



# Task 2.3.1 Regional database for beach litter and micro litter

## Hanna Haaksi & Joni Kaitaranta Helsinki Commission (HELCOM)

# Contents

Introduction
HELCOM data on marine litter
Data call on marine litter
Marlin database
Technical5
Database in action
User types7
Adding a monitoring site
Collecting the monitoring data9
Measurements – beach assessments 11
Statistics
Data quality in the Marlin database
European Environment Agency database – Marine Litter Watch
Technical
Marine Litter Watch in action
New beach
New event – new assessment and reporting 28
Litter report
Litter events to study
Data quality and availability of the Marine Litter Watch
OSPAR Database
Technical
Database in action
Measurements
Measurement data to study and beach information

Input of data	
Adding a new beach	
Analytic tools	
Summary of key elements	
HELCOM database	
Discussion	

### Introduction

The purpose of this document is to briefly describe three different databases or programmes which are used in the work with marine litter related issues as a prerequisite to identify the best option for setting up a regional database for beach litter. The three studied ones are OSPAR database, MARLIN database (a harmonised marine litter monitoring method based on the UNEP/IOC monitoring guidelines adapted for the Baltic Sea) and Marine Litter Watch (EEA).

### HELCOM data on marine litter

Monitoring of beach litter in the Baltic Sea area is carried out in Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden. In six countries monitoring started in 2012, in five of them data were collected in the period 2012-2016. In Denmark and Poland monitoring started in 2015 (see Table 1).

Country	Monitoring period	Number of monitoring sections	Length of monitored section	Beach types (number)	Frequency of monitoring per year	Seasons (total number of visits)	Marine litter items categorization
Denmark	2015 - 2016	3	100	reference (rural) (3)	3(4)	spring (6), summer (6), autumn (6), winter (1)	TG ML Master list
Estonia	2012 - 2016	10	300, 350, 400, 500, 600, 800, 2500, 3000	peri-urban (5), urban (1), rural (4)	3	spring (32), summer (42), autumn (32)	UNEP/ MARLIN
Finland	2012 - 2016	12	100, 110, 152, 320, 326	peri-urban (3), urban (5), rural (4)	3	spring (45), summer (42), autumn (42)	UNEP/ MARLIN
Germany	2012 - 2016	26	100	reference (11), urban (1), rural (14)	4	spring (96), summer (102), autumn (101), winter (79)	OSPAR Guideline for Monitoring Marine Litter on the Beaches, with slight adaptations
Latvia	2012 - 2016	42	100	urban (12), rural (18), peri-urban (5), periurban(rur al) (4), rural/remote (3)	1	summer (175)	UNEP/ MARLIN
Lithuania	2012 - 2013	4	100	urban (1) rural (1) semi- urban (1) touristic (1)	4	spring (8), summer (8), autumn (8), winter (8)	
Poland	2015 - 2016	15	1000	urban (7), rural (8)	4	spring (30), summer (30), autumn (30), winter (30)	TG ML Master list
Sweden	2012 - 2016	10	100	peri-urban(6), rural (4)	3	spring (37), summer (37), autumn (39)	UNEP/ MARLIN

Table 1. Summary of available national beach litter monitoring data: spatial, temporal and categorizationmethod used.

The number of monitored beaches (stations) varies by country. The smallest number of beaches is monitored in Denmark (3) and Lithuania (4), while the largest number of monitored beaches is in Latvia (42). The main types of monitored beaches are urban and rural ones, but in some countries reference beaches (where the

anthropogenic impact is minimal) as well as peri-urban beaches<sup>1</sup> are monitored. The length of the monitored beaches ranges from 100 to 3000m, being 100m the most common length used (in five countries). In four countries, monitoring is conducted three times a year (spring, summer and autumn). In the case of Denmark, only one survey was conducted in winter time. In Germany and Poland regular monitoring is conducted in the four seasons of the year. In Latvia, monitoring is carried out only in the summer season.

The monitored litter is assigned to eight main material categories: artificial polymer materials, rubber, cloth/textile, paper/cardboard, processed/worked wood, metal, glass/ceramics and unclassified. Some countries have identified two additional categories: food waste and chemicals such as e.g. paraffin, wax, oil or tar. The categorization of individual litter items is conducted according to different methodologies and protocols (UNEP 2009, OSPAR 2010, JRC 2013, MARLIN 2013) depending on the countries. Task Group Master List (TG ML) (JRC 2013) is used in Denmark and Poland, the UNEP/MARLIN classification methodology is used in four countries: Estonia, Finland, Latvia and Sweden, whereas Germany use the OSPAR methodology and protocol.

### Data call on marine litter

A data call on marine litter was launched to HELCOM countries in May 2017. It was conducted in Excel-format via email. Instructions on filling the Excel-template were on the first sheet of the file (Table 2), and the actual data call template on the second sheet (Table 3).

Please read these short instructions before filling-in the table
Please indicate the coding list used: UNEP, OSPAR, TG ML. If none of this, please provide reference
Data on <b>number of items</b> is to be included below each green column
Please create one column per item code reported. Create as many columns as needed
When creating a column, please first indicate the 'Material' to be followed by 'a short description of the item' followed by the 'Item code'. The idea is to merge all this information in one field. For example: 'Plastic: Shoes [44]' if using the OSPAR coding list.
Please select from the list below when indicating the 'Material':
ARTPOLY -> Artificial polymer materials
RUBBER-> Rubber
TEXTILE -> Cloth/textile
PAPER -> Paper/cardboard
WOOD -> Processed/worked wood
METAL -> Metal
GLASS -> Glass/ceramics
CHEM -> Chemicals
FOOD -> Food waste
UNDEF -> Undefined

#### Table 2. Data call, instructions sheet

<sup>&</sup>lt;sup>1</sup> Understood as beaches with (many) visitors but which are not in or very close to a city.

COLUMN	FORMAT
Country	General
E-mail contact person	General
Monitoring protocol used	General
Type of beach (rural/urban/reference beach)	General
Monitoring area ID	General
Length (m)	General
Width (m)	General
Start geographical longitude	General
Start geographical latitude	General
End geographical longitude	General
End geographical latitude	General
HELCOM subbasin name (level 3 according to the HELCOM Monitoring and Assessment Strategy)	General
Monitoring date: dd/mm/yy	General
Coding list used	General
Material: description of the item [item code]	General
Material: description of the item [item code]	General
Material: description of the item [item code]	General

Table 3. Data call, data template

### Marlin database

Marlin database was created as a product of the Central Baltic project Baltic Marine Litter (MARLIN), which ran in 2011-2013. Countries involved in the project were Estonia, Finland, Latvia and Sweden. Swedish partner was in charge of building, launching and maintaining the database. After the project ended the Swedish partner, Keep Sweden Tidy, has been maintaining the database. The database is now funded by The Swedish Agency for Marine and Water Management.

The purpose of the database was and still is to collect data from beach assessments into one database from where reports on the litter situation can easily be drawn.

Beaches are established to the database and from each beach assessment litter data is input. The database is not meant to be used by public as a citizen science tool, but rather the managers of beaches/assessment beaches, NGOs active in marine litter issues and officials.

### Technical Located at: <u>http://hsr-beach.herokuapp.com/login</u>

Operation and maintenance of the database is financed by: The Swedish Agency for Marine and Water Management

Technical support and access to the database is provided by: Keep Sweden Tidy, info@hsr.se

Map: Google maps

### Database in action

Database is aimed at professionals in the field of marine litter. It is essential to know different beach litter monitoring methodologies and protocols. Itself the database is self-guiding when using it, and clearly defined.

🗋 Start	×		🖾 – 🖻 🗙
← → C O hsr-b	each.herokuapp.com		☆ ;
		Upload manual   MyLaccount   Log.out	
	START BEACHES MEASUREMENTS	S STATISTICS ADMIN ADD MEASUREMENT ADD BEACH	
Welcome!			
News			
2017-03-04		Technical support	
14:22	Measuring periods 2017		
	The measuring periods for 2017 are: Spring w. 16-18 (17/4-7/5), Summer w. 29-31 (17/7-6/8), and Autumn w. 42-44 (16/10-5/11).	For questions or technical support please contact Keep Sweden Tidy at info@hsr.se or call	
2016-02-08			
14:15	Measuring periods 2016	Eva Bildderg, +46 (0)/2 551 64 /1	
	Spring v.16-18: 18/4-8/5 Summer v.29-31: 18/7-7/8 Autumn v.42-44: 17/10-6/11		
2015-03-13		Andreas Frössberg: +46 (0)70 723 71 87	
09:35	Managering particile 2017		
	Spring: 13/4-3/5 Summer: 13/7-2/8 Autumn 12/10-1/11		
- 2 🗎	💽 📴 🕄 🖬		10:11

Figure 1. First page of the database web application

Beaches in the database are located in Estonia, Finland, Germany, Latvia, Lithuania and Poland. Most of the beaches are monitored with UNEP/Marlin method and UNEP/Marlin protocol for litter items. The database, also includes beaches monitored in the OSPAR area. A great advantage with the Marlin database is that more than one protocol can be added to the database, thus giving the chance of developing this database into a regional database where all protocols can be added.

C O hsr-beach.her	okuapp.com/beach/list					☆
		1 TIDY		Upikad manual   My a	ccourt   Log out	
		START BEACHES	MEASUREMENTS STATISTIC	S ADMIN ADD MEASUREMENT	ADD BEACH	
aches						
ach group: All	Ocean/Sea, Lake All	Country All		Municipality or region   All +   Province   All +		
ame All	OceanSeaLake		Country	Municipality or region	Province	
irehamn sti Estonia	Baltic Sea		Sweden	Borgholm	Kalmar lan	
brostrand Finland	Baltic Sea		Sweden	Ystad kommun	Skånes lan	
avallen/S) HSR	Baltic Sea		Sweden	Kävlinge kommun	Skånes län	
orsand Latvia	Baltic Sea		Sweden	Skellefteå	Västerbotten län	
dde strand OSPAR Sverige	Baltic Sea		Sweden	Varberg	Hallands län	
olion SE2 Poland	North Sea		Sweden	Orust	Västra Götalands län	
ső SE3 Sweden	North Sea		Sweden	Lysekil	Västra Götalands län	
jón SE1	North Sea		Sweden	Kungalv kommun	Västra Götalands län	
va	Baltic Sea		Estonia	Nõva	Läänemaa	
rtsapcole	Baltic Sea		Estonia	Haademeeste	Pārnumaa	
ora Sand Värmdö	Baltic Sea		Sweden	Varmdo	Stockholms län	
gsdorf	Baltic Sea		Germany	Bastorf	Bad Doberan	
rnemünde	Baltic Sea		Germany	Rostock	Rostock	
svik SE5	North Sea		Sweden	Tanum	Västra Götalands län	
oderhamnsvik SE9	North Sea		Sweden	Lysekil	Västra Götalands län	
by SE4	North Sea		Sweden	Sotenas	Västra Götalands län	
sklåvebukten - Saltö - SE6	North Sea		Sweden	Strömstads kommun	Västra Götalands län	
he Düne	Baltic Sea		Germany	Rostock	Rostock	
rrevik SE8	North Sea		Sweden	Orust	Västra Götalands län	
	North Sea		Sweden	Kundély kommun	Västra Götalands län	



