



Seafloor Litter Monitoring

Josie Russell – Marine Litter Scientist



Centre for Environment
Fisheries & Aquaculture
Science

World Class Science for the Marine and
Freshwater Environment



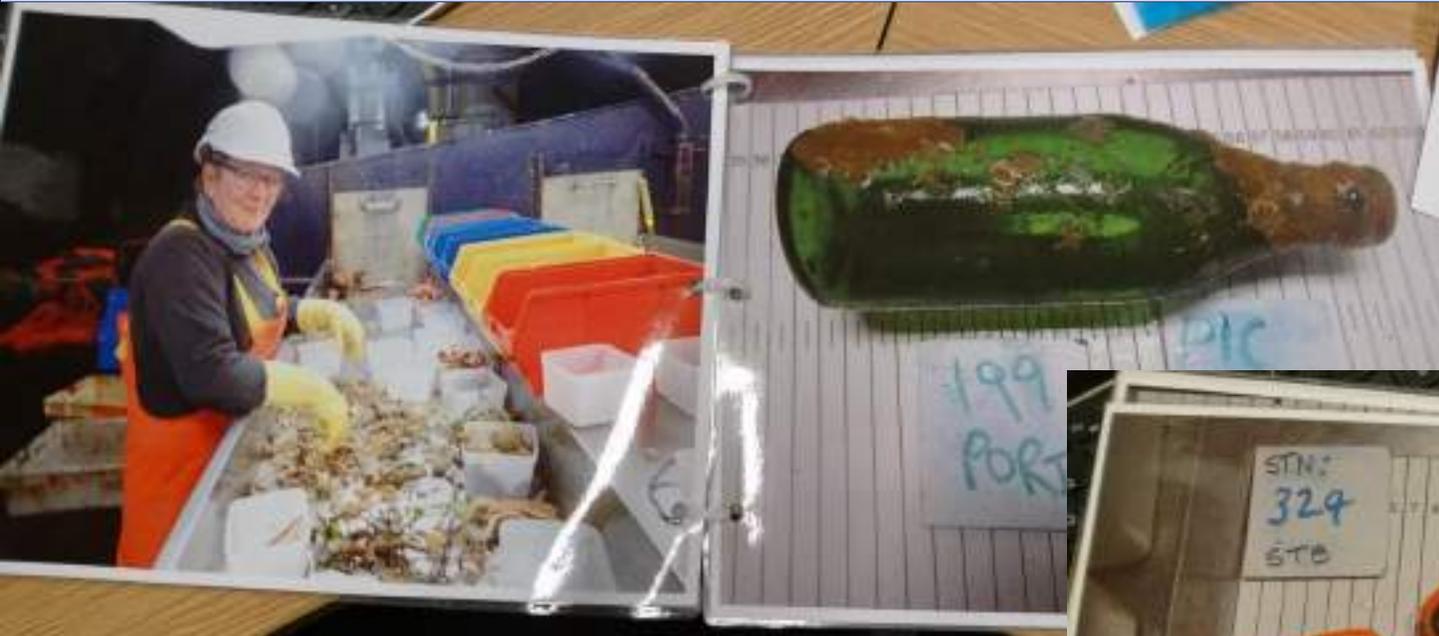
Cefas



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 cm²	
A2. Sheet	B2. Cans (beverage)	B: <10*10 cm= 100 cm²	
A3. Bag	B3. Fishing related	C: <20*20 cm= 400 cm²	
A4. Caps/ lids (monofilament)	B4. Drums	D: <50*50 cm= 2500 cm²	
A6. Fishing line (entangled)	B5. appliances	E: <100*100 cm= 10000 cm²= 1 m²	
A7. Synthetic rope	B6. car parts	F: >100*100 cm= 10000 cm²= 1 m²	
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	BTS	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)

