



Task 2.3.1 Regional database for beach litter and micro litter

Hanna Haaksi & Joni Kaitaranta

Helsinki Commission (HELCOM)

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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(rural) (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 categorization method 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 beaches¹ 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 number of items 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

¹ 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: <http://hsr-beach.herokuapp.com/login>

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.

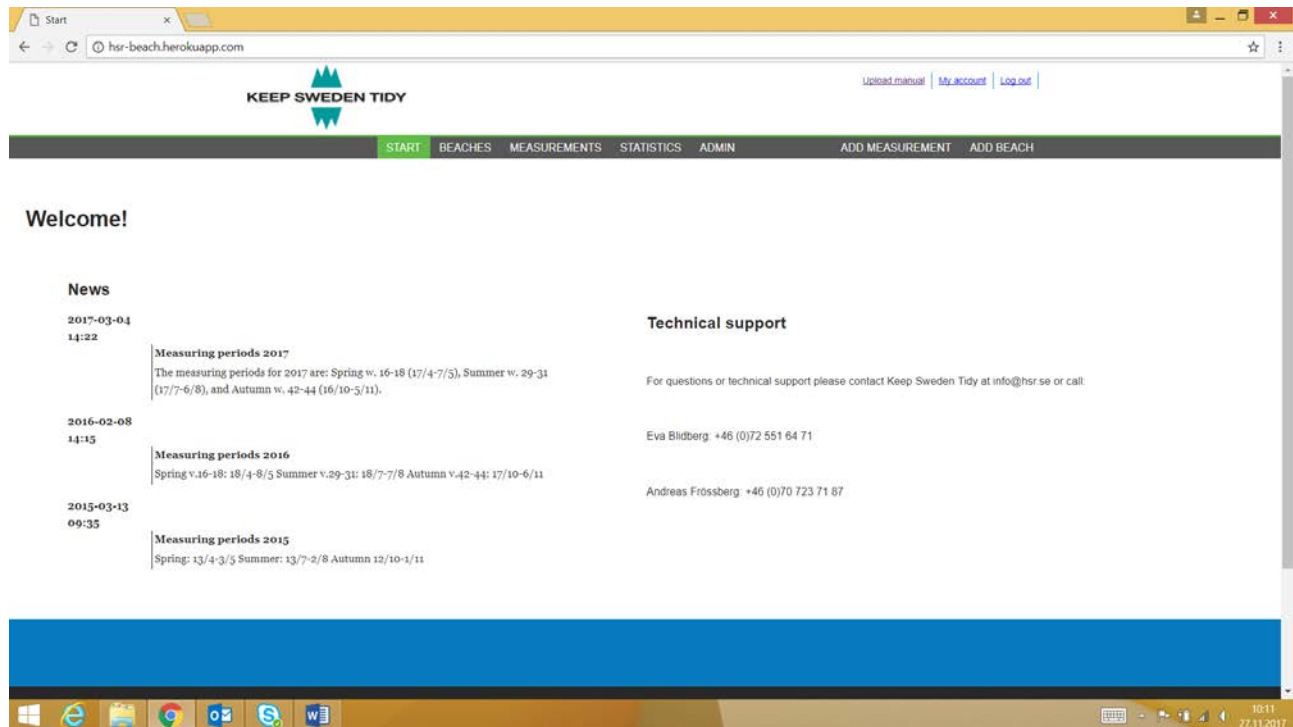


Figure 1. First page of the database web application

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.

Beaches

hsl-beach.herokuapp.com/beach/list

KEEP SWEDEN TIDY

START BEACHES MEASUREMENTS STATISTICS ADMIN ADD MEASUREMENT ADD BEACH

Beaches

Beach group: All Ocean/Sea, Lake: All Country: All Municipality or region: All Province: All

Name	Ocean/Sea, Lake	Country	Municipality or region	Province
Kårehamn st	Baltic Sea	Sweden	Borgholm	Kalmar län
Nybrostrand	Baltic Sea	Sweden	Ystad kommun	Skånes län
Järavallen/S	Baltic Sea	Sweden	Kävlinge kommun	Skånes län
Storsand	Baltic Sea	Sweden	Skellefteå	Västerbotten län
Sudde strand	Baltic Sea	Sweden	Varberg	Hallands län
Mollon SE2	North Sea	Sweden	Orust	Västra Götalands län
Gåsö SE3	North Sea	Sweden	Lysekil	Västra Götalands län
Aigön SE1	North Sea	Sweden	Kungälv kommun	Västra Götalands län
Növa	Baltic Sea	Estonia	Nõva	Läänemaa
Metsapöole	Baltic Sea	Estonia	Häädemeeste	Pärnumaa
Stora Sand Värmdö	Baltic Sea	Sweden	Värmdö	Stockholms län
Kägsdorf	Baltic Sea	Germany	Bastorf	Bad Doberan
Warmemünde	Baltic Sea	Germany	Rostock	Rostock
Edsvik SE5	North Sea	Sweden	Tanum	Västra Götalands län
Grödenhamnsvik SE9	North Sea	Sweden	Lysekil	Västra Götalands län
Haby SE4	North Sea	Sweden	Sotenäs	Västra Götalands län
Ångklävebukten - Salto - SE6	North Sea	Sweden	Strömstads kommun	Västra Götalands län
Hohe Düne	Baltic Sea	Germany	Rostock	Rostock
Barrevik SE8	North Sea	Sweden	Orust	Västra Götalands län
Grönevik, Överön SE7	North Sea	Sweden	Kungälv kommun	Västra Götalands län

Figure 2. Beach list view in the database web application

Beaches

hsl-beach.herokuapp.com/beach/list

KEEP SWEDEN TIDY

START BEACHES MEASUREMENTS STATISTICS ADMIN ADD MEASUREMENT ADD BEACH

Beaches

Beach group: All Ocean/Sea, Lake: All Country: All Municipality or region: All Province: All

Name	Ocean/Sea, Lake	Country	Municipality or region	Province
Kårehamn strand/Skanviken	Baltic Sea	Sweden	Borgholm	Kalmar län
Nybrostrand	North Sea	Sweden	Ystad kommun	Skånes län
Järavallen/Sjöängarna	Gulf of Riga	Sweden	Kävlinge kommun	Skånes län
Storsand	Gulf of Bothnia	Sweden	Skellefteå	Västerbotten län
Sudde strand	Skagerrak Strait	Sweden	Varberg	Hallands län
Mollon SE2	Kattegat Bay	Sweden	Orust	Västra Götalands län
Gåsö SE3	Öresund	Sweden	Lysekil	Västra Götalands län
Aigön SE1	North Sea	Sweden	Kungälv kommun	Västra Götalands län
Növa	North Sea	Estonia	Nõva	Läänemaa
Metsapöole	North Sea	Estonia	Häädemeeste	Pärnumaa
Stora Sand Värmdö	North Sea	Sweden	Värmdö	Stockholms län
Kägsdorf	North Sea	Germany	Bastorf	Bad Doberan
Warmemünde	North Sea	Germany	Rostock	Rostock
Edsvik SE5	North Sea	Sweden	Tanum	Västra Götalands län
Grödenhamnsvik SE9	North Sea	Sweden	Lysekil	Västra Götalands län
Haby SE4	North Sea	Sweden	Sotenäs	Västra Götalands län
Ångklävebukten - Salto - SE6	North Sea	Sweden	Strömstads kommun	Västra Götalands län
Hohe Düne	North Sea	Germany	Rostock	Rostock
Barrevik SE8	North Sea	Sweden	Orust	Västra Götalands län
Grönevik, Överön SE7	North Sea	Sweden	Kungälv kommun	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.

