



Seafloor Litter Monitoring

Josie Russell – Marine Litter Scientist



Centre for Environment
Fisheries & Aquaculture
Science

World Class Science for the Marine and
Freshwater Environment



Cefas



How it all started...



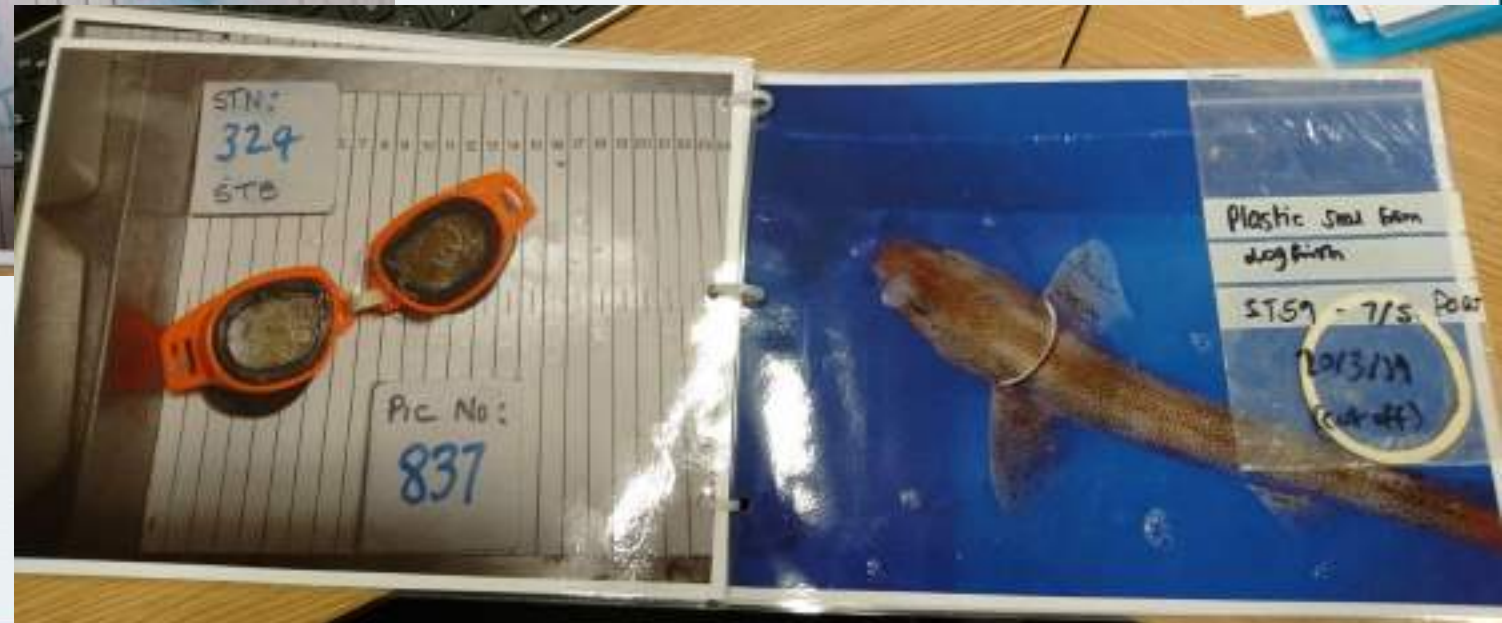
Monitoring



Sorting and collection



Entanglement



Marine Litter Science in action

Monitoring



A: Plastic	B: Metals	Related size category	
A1. Bottle	B1. Cans (food)	A: <5*5 cm= 25 cm ²	
A2. Sheet	B2. Cans (beverage)	B: <10*10 cm= 100 cm ²	
A3. Bag	B3. Fishing related	C: <20*20 cm= 400 cm ²	
A4. Caps/lids (monofilament)	B4. Drums	D: <50*50 cm= 2500 cm ²	
A6. Fishing line (entangled)	B5. appliances	E: <100*100 cm= 10000 cm ² = 1 m ²	
A7. Synthetic rope	B6. car parts	F: >100*100 cm = 10000 cm ² = 1 m ²	
A8. Fishing net	B7. cables		
A9. Cable ties	B8. other		
A10. Strapping band			
A11. crates and containers			
A12. diapers			
A13. sanitary towel/tampon			
A14. other			
C: Rubber	D: Glass/ Ceramics	E: Natural products	F: Miscellaneous
C1. Boots	D1. Jar	E1. Wood (processed)	F1. Clothing/ rags
C2. Balloons	D2. Bottle	E2. Rope	F2. Shoes



