✓	
	Elevated Taxa Count Index	✓	
Macroalgae (Seaweeds)	Opportunistic Macroalgae	☒	
	Reduced Species List	✓	
Angiosperms	Seagrass	☒	
	Saltmarsh	☒	
Benthic Invertebrates	Infaunal Quality Index	✓	
	Imposex	✓	
Physico-chemical (Water)	-Dissolved Oxygen	✓	
	-Nutrients	✓	
	Specific Pollutants (Annex VIII substances)	✓	
Hydromorphological Quality Elements	SEPA Rapid Designation	✓	
	TraC MIMAS	✓	
Chemical Status			
Priority Hazardous Substances	Annex X substances	✓	

Table 2: Sampling frequency for each quality element

Monitoring Level: Surveillance

Quality Elements		Data year contributing to classification	No of Sites/samples
Biological			
Phytoplankton		2009-2014	50 samples 5 sites
Macroalgae (Seaweed)	Reduced Species List	2011, 2013	3 sites 6 surveys
Angiosperms	Seagrass	2009, 2013	n/a
Benthic Invertebrates	Infaunal Quality Index	2010-2013	11 sites 38 samples
	Imposex	2010,2013	3 sites
Physico-chemical			
Nutrients		2010-2014	21 sites 54 samples
Dissolved Oxygen (DO)		2010-2015	154 daily averages
Specific polluting substances (Annex VIII)		2010-2014	
Hydromorphology		2007	
Water chemistry			
(Annex X)		2010-2014	

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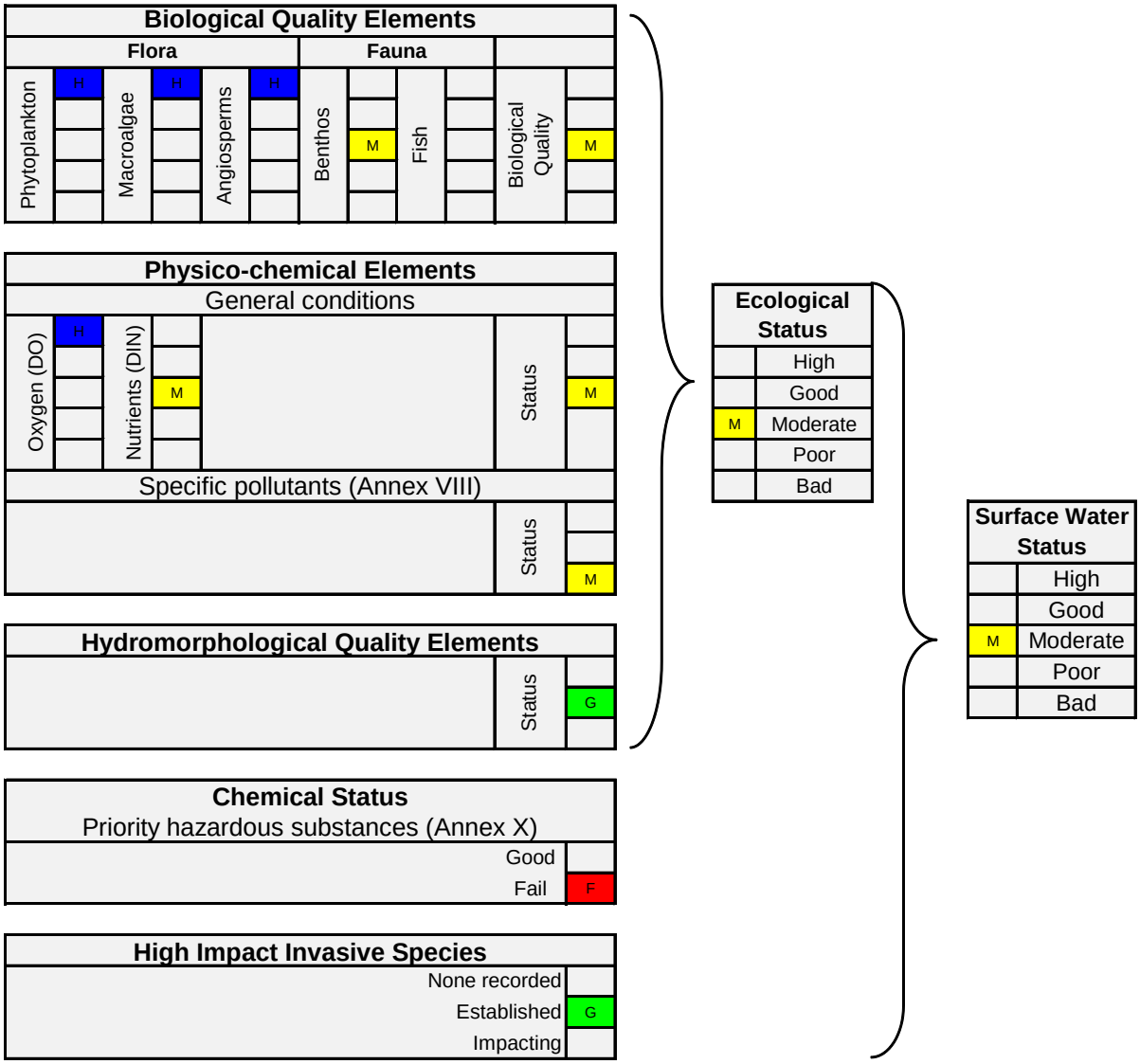