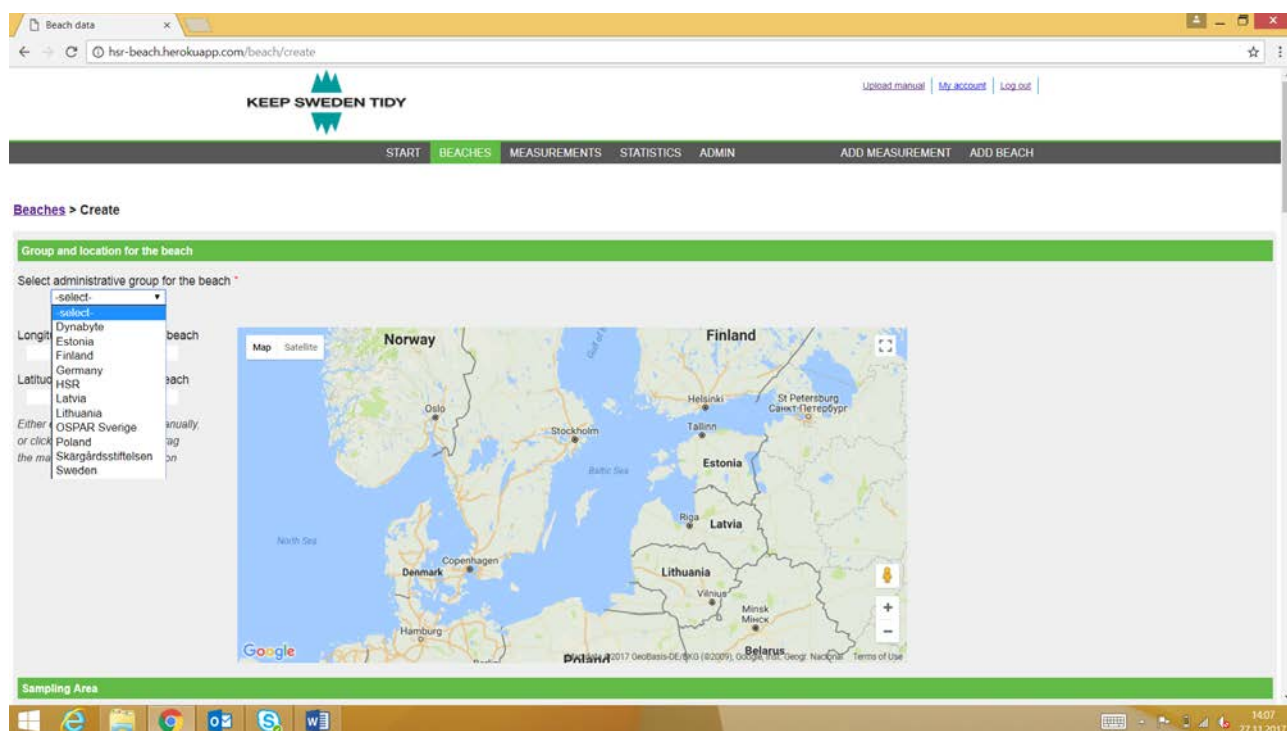


Figure 4. Creating a new beach/monitoring site

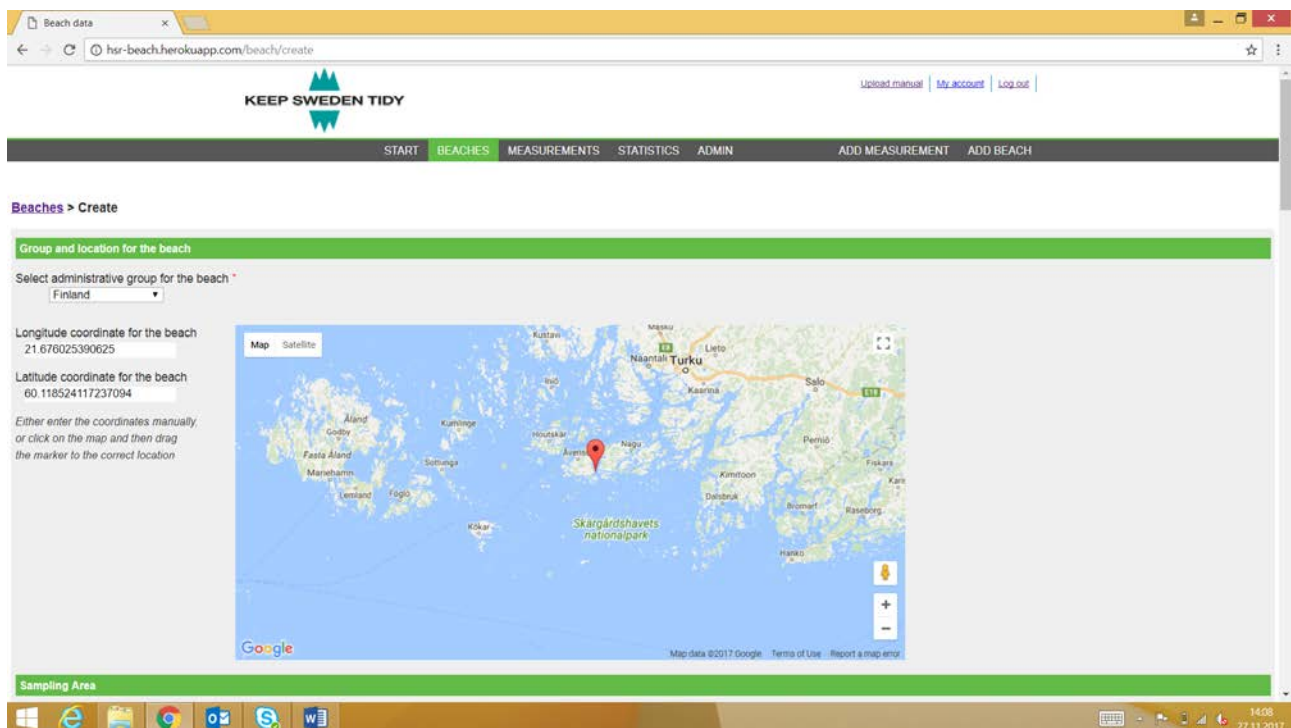


Figure 5. Creating a new beach/monitoring site

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).

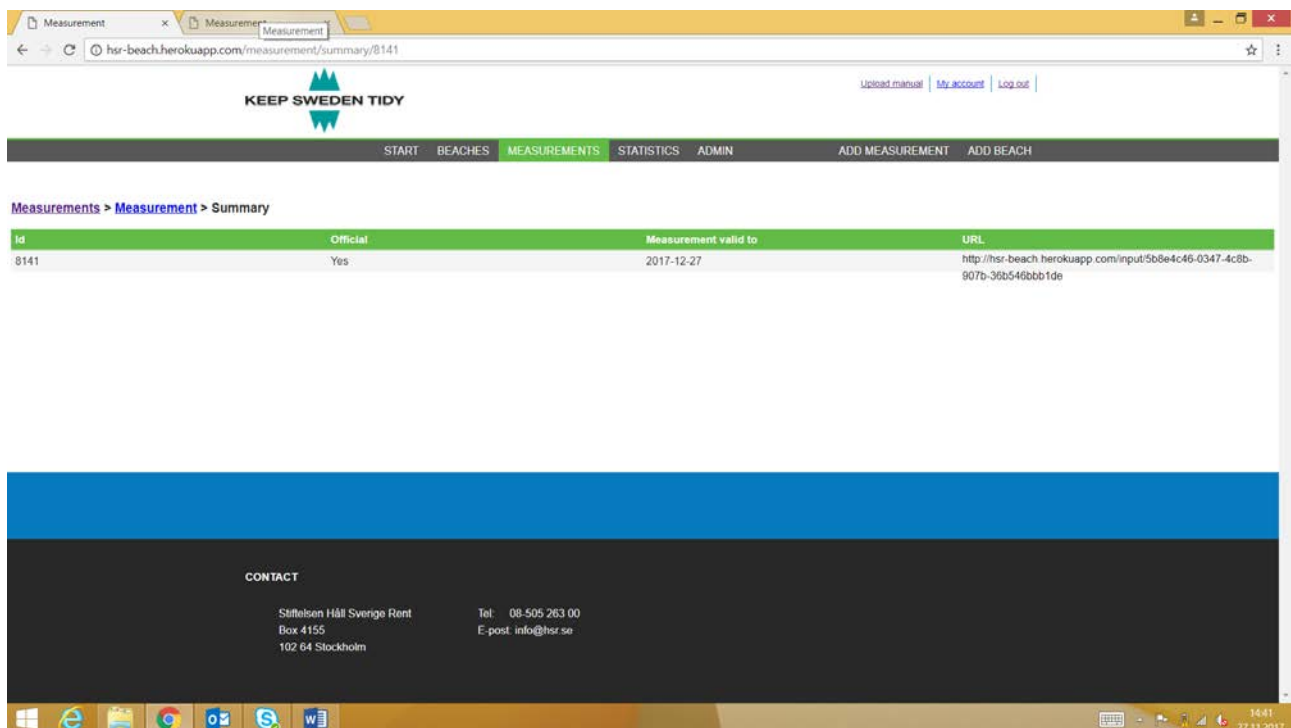


Figure 6. Collecting data

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.

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

Stiftelsen Håll Sverige Rent Tel: 08-505 263 00

Figure 7. Collecting data

Input > Measurement data

Number	Material	Code	Litter type	Amount
1	Plastic	PL01	Bottle caps and lids	0
2	Plastic	PL02	Bottles < 2 L	0
3	Plastic	PL03	Bottles, drums, jerrycans and buckets > 2 L	0
4	Plastic	PL04	Knives, forks, spoons, straws, stirrers, (cutlery)	0
5	Plastic	PL05	Drink package rings, six-pack rings, ring carriers	0
6	Plastic	PL06	Food containers, candy wrappers	0
7	Plastic	PL07	Plastic bags (opaque and clear)	0
8	Plastic	PL08	Toys and party poppers	0
9	Plastic	PL09	Gloves	0
10	Plastic	PL10	Cigarette lighters	0
11	Plastic	PL11	Syringes	0
12	Plastic	PL12	Syringes	0

Figure 8. Collecting data, adding litter items

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).