L beatries	Anna I					A CONTRACTOR OF A
← → C O hsr-beach.herol	kuapp.com/beach/list					\$
		TIDY		Uplead manual   My acc	count   Log.out	
		START BEACHES MEAS	UREMENTS STATISTICS	ADMIN ADD MEASUREMENT	ADD BEACH	
Beaches						
Beach group All	Ocean/Sea, Lake All	Country All		Municipality or region All + Province All +		
Name	Oc All	Cou	intry	Municipality or region	Province	
Kårehamn strand/Skanviken	Bal North Sea	Swe	iden	Borgholm	Kalmar län	
Nybrostrand	Bal Gulf of Finland	Swe	iden	Ystad kommun	Skånes lan	
Järavallen/Sjöängarna	Bal Gulf of Bothnia	Swe	iden	Kävlinge kommun	Skånes län	
Storsand	Bal Skagerrak Strait	Swe	uden	Skellefteå	Västerbotten län	
Sudde strand	Bal Øresund	Swe	iden	Varberg	Hallands län	
Mollón SE2	Not Oresund	Swe	uden	Orust	Vastra Götalands län	
Gáső SE3	North Sea	Swe	iden	Lysekil	Västra Götalands län	
Ngon SE1	North Sea	Swe	Jden	Kungalv kommun	Västra Götalands län	
Nõva	Baltic Sea	Esto	unia	Nõva	Laänemaa	
Metsapoole	Baltic Sea	Esto	onia	Haademeeste	Parnumaa	
Stora Sand Varmdö	Baltic Sea	Swe	vden	Värmdö	Stockholms län	
Kägsdorf	Baltic Sea	Gen	many	Bastorf	Bad Doberan	
Namemünde	Baltic Sea	Ger	many	Rostock	Rostock	
Edsvik SE5	North Sea	Swe	iden	Tanum	Västra Götalands län	
Gröderhamnsvik SE9	North Sea	Swe	aden	Lysekil	Västra Götalands län	
Haby SE4	North Sea	Swe	aden	Sotenas	Västra Götalands län	
Angklåvebukten - Saltö - SE6	North Sea	Swe	iden	Strömstads kommun	Västra Götalands län	
Hohe Düne	Baltic Sea	Gen	many	Rostock	Rostock	
Barrevik SE8	North Sea	Swe	aden	Orust	Västra Götalands län	

Figure 3. Beach list view in the database web application

### User types

There are different types of users, each user type has different rights. A basic user can only see the data from his respective country, group administrator is so called beach manager and can input data for his monitoring

beach and super administrator can input data and see data from all beaches in the database. The user types are given by the Swedish NGO Keep Sweden Tidy.

### Adding a monitoring site

Beach managers and administrators can add a monitoring site to the database. As a first step a country/area is chosen and then a place from the map is pointed. The map tool uses Google maps and coordinates are given by the system, when pointing the place from the map (Figure 4 – Figure 5). Background information on the beach is filled out at this point (from physical characteristics to estimated visitors). Information can be edited at any point.



Figure 4. Creating a new beach/monitoring site



Figure 5. Creating a new beach/monitoring site

### Collecting the monitoring data

Data from monitoring sites is collected through the website. Main user can send a link to the monitoring beach manager who can input the litter info, or the main user can input info on behalf of the beach manager. It is possible to set a separate manager for each beach (Figure 6).

🖸 Measurement 🛛 🗙 🗋 Mea	suremer Measurement				🖻 – 🗖 🗙
← → C © hsr-beach.herokuapp.c	om/measurement/summary/8141				☆ !
			Ur.	stead manual   My.account   Log.cod	
	START B	EACHES MEASUREMENTS STATISTICS	ADMIN ADD N	NEASUREMENT ADD BEACH	
Measurements > Measurement > Su	mmary				
ld	Official	Measure	ment valid to	URL	
011	193.	2011-12		907b-36b546bbb1de	
	CONTACT				
		T.L. 00 FOF 353 00			
	Stiffelsen Håll Sverige Rent Box 4155 102 64 Stockholm	Tel: 08-505 263 00 E-post: info@hsr.se			
🗐 🙆 🚔 🕥 💶					• 1441 27.11.2017

Figure 6. Collecting data

For each monitoring, litter data and monitoring data is "input". Monitoring data refers to background information from a particular monitoring event e.g. unusual circumstances, such as storm activity. The actual litter data is input simply by inputting total numbers of litter items to each litter category (Figure 7 – Figure 8). At the moment this is the only possible way to upload data.

D Messurement × D Messurement ×		🛋 - 🗖 🗙
← → C O hsr-beach.herokuapp.com/input/5b8e4c46-0347-4c8b-907b-36b546bbb1de		☆ 1
	Uplead manual   My account   Log.lost	Î
START BEACHES MEASUREMENTS STATISTICS ADMIN	ADD MEASUREMENT ADD BEACH	
Input		
Measurement and beach data		
Input beach and measurement information		
BEACH DATA MEASUREMENT DATA		
Amount of litter		
Input amount of litter		
BC02:3		
Finalize measurement		
Once you have finalized the measurement this URL will no longer be valid. Make sure you have entered all necessary information before you proceed		
FINALIZE		
CONTACT		
Stiffelsen Håll Sverige Rent Tel 08-505 263 00		
		· · · · · · · · · · · · · · · · · · ·

Figure 7. Collecting data

Measurement × D M	Aeasurement data ×			E - 0 E
C      O hsr-beach.herokuap	p.com/input/measurementData/	5b8e4c46-0347-4c8b-907b-36b546bbb1de/8C02.3	Lipioad.manual   My.account   Log	 ∞
		START BEACHES MEASUREMENTS STATISTICS ADMIN	ADD MEASUREMENT ADD BEA	ACH
ut > Massurament data				
umber	Material	Code	Litter type	Amount
	Plastic	PL01	Bottle caps and lids	0
	Plastic	PL02	Bottles < 2 L	0
	Plastic	PL03	Bottles, drums, jerrycans and buckets > 2 L	0
	Plastic	PL04	Knives, forks, spoons, straws, stimers, (cutlery)	0
	Plastic	PL05 :	Drnk package rings, six-pack rings, ring carriers	0
	Plastic	PL06	Food containers, candy wrappers	0
	Plastic	PL07	Plastic bags (opaque and clear)	0
	Plastic	PL08	Toys and party poppers	0
	Plastic	PL09	Gloves	0
	Plastic	PL10	Cigarette lighters	0



### Measurements – beach assessments

Measurements can be filtered by groups (country related category), beaches, status and protocols. All different options from drop-down menus are presented below (Figure 9 – Figure 12).

	* (				
C O hsr-beach	herokuapp.com/measurement/lis	t			\$
	KEEP SWEE	DEN TIDY	Upload manual   My account	a roa out	
		START BEACHES	MEASUREMENTS STATISTICS ADMIN	ADD MEASUREMENT AI	DD BEACH
easurements					
oup All +	Beach All + Status All +	Protocol All	•		
All	Beach	Survey date	Status	Group	Official
Estonia	Björkängs Havsbad	2012-04-01	Finished	Sweden	Yes
Finland Germany	Björkangs Havsbad	2012-07-23	Finished	Sweden	Yes
HSR	Björkängs Havsbad	2013-04-29	Finished	Sweden	Yes
1 Latvia Lithuania	Björkängs Havsbad	2012-11-03	Finished	Sweden	Yes
OSPAR Sverige	Björkängs Havsbad	2013-07-30	Finished	Sweden	Yes
)31 Poland Skaroårdsstiftelsen	Björkängs Havsbad	2013-10-16	Finished	Sweden	Yes
51 Sweden	Björkängs Havsbad	2014-04-27	Finished	Sweden	Yes
	Rulisand	2013-05-06	Finished	Sweden	Yes
1	Rullsand	2012-09-21	Finished	Sweden	Yes
	Rulisand	2012-07-25	Finished	Sweden	Yes
)1	Rullsand	2012-04-18	Finished	Sweden	Yes
331	Rullsand	2013-08-26	Finished	Sweden	Yes
151	Rullsand	2013-11-08	Finished	Sweden	Yes
211	Rullsand	2014-05-06	Finished	Sweden	Yes
961	Rullsand	2014-10-30	Finished	Sweden	Yes
151	Rullsand	2015-04-15	Finished	Sweden	Yes
191	Rullsand	2015-07-28	Finished	Sweden	Yes
131	Rulisand	2015-10-16	Finished	Sweden	Yes
	Rullsand	2016-04-18	Finished	Sweden	Yes
'11					

Figure 9. Studying litter data, different search filters

Measurement	×					1 - 6 ×
← → C ⊙ hsr	-beach.herokuapp.com/measurement/list					☆ :
				Uplead manual   bity account	t Log.out	Î
		START BEACHES MEASUREMEN	ITS STATISTICS ADMIN	ADD MEASUREMENT AD	DD BEACH	
Measurements						
Group Finland	Beach All     Status All	Protocol All	*			
Id	All	Survey date	Status	Group	Official	
661	Björkö	2012-04-16	Finished	Finland	Yes	
671	Abo St. Karins	2012-08-14	Finished	Finland	Yes	
681	Helsinki	2012-10-23	Finished	Finland	Yes	
1101	Kotka inner Kotka outer	2013-04-12	Finished	Finland	Yes	
1231	Mustfinn	2013-08-15	Finished	Finland	Yes	
2001	Jussaro	2013-10-11	Finished	Finland	Yes	
2131	Uto		Incomplete	Finland	Yes	
5201	Uto	2014-08-14	Finished	Finland	Yes	
691	Bjorkö	2012-04-14	Finished	Finland	Yes	
701	Bjorko	2012-07-28	Finished	Finland	Yes	
711	Bjorko	2012-10-19	Finished	Finland	Yes	
1111	Björkö	2013-04-13	Finished	Finland	Yes	
1241	Björkö	2013-08-02	Finished	Finland	Yes	
2011	Bjorko	2013-10-13	Finished	Finland	Yes	
721	Abo	2012-04-18	Finished	Finland	Yes	
731	Abo	2012-08-16	Finished	Finland	Yes	
741	Abo	2012-10-23	Finished	Finland	Yes	
1181	Abo	2013-04-18	Finished	Finland	Yes	
1311	Аьо	2013-09-02	Finished	Finland	Yes	
1001	Ábo	2013-10-10	Finished	Finland	Yes	