Figure 2: Overall classification of Carlingford Lough (Coastal Water).

ANNEX A: Classification of Biological Quality Elements

QE: Phytoplankton

QE Phytoplankton assessment (+ data confidence):	HIGH (89.1%)	

Classification metrics:

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

1. Chlorophyll Biomass Index

GOOD (96.3%)

Data store: ..\Coastal data\Carlingford 90th Percentile.xls
Data Availability (spot & continuous samples): spot samples (2009 -2014) NIEA & AFBINI.

Thresholds:

Water Ref. Area		Status				
		High	Good	Moderate	Poor	Bad
North/Irish Sea	Chl μg l^{-1}	<5	5-10	10-15	15-20	>20
	EQR	0 -1.0	1.0-0.8	0.8-0.6	0.6-0.4	0.4-0.2

Results:

90%ile	Status	Data Years	Data Quality	No. of daily averages	No. of Sites	No. of Samples	Data Confidence (proportion of possible months with data*)
6.62	GOOD	2009-2014	High	6	5	50	96.3

* proportion of possible months (of growing season in years assessed) for which data are available

2. *Elevated Taxa Count Index*

Waterbody Elevated Taxa Assessment

Thresholds:

Tool	Thresholds	
	North/Irish Sea	Atlantic
I_1 - Individual Species Count (excl. Phaeocystis) (%)	500,000 (cells l^{-1})	
I_2 – Total Taxa Count (%)	10^7 (cells l^{-1})	
I_3– Elevated Biomass Count (%)	>10 ($\mu g\ l^{-1}$)	>5 ($\mu g\ l^{-1}$)

EQR Boundaries:

% exceedances (Face value range)	Metric range (0-1)	Class
0 - <10	≥0.8 - 1.0	High
≥10 - < 20	≥0.6 - < 0.8	Good
≥20 - < 40	≥0.4 - < 0.6	Moderate
≥40 - <60	≥0.2 - < 0.4	Poor
≥60 - 100	≥0 - < 0.2	Bad

Results % Exceedence:

I_1	I_2	I_3	Elevated Count EQR	Status	Data Years	No. of phytoplankton samples	Data confidence
2.1%	0	6.3%	0.944	HIGH	2009-2014	3	98.9%

Data confidence: 98.9%

- Data analysed for Confidence of Class using PUGWASH (V10 7).