Id	Beach	Survey date	Status	Group	Official
1	Björkängs Havsbad	2012-04-01	Finished	Sweden	Yes
11	Björkängs Havsbad	2012-07-23	Finished	Sweden	Yes
61	Björkängs Havsbad	2013-04-29	Finished	Sweden	Yes
111	Björkängs Havsbad	2012-11-03	Finished	Sweden	Yes
321	Björkängs Havsbad	2013-07-30	Finished	Sweden	Yes
2031	Björkängs Havsbad	2013-10-16	Finished	Sweden	Yes
4951	Björkängs Havsbad	2014-04-27	Finished	Sweden	Yes
51	Rullsand	2013-05-06	Finished	Sweden	Yes
81	Rullsand	2012-09-21	Finished	Sweden	Yes
91	Rullsand	2012-07-25	Finished	Sweden	Yes
101	Rullsand	2012-04-18	Finished	Sweden	Yes
1631	Rullsand	2013-08-26	Finished	Sweden	Yes
2051	Rullsand	2013-11-08	Finished	Sweden	Yes
5211	Rullsand	2014-05-06	Finished	Sweden	Yes
5261	Rullsand	2014-10-30	Finished	Sweden	Yes
5451	Rullsand	2015-04-15	Finished	Sweden	Yes
5891	Rullsand	2015-07-28	Finished	Sweden	Yes
6131	Rullsand	2015-10-16	Finished	Sweden	Yes
6711	Rullsand	2016-04-18	Finished	Sweden	Yes
6901	Rullsand	2016-08-01	Finished	Sweden	Yes

Figure 9. Studying litter data, different search filters

Id	Beach	Survey date	Status	Group	Official
661	Uto	2012-04-16	Finished	Finland	Yes
671	Björkö	2012-06-14	Finished	Finland	Yes
681	Åbo	2012-10-23	Finished	Finland	Yes
1101	Helsinki	2013-04-12	Finished	Finland	Yes
1231	Kotka inner	2013-08-15	Finished	Finland	Yes
2001	Kotka outer	2013-10-11	Finished	Finland	Yes
2131	Mustinn		Incomplete	Finland	Yes
5201	Jussaro	2014-08-14	Finished	Finland	Yes
691	Uto	2012-04-14	Finished	Finland	Yes
701	Björkö	2012-07-28	Finished	Finland	Yes
711	Björkö	2012-10-19	Finished	Finland	Yes
1111	Björkö	2013-04-13	Finished	Finland	Yes
1241	Björkö	2013-08-02	Finished	Finland	Yes
2011	Björkö	2013-10-13	Finished	Finland	Yes
721	Åbo	2012-04-18	Finished	Finland	Yes
731	Åbo	2012-08-16	Finished	Finland	Yes
741	Åbo	2012-10-23	Finished	Finland	Yes
1181	Åbo	2013-04-18	Finished	Finland	Yes
1311	Åbo	2013-09-02	Finished	Finland	Yes
1991	Åbo	2013-10-10	Finished	Finland	Yes

Figure 10. Studying litter data, different search filters

KEEP SWEDEN TIDY

START BEACHES MEASUREMENTS STATISTICS ADMIN ADD MEASUREMENT ADD BEACH

Measurements

Group: Finland Beach: All Status: All Protocol: All

Id	Beach	Status	Survey date	Group	Official
661	Uto	Finished	2012-04-16	Finland	Yes
671	Uto	Finished	2012-08-14	Finland	Yes
681	Uto	Finished	2012-10-23	Finland	Yes
1101	Uto	Finished	2013-04-12	Finland	Yes
1231	Uto	Finished	2013-08-15	Finland	Yes
2001	Uto	Finished	2013-10-11	Finland	Yes
2131	Uto	Incomplete		Finland	Yes
5201	Uto	Finished	2014-08-14	Finland	Yes
691	Björkö	Finished	2012-04-14	Finland	Yes
701	Björkö	Finished	2012-07-28	Finland	Yes
711	Björkö	Finished	2012-10-19	Finland	Yes
1111	Björkö	Finished	2013-04-13	Finland	Yes
1241	Björkö	Finished	2013-08-02	Finland	Yes
2011	Björkö	Finished	2013-10-13	Finland	Yes
721	Abo	Finished	2012-04-18	Finland	Yes
731	Abo	Finished	2012-08-16	Finland	Yes
741	Abo	Finished	2012-10-23	Finland	Yes
1181	Abo	Finished	2013-04-18	Finland	Yes
1311	Abo	Finished	2013-09-02	Finland	Yes
1991	Abo	Finished	2013-10-10	Finland	Yes

Figure 11. Studying litter data, different search filters

KEEP SWEDEN TIDY

START BEACHES MEASUREMENTS STATISTICS ADMIN ADD MEASUREMENT ADD BEACH

Measurements

Group: Finland Beach: All Status: All Protocol: All

Id	Beach	Status	Survey date	Group	Official
661	Uto	Finished	BC02.3	Finland	Yes
671	Uto	Finished	BC02.2	Finland	Yes
681	Uto	Finished	BC03.3 - Area 3	Finland	Yes
1101	Uto	Finished	2014 OSPAR_1	Finland	Yes
1231	Uto	Finished	2014 OSPAR_2	Finland	Yes
2001	Uto	Finished	2014 OSPAR_3	Finland	Yes
2131	Uto	Incomplete	BC02.3 - Survey area 3 - OLD	Finland	Yes
5201	Uto	Finished	2013-08-15	Finland	Yes
691	Björkö	Finished	2012-04-14	Finland	Yes
701	Björkö	Finished	2012-07-28	Finland	Yes
711	Björkö	Finished	2012-10-19	Finland	Yes
1111	Björkö	Finished	2013-04-13	Finland	Yes
1241	Björkö	Finished	2013-08-02	Finland	Yes
2011	Björkö	Finished	2013-10-13	Finland	Yes
721	Abo	Finished	2012-04-18	Finland	Yes
731	Abo	Finished	2012-08-16	Finland	Yes
741	Abo	Finished	2012-10-23	Finland	Yes
1181	Abo	Finished	2013-04-18	Finland	Yes
1311	Abo	Finished	2013-09-02	Finland	Yes
1991	Abo	Finished	2013-10-10	Finland	Yes

Figure 12. Studying litter data, different search filters

Single measurements to study

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.