RecordTyp	Quarter	Country	Ship	Gear	Survey	Reserved1	Reserved2	StNo	HaulNo	Year	LTREF	PARAM	LTSZC	UnitWgt	LT_Weigh	UnitItem	LT_Items	LTSRC	TYPPL	LTPRP
LT	3	ENG	END	BT5	BTS-VIIa	-9	-9		3	2015	C-TS-REV	A2	B	kg/haul	0.0080	Items/haul	1	UNK	-9	AO
LT	3	ENG	END	GOV	NS-IBTS	-9	-9	29	56	2014	RECO-LT	LT-TOT	-9	kg/haul	-9.0000	Items/haul	0	-9	-9	-9
LT	3	ENG	END	GOV	NS-IBTS	-9	-9	68	93	2017	C-TS-REV	A5	A	kg/haul	0.0001	Items/haul	1	UNK	-9	-9
LT	3	ENG	END	GOV	NS-IBTS	-9	-9	74	94	2017	C-TS-REV	C5	C	kg/haul	0.1398	Items/haul	1	UNK	-9	AO
LT	3	ENG	END	GOV	NS-IBTS	-9	-9	74	94	2017	C-TS-REV	A7	B	kg/haul	0.0054	Items/haul	1	UNK	-9	-9
LT	3	ENG	END	GOV	NS-IBTS	-9	-9	74	94	2017	C-TS-REV	A9	B	kg/haul	0.0081	Items/haul	1	UNK	-9	AO
LT	3	ENG	END	GOV	NS-IBTS	-9	-9	74	94	2017	C-TS-REV	A7	B	kg/haul	0.0024	Items/haul	1	UNK	-9	-9
LT	3	ENG	END	GOV	NS-IBTS	-9	-9	74	94	2017	C-TS-REV	A2	A	kg/haul	0.0020	Items/haul	1	UNK	-9	-9
LT	3	ENG	END	GOV	NS-IBTS	-9	-9	73	98	2017	C-TS-REV	A2	C	kg/haul	0.0599	Items/haul	1	UNK	-9	AO

Monitoring



Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv



Below the surface: Twenty-five years of seafloor litter monitoring in coastal seas of North West Europe (1992–2017)

T. Maes ^{a,b,*}, J. Barry ^a, H.A. Leslie ^b, A.D. Vethaak ^{b,c}, E.E.M. Nicolaus ^a, R.J. Law ^{a,d}, B.P. Lyons ^e, R. Martinez ^a, B. Harley ^a, J.E. Thain ^e

^a Cefas, Centre for Environment, Fisheries and Aquaculture Science, Pakefield Road, Lowestoft NR33 0HT, UK

^b Dept. of Environment and Health, Faculty of Science, Vrije Universiteit Amsterdam, De Boelelaan 1085, 1081 HZ Amsterdam, The Netherlands

^c Deltares, Boussinesqweg 1, 2629 HV Delft, The Netherlands

^d Institute of Zoology, Regent's Park, London NW1 4RY, UK

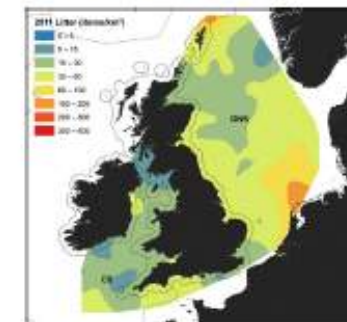
^e Cefas, Centre for Environment, Fisheries and Aquaculture Science, The Nothe, Weymouth, Dorset DT4 8UB, UK

HIGHLIGHTS

- Widespread distribution of litter items on the seabed, up to 1835 pieces km⁻²
- Over the 25-year period, 63% of the trawls contained at least one plastic litter item.
- No significant temporal trend in total number of litter items km⁻²
- Significant trends in plastic bags (down) and fishing debris (up)
- Potential influence of behavioural changes on litter abundance?

GRAPHICAL ABSTRACT

Marine litter abundance (litter items km⁻²) on the seafloor in North West European Seas, all data from 2011 interpolated using R, Shiny and PostGIS. The black line surrounding the UK represents the 12 nm boundary. The black line in the Western Channel and starting near the tip of Shetland symbolizes the MSFD boundary for the Celtic Sea (CS) and Greater North Sea (GNS). Key to regional divisions: GNS-off, Greater North Sea offshore stations outside 12 nm; GNS-in, Greater North Sea inshore stations within 12 nm; CS-off, Celtic Sea offshore stations outside 12 nm; CS-in, Celtic Sea inshore stations within 12 nm.