Figure 10. Studying litter data, different search filters

	~ <u>()</u>					and the second
← → C ① hsr	<ul> <li>beach.herokuapp.com/measurement/lis</li> </ul>	t				\$
	KEEP SWE	DEN TIDY		Upload manual My account	t Log.out	
		START BEACHES MEASURI	EMENTS STATISTICS ADMIN	ADD MEASUREMENT AD	D BEACH	
leasurements						
Finland	Beach All     Status All	Protocol All	•			
đ	Beach All	Survey date	Status	Group	Official	
61	Uto On	going 2012-04-16	Finished	Finland	Yes	
571	Uto Fin	ished 2012-08-14	Finished	Finland	Yes	
81	Uto Del	leted 2012-10-23	Finished	Finland	Yes	
101	Uto	2013-04-12	Finished	Finland	Yes	
231	Uto	2013-08-15	Finished	Finland	Yes	
001	Utó	2013-10-11	Finished	Finland	Yes	
131	Uto		Incomplete	Finland	Yes	
201	Uto	2014-08-14	Finished	Finland	Yes	
91	Bjorko	2012-04-14	Finished	Finland	Yes	
01	Björkö	2012-07-28	Finished	Finland	Yes	
11	Bjorko	2012-10-19	Finished	Finland	Yes	
111	Bjorko	2013-04-13	Finished	Finland	Yes	
241	Bjorko	2013-08-02	Finished	Finland	Yes	
011	Bjorko	2013-10-13	Finished	Finland	Yes	
21	Abo	2012-04-18	Finished	Finland	Yes	
31	Abo	2012-08-16	Finished	Finland	Yes	
'41	Abo	2012-10-23	Finished	Finland	Yes	
181	Abo	2013-04-18	Finished	Finland	Yes	
311	Abo	2013-09-02	Finished	Finland	Yes	
	44-	2012 10 10	Einisbed	Einland	Voc	

Figure 11. Studying litter data, different search filters

	to the former of the second se					
e - C O har	-beach.nerokuapp.com/measurement/list					¥
		NTIDY		Upload manual My account	Log.out	
	KEEP SWEDE	N HOT				
		START BEACHES MEASUREMENTS	STATISTICS ADMIN	ADD MEASUREMENT AD	D BEACH	
easurements						
roup Finland	Beach All     Status All	Protocol All				
	Beach	All PC02:2	Status	Group	Official	
51	Uto	BC02:2	Finished	Finland	Yes	
71	Uto	BC03:3 - Area 3	Finished	Finland	Yes	
81	Uto	2014 OSPAR_2	Finished	Finland	Yes	
101	Uto	2014 OSPAR_3 RC0223 Extransitioner 3 OLD	Finished	Finland	Yes	
231	Uto	2013-08-15	Finished	Finland	Yes	
001	Uto	2013-10-11	Finished	Finland	Yes	
131	Uto		Incomplete	Finland	Yes	
201	Uto	2014-08-14	Finished	Finland	Yes	
91	Bjorko	2012-04-14	Finished	Finland	Yes	
01	Bjorko	2012-07-28	Finished	Finland	Yes	
15	Björkö	2012-10-19	Finished	Finland	Yes	
11	Bjorko	2013-04-13	Finished	Finland	Yes	
241	Björkö	2013-08-02	Finished	Finland	Yes	
011	Björko	2013-10-13	Finished	Finland	Yes	
21	Аво	2012-04-18	Finished	Finland	Yes	
31	Abo	2012-08-16	Finished	Finland	Yes	
11	Аво	2012-10-23	Finished	Finland	Yes	
81	Abo	2013-04-18	Finished	Finland	Yes	
111	Abo	2013-09-02	Finished	Finland	Yes	
				Fisherd		

Figure 12. Studying litter data, different search filters

#### Single measurements to study

1

All measurements can be studied separately in the web interface or by downloading the results as an Excel or pdf file. It is possible to study:

- beach information, which consists of information on the beach and its characteristics, Figure 13
- measurement information, which consists of background information on the specific conditions when the measurement was conducted, Figure 14
- measurement data, consisting of litter data from the specific measurement, Figure 15.

🗅 View measurement 🛛 🗙 🚬				🖬 – 8 🗖
E 🚽 C 🔘 hsr-beach.herokuapp.com	n/measurement/view/бб1			\$
			Upload manual   My acc	sent   Log.oot
	START BE	ACHES MEASUREMENTS STATISTICS	ADMIN ADD MEASUREMENT	ADD BEACH
easurements > Measurement				
uons				
EDIT BACK GENERA	TE NEW URL EDIT BC02:3	EDIT BC02:2		
are forms (PDF)				
BEACH INFORMATION	ASUREMENT INFORMATION	ALEASUREMENT DATA - BC02:3	MEASUREMENT DATA - BC02:2	
人		X		
nerace forms (Excel)				
BEACH INFORMATION ME	ASUREMENT INFORMATION	MEASUREMENT DATA - BC02:3	MEASUREMENT DATA - BC02:2	
asurement status:		Finished		
surement comments:		total. 0 kg	old id: 60	
tocols:		BC02 3, B	C02.2	
stact information				
anization:		Uto		
ntact person:		Brita Wills	tróm	
phone:		12345678	9	
nicipality or region:		Lansi-Turi	inmaa	
vince:		Sydvästra	Finland	
				and the second se

Figure 13. Studying litter data, different form selection and beach information

U view measurer	ment ×								
€ 0 C 01	hsr-beach.herokuapp.co	m/measurement/view/6	51						Q 🛠 🗄
and the second se			-						
									2
Status					1010000				
Measurement status:					Finished				
Measurement comment	ta:				total 0 kg old id 60				
Protocols:					BC02.3, BC02.2				
Contact information									
Organization:					Uto				
Contact person:					Brita Wilstrom				
Telephone:					123456789				
Municipality or region:					Länsi-Turunmaa				
Province:					Sydvästra Finland				
Beach:					Uto				
Date & Time									
Survey date:					2012-04-16				
Time start:					09:30				
Time end:					11.00				
Season:					Spring				
Misc									
Date of last cleaning:					0001-01-01 00 00:00 0	V.			
Responsible for beach	cleaning on a regular basis:				No one.				
Storm activity:					true				
Any trash bins/waste fa	cilities in connection to the s	urvey area:			false				
Number of trash bins:					0				
Vendors of food/bevera	ge in connection to beach:				false				
Number of persons:					12				
Survey area									in the second
Length of beach:					144				
Width of beach:					37.0				
Area of survey area 1:					370				
Area of survey area 2:					3700				
Area of survey area 3:					5317				
Amount of litter area 1	(ka):				0.00				
Amount of litter area 2	(ka):				0.00				
Amount of litter area 3	(ka):				0.00				
Coordinates A	Coordinates B	Coordinates C	Coordinates D	Coordinates E	Coordinates F	Coordinates G	Coordinates H	Coordinates I	Coordinates J
Lat	Lat	Lat	Lat	Lat	Lat	Lat	Lat	Lat	Lat
		2.444				122	tool a	Line	E.C.

Figure 14. Studying litter data, measurement information

← → C © hsr-beach.herokuapp.co	m/measurement/view/661			☆ :
Showhide measurement data Survey Area 1				
Material	Code	Litter Type	Amount	
Plastic	PL11	Cigarettes, butts and filters	0	
Organic	OR01	Snuff, swedish snus	0	
Survey Area 2				
Material	Code	Litter Type	Amount	
Plastic	PL01	Bottle caps and lids	13	
Plastic	PL02	Bottles < 2 L	8	
Plastic	PL03	Bottles, drums, jerrycans and buckets > 2 L	8	
Plastic	PL04	Knives, forks, spoons, straws, stirrers, (cutlery)	1	
Plastic	PL05	Drink package rings, six-pack rings, ring carriers	0	
Plastic	PL06	Food containers, candy wrappers	7	
Plastic	PL07	Plastic bags (opaque and clear)	34	
Plastic	PL08	Toys and party poppers	0	
Plastic	PL09	Gloves	0	
Plastic	PL10	Cigarette lighters	2	
Plastic	PL12	Syringes	0	
Plastic	PL13	Baskets, crates and trays	0	
Plastic	PL14	Plastic bouys	0	
Plastic	PL15	Mesh bags (vegetable, oyster nets and mussel bags)	0	
Plastic	PL16	Sheeting (tarpaulin or other woven plastic bags, palettewrap)	5	
Plastic	PL17	Fishing gear (lures, traps and pots)	0	
Plastic	PL18	Monofilament line	14	
Plastic	PL19	Rope	20	
Plastic	PL20	Fishing net	0	
Plastic	PL21	Strapping	1	
Plastic	PL22	Fibreglass fragments	0	
Plastic	PL23	Resin pellets	0	
Plastic	PL24	Other (specify)	78	

Figure 15. Studying litter data, measurement litter data

### Statistics

The statistic tool enables to study the litter data in different ways: by measurement, beach and filter (Figure 16). All these possibilities are presented below.

C Select statistics ×		🗎 – 🗗	×
← → C O hsr-beach.herokuapp.com/statistics		3	5 I
		Lipitost.manual   My.account   Log.out	
START	BEACHES MEASUREMENTS STATISTICS AD	AIN ADD MEASUREMENT ADD BEACH	
Statistics BY MEASUREMENT BY BEACHES BY FILTER			
CONTACT			
Stiffelsen Håll Sverige Rent Box 4155 102 64 Stockholm	Tel: 08-505 263 00 E-post info@hsrse		
hsr-beach.herokuapp.com/statistics/measurement			
🗐 🤌 🚔 🔇 💶		📖 - 🗮 i 🖌 ( <sub>11</sub>	11540 11.2017

Figure 16. Studying litter data, statistics tool, choices

The results of each search are presented in the same format whether measurement, beach or filter tool is used. The results are presented in the web browser immediately. From the web browser view it is possible to study common litter items (Top 10), litter trend per main category (plastic, rubber, wood, etc.), material proportion percentages, key figures, included measurements and a map. Top litter items are calculated by the simple method, based on the total number of items found. These are presented in Figure 17 – Figure 22. Additionally to the web browser view, it is possible to download different reports in excel and pdf format. The basic excel file contains the same information as the web browser view. That same information can also be downloaded as a pdf file. In the excel format it is also possible to download the raw data, which includes only litter items recorded in numerical format, columns being beach name, measurement id, material type, trash code, trash code description, survey area and amount (litter items).