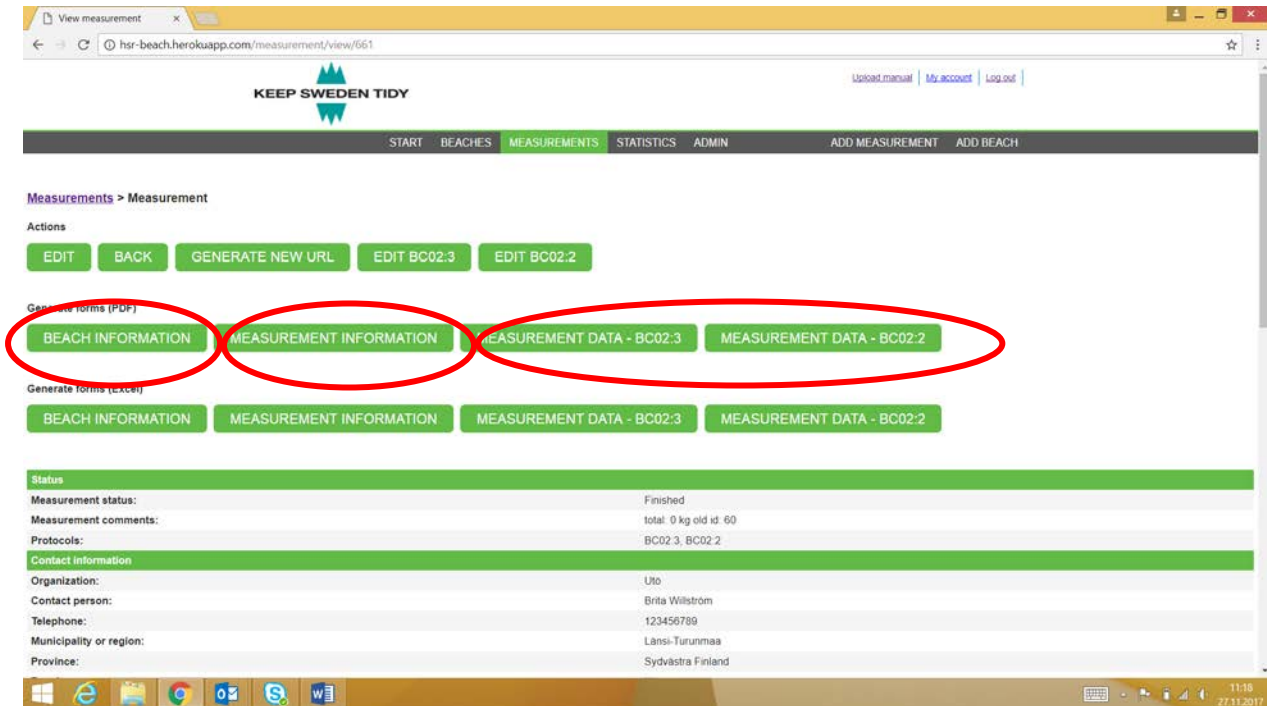


Figure 13. Studying litter data, different form selection and beach information

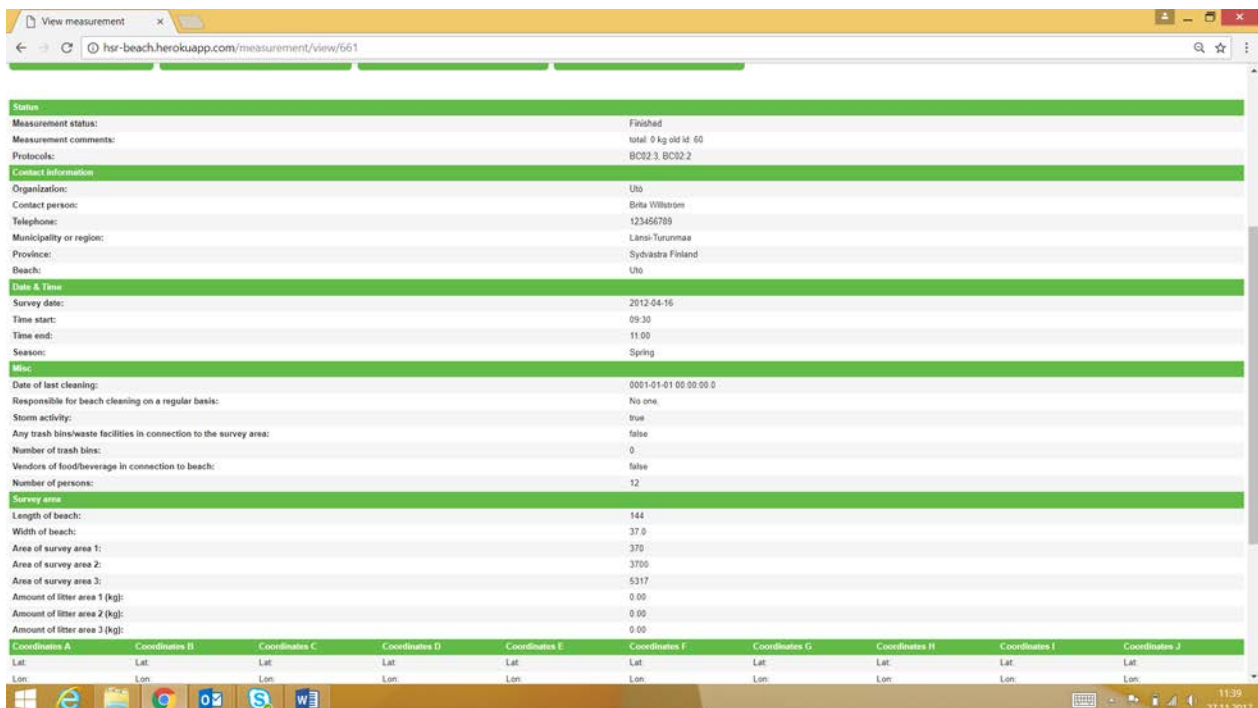


Figure 14. Studying litter data, measurement information

View measurement x MeasurementSheet_BCD x

hsr-beach.herokuapp.com/measurement/view/661

Show/hide 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, palletwrap)	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
Foamed Plastic	FO01	Foam sponges	0

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.

Select statistics x

hsr-beach.herokuapp.com/statistics

KEEP SWEDEN TIDY

Upload manual | My account | Log out

START BEACHES MEASUREMENTS **STATISTICS** ADMIN ADD MEASUREMENT ADD BEACH

Statistics

BY MEASUREMENT BY BEACHES BY FILTER

CONTACT

Stiftelsen Håll Sverige Rent
Box 4155
102 64 Stockholm

Tel: 08-505 263 00
E-post: info@hsr.se

hsr-beach.herokuapp.com/statistics/measurement

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).