Data analysed using:

M:\Projects 14\Phycology 2014\MM14-14 Phytoplankton and Chlorophyll\classification 15\2015CW_Phytoplankton_CoC_tool_v10 7_UKTAG.xls

Overall Waterbody Status

High (89.1%)

QE: Macroalgae

QE macroalgal assessment (+ data confidence):	HIGH (82.3%)	

Classification tools:

1. Reduced species list (RSL)
2. Angiosperm Tool – Quercus Report (2012)

1. Reduced Species List (RSL)

- WFD surveillance monitoring: 2011, 2013
- Data Availability (classification): 2011, 2013 - 3 sites each year
  Data Store: M:\Projects 14\Phycology 2014\MM14-12 Intertidal Rocky Shore\FSL-RSL Classification update 2015 (09-14)Datasheet.xls

Boundaries:

Parameters	Quality Status / Sub-metric quality status	Bad 0.0 – 0.2	Poor 0.21 – 0.4	Moderate 0.41 – 0.6	Good 0.61 – 0.8	High 0.81 – 1.0
Species richness (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
Proportion of Rhodophyta (% R)		0 – 10	10 – 25	25 – 35	35 – 45	45 – 100
Ecological Status Group ratio (ESG)		0.0 – 0.2	0.2 – 0.4	0.4 – 0.6	0.6 – 0.8	0.8 – 1.2
Proportion of opportunists (% opp)		50 – 100	35 – 50	25 – 35	15 – 25	0 – 15

Results

Shore	Sub-Metric EQR							RSL EQR	Status
	Shore desc.	Sp. richness	Adj. Sp. Richness	% G	% R	ESG	% Opp		
Carlingford Slipway 2011	12	47	56.87	19.15	46.81	1.24	10.64	0.865	HIGH
Greer's Quay 2011	12	44	53.24	11.36	54.55	1.00	15.91	0.823	HIGH
Greencastle 2011	17	52	45.24	13.46	53.85	1.08	9.62	0.860	HIGH
Greencastle 2013	19	48	35.52	12.50	56.25	1.09	8.33	0.860	HIGH
Greers Quay 2013	13	39	44.46	20.51	51.28	0.86	15.38	0.773	GOOD
Carlingford Slip 2013	12	41	49.61	26.83	41.46	0.95	14.63	0.748	GOOD
							Mean	0.822 ±0.050	**HIGH**

Macroalgae (cont'd)

Confidence of Classification: High (82.3%)

- Data analysed for Confidence of Class using PIRATES (V04). M:\Projects 14\Phycology 2014\MM14-12 Intertidal Rocky Shore\PIRATES_v04 - Class update 2015 (09-14) for UKTAG.xls
- Standard Deviation (±) is included with the mean EQR.
- Data QA (expert team).
- WFD specific data (reduced species list completed; full species list not completed).
- Three shores (good spatial coverage) over two years (moderate temporal trend assessment).

2. Macroalgal Blooming Tool

Waterbody MBT assessment: ***Good (ND)***

- WFD surveillance monitoring:
- Data Store:
- Data Availability
- **Boundaries:**

Parameters	Quality Status	High	Good	Moderate	Poor	Bad
	Sub-metric EQR	***≥0.8 – 1.0***	***≥0.6 – 0.8***	***≥0.4 – 0.6***	***≥0.2 – 0.4***	***0.0 – 0.2***
Available Intertidal Habitat (AIH) %		0 – 5	5 – 15	15 – 25	25 – 75	75 – 100
Affected Area (ha)		0 – 10	10 – 50	50 – 100	100 – 1000	1000 – 2000
Biomass of AIH (g m^2)		0 – 100	100 – 500	500 – 1000	1000 – 3000	3000 - 6000
Biomass of affected area -AA (g m^2)		0 – 100	100 – 500	500 – 1000	1000 – 3000	3000 - 6000
Presence of entrained algae (% of quadrats)		0 – 1	1 – 5	5 – 20	20 – 50	50 – 100