Measurement statistics	× (00)			<b>a</b> _ 5
+ C () har-bee	ch.herokuapp.com/statistics/measureme	ant/show		\$
title SHOW STATISTIC	S PDF EXCEL E	XCEL (RAW DATA) BACK		
common items	Litter Trend Material proportio	n Key figures Included measurements	Map	
1ost comm This report	on litter items			
Rank	Code	Material type	Description	Percentage
1	PL24	Plastic	Other (specify)	24.8%
	PL07	Plastic	Plastic bags (opaque and o	lear) 10.8%
	GC07	Glass & ceramic	Glass or ceramic fragment	s 9.2%
	PL19	Plastic	Rope	6.4%
	WD04	Wood	Processed timber and palle	t crates 6.1%
	PL18	Plastic	Monofilament line	4.5%
	CL04	Cloth	Rope and string	4.1%
	PL01	Plastic	Bottle caps and lids	4.1%
	FP04	Foamed Plastic	Foam (insulation and pack	aging) 2.9%
i i	GC02	Glass & ceramic	Bottles and jars	2,9%
nce start				
ank	Code	Material type	Description	Percentage
	PL24	Plastic	Other (specify)	20.1%
	PL07	Plastic	Plastic bags (opaque and o	lear) 14.6%
	6007	Glass & ceramic	Glass or ceramic fragment	s 9.9%
	0007			
	PL19	Plastic	Rope	6.4%
	PL19 WD04	Plastic Wood	Rope Processed timber and palls	6.4% et crates 5.2%

Figure 17. Statistics, litter data, web browser view of the report



Figure 18. Statistics, litter data, web browser view of the report



Figure 19. Statistics, litter data, web browser view of the report

C O INF-Deacrimerokuapp.	com/statistics/measurement/show			
tics				
y Ali •				
beach (161) Uto	•			
ement (report will also include al (661) 2012-04-16 - Spring 🔹	Il earlier measurements)			
ly selected measurement				
Yes				
e				
_				
HOW STATISTICS PDF	F XCEL EXCEL (RAW DATA)	BACK		
IOW STATISTICS PDF	F EXCEL EXCEL (RAW DATA)	BACK uded measurements Map		
IOW STATISTICS PDF	EXCEL EXCEL (RAW DATA)  Material proportion Key figures Incl	BACK uded measurements Map		
OW STATISTICS PDF nmon items. Litter Trend ay figures	F EXCEL EXCEL (RAW DATA) Material proportion Key figures Incl Average amount of litter / 100m (this report)	BACK uded measurements Map Total amount (this report)	Average amount / 10m <sup>2</sup> (this report)	Flux rate (since chosen measurement)
OW STATISTICS PDI nmon items Litter Trend ay figures ea rvey area 1	F EXCEL EXCEL (RAW DATA) Material proportion Key figures Incl Average amount of litter / 100m (this report) 0.0	BACK luded measurements Map Total amount (this report)	Average amount / 10m <sup>2</sup> (this report) 0.0	Flux rate (since chosen measurement) 0.0
IOW STATISTICS PDI mmon items Litter Trend ea rivey area 1 irvey area 2	F EXCEL EXCEL (RAW DATA) Material proportion Key figures Incl Average amount of litter / 100m (this report) 0.0 314.0	BACK uded measurements Map Total amount (this report) 0 314	Average amount / 10m <sup>2</sup> (this report) 0.0 0.8	Flux rate (since chosen measurement) 0.0 0.0
HOW STATISTICS     PDI       mmon items     Litter Trend       ay figures       ea       invey area 1       rvey area 2       rvey area 3	EXCEL EXCEL (RAW DATA)     Material proportion Key figures Incl     Average amount of litter / 100m     (this report)     0.0     314.0     0.0	BACK uded measurements Map Total amount (this report) 0 314 0	Average amount / 10m <sup>2</sup> (this report) 0.0 0.8 0.0	Flux rate (since chosen measurement) 0.0 0.0 0.0
ACW STATISTICS PD mmon items Litter Trend ay figures ea rvey area 1 rvey area 2 rvey area 3 rvey area 2+3	EXCEL       EXCEL (RAW DATA)         Material proportion       Key figures       Incl         Average amount of litter / 100m (this report)       0.0       314.0         0.0       314.0       .0         314.0       .0       .0         314.0       .0       .0	BACK uded measurements Map Total amount (this report) 0 314 0 314	Average amount / 10m <sup>2</sup> (this report) 0.0 0.8 0.0 0.8 0.0 0.8	Flux rate (since chosen measurement) 0.0 0.0 0.0 0.0 0.0
ow statistics PD nmon items Litter Trend ay figures a rvey area 1 rvey area 2 rvey area 3 rvey area 2+3	EXCEL EXCEL (RAW DATA)     Material proportion Key figures Incl     Average amount of litter / 100m     (this report)     0.0     314.0     0.0     314.0	BACK uded measurements Map Total amount (this report) 0 314 0 314	Average amount / 10m <sup>2</sup> (this report) 0.0 0.8 0.0 0.8 0.0 0.8	Flux rate (since chosen measurement) 0.0 0.0 0.0 0.0 0.0
OW STATISTICS PD nmon items Litter Trend ay figures as rvey area 1 rvey area 2 rvey area 3 rvey area 2+3	EXCEL       EXCEL (RAW DATA)         Material proportion       Key figures       Incl         Average amount of litter / 100m (this report)       0.0         314.0       0.0         314.0	BACK uded measurements Map Total amount (this report) 0 314 0 314	Average amount / 10m <sup>2</sup> (this report) 0.0 0.8 0.0 0.8	Flux rate (since chosen measurement) 0.0 0.0 0.0 0.0 0.0

Figure 20. Statistics, litter data, web browser view of the report

🖞 Measurement statist	α x 📃								
e - C O hsr-b	each.herokuapp.co	m/statistics/measurement/she	ow						\$
Statistics									
Country									
Select beach (161) Uto		-							
Veasurement (report w (661) 2012-04-1	ill also include all e 5 - Spring 🔹	earlier measurements)							
Jse only selected mea	surement								
Official Yes •									
Subtitle									
SHOW STATIST	ICS PDF	EXCEL EXCE	L (RAW DATA)	BACK					
Common items	Litter Trend	Material proportion	Key figures	Included measurements	Мар				
Included r	neasurem	ents							
ID	Country	Province	Municipality	Beach	Ocean	Location	Usage	Date	Season
661	Finland	Sydvästra Finland	i Länsi-Turunm	aa Utö	Baltic Sea	RURAL	Nature & recreation	2012-04-16	Spring
r-beach.herokuapp.com/s	atistics/measurement,	/show#tab-measurements	-						
1 /2 🚞	6 57	S 🕅	100		1				III

Figure 21. Statistics, litter data, web browser view of the report



Figure 22. Statistics, litter data, web browser view of the report

### By measurement

It is possible to study litter data more in detail by individual "measurements" (e.g. beach surveys). All the measurements in the database can be found in the dropdown menus (Figure 23).

C Measurement statistics ×		🛋 _ 🗖 🗙
← → C O hsr-beach.herokuapp.com/statistics/measurement		☆ :
KEEP SWEDEN TIDY	Uplead manual   My_account   Log.out	
START BEACHES MEASUREMENTS STATISTICS ADMIN	ADD MEASUREMENT ADD BEACH	
Statistics > Measurement statistics		
Statistics		
Country Finland •		
Select beach (161) Uto •		
Measurement (report will also include all earlier measurements) (661) 2012-04-16 - Spring •		
Use only selected measurement		
Official -Select- •		
Subtite		
SHOW STATISTICS PDF EXCEL EXCEL (RAW DATA) BACK		
CONTACT		
		■ - ► T a + 1043 27.11.201

Figure 23. Statistics, litter data, measurement search filters

#### By beaches

Under statistics tool it is possible to study litter data by beaches. Data can be filtered by year and season. More than one beach can be included into the report and there is also the possibility to compare beaches or a group of beaches to other beaches (Figure 24 – Figure 27).

🗅 Select beaches for statis 🗙 📃	🗎 – 🗖 🗙
← → C O Not secure   hsr-beach.herokuapp.com/statistics/beaches	± 1
	st
START BEACHES MEASUREMENTS STATISTICS ADMIN ADD MEASUREMENT ADD BEAC	CH .
Statistics > Beach statistics	
Time	
From year         From season         To year         To season         Official         Subtile           2012         -Select- •         2013         -Select- •         -Select- •         -Select- •	
Group 1 Solect Summer	
Beaches Autumn Protocols -select. • ADD	
Beaches. Protocols:	PENOVE
COMPARE TO SHOW STATISTICS PDF EXCEL EXCEL(RAW DATA) BACK	REMOVE
CONTACT	
Stittelsen Hålf Sverige Rent Tet 08-505 263 00 Box 4155 E-post: info@her se	
🗉 ⋵ 🚊 💽 💷 🕄 💷	12.18 27.11.2017

Figure 24. Statistics, litter data, beach search filters

C Select beaches for statin x		🛋 🗕 🗖 🗡
← → C O Not secure   hsr-beach.herokuapp.com/statistics/beaches		☆ :
KEEP SWEDEN TIDY	Uplead manual   My account   Log out	
START BEACHES MEASUREMENTS STATISTICS ADMIN	ADD MEASUREMENT ADD BEACH	
Statistics > Beach statistics		
Time		
From year From season To year To season Official Subtitie 2012 -Select • 2013 -Select • Select •		
Group 1		
Beaches Protocols		
Beach Finland - Jussard		
Protoc Finland - Kotke innor Finland - Kotke outer Finland - Mustlinn		REMOVE
COMP Finland - St Karins PDF EXCEL EXCEL(RAW DATA) BACK		
Finland - Abo Germany - Hohe Dune Germany - Kajsdorf		
Germany - Warnemünde Latvia - Jaunkemen Latvia - Zolka		
Latvia - Vantoulli Latvia - Ventspils		
Latvia - Zvejniekciems Sweden - Barrevik SE8 Sweden - Biotkanas Havsbad		
Sweden - Edsvik SE5 vitesen Håll Sverige Rent Tel: 08-505 263.00 Sweden - Ekons Høvsbad Box 4155 E-post: info@hsr.se		
🗄 ⋵ 🚞 📀 💶 🔕 💷 💴		1219 27.11.2017

Figure 25. Statistics, litter data, beach search filters

Select beaches for statis	×			
← → C O Not secur	re   hsr-beach.herokuapp.com/statistic	s/beaches		\$
		N TIDY	Upload manual   My account   Log out	
		START BEACHES MEASUREMENTS STATISTICS ADMIN	ADD MEASUREMENT ADD BEACH	
tatistics > Beach statis	stics			
lime				
rom year	From season To year	To season Official Subtitie		
-	London Laboration of Carton State	Indebiological Redecided States		
Group 1				
Beaches Finland - Uto Beaches: Protocols:	·	Protocols  Protocols  Protocols  Protocols  Protocols  ADD  ADD  ADD  ADD  ADD  ADD  ADD  A		REMOVE
COMPARE TO	SHOW STATISTICS PDF	BCU3 3 - Ama 3 2014 OSPAR_1 EX 2014 OSPAR_2 BC02 3 - Survey area 3 - OLD		
	CONTACT			
	Stiftelsen Håll S Box 4155	verige Rent Tet. 08-505 263 00 E-post:into@hsr.se		

Figure 26. Statistics, litter data, beach search filters

Select beaches for statis	×			🗳 – 6 💌
← → C ◎ Not secu	ure   hsr-beach.herokuapp.com/statisti	cs/beaches		☆ :
		START BEACHES MEASUREMENTS STATISTICS ADMIN	ADD MEASUREMENT ADD BEACH	
Statistics > Beach stati	istics			
1				
Time.	162 162	and the second second		
From year 2012	From season To year Select • 2013	To season Official Subtitle		
	Concert Concerts			
Group 1				
Beaches		Protocols		
Finland - Uto	AD	D -select-		
Beaches: Protocols:				-
				REMOVE
Group 2				
Beaches		Profocols		
Finland - Abo	. AD	ADD		
Beaches:				
Protocols:				REMOVE
COMPARE TO	SHOW STATISTICS PD			
	CONTACT			
		<b>VB</b>		12.22

Figure 27. Statistics, litter data, beach search filters, comparison view

### By filter

Under the statistics tool it is possible to study litter data through different filters. These filters include the following dropdown menus: country, water (in reference to sea area), location, characteristic and protocol. Also, as in other statistic tools, it is possible to filter data by year and season. More than one beach can be included in the report and it is possible to carry out comparisons between individual beaches or a group of them. All the possibile filters are presented in Figure 28 – Figure 31.