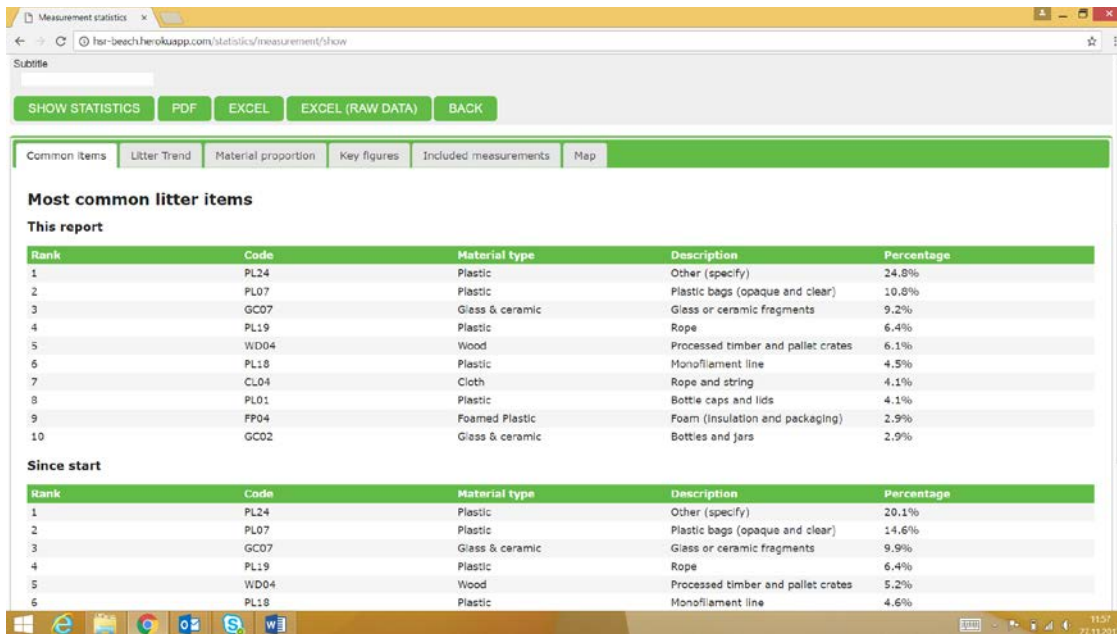


Figure 17. Statistics, litter data, web browser view of the report

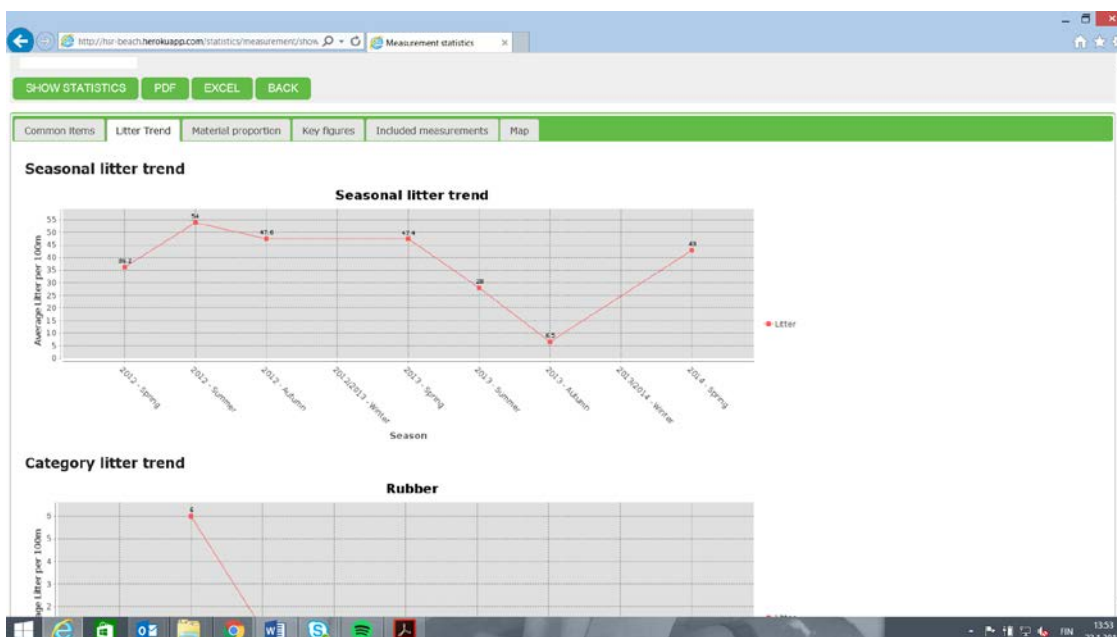


Figure 18. Statistics, litter data, web browser view of the report

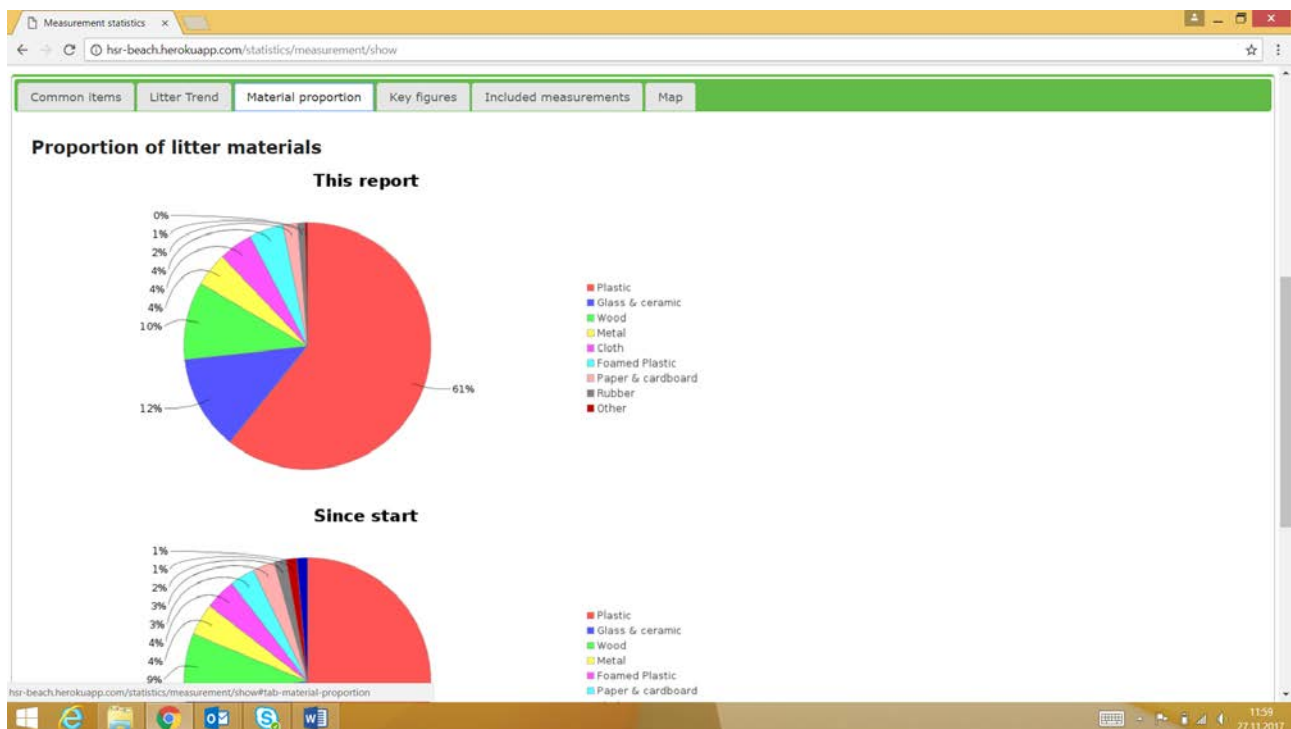


Figure 19. Statistics, litter data, web browser view of the report

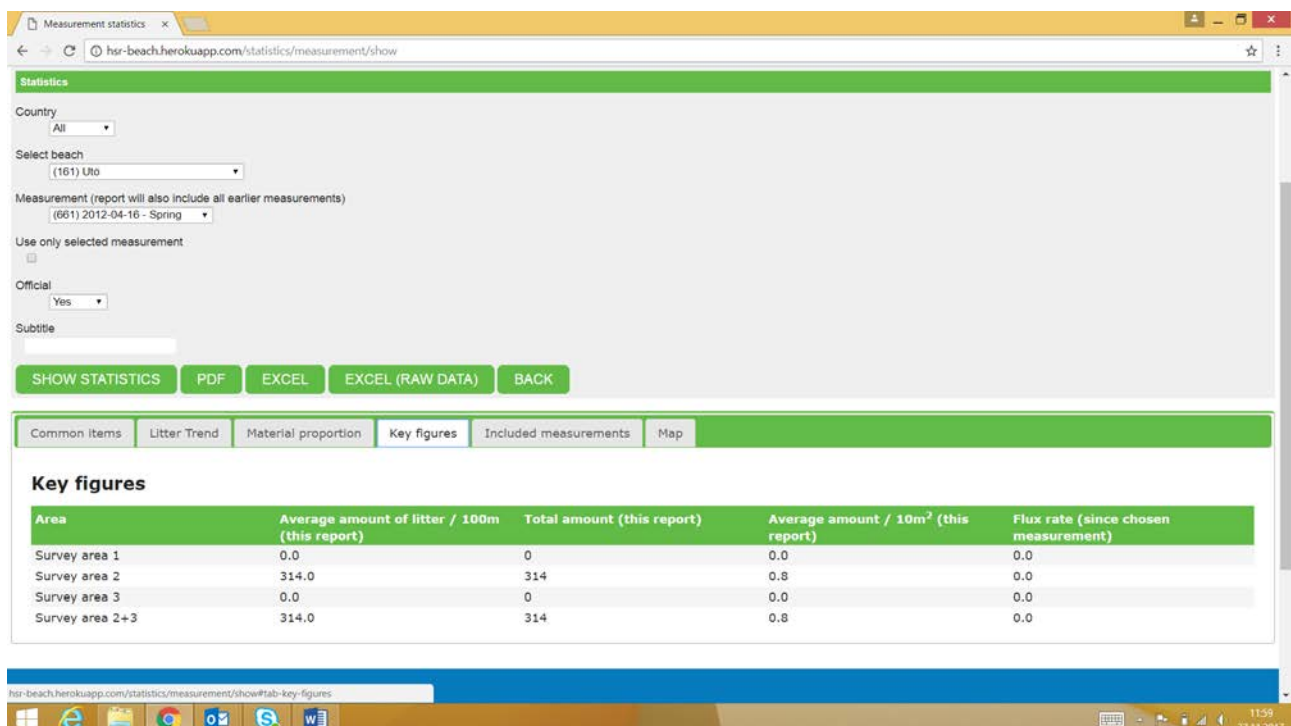


Figure 20. Statistics, litter data, web browser view of the report