Results

Year	Sub-metric EQR					Mean EQR	Status
	% cover of AIH	Affected Area	Biomass of AIH	Biomass of affected area	Entrained algae		
2009	<5%						
2013	<5%						
					Mean		

Data Confidence: Visual inspection, during 2009 & 2013 EPA Seagrass surveys **LOW**

Waterbody Angiosperm Classification + (data confidence):	HIGH (87.4%)	

Classification Tools:
1. Seagrass A. Taxonomic composition
B. Shoot density
C. Bed spatial extent

2. Saltmarsh – monitored but no classification tool established for first round.

1. Seagrass

Data store: M:\Projects 09\Phycology2009\Zostera\Carlingford\Carlingford Comp 2003 and 2009 surveys.xls
Data Availability (classification): 2009 & 2013

- **EQR Boundaries:**

Status	Mean Score Ranges
High	0.8-1.0
Good	0.6-0.79
Moderate	0.4-0.59
Poor	0.2-0.39
Bad	0.0-0.19

Sub-Metric Boundaries:
A. Taxonomic composition

Disturbance	Change in taxonomic composition	Metric score (mid-point of EQR range)
No detectable change	All taxa present	0.9
Slight signs of disturbance	Loss of ¼ to ⅓ of species	0.7
Moderate distortions	Loss of ½ of species	0.5
Major distortions	Loss of ⅔ to ¾ of species	0.3
Severe distortions	Loss of all species	0.1

B. Shoot Density

Disturbance	% Shoot Loss		Score
	Annual	5 Year Mean	
No detectable change	0-10	0-5	0.8
Slight signs of disturbance	11-30	6-15	0.6
Moderate distortions	31-50	16-25	0.4
Major distortions	51-70	26-35	0.2
Severe distortions	70-100	36-100	0.1

Angiosperms (cont'd)

C. Bed spatial extent

Disturbance	% Area Loss	Score
No detectable change	0-10	0.8
Slight signs of disturbance	11-30	0.6
Moderate distortions	31-50	0.4
Major distortions	51-70	0.2
Severe distortions	70-100	0.1

Results:

Site	Tool			Mean Metric Score	Mean Status
	Taxonomic composition	*Shoot Density*	*Bed Spatial Extent*		
Carlingford Lough	0.9	1	0.99	0.97 (+/- 0.06)	HIGH
				0.97	**HIGH**

Data confidence: High (87.4%)
Parentheses refer to the Standard Error of the final EQR

Data analysed using M:\Projects 14\Phycology 2014\MM14-15 Intertidal Seagrass Assessment\SAILOR_v2.3_2015 - Copy.xlsx

HIGH (87.4%) for 2009 but Low in 2012 from the survey by Queens which provided very little new data or data that could be compared with the 2009 survey. 2013 visual survey suggests less than 5% coverage of the intertidal area.

QE: Benthic Invertebrates

QE benthic invertebrate assessment (+ Data confidence):	MODERATE (L)	

Classification tools: 1. Infaunal Quality Index (IQI)
2. Imposex tool (VDSI)

1. IQI (UKTAG v01 20140228)

Water body IQI assessment: **Moderate (Low)**

WFD surveillance monitoring:

- **Data store:** ..\Carlingford Lough water body\Carlingford Lough Water body 08-13 fauna data 1mm.xlsx
- **Benthic invertebrates** UNICORN (NMMT) Database
- **Supporting Parameters** Water Quality Data Set
- **Digital images** AMAP Project folder
- **Data Availability (classification):** 11 sites, 5, 3 & 1 reps, 4 years, Day Grab, 1 mm sieve, n=38.

Boundaries (Intercalibrated NEAGIG):

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	MM-Benthos	CL2(3)	3	0.54	0.04	Moderate
2011	MM-Benthos	CL2(5)	5	0.63	0.10	Moderate
2012	MM-Benthos	CL2(5)	5	0.68	0.04	Good
2013	MM-Benthos	CL2(5), CLBR (20)	25	0.66	0.13	Good
2014	MM-Benthos	CL2(5)	-	-	-	-
2015	MM-Benthos	CL2(5)	-	-	-	-
Overall 6 year waterbody means			**9.5**	**0.63 (*0.55)**	**0.08**	**Moderate**

* IQI derived from data averaged minus Standard Deviation (see issues with tools paper). This figure is used for classification.