Select filtering for statis	x x			🖾 – 🗇 💌
← → C O Not sec	ure   hsr-beach.herokuapp.com/statistic	/filter		\$
		ITIDY	Uplead manual My a	consent   Log not
		START BEACHES MEASUREMENTS STATIST	CS ADMIN ADD MEASUREMENT	ADD BEACH
Statistics > Filter statis	stics			
Time				
From year	From season To year -Select •	To season Official Subtitle		
Filter 1				
Country -select-	ADD Water solect. • Solect. Batic Sea North Sea Gulf of Finland	ADD -select ADD -se	stic Protocols	ADD
Characteristics: Protocols:	Gulf of Riga Gulf of Bothnia Skagerrak Strait Kattegat Bay			REMOVE
COMPARE TO	SHOW STAT Oresund	EXCEL EXCEL(RAW DATA) BAG	ж.	
	CONTACT			
	6 5 8	A CONTRACTOR OF TAXABLE PARTY.		1234 L

Figure 28. Statistics, litter data, different search filters

Select filtering for sta	atis) ×			🖾 – 🗖
C O Not se	ecure   hsr-beach.herokuapp.com/statistics/	ilter		
		TIDY	Uptrast.manual   MyLaccount   Log.out	
		START BEACHES MEASUREMENTS STATISTICS ADMIN	ADD MEASUREMENT ADD BEACH	
tatistics > Filter sta	tistics			
Time				
rom year	From season To year -Select •	To season Official Subtitle -Select- •		
Filter 1				
Country select • Countries: Waters: Locations: Characteristics: Protocols;	ADD Weter -select-	ADD Location ADD Characteristic -select ADD -select - PERLINBAN RURAL URBAN	ADD Protocols	
a reversion				REMOVE
COMPARE TO	SHOW STATISTICS PDF	EXCEL EXCEL(RAW DATA) BACK		
	CONTACT			
-				

Figure 29. Statistics, litter data, different search filters

Select filtering for sta	ntist 🗙 🔼				🖻 – 🗖 🖬
← → C © Not se	ecure   hsr-beach.herokuapp.com/statis	tics/filter			\$
	KEEP SWED	EN TIDY		Lipitead manual   My account   Log.cot	
		START BEACHES MEASUREMENTS	STATISTICS ADMIN	ADD MEASUREMENT ADD BEACH	
<u>statistics</u> > Filter stat	tistics				
Time					
From year	From season To year	To season Official -Select- • Select	Subtitle		
Filter 1					
Country -select- • Countries: Waters: Locations: Characteristics: Protocols:	ADD Water solect.	ADD select ADD	Characteristic -select- -select- Fishing Nature & recreation Surfing Swimming	ADD Protocols ADD	REMOVE
COMPARE TO	SHOW STATISTICS PE	F EXCEL EXCEL(RAW DATA	BACK		
	CONTACT				
		the second s			123



C O Not se	acure   hsr-beach.herokuapp.com/statisti	ics/filter					19
					Upload manual My account Log out	1	
	KEEP SWEDE	IN TIDY					
		START BEACHES MEASURE	MENTS STATISTICS ADMI	N AI	D MEASUREMENT ADD BEACH		
istics > Filter stat	tistics						
izuga - Tinter otar							
ne							
un unar	From season To year	To season Officia	d Cubilla				
in year	-Select- +	-Select- •	-Select- •				
	1 to the Property of the Prope						
Filter 1							
Country	Water	Location	Characteristic	Pro	tocols		
-select- •	ADD -select-	ADD -select- •	ADD -select-	<ul> <li>ADD</li> </ul>	-select-	ADD	
Countries:					BC02:3		
Waters:					BC02:2 BC03:3 - Area 3		
Characteristics:					2014 OSPAR_1		
Protocols:					2014 OSPAR_2 2014 OSPAR_3		REMOVE
					BC02:3 - Survey area 3 - OLD		KEMOVE
	SHOW STATISTICS DO	F EXCEL EXCEL(RAW	DATA) BACK				
COMPARE TO	Show Shandhos PD						
COMPARE TO							
COMPARE TO							
COMPARE TO							
COMPARE TO							
COMPARE TO							
COMPARE TO							

Figure 31. Statistics, litter data, different search filters

### Data quality in the Marlin database

Data to the Marlin database is mostly collected by volunteers and NGO's. In most cases, it is an NGO who trains and educates people collecting litter and thus the data. Training and educating is essential in order to ensure the quality of data collected. It is crucial that guidelines on cleaning methods and protocol codes are followed accordingly. Data is in most cases used for national marine litter monitoring programs and other statistical means.

### European Environment Agency database – Marine Litter Watch

Marine Litter Watch (MLW) is designed by the European Environment Agency (EEA) to support data collection events on beaches and on coast. MLW offers a mobile application, a web portal and a public database - to collect and share comparable data on marine litter on beaches.

MLW primarily consists of a mobile application. It allows users to conduct beach litter monitoring surveys and support national monitoring programs. The application also enables the collection of data from public clean-up campaigns. Data from popular clean-ups and national monitoring can be studied separately (Figure 32).



Figure 32. MLW, maps of events, statistics tool

MLW has three elements: organized groups (so called communities), a mobile application, and a database. Communities organize either clean-up or monitoring events on beaches and use the mobile application to report on litter items found. A web portal is also available for the communities for the management of their cleaning events and data. The application uses a European harmonized list of items. Data is available through EEA's website.

### Technical

The MLW mobile application is available for Android & iPhone devices. Minimum standards recommended are 3G mobile network; iOS 7.0 or later (iPhone 4 or newer); Android v.3.0 (from 2012 onwards). The application can be downloaded free of charge from the Google Play Store and the App Store.

Web portal can be found at: <u>https://marinelitterwatch.discomap.eea.europa.eu/</u>

### Marine Litter Watch in action

MLW is aimed for the larger public to use while monitoring beach litter. The MLW mobile application allows users to monitor, identify and report marine litter items found on beaches using the master list of categories of litter items by the JRC Guidance on Monitoring of Marine Litter in European Seas (2013). It needs to be noted that, only that particular master list is in use in the MLW, and it is not possible to report litter with UNEP or OSPAR litter categories.

Quality assurance is a key question in the use of MLW in order to have good data. Communities should make their volunteers aware of quality assurance and quality control issues to ensure that litter collection and classification follow the monitoring protocol and JRC Guidance, especially when conducting a monitoring assessment. This will also ensure consistency across the submitted surveys. Investment in communication and the training of the national, regional and local survey coordinators and managers is therefore critical. Communities are encouraged to contact their national bodies responsible for monitoring marine litter when designing their monitoring strategies (see Figure 33).

To set-up a monitoring event, communities should use the web interface available for this purpose and manage the community data.



Figure 33. MLW process of collecting data into the database

### New beach

New beach can be established with the mobile application or with the web interface. Location coordinates of the beach are determined with the map tool provided by the MLW. Map tool is provided by Earthstar Geographics (ESRI). It is noticeable that within beach details beach types available for choosing are urban, rural and near river mouth – peri-urban beaches, whereas reference beaches are not available (see Figure 34 – Figure 38).

Marine LitterWatch × Setting-up monitoring + ×		🛋 - 8 🗙
← → C ▲ Secure   https://marinelitterwatch.discomap.eea.europa.e	u	© ☆ :
Marine LitterWatch Web portal		X Change password
Alexe -		
25		
Communities	Login	
Excited	Email	
Conta	Password	
Server	Log in	
Q Mapo	Did you forget your password?	
	More options: Register new user <u>Activate your account</u>	
Reporta	Marine LitterWatch do not support login using Facebook, Google or Twitter anymore. Instead we kindly ask you	
8,	to create a new login based on your email. The login is purely used for Marine LitterWatch. If you wish to re-link data previously collected using your old account (Facebook, Goople or Twrtter) please contact EEA	
Data download	(marinelitterwatch@eea.europa.eu).	
		1503
		28.11.2017

Figure 34. MLW startpage in the web interface

Arine LitterWatch	× Setting-up monitoring e	×	E - 1	8 ×
← → C ≜ Secu	re   https://marinelitterwatch.discon	ap.eea.europa.eu/index.html	or ۵۵	1 ☆ 1
Marine Lit	terWatch Web portal		User: hanna.haaksi@pssry.fi [➡L/ Change password	ogout
View:	Beach	Add new beach		
Communities		Beach details Beach location		
		Name: (*)		
Beaches		Country code: (*)		
		Length (meters):		
Events		Survey location:		
Surveys		Beach type: (*)	*	
•		Beach location: (*)		
Мара		Security info:		
$\sim$		National code/reference:		
Reports		External link (url):		
Data download			Fields marked as *** are mandatory	
			Save	
· 🌣				
🔳 🤌 🚆		1 🗣	· · · · · ·	15:05 28:11:2017

Figure 35. Adding a new beach into MLW in web interface

Arine LitterWatch	× Setting-up m	nonitoring e ×						🖹 - 🗖 🗙
← → C A Secur	e   https://marinelitterw	atch.discomap.e	ea.europa.eu/index.html					아ઘ☆
Marine Litt	erWatch Web porta	ป						Jser: hanna.haaksi@pssry.fi 🔄 Logout Change password
	Beach	$\oplus$	Add new be	each			۲	$\otimes$
Communities			Beach details	Beach location				
Beaches			Country code: (*)		Salmis			
Events			Length (meters):					
Surveys			Beach type: (*)			•		
<b>O</b> Maps			Beach location: (*) Security info:	)	Pebbels Sandy Rocky Other (mixed)			
Reports			National code/ref	erence:				
Data download					Fields marked as "*" are mai	ndatory		
					Save			
1 1 1 🔅								
🛯 é 🗎	S 🔯 🔇	<b>9</b>	<b>\$</b>					1506 28.11.2017

Figure 36. Adding a new beach into MLW in web interface

Marine LitterWatch	× Setting-up monitoring e	×				🛋 – 🗖 🗙
← → C 🌢 Secur	e   https://marinelitterwatch.disco	map.eea.europa.eu/index.html				아 國 ☆ :
Marine Litt	terWatch Web portal					User: hanna.haaksi@pssry.fi 🔄 Logout Change password
View:	Beach	Add new b	each			$\oslash$
Communities		Beach details	Beach location			
		Name: (*)		Salmis		
Beaches		Country code: (	*)	Finland		
		Length (meters	3:			
Eventa		Survey location				
Surveys		Beach type: (*)		Other (mixed)	•	
•		Beach location	(*)		.*	
Маря		Security info:		Urban		
$\sim$		National code/	reference:	Near river mouth		
Reports		External link (u	d):			
Data download				Fields marked	as *** are mandatory	
				Sav	•	
1 1 1 🕸						
🔳 🙆 🚞	📀 🔯 S 🛛					1506 28112017

Figure 37. Adding a new beach into MLW in web interface



Figure 38. Adding a new beach into MLW in web interface

### New event - new assessment and reporting

New events or assessments can be created with the mobile application or with the web interface. Each event has a separate event code which is created by the MLW. That code will then be distributed to those attending the event, in order for them to report litter through the application. When creating an event, it can be labelled either as a clean-up or as a monitoring assessment. The number of litter items found are simply reported with the MLW application by clicking as many times + -button on the screen as many litter items are found (see Figure 39 – Figure 41).