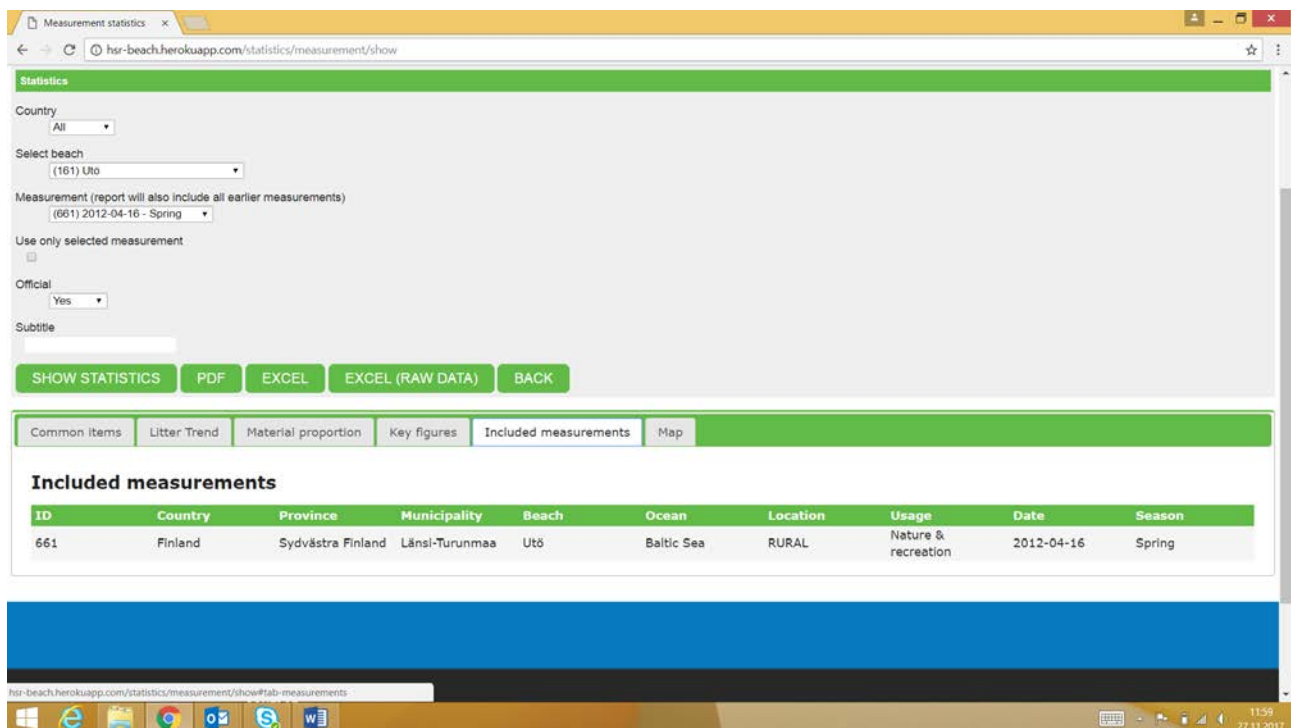


Figure 21. Statistics, litter data, web browser view of the report

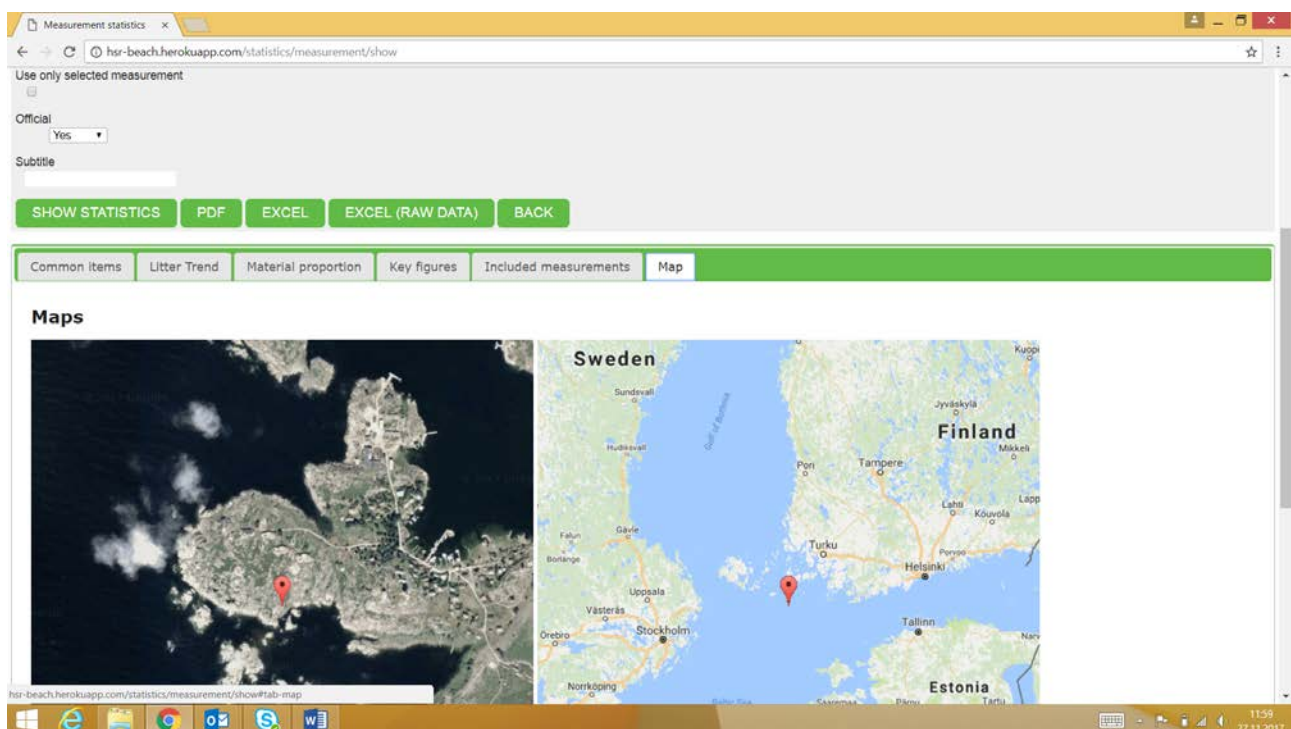


Figure 22. Statistics, litter data, web browser view of the report

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).

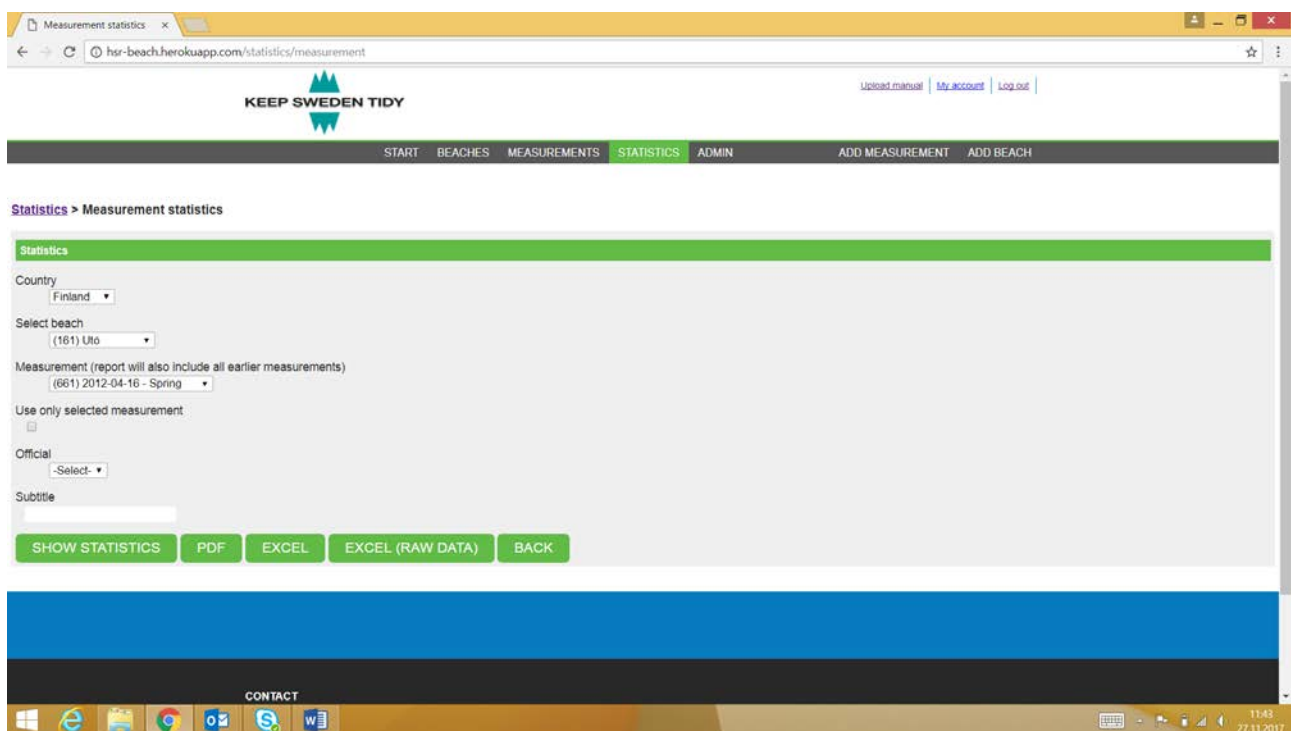


Figure 23. Statistics, litter data, measurement search filters

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).