European Seafloor Assessment



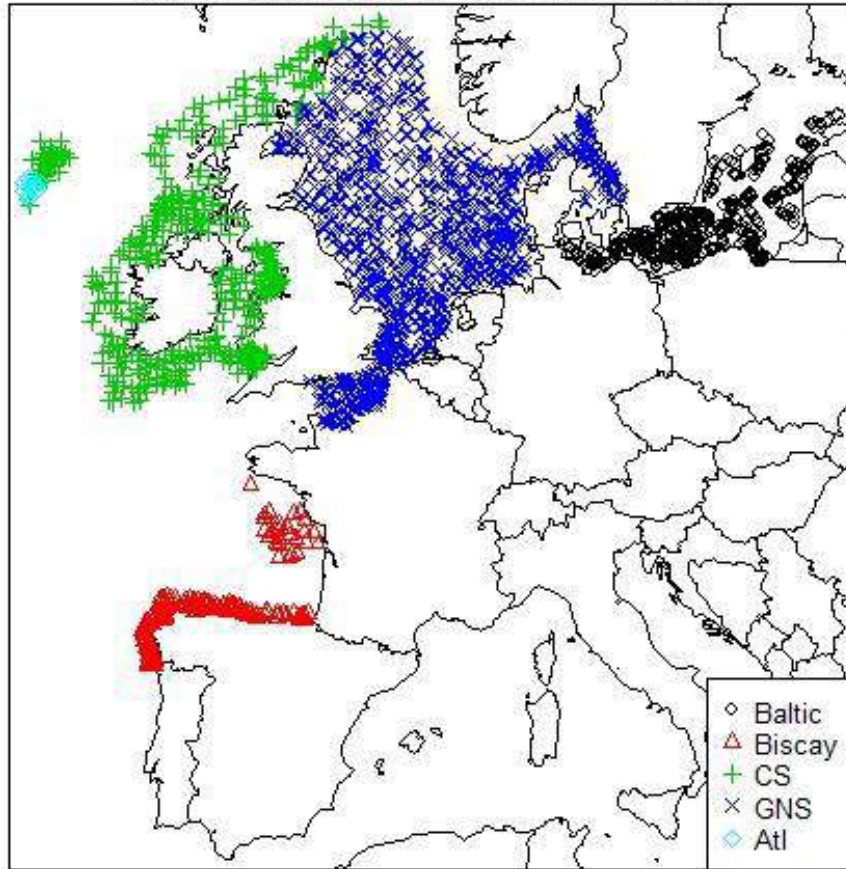
Clean
Atlantic



Interreg
Atlantic Area
European Regional Development Fund



Haul locations in 2017 by OSPAR region



Spatial maps for plastic

Variables;

- Haul length
- Gear type
- Unequal sampling effort

Clean Atlantic Deliverable



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Monitoring



Litter Record Sheet						
Cruise:	Station:				Date:	
Litter Type (A1; B2; C...)	Description (Label/ Brand)	Size category (A; B; C...)	Weight (kg)	Picture (number)	attached organisms (yes/no) Taxonomy Info	Comments (Item description if other under litter type)



Cruise
CEND 24/15x

Station ID

Haul

Date
03/03/2017

[Click to add today's date](#)

Plastic

Metals

Rubber

Glass

Nat Prod

Miscellan

Cat Help

Bottle

Sheet

Bag

Caps/lids

Fishing - Monofilam

Fishing - entangled

Synthetic rope

Fishing net

Cable ties

Strapping band

Crate/container

Diapers

Sanitary towel/tamp

Other

Size category

< 5 x 5 cm

< 10 x 10 cm

< 20 x 20 cm

< 50 x 50 cm

< 100 x 100 cm

> 100 x 100 cm

Weight in Kilogram

Picture numbers

1

Attached organisms

☐ Yes
☐ No

Enter relevant taxonomic data here

Comments

Item description if other under litter type

☐ No litter present

Submit data



Cefas Seafloor Marine Litter App



New
Station
Entry

Review
Stations

- Improved data entry
 - Electronic
 - Instant transfer to database,
 - Reduced paper logs
 - Standardised entry and outputs.
- Android
- Development ongoing
- Tested onboard RV Cefas Endeavour during recent fisheries survey (March 2019).

First look



New Station Entry +

CEND0119 - Test1 / 1
This station is read-only

CEND0119 - Test2 / 02
This station is read-only

CEND19 - /
This station is read-only

CEND19 - /
This station is read-only

Station Metadata

Survey CEND 15 19

Date 03/05/2019

Gear Gear 1

Station ID ST3SN2

Haul / Station No 45

Lat / Long

User Recording BS

NO LITTER CLEAR DATA DONE

CEND1519 / ST4SN2 / 46 / 1

Category A: Plastic

Sub-Category A5: Fishing Line (Monofila

Size A: <5*5 = <25cm^2

Weight (g) 1.8

Comments Orange mono

Attached Organisms

Taxonomic Details Hydroids

CLEAR DATA TAKE PICTURE





Thank you!

Josie.russell@cefas.co.uk