D Marin	e LitterWatch	×	FME Dat	ta Downioa	d Ser 🗙	Setting-up monitoring = X	www.google.fi	× Esri Finla	nd - Paikkatieto X			🛋 - 6 🗙
$\epsilon \rightarrow 0$	C A Secure	https://	marinelitt	terwatch.c	liscomap.	ea.europa.eu/index.html						아 🗟 ☆ 🚦
ا 🌔	Marine Litte	erWatch	Web po	ortal							Use Char	r: hanna.haaksi@pssry.fi
View:		Events	6		$\oplus$	Add new eve	ent				0	×
	¥.					Beach: (*)		salmis		¥		
Com	munities					Start date: (*)		2017-11-28				
Be	C seches					End date:			-:-			
	>					Release date:						
						Event type:		Clean-up      M	opitoring			
S	EQ aveys					Additional information:		e olcan ap e n	ontoning			
	• Vapa					Number of people attende	ed:					
	$\sim$					Event summary:						
R	sports											Save
Data	download											
Generation	Ø											
- 6	ð 📋	(Ç	02	9								

Figure 39. Adding a new event into MLW in web interface

Arine LitterWatch	×	nioad Ser X	Setting-up monitoring = X			🔳 _ 🗖 🗙
← → C A Secure	https://marinelitterwat	tch.discomap.e	ea.europa.eu/index.html			아 및 ☆ :
Marine Litt	erWatch Web portal					User: hanna.haaksi@pssry.fi L➡Logout Change password
View:	Events	$\oplus$	Events details			$\oslash$
*	► salmis 2017-11-28		Event code:	TCMCW		
Constructioners	ealmis	-	Beach: (*)	salmis	*	
Beaches	2017-11-28		Start date: (*)	2017-11-28 16:39		
			End date:			
Events			Release date:			
Sanvere			Visibility.	Public · Private		
-			Event type:	Clean-up Monitoring		
Meps			Additional information:			
$\sim$			Number of people attended:			
Reports			Event summary:			
Data download						
terana terana tapan 🌺						
🗏 🥝 🚆	S 🔯		<b>\$</b>			i a + 1605 28.11.2017

Figure 40. Adding a new event into MLW in web interface



Figure 41. Reporting litter with MLW mobile application

### Litter report

After the survey is completed on-site and submitted, the litter report is shown in the beach manager's web portal (Figure 42 – Figure 44) where it can be further analyzed.



Figure 42. Studying a single survey litter report, web interface

Arine LitterWatch	×	Ser ×	Setting-up monitoring = ×	🗐 – 🗇 🗙		
← → C ▲ Secu	e   https://marinelitterwatch.di	scomap.e	ea.europa.eu/index.html	아 및 ☆ !		
Marine Lit	terWatch Web portal			User: hanna.haaksi@pssry.fi LetLogout Change password		
View:	Survey	$\oplus$	Survey	$\odot$		
Lonmunities	6		Survey details: hanna.haaksl@pssry.fi - 2017-11-28 Event: TCMCW Reviewed:			
C	8		Survey Survey details			
Beaches	hanna.haaksi@pssry.fi - 11-28 items	2017-	Plastic G8 Drink bottles >0.51	1		
Surveys			G4 Small plastic bags, e.g. freezer bags	1		
Mapa			G7 Drink bottles <= 0.51	1		
Reports						
Data download						
ternan lannes tanış 🅸						
💶 🤗 🚞	📀 🔹 😣	WI				

Figure 43. Studying a single survey litter report, web interface

Marine LitterWate	ch ×	ita Download Sec 🛪 🗸	Setting-up monitoring e			🛋 - 🗇 🗙
← → C • Se	cure   https://marinelit	terwatch.discomap.e	ea.europa.eu/index.html			아 왜 ☆ !
Marine L	itterWatch Web p	ortal				User: hanna.haaksi@pssry.fi L+Logout Change password
View:	Survey	$\oplus$	Survey		۲	$\otimes$
Communities	8		Survey details: Event: Reviewed:	hanna.haaksi@pssry.fi - 2017-11-28 TCMCW		
<u> </u>			Survey	Survey details		
Beaches Events Surveys Maps Reports	hanna.haaksi 11-28 Coltems	@pssry.fl - 2017-	Number of partic	ipants:		1
Deta download						
🔳 🤗 🔋	i 📀 🔯	S. 🖬	- Charles	A DESCRIPTION OF TAXABLE PARTY.		

Figure 44. Studying a single survey litter report, web interface

### Litter events to study

Each litter event can be studied in the web portal under the reports tool. The portal also produces a summary of the event, in which top ten litter items are presented. The report does not automatically provide proportions of the different litter materials. Further analyses can be done from the raw data which can be downloaded as an Excel/CSV file. The report tool also offers the possibility to study other matters, such as a map of events (see Figure 45 – Figure 47).



Figure 45. Litter report tools

Marine Litte	erWatch × 🗋 discomap.eea.eur	opaleu 🗙 🏹 😋 Settin	g-up monitoring e	10	
- C (	) discomap.eea.europa.eu/report/Li	terWatch/Events			
4 4 4	of 2.7 b bl				
Aarine	LitterWatch				-
Evente	list of all events				100
Events -	list of all events				
Eventcode	Beach name	Starting time :	Finishing	Type :	Count \$
ZQTVY	sitter_stgallen_steinbrunnerf	13-12-2017 15:30	13-12-2017 17:00	Private	
TCMCW	salmis	28-11-2017 14:05		Private	4
INEYR	salmis	28-11-2017 14:05		Private	
MFRVK	Zürichsee_Küsnachterhorn_Thirkell- WhiteJ	28-11-2017 07:50		Private	31
IXXIU	lacléman_gland_kubela	28-11-2017 07:00	28-11-2017 07:41	Public	
VMIBS	lacléman_gland_kubela	28-11-2017 07:00	28-11-2017 07:42	Private	37
DCFTG	punta mogotes	27-11-2017 13:00	27-11-2017 21:01	Public	
FOEXS	Sihl_Horgen_BucherF	27-11-2017 12:27		Public	0
EFJKN	limmat_dietikon_keiserp	27-11-2017 12:00	27-11-2017 13:00	Public	31
DOLPU	Rhein_Basel_HungerbuehlerN	26-11-2017 15:00	26-11-2017 15:15	Public	1
RDEWO	thunersee_spiez_meierd_1	26-11-2017 14:30	26-11-2017 15:00	Private	14
VMUHM	reuss_ottenbach_schoenenbergerl	26-11-2017 10:15		Private	3
BWFSG	Sense_Torishaus_g-cubes	25-11-2017 09:00		Private	60
MTGGL	tost	24-11-2017 12:00		Private	
VDDPC	test	23-11-2017 23:00	24-11-2017 12:00	Private	
QQNUC	test	23-11-2017 23:00	24-11-2017 12:00	Private	
UZSDO	rhein_domatems_foppa_f	23-11-2017 12:25	23-11-2017 12:50	Private	26
FLSQK	limmat_zuerich_suterd&glauserp	23-11-2017 11:00	23-11-2017 11:10	Public	10
HZVUO	langete_langenthal_geiserm	22-11-2017 14:00	22-11-2017 14:30	Private	22
XOKDQ	SpotX	21-11-2017 23:00		Private	
000514	zürichsen wollishofen Jappandorfm	20-11-2017 12:00	20-11-2017 13:32	Public	





Figure 47. Litter report, web browser view

#### Data quality and availability of the Marine Litter Watch

Data collected by the MLW communities or independent users is made available in the application as soon as it enters the EEA database, without any further manual quality control. Users submitting the data are responsible for its accuracy. At present, the MLW data represents the effort made by the communities collecting it and is therefore illustrative of the amount and type of items found on the surveyed beaches. Additional handling is required for using this data for further statistical purposes.

#### **OSPAR** Database

The OSPAR beach litter database stores marine litter data collected on reference beaches using the standardized OSPAR beach litter monitoring guidelines. The database has been developed to manage the data and allow it to be interrogated at the regional, sub-regional and beach level.

#### Technical

The database is available online at: <u>https://www.mcsuk.org/ospar/</u>. The database is hosted and managed by the Marine Conservation Society. It is possible to study data in the database without having access to it (see Figure 48).

#### Database in action

The database provides an assessment tool for national assessment performers from the OSPAR region.



Figure 48. Start page of OSPAR database web application

Once the user has been granted access inside the database it is possible to add beaches, measurements and perform other modifications (Figure 49).



Figure 49. Start page of the OSPAR database web application when logged in as a user

### Measurements

Search for litter data can be categorized by beach/country/region. The map tool enables the search for a location, and it also gives a thorough overview of the beaches in the database (Figure 50 – Figure 52).