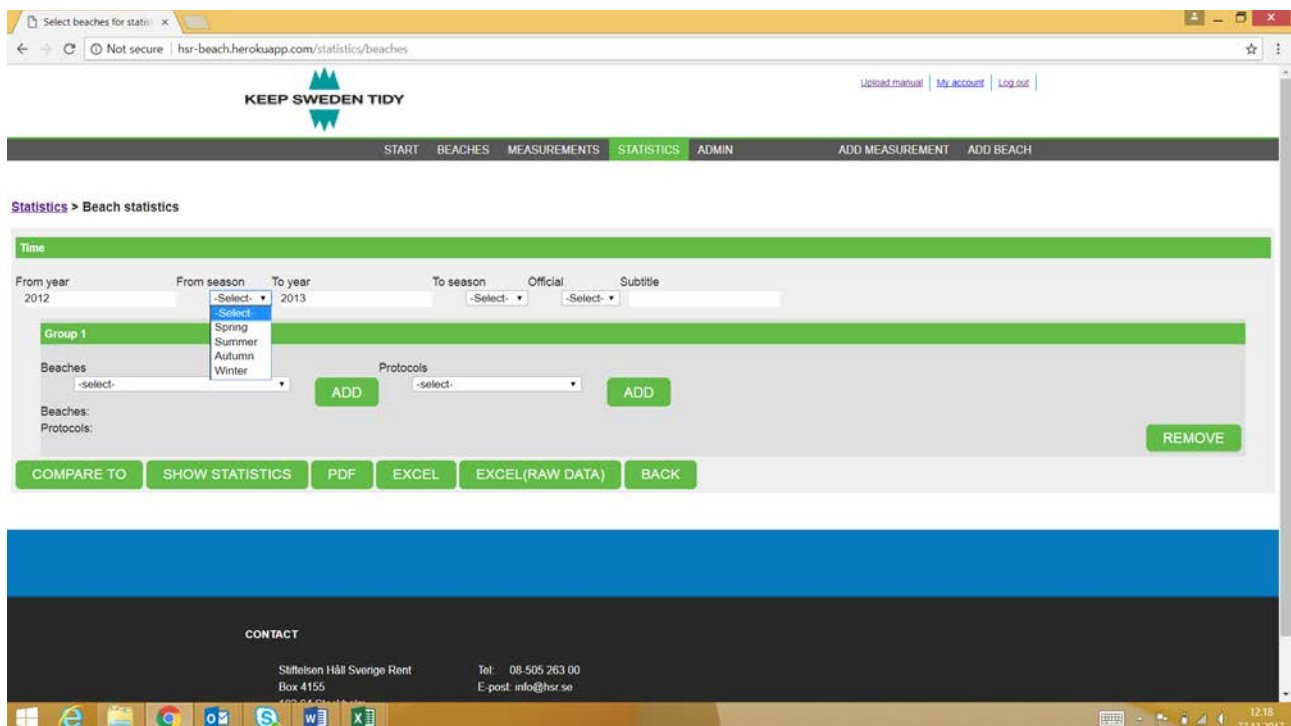


Figure 24. Statistics, litter data, beach search filters

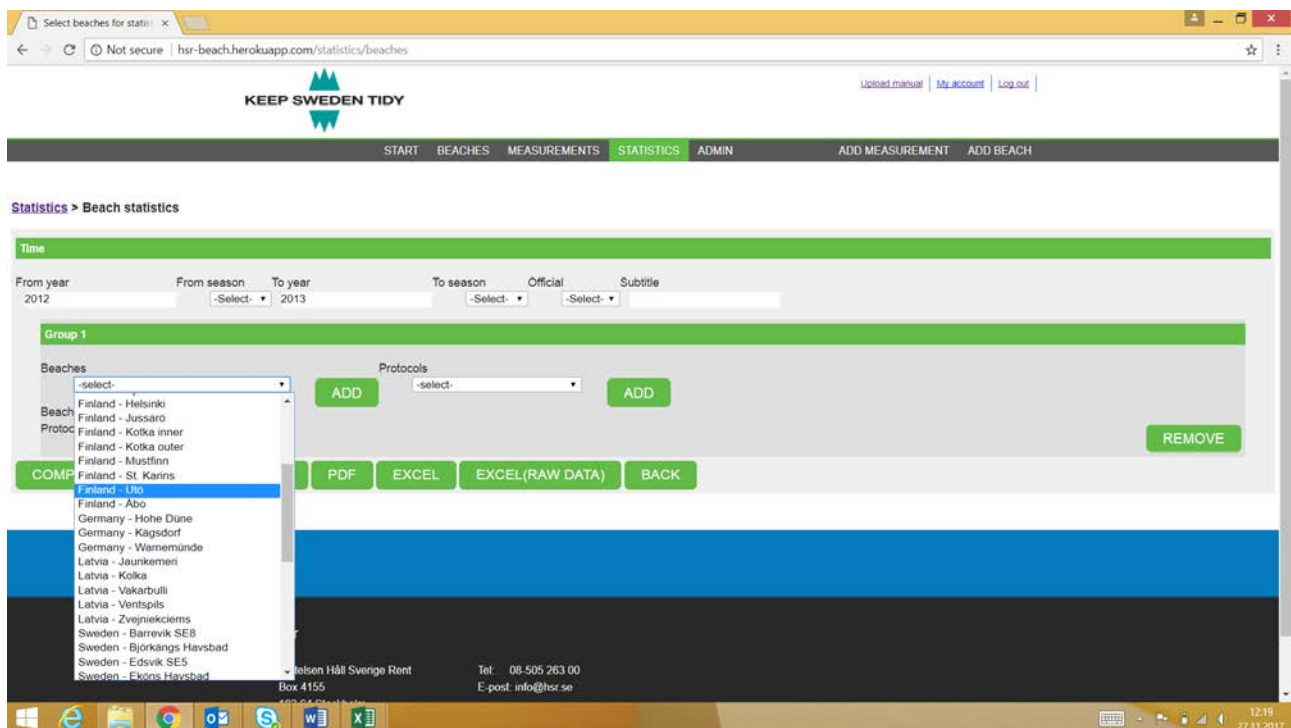


Figure 25. Statistics, litter data, beach search filters

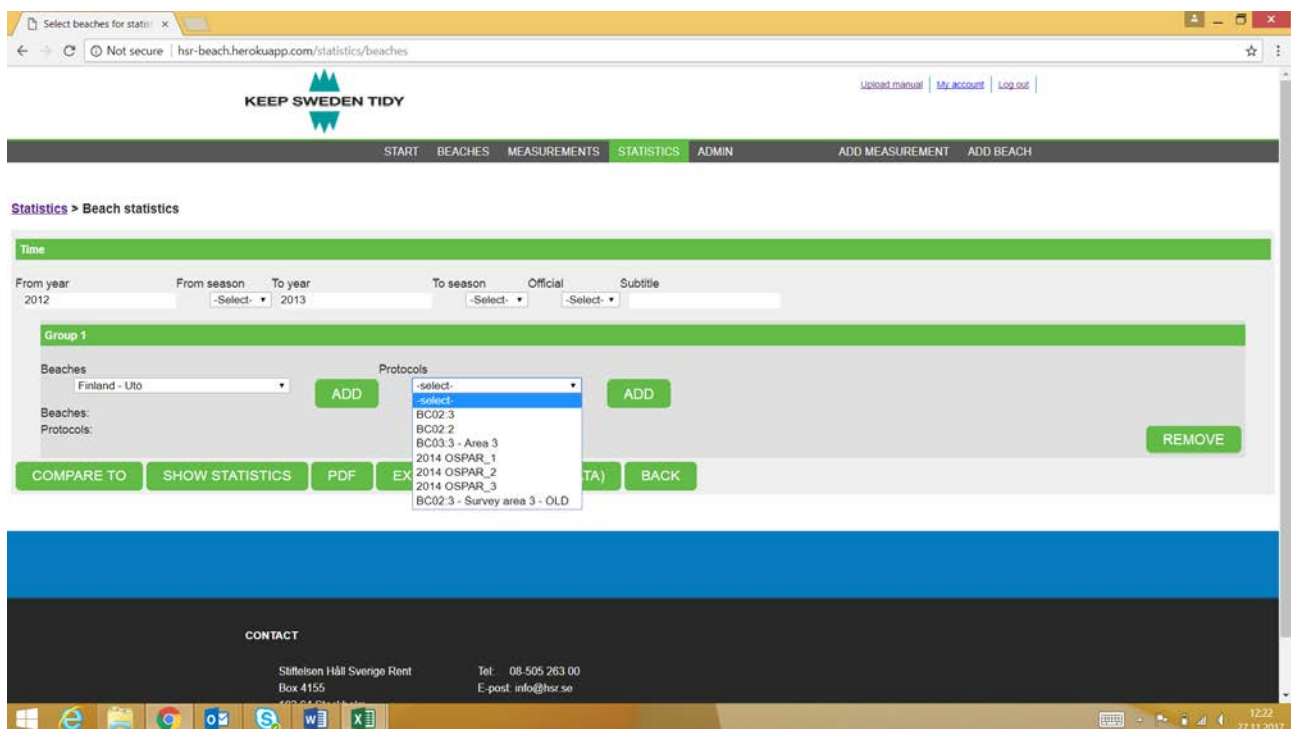


Figure 26. Statistics, litter data, beach search filters

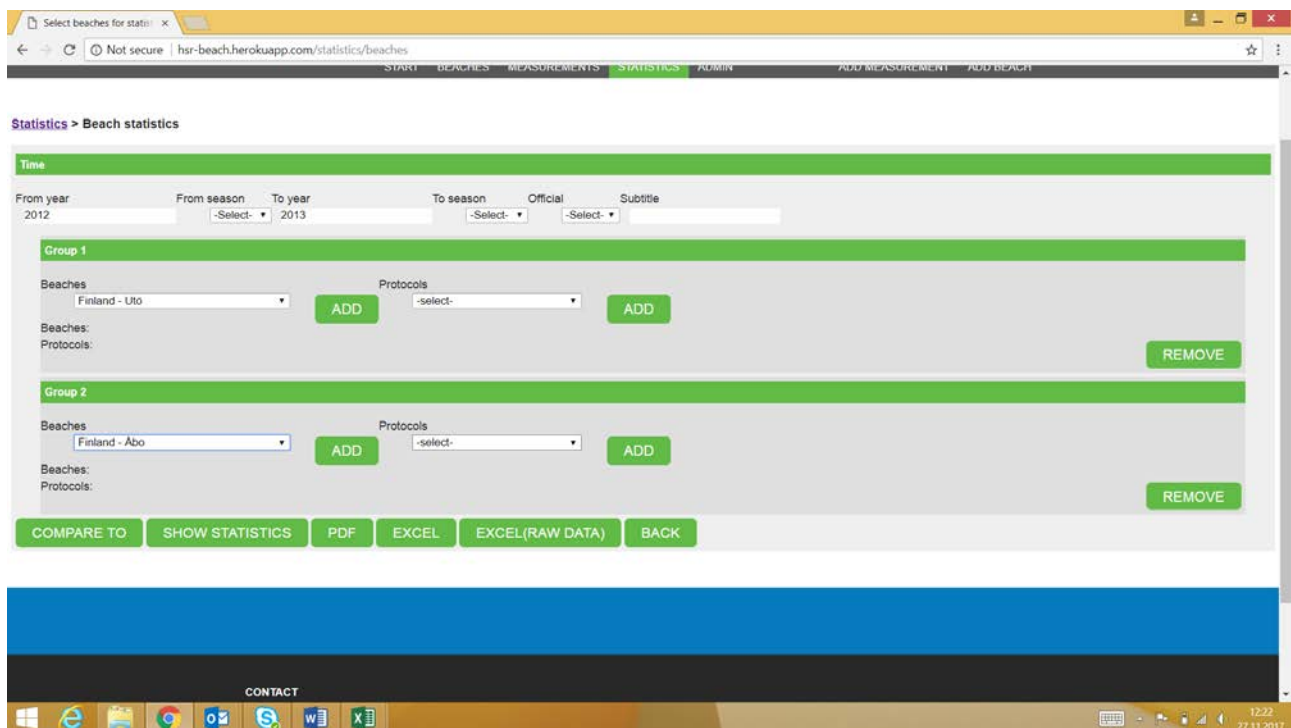


Figure 27. Statistics, litter data, beach search filters, comparison view

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 possible filters are presented in Figure 28 – Figure 31.