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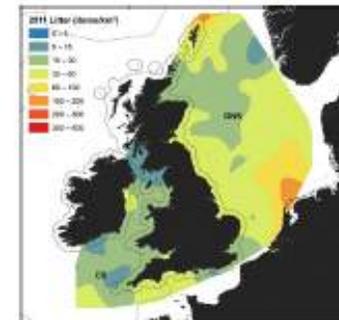
^e Cefas, Centre for Environment, Fisheries and Aquaculture Science, The Nothe, Weymouth, Dorset DT4 8UB, UK

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

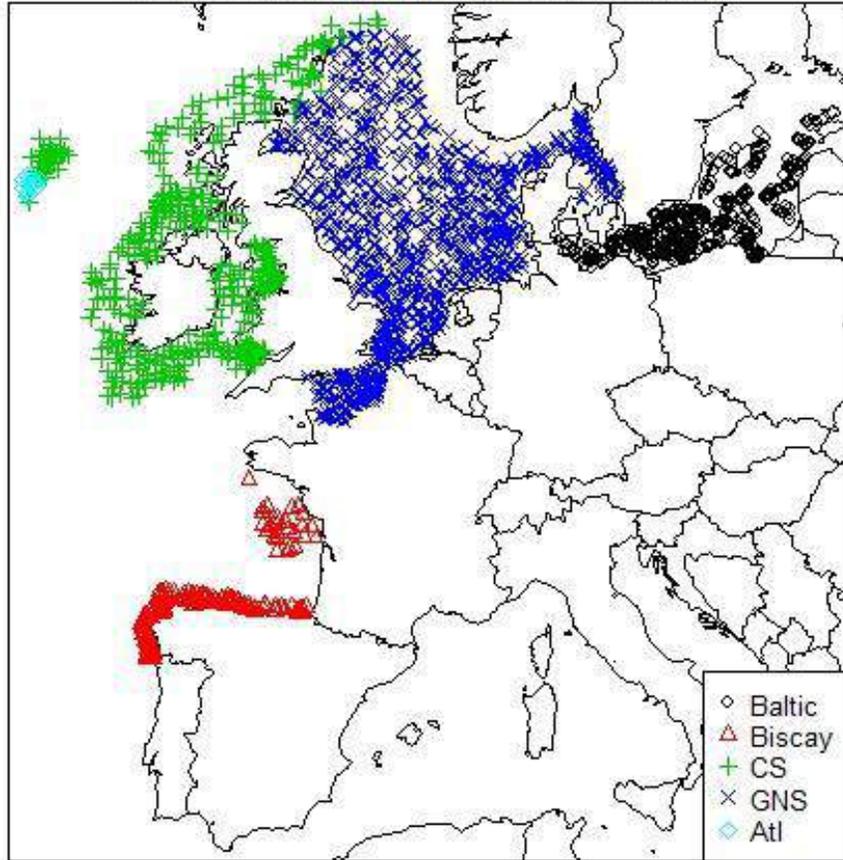
Marine litter abundance (litter items km⁻²) on the seafloor in North West European Seas, all data from 2011 interpolated using R, Shiny and PostGIS. The black line surrounding the UK represents the 12 nm boundary. The black line in the Western Channel and starting near the tip of Shetland symbolizes 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



Haul locations in 2017 by OSPAR region



Spatial maps for plastic

Variables;

- Haul length
- Gear type
- Unequal sampling effort

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

RESET

<input checked="" type="checkbox"/> Plastic	<input type="checkbox"/> Bottle	<input type="checkbox"/> Fishing net	Size category	Picture numbers
<input type="checkbox"/> Metals	<input type="checkbox"/> Sheet	<input type="checkbox"/> Cable ties	< 5 x 5 cm	<input type="text" value="1"/>
<input type="checkbox"/> Rubber	<input type="checkbox"/> Bag	<input type="checkbox"/> Strapping band	< 10 x 10 cm	<input type="text"/>
<input type="checkbox"/> Glass	<input type="checkbox"/> Caps/lids	<input type="checkbox"/> Crate/container	< 20 x 20 cm	<input type="text"/>
<input type="checkbox"/> Nat Prod	<input type="checkbox"/> Fishing - Monofilam	<input type="checkbox"/> Diapers	< 50 x 50 cm	<input type="text"/>
<input type="checkbox"/> Miscellan	<input type="checkbox"/> Fishing - entangled	<input type="checkbox"/> Sanitary towel/tamp	< 100 x 100 cm	<input type="text" value="1"/>
<input type="checkbox"/> Cat Help	<input type="checkbox"/> Synthetic rope	<input type="checkbox"/> Other	> 100 x 100 cm	<input type="text"/>