Data confidence: **Low**

- Sample analysis QA'd through NMBAQC (Good)
- Database QA'd (Good)
- No specific WFD data (1 single points with reps with additional spatial coverage in 2013 with 10 sites)

2. VDSI (Nucella lapillus)

Waterbody VDSI assessment: ***High (M)***

- **Data store:** ..\..\..\BIOEFFECTS\Imposex\Imposex 2013\Report\IMPOSEX MASTER DATA SHEET TEMPLATE.xls
- **Data availability:** 2004/2007/2010/2013 NI survey

Boundaries:

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

Results:

Year	Shore	VDSI	EQR	Status
2013	Greencastle	0.40	0.93	Good
2013	Warrenpoint	0.00	1.00	High
	Mean	**0.20**		**High**

Data confidence: **Medium**

- Sample analysis QA through QUASIMEME (High)
- <3 sites (Medium)

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

QE: Dissolved Oxygen

Dissolved oxygen (+ data confidence):	HIGH (100%)	

Classification tools: Comparison of 5% ile against reference standards

- Data Availability: 2010 – 2015.
- Data Store: ..\..\DO Classification 2012\Shortcut to DO FIELD VALUES 2006 -2010.lnk
- Data Availability (spot & continuous samples): Spot & Continuous

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*)
7.64	HIGH	2010-15	**	154	

***** Proportion of possible months for which data are available

QE: Nutrients – N regulation

QE N regulation assessment (+ Data confidence):	MODERATE (69%)	

- **Data store:** ..\Coastal WB inc AFBI 15.xls
- **Data Availability:** 2010 to 2014
  DIN & salinity (Nov to Feb)
- **Data Source (spot & continuous samples):** spot

Thresholds:

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

Results:

Mean Winter DIN (uM) (Avg DIN)*	Winter DIN Daily average (n)	No. of samples (n)	No. of sites	Data Years	Data Quality	Status
22.77		54	21	2010-2014	Database not yet QA'd	**MODERATE**

*Average DIN used as r^2 value of regression model is less than 0.75

Data confidence source: ..\CofCDINth.xlsx

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

Specific pollutants assessment (+data confidence)	MODERATE	

Classification tools: Comparison with EQS levels.

Data assessed for 2013 Update:

Specific Pollutants:

Suite	Parameter	Data Availability
Trace Metals	Chromium	CSEG 2012 / SWMP 2012
Trace Metals	Iron	CSEG 2012 / SWMP 2012
Trace Metals	Copper	CSEG 2012 / SWMP 2012
Trace Metals	Zinc	CSEG 2012 / SWMP 2012
Trace Metals	Arsenic	CSEG 2012 / SWMP 2012
Trace Organics (OPONS)	Dimethoate	DEC 2010 – APR 2011
Trace Organics (OPONS)	Diazinon	DEC 2010 – APR 2011
Trace Organics (OPONS)	Fenitrothion	DEC 2010 – APR 2011
Urea Herbicides	Linuron	OCT 2011 – MAY 2012
Nutrients (Winter Nutrients)	Unionised Ammonia (at pH8)	WIN NUTS 2012-2013
Candidate Specific pollutant	Glyphosate	NOV 2012 – MAR 2013

Other Pollutants – DSD list 2 (with existing EQS):

Suite	Parameter	Data Availability
Trace Metals (DSD list 2)	Vanadium	CSEG 2012
Trace Organics (OPONS)	Mevinphos	DEC 2010 – APR 2011
Trace Organics (OPONS)	Triazaphos*	DEC 2010 – APR 2011
Trace Organics (OPONS)	Dichlorvos	DEC 2010 – APR 2011

Triazaphos* LOD above the EQS.