							- 0
https://www.mcsuk.org/ospar/list 🔎 + 🗎 Mar	rine Conserv G	<ul> <li>Surv</li> </ul>	ey beaches   OSPAR be ×				() ()
Convert • IB/Select retent management Site building Site configuration OSPAR	lser management	Help.	_			x Googe	5/1 Log out Mart
Home   Beach	SPAR OMMISSIO	DN 🕻	rotecting and conserving the lorth-East Atlantic and its reso Survey data	inces			
Survey bea	ches						
Country - Select - Belgium Denmark (incl. the	Country Select - Belgium Denmark (incl. the Faeroe Islands) France Germany Icoland Ireland		gion My>	Search Reset	Longitude	OSPAR beaches Marta.Ruiz Your beaches	
France Germany Icoland Ireland			Oostende	Edit 51,241552777778	2.937111111111	Other options • Add a new beach	
Isle of Man Netherlands		002	Koksijde, St André	Edit		Administration	
Norway Portugal Spain Sweden United Kinedom	Norway Portugal Spain Sweden	5003	Reverside	Edit 51.204569444444	2,851455555556	Manage your account Manage surveyors Manage users Manage beaches/surveys	
Faeroo Islands)	North Soa	DK001	MSFD Nymindegab Strand	Edit 55.841508333333	8.1638027777778	OSPAR admin     Administer	
Denmark (incl. the Faeroe Islands)	1. Northern North Sea	DK004	MSED Skagen Skagen Strand	Edit 57.748630555556	10.581861111111	Log out	
Denmark (incl. the Faeroe Islands)	1. Northern North Sea	DK005	Hvide Sande	Edit 55.836421666667	8 1654005555556		
Denmark (incl. the Faeroe Islands)	1. Northern North Sea	F0002	Suggan Streymoy Island (EO)	Edit 61.952718055556	-6.7988177777778		
Denmark (incl. the Faeroe Islands)	0. Arctic Seas	GRL001	Dagmar island North St1	Edit 81.686416666667	-17.563722222222		
Denmark (incl. the Faeroe Islands)	0. Arctic Seas	GRL002	Henryland East Greenland	Edit 69.6079166666667	-23.6399666666667		
Denmark (incl. the	0. Arctic	001.000	Gentere Brook Grad		on actors		



Convert • ESelect		ile conserv O	Sur	vey beaches   USPAR be ×			× Geogle	✓ Search • More ≫
Content management Site building	Site configuration OSPAR U	ser management SPAR MMISS	Help	Protecting and conserving the North-East Atlantic and its reso Survey data	urces			S / I 🤹 Log out Marta.R
	Country <any></any>	hes	Re	agion Anyo Select - Arctic Seas	Search (Reset)		OSPAR beaches Marta-Ruiz Your baarbes	
	Country Belgium	Region 3. Southern North Sea	ID 1. 23 8E0 4	Northern North Sea Celtic Seas Southern North Sea Bay of Biscay	Latitude Edit 51.241552777778	Longitude 2.9371111111111	None Other options	
	Belgium	3. Southern North Sea	BE002	Kolssida, St André	Edit		Administration	
	Bolgium	3. Southern North Sea	BE003	Raverside	Edit 51.204569444444	2.8514555555556	Manage your account Manage surveyors Manage users	
	Denmark (incl. the Faeroe Islands)	1. Northern North Sea	DK001	MSED Nymandegab Strand	Edit 55.841508333333	8.1638027777778	OSPAR admin     Administer	
	Denmark (incl. the Faeroe Islands)	1. Northern North Sea	DK004	MSFD Skagen Skagen Strand	Edit 57.748630555556	10.581861111111	Log out	
	Denmark (incl. the Faeroe Islands)	1. Northern North Sea	DK005	Hvde Sande	Edit 55.836421666667	8.1654005555556		
	Denmark (incl. the Faeroe Islands)	1. Northern North Sea	F0002	Suggan Streymoy Island (FO)	Edit 61.952718055556	-6 796817777778		
	Denmark (incl. the Faeroe Islands)	0. Arctic Seas	GRL00	Degmint Island North St1	Edit 81.686416666667	-17.56372222222		
	Denmark (incl. the Faeroe Islands)	0. Arctic Seas	GRL00	2 Herryland - East Graenland	Edit 69.6079166666667	-23.6399666666667		

Figure 51. Measurement data search



Figure 52. Measurement data search, map tool

### Measurement data to study and beach information

Measurement data is found from the database by clicking on the particular beach and then finding the data to be studied (Figure 53). In the beach list –view it is possible to access the particular beach information and add background information. Beach location is determined with the map tool or with <u>Earth Point tool</u> provided by Google (Figure 54 – Figure 59).

■ Select			- Jurr	A nearest considered.			×	Google	v 🕄 Search -
anayonnan. and unionity and u	<b>C</b> 3 0	SPAR	- the p						
	CO CO	MMISS		rotecting and conserving the orth-East Atlantic and its reso	urces				
	Home Beach n	nap   Beacl	nlist   :	Survey data					
	Survey beac	hes							
	Country <any></any>		Reg	jion	Search Reset		OSPAR beaches		
	Country	Region	ID	Beach name	Latitude	Longitude	Marta.Ruiz Your beaches None		
	Belgium	3. Southern North Sea	BE001	Qostende	Edd 51.241552777778	2.937111111111	Other options • Add a new beach		
	Belgium	3. Southern North Sea	BE002	Koksijde: St André	Edit		Administration		
	Belgium	3. Southern North Sea	BE003	Raversäde	Eds 51.204569444444	2.8514555555556	<ul> <li>Manage your account Manage surveyors Manage users</li> </ul>		
	Denmark (incl. the Faeroe Islands)	1. Northern North Sea	DK001	MSED Nymindegab Strand	Edit 55.841508333333	8.1638027777778	OSPAR admin     Administer		
	Denmark (incl. the Faeroe Islands)	1. Northern North Sea	DK004	MSFD Skagen Skagen Strand	Edit 57 748630555556	10.581861111111	Log ton		
	Denmark (incl. the Faeroe Islands)	1. Northern North Sea	DK005	tivide Sande	Edtt 55.836421666667	8,1654005555556			
	Denmark (incl. the Faeroe Islands)	1. Northern North Sea	F0002	Suggan Streymoy	Edt 61.952718055556	-6.7988177777778			
	Denmark (incl. the Faeroe Islands)	0. Arctic Seas	GRL001	Degmar island North St1	Edt 81.686416666667	-17.563722222222			
	Denmark (incl. the Faeroe Islands)	0. Arctic Seas	GRL002	Henryland - East Groenland	Edl 69.6079166666667	-23.6399666666667			
		C. Austin							

Figure 53. Beach list, edit tool

× Sconvert • BSelect		x: 0	Google v 👌 Search • More »
Content management Site building	Site configuration OSPAR User management Help OSPARE COMMISSION Protecting and conserving the North-Card Atlantic and its resources Home   Beach map   Beach list   Survey data		7 / 1 🤽 Log out Marta.
	Oostende View Edit Signings Name of beach *	OSPAR beaches	
	Oostende OSPAR beach ID * BE001	Options for this beach Submit 100m survey	
	e g. E5005 Country * Belgium	Submit 1km survey Your beaches	
	Ragion * 3. Southern North Sea  View a map of the regions	None Other options Add a new beach	
	- Summary information Tourism: * © Yes No	Administration Manage your account Manage surveyors Manage users Manage users	
	Cleaned:" ⊛Yes ◯No	OSPAR admin     Administor     Log out	
	Litter collection: * O Yes No		
	Beach factsheet: *		

Figure 54. Beach information



Figure 55. Beach information



Figure 56. Beach information



Figure 57. Beach information

Litter data of the particular beach is found on survey basis. By choosing a single survey to study, a summary of litter data on that survey opens up (Figure 58 - Figure 59).

Convert • BSelect	par/beach/oostende	D + C Ooste	nde   OSPAR beach su ×			×	Google	Search • More >
Connects This Report of the Destarting								con our runal
	COM	MISSION	tecting and conserving the					
	~							
	Home   Beach map	Beach list   Su	rvey data					
	Oostende							
	View Edit S	lignups				OSPAR beaches		
	100m Survey data					Marta.Ruiz		
	14 January 2017	13 October 2016	22 July 2016	23 June 2016	24 April 2016	Options for this beach		
	24 January 2016	01 November 2015	11 July 2015	22 April 2015	03 February 2015	0.1.1.1.1.400		
	09 November 2014	23 July 2014	21 April 2014	01 February 2014	21 September 2013	Submit 100m survey		
	30 June 2013	05 May 2013	15 December 2012	02 September 2012	01 July 2006	-		
	01 April 2006	01 January 2006	01 October 2005	01 July 2005	01 January 2005	Submit 1km survey		
	01 October 2004	01 July 2004	01 April 2004	01 January 2004	01 October 2003			
	01 July 2003	01 April 2003	01 January 2003	01 October 2002	01 July 2002	Your beaches		
	the Cuprent data	1108				None		
	1km Survey data	13 October 2016	22. July 2016	23 June 2016	24 April 2016	Other options		
	24 January 2016	01 November 2015	11 July 2015	22 April 2015	03 Enhrunty 2015	<ul> <li>Add a new beach</li> </ul>		
	09 November 2014	23 July 2014	21 April 2014	01 February 2014	21 September 2013	Administration		
	30 June 2013	05 May 2013	15 December 2012	02 September 2012	01 July 2006	Manage your account		
	01 April 2006	01 January 2006	01 October 2005	01 July 2005	01 January 2005	Manago surveyors Manago users		
	01 October 2004	01 July 2004	01 April 2004	01 January 2004	01 October 2003	Manage beaches/surveys		
	01 July 2003	01 April 2003	01 January 2003	01 October 2002	01 July 2002	OSPAR admin     Administer		
	01 April 2002	01 January 2002	01 October 2001	01 July 2001	Hide	Log out		
	OSPAR beach ID:	BE001						
	Country:	Belgium						
	Region: Summary informati	3. South	em North Sea					
	Tourism:	Yes						

Figure 58. Beach information, list of surveys conducted



Figure 59. Litter data of a specific survey

#### Input of data

Litter data cannot be uploaded directly into the database. Number of litter items is input by litter category under different material categories. Alternatives for survey area are either 100 or 1000 meters stretch (Figure 60 – Figure 62=.









nttps://www.mcsuk.org	osparrioderada 💭 🕋 🚵 Manne Conserv 😋 Create Survey 100m   OSPA 🗴	n * 9
Convert • BSelect		× Google v 🛃 Search • More » Sign
Content management Site buildin	Site configuration OSPAR User management. Help	4/1 dt Log out Marta.Ruiz
	Collected items summary The following sections detail the items collected. Only integer numbers should be entered.	
	Plastic/Polystyrene	
	Rubber	
	+ Cloth	
	Paper/Cardboard	
	Wood (machined)	
	• Metal	
	Aerosol/spray cans	
	foreign to set	
	Bottle caps	
	10 105949 ID 771	
	Drink cans	
	[OSPAR ID 78]	
	Disposable BBOs	
	0	
	[OSPAR ID 120]	
	Electrical appliances	
	0	
	[OSPAR ID 79]	
	Fishing weights	
	0	
	[OSPAR ID 80]	
	Foil wrappers	
	0	



### Adding a new beach

A new beach is added by choosing add a new page from the frontpage when signed in as a user. The information of the beach is then input step-by-step as guided by the website (Figure 63 – Figure 65). The information that is required is the same information that can be edited for existing beaches, as presented in Figure 54 – Figure 57.