Attached organisms: Yes No
 Enter relevant taxonomic data here:

Comments: Item description if other under litter type

No litter present

Submit data



Improving data collection

Cefas Seafloor Marine Litter App

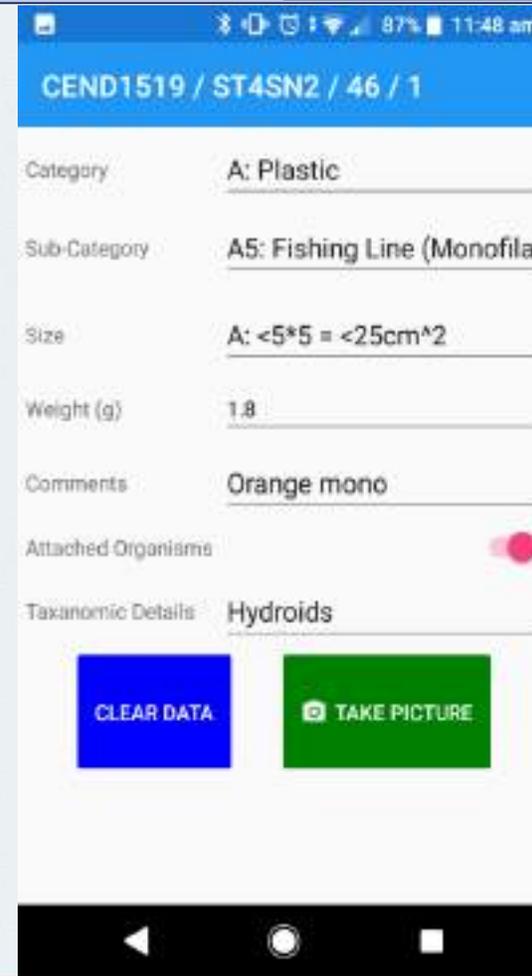
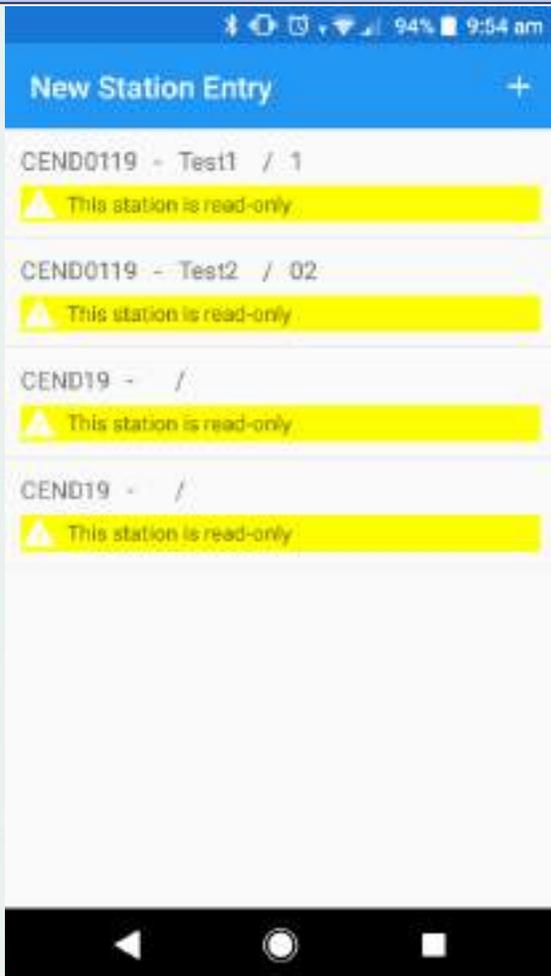


New
Station
Entry

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





Thank you!

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