Link to Data, Assessment and EQSs

G:\MARINE\Water Framework Directive\WFD ANNUAL CLASSIFCATION UPDATE 2013\Chemistry

Data assessed for 2014 Update:

Suite	Parameter	Data Availability
Trace Metals	Chromium	CSEG 2013 / SWMP 2013
Trace Metals	Iron	CSEG 2013 / SWMP 2013
Trace Metals	Copper	CSEG 2013 / SWMP 2013
Trace Metals	Zinc	CSEG 2013 / SWMP 2013
Trace Metals	Arsenic	CSEG 2013 / SWMP 2013

Other Pollutants – DSD list 2 (with existing EQS):

Suite	Parameter	Data Availability
Trace Metals (DSD list 2)	Vanadium	CSEG 2013
Trace Metals (DSD list 2)	Boron	CSEG 2013

No EQS failures

Link to Data, Assessment and EQSs:

..\..\Data

Data assessed for 2015 Update:

Suite	Parameter	Data Availability
Trace Organics	Permethrin	June 2013 – June 2014
Trace Organics	Cypermethrin	June 2013 – June 2014
Trace Organics	Toluene	Nov 2013 – Sept 2014
Trace Organics	Xylene	Nov 2013 – Sept 2014
Trace Metals	Chromium	Sept 2014 – Dec 2014
Trace Metals	Iron	Sept 2014 – Dec 2014
Trace Metals	Copper	Sept 2014 – Dec 2014
Trace Metals	Zinc	Sept 2014 – Dec 2014
Trace Metals	Arsenic	Sept 2014 – Dec 2014

Other Pollutants – DSD list 2 (with existing EQS):

Suite	Parameter	Data Availability
Trace Metals (DSD list 2)	Vanadium	Sept 2014 – Dec 2014

EQS failures:

Cypermethrin

Link to Data, Assessment and EQSs:

G:\MARINE\Water Framework Directive\WFD ANNUAL CLASSIFICATION UPDATE 2015\2015 QE sheets

ANNEX D: Hydromorphological quality elements

Overall hydromorphology assessment	$_{G}H$	

Classification tools:

1. TRaC Hydromorphology metrics
2. MIMAS

ANNEX E: Chemical Status – Annex X Chemicals

Priority hazardous substances (+data confidence)	FAIL	

Classification tools: Comparison with EQS levels.

Annex X: Overall Compliance	**Fail**
Annex X: Pass/Fail	**Fail**

Data Assessed for 2013 Update:

Suite	Parameter	Data Availability
Trace Metals	Nickel	SWMP 2012
Trace Metals	Cadmium	SWMP 2012
Trace Metals	Lead	SWMP 2012
Trace Metals	Mercury	SWMP 2012
Trace Organics (OPONS	Atrazine	DEC 2010 – APR 2011
Trace Organics (OPONS)	Chlorfenvinphos	DEC 2010 – APR 2011
Trace Organics (OPONS)	Chlorpyrifos	DEC 2010 – APR 2011
Trace Organics (OPONS)	Simazine	DEC 2010 – APR 2011
Urea Herbicides	Isoproturon	OCT 2011- MAY 2012
Urea Herbicides	Diuron	OCT 2011- MAY 2012
PAH	Anthracene	DEC 2010 – JUN 2011
PAH	Fluoranthene	DEC 2010 – JUN 2011
PAH	Naphthalene	DEC 2010 – JUN 2011
PAH	Benzo (a) pyrene	DEC 2010 – JUN 2011
PAH	*Benzo(b)fluoranthene	DEC 2010 – JUN 2011
PAH	*Benzo(k)fluoranthene	DEC 2010 – JUN 2011
PAH	*Benzo(g,h,i)perylene	DEC 2010 – JUN 2011
PAH	*Indeno(1,2,3 cd) pyrene	DEC 2010 – JUN 2011

*AA - EQS = Sum of Benzo(b)fluoranthene and Benzo(k)fluoranthene = 0.03ug/l (No Marine MAC – EQS)

*AA - EQS = Sum of Benzo(g,h,i)perylene and Indeno(1,2,3 cd) pyrene = 0.002ug/l (No Marine MAC – EQS)

EQS Failures:

AA – EQS failure for the sum of Benzo(g,h,i)perylene and Indeno(1,2,3 cd) pyrene.