Figure 63. Creating a new monitoring beach

			- 6 ×
CO O https://www.mcsuk.org/ospar/node	/add/boach Dev C Create Beach   OSPAR beac X	and the state	n * 0
Content management Site building Site cont	guration OSPAR User management Help	x Google	9/3 Log out Marta.Ruiz
Context management. Site bauding site cont	Variant       Variant       Variant       Variant         Variant		973 M
	g Sverige		
📢 🙆 🚆 👩 🚺	S. 1		12.10 4.12.2017

Figure 64. Creating a new monitoring beach



Figure 65. Creating a new monitoring beach

### Analytic tools

All data in the database can be studied under the survey data –tool. With the tool it is possible to study the data more in detail as groups, year, date, country and region can be chosen as filtering possibilities. One or many filters can be used, but at least one is to be used. After choosing a country, it is also possible to choose a beach. The report produced contains information on material proportions and possible source indication (Figure 66 – Figure 69). Both of these charts can be downloaded as pdf, png, jpeg and svg files. It is not possible to see the charts, nor download them with Google Chrome browser.



8	9	02	9	📖 - M 🖬 /	12:23



Conderd anarogeneous       Sale building       Sale building       Sale building       1/3/2       Log out Alusta builting         Norme       Based Image       Description       Survey data       Survey sur	× Convert • Eselect	source to back the second dy dia 🖸 💟 Survey data   USYAK beach A	× Google v 🍕 Search - More » Sign
Survey data Strawy data report Create a summary report of the solected survey data. Solecting a single year will display the data in a pie chart, a range of dates will display the data on a line graph. Solecting a single year will display the data in a pie chart, a range of dates will display the data on a line graph. Solecting a single year will display the data in a pie chart, a range of dates will display the data on a line graph. Solecting a single year will display the data in a pie chart, a range of dates will display the data on a line graph. Solecting a single year will display the data in a pie chart, a range of dates will display the data on a line graph. Solecting a single year will display the data in a pie chart, a range of dates will display the data on a line graph. Solecting a single year will display the data in a pie chart, a range of dates will display the data on a line graph. Solecting a single year of a pie of a pie of a selected. Solecting a specie of a year OR a from. To date range. Solecting a specie of a year OR a from. To date range. Solecting a specie of a year OR a from. To date range. Solecting a specie of a year of a selected. Sole of a selected - Sole of a specie of a year of a selected. Sole of a specie of a graph or Country for single Beach (select a Country first). Area: The fregorin a general of a beach is selected. Sole of a selected - Sole of	Content management Site building	Ste configuration OSPAR User management. Help Home   Beach imap   Beach list   Survey data	1/3 🍇 Log out Marta Ratz
Country - None selected -		Survey data         Survey data roports       Survey data export         Create a summary report of the selected survey data.         Selecting a single year will display the data in a pie chart, a range of dates will display the data on a line graph.         Select survey type: *         Image: The data range is granted if a year is selected.         Year         Image: Note: Selected - Image: Note: The data range is selected.         Year         Image: Note: Selected - Image: Note: The data range is selected.         Year         Image: Note: Selected - Image: Note: The data range is selected.         Year         Image: Note: Selected - Image: Note: The data range is selected.         Year         Image: Note: Selected - Image: Note: The Region is not selected.         From date       To date         Format: 04-12:2017       Format: 04-12:2017         Optionally select a Region or Country or single Beach (select a Country first).         Add: The Region is general if a Beach is selected.         Region         Optionally select a Region or Country or single Beach (select a Country first).         Add: The Region is general if a Beach is selected.         Optionally select a Region or Country or single Beach (select a Country first).         Add: The Region is general if a Beach is selected.         Optionall	OSPAR beaches Marta Ruiz Your beaches None Other options • Administration • Manage surveys Manage surveys Manage beaches/surveys • OSPAR admin • Administr Log out
Cotional		Country None selected -	

Figure 67. Studying litter data



Figure 68. Litter data report

		- <b>a</b> ×
thttp://www.mcsakorg/ospai/sumet/report/disp. D * C     Survey report summary IOS ×	a Carda	n x 9
A tolConnect * Biselect - Content management : Selection OSPAR User management Help	x Goode	2/3 K Log out Marta.Ruiz
Rubber 0.43 % '		
Plastic/Polystyrene 85.81 %		
🔳 Plastic/Polystyrene 📕 Rubber 💶 Cloth 📕 Pottery/Ceramics 📕 Metal 📕 Medical 📕 Sanitary 📕 Paper/Cardboard 📕 Wood (machined) 🛄 Glass		
Sources		
Survey type: 100m Year: 2017 Number of surveys: 34		
Country: All Region: 0. Arctic Seas Beach: All		
(Fishing & Aquacuture: 2.04 %		
Packaging .6.4 %		
2004 301 20 20 20 300 300 300 300 20 30		
A 01 (Dial) . 62.07 A		
Other: \$2.87 %		
Fishing & Aquaculture Markaging State Other		
Refine this report. Create new report		
Copyright 67/017 CISPAR Commission		
Costact.OSPAR158te.mxii 1 Termi st ose 1 Linka		
Hosted and managed by the <u>Manne</u> Conservation Blogery, site by <u>Envirence</u>		~
		12-12 4.12.2017

Figure 69. Litter data report

It is also possible to export the data from the database as a csv-file, with the same filters as those described above (Figure 70).

Convert • #Select	nim/csi 🔎 + 🔒 Marine Conserv 🖒 💽 s niguration OSPAR User management. Help	invey admin   OSPAR beac ×	x Googe	✓ to Search • More > 2/3 To out Mart
	Home   Beach map   Beach list	Protecting and conserving the North-East Atlantic and its resources Sturvey data		
	Survey reports Export survey data Export a CSV file of survey data Select survey type: "		OSPAR beaches Marta.Ruiz Your beaches None	
	Select a Year OR a From-To date range*           Mote: The date range is ignored if a year is detected           Year           2017           Year = Peniods 1, 2, 3 & 4 e.g. 2011 = Dec 2010 to           From date         To date	d 001 2011	Add a now beach     Add a now beach     Administration     Manage surveyors     Manage surveyors     Manage surveyors     Manage surveyors     Manage surveyors     Sarage to beaches/surveys     OSPAR admin     Beach export	
	Format: 04-12-2017 Format: 04-12-2	D17 Region	Survey admin • Administer Log out	
	- None selected - V	0, Arctic Seas 🔽		
	Arctic 2017 .csv Optional Export CSV Reset selections			

Figure 70. Litter data export

Statistical analyses from the litter data can be performed by the Litter Analyst software: <u>https://www.amo-nl.com/software/litter-analyst/</u>.The password needed to download the software can be requested through the website. The user manual of the software is also publicly available: <u>https://www.amo-nl.com/pdf/User%20manual%20Litter%20Analyst.pdf</u>.

### Summary of key elements

	Marlin	OSPAR	MLW
Found at	http://hsr-	https://www.mcsuk.or	https://marinelitterwatch.discomap.ee
	beach.herokuap	g/ospar/	a.europa.eu/
	<u>p.com</u>		
Mobile	No	No	Yes, iPhone and Android
application			
Map tool	Google maps	Earthpoint, Google	Earthstar Geographics, ESRI
Coordinates	Yes	Yes	Yes
given			
automatically			
Upload data	No	No	No
Download raw	Excel	CSV	CSV, Excel pivot
data			
Litter reports	pdf, Excel, web	pdf, jpeg, svg, web	Web interface
	interface	interface (does not	
		work with Google	
		Chrome)	

Top litter item	Yes	No,	Yes
list -report,	Simple method	Separate software	
which		developed for this,	
calculation		Litter Analyst available	
method		at https://www.amo-	
		nl.com/software/litter-	
		analyst/	

Table 4. Summary of key elements from different databases

### HELCOM database

At the moment there is no beach litter regional database in the HELCOM region. Important key element to consider, if a regional database is set up, to serve both decision makers and researchers, are compiled in Table 5-Table7.

	HELCOM database, basics		
Found at	Under helcom.fi		
	Yes, especially important for the field work		
Mobile application	iPhone, Android		
Special software	No, only mobile and web application		
Usertypes	Main, country manager, beach manager, litter collector		
	Yes		
Map tool	E.g. Google maps		
Coordinates given automatically	ly Yes		
Upload data	Yes		
Download raw data	Excel, CSV		
Upload and download template	Used in HELCOM data call on marine litter, May 2017		
	Yes		
Top litter item list -report,	Simple method		
which calculation method	Rank method		
Litter reports	pdf, Excel, web interface		

Table 5. Requirements of HELCOM database, basics

	HELCOM database, litter reports
	100m, 1km length
Number of litter items	10m width
Number of litter items	seasonal change graph, trend
Litter categories separately	proportions
Litter categories separately	seasonal change graph, trend
Single litter items	proportions
Single litter items	seasonal change graph, trend
Top litter items	Simple method
Top litter items	Rank method
Compare tool	In the reports there needs to be the possibility to compare reports according to filters (described in table xx)

Table 6. Requirements of HELCOM database, litter reports

	HELCOM database, data filtering tools
By region	
By country	
By sub-basin	Level 3 according to the HELCOM Monitoring and Assessment Strategy
By beach	
By beachtype	Urban, rural, peri-urban
By assessment	
By season	
By year	
By litter item	
	The ones in use in the HELCOM region at that
	point.
	There needs to be the possibility to modify
By protocol	these easily.

Table 7. Requirements of HELCOM database, data filtering tools

### Discussion

There are three different major databases in use in the HELCOM region. Many of the northern countries use the Marlin database, countries that are part of the OSPAR region use the OSPAR database. The MLW is more used by the occasional users that organize clean-ups, or by clean-up campaigns that are not part of the national marine litter monitoring conducted by countries.

Compared to the OSPAR database, the Marlin database is the database with more tools available for the user to easily analyse data. It also provides the possibility to export data for further analyses that would be conducted in Excel or in other software meant for that use. Neither Marlin non OSPAR database has a separate mobile applications developed, being both used through the web interface. This makes the use of the database out on the field a bit tricky, but not impossible. Maybe it is also due to this choice, that both of them seem to be more user friendly and bug free. The Marlin database offers possibilities to use different survey protocols and categories (UNEP; OSPAR, TG ML. If the development of a common HELCOM database is foreseen as a goal, developing Marlin database into a Baltic Sea regional database could be the solution. The database has many analytical tools that would be appreciated by users who need to find data in a usable format quickly.

The MLW is a good tool for citizen science and collecting massive amounts of information. At the moment some of the tools do not work properly making the effort of studying the litter data time consuming. Collecting the data in the field is easy with the mobile application and it also removes one step of work – transferring the data from paper to database.

As there are three marine litter databases in use already in the HELCOM area, it is suggested to join forces to further develop one of these into a regional marine litter database. Especially the Marlin database is seen as a strong candidate for that. The regional database needs to meet the needs of research and decision makers.