Calculated mean = 0.0024ug/l

There is low confidence as the EQS is an annual average and the mean is calculated with only 3 months of monitoring data (Dec 10, Apr 11 and Jun 11).

There is no marine maximum allowable concentration (MAC) for comparison.

Link to Data, Assessment and EQSs:

G:\MARINE\Water Framework Directive\WFD ANNUAL CLASSIFCATION UPDATE 2013\Chemistry

Data Assessed for 2014 Update:

Suite	Parameter	Data Availability
Trace Metals	Nickel	CSEG 2013 / SWMP 2013
Trace Metals	Cadmium	CSEG 2013 / SWMP 2013
Trace Metals	Lead	CSEG 2013 / SWMP 2013
Trace Metals	Mercury	CSEG 2013 / SWMP 2013

No EQS failures

Link to Data, Assessment and EQSs:

..\..\Data

Data Assessed for 2015 Update:

Suite	Parameter	Data Availability
Trace Metals	Nickel	Sep 2014 – Dec 2014
Trace Metals	Cadmium	Sep 2014 – Dec 2014
Trace Metals	Lead	Sep 2014 – Dec 2014
Trace Metals	Mercury	Sep 2014 – Dec 2014
Trace Organics	Benzene	Nov 2013 – Sept 2014
Trace Organics	Nonylphenol	April 2014 – Dec 2014
Trace Organics	Octylphenol	April 2014 – Dec 2014
Pesticides	Pentachlorobenzene	April 2014 – Dec 2014
Pesticides	Trifluralin	April 2014 – Dec 2014
Pesticides	HCH	April 2014 – Dec 2014
Pesticides	Hexachlorobenzene	April 2014 – Dec 2014
Pesticides	Alachlor	April 2014 – Dec 2014
Pesticides	Cyclodienes	April 2014 – Dec 2014
Pesticides	Endosuphan	April 2014 – Dec 2014
Pesticides	DDT	April 2014 – Dec 2014
Pesticides	pp DDT	April 2014 – Dec 2014

MARINE PAH INVESTIGATIVE MONITORING 2014:

Suite	Parameter	Data Availability
PAH	Naphthalene	6 samples
PAH	Anthracene	NR
PAH	Fluoranthene	NR
PAH	Benzo(b)fluoranthene	6 samples
PAH	Benzo(k)fluoranthene	6 samples
PAH	Benzo (a) pyrene	6 samples
PAH	Indeno(1,2,3 cd) pyrene	6 samples
PAH	Benzo(g,h,i)perylene	6 samples

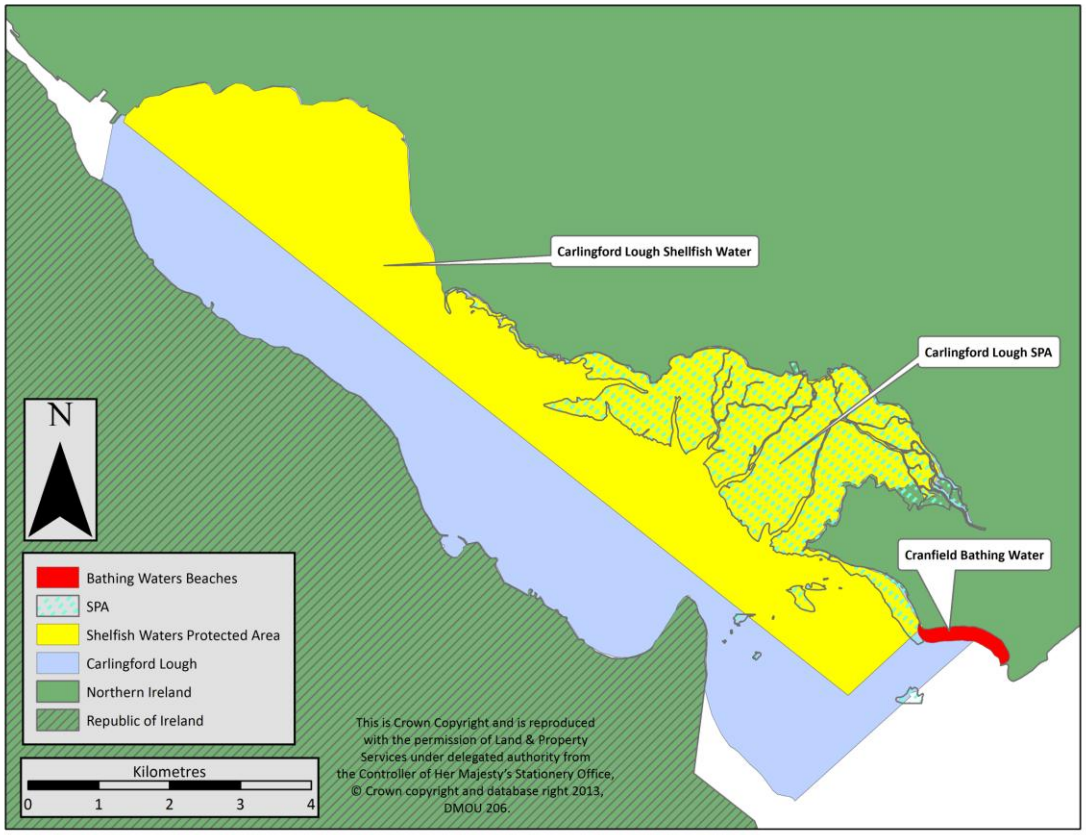
All Results less than LOD.

No EQS failures

Link to Data, Assessment and EQSs:

G:\MARINE\Water Framework Directive\WFD ANNUAL CLASSIFICATION UPDATE 2015\2015 QE sheets

ANNEX F: Protected Areas



Protected areas within Carlingford Lough (Coastal Water).

The following Protected Areas are situated either wholly or partly within the Carlingford Lough 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
Carlingford Lough SPA	Unfavourable	Sandwich Tern; Common Tern; Light Bellied Brent Goose	Common Tern; Sandwich Tern	Non marine water quality related

Shellfish Water Protected Areas:

Shellfish Water Protected Area	Met Guideline Microbiological Standard* in 2014
Carlingford Lough	Yes (n=39)

*75% of samples contain ≤230 *E. coli* /100ml of shellfish flesh and intervalvular liquid

Bathing Waters Directive Beaches:

Beach	2011-2014 Revised Bathing Waters Classification
Cranfield	Excellent

ANNEX G: High Impact Invasive Species

High Impact Invasive Species check		**GOOD**

Ecoregion 17 Marine High Impact Invasive Species List

Phylum	Species	P	E	I	Record
Chordata	*Didemnum* spp.		Y		PO
Chordata	*Styela clava*				
Crustacea	*Eriocheir sinensis*				
Mollusca	*Crassostrea gigas*				
Mollusca	*Crepidula fornicata*				
Phaeophyceae	*Sargassum muticum*		Y		W
Angiosperms	*Spartina anglica*		Y		W

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.

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
$_{G}$H	Good/High status
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	Moderate Ecological Potential
NB	Neagh Bann
ND	No data
NE	North Eastern
NEAGIG	North Eastern Atlantic Geographical Intercalibration Group
NIEA	Northern Ireland Environment Agency
N-regs	Nitrogen Regulation
NVZ	Nitrate Vulnerable Zone
NW	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
WWTW	Waste water treatment works