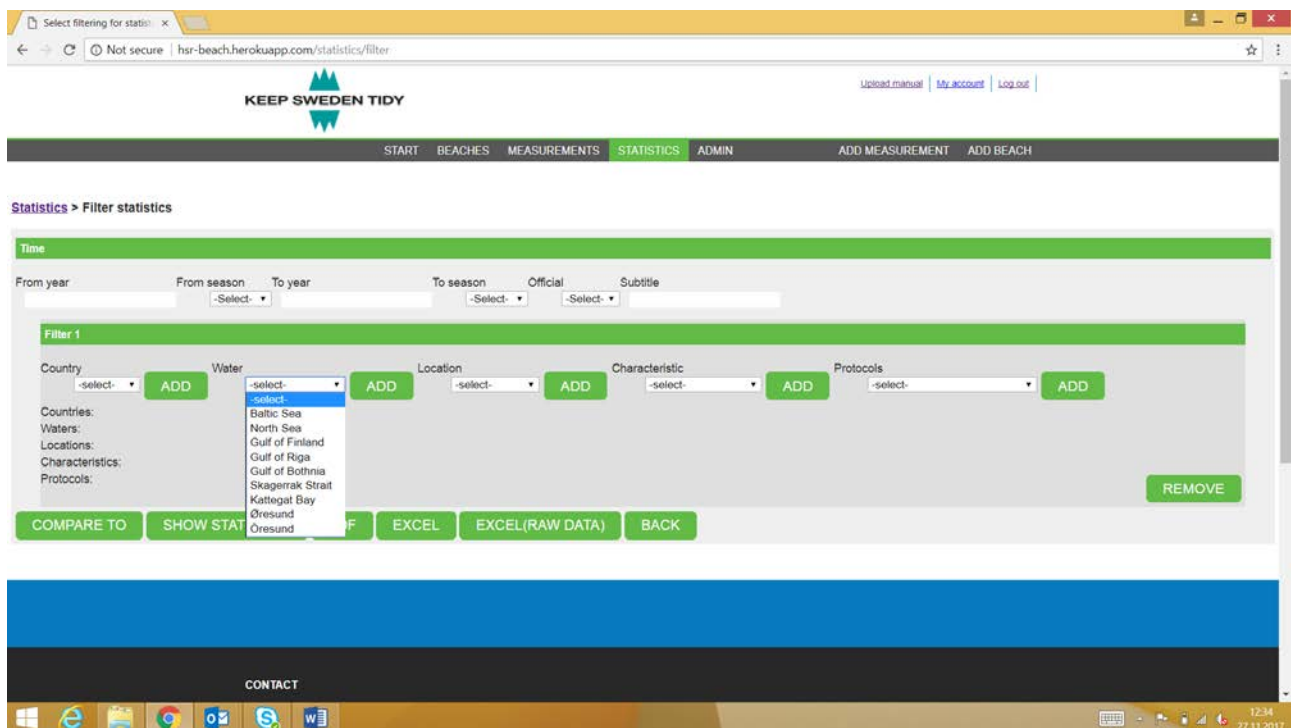


Figure 28. Statistics, litter data, different search filters

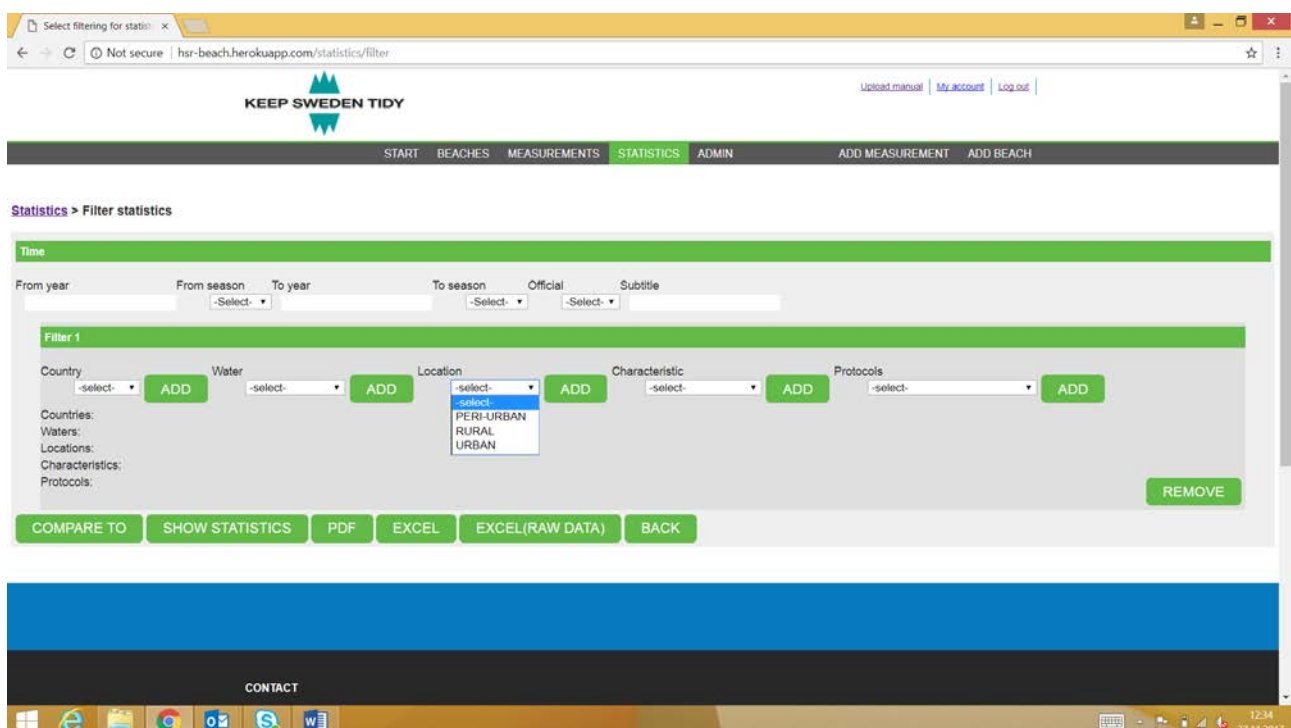


Figure 29. Statistics, litter data, different search filters

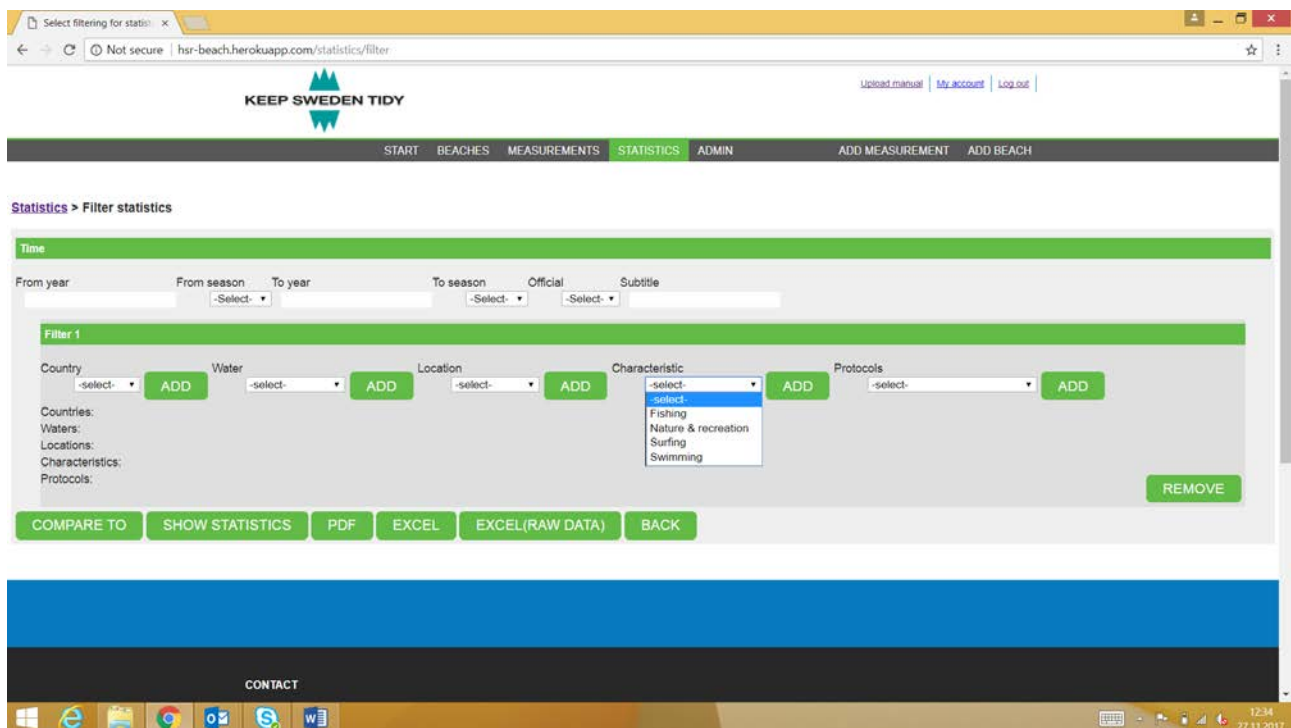


Figure 30. Statistics, litter data, different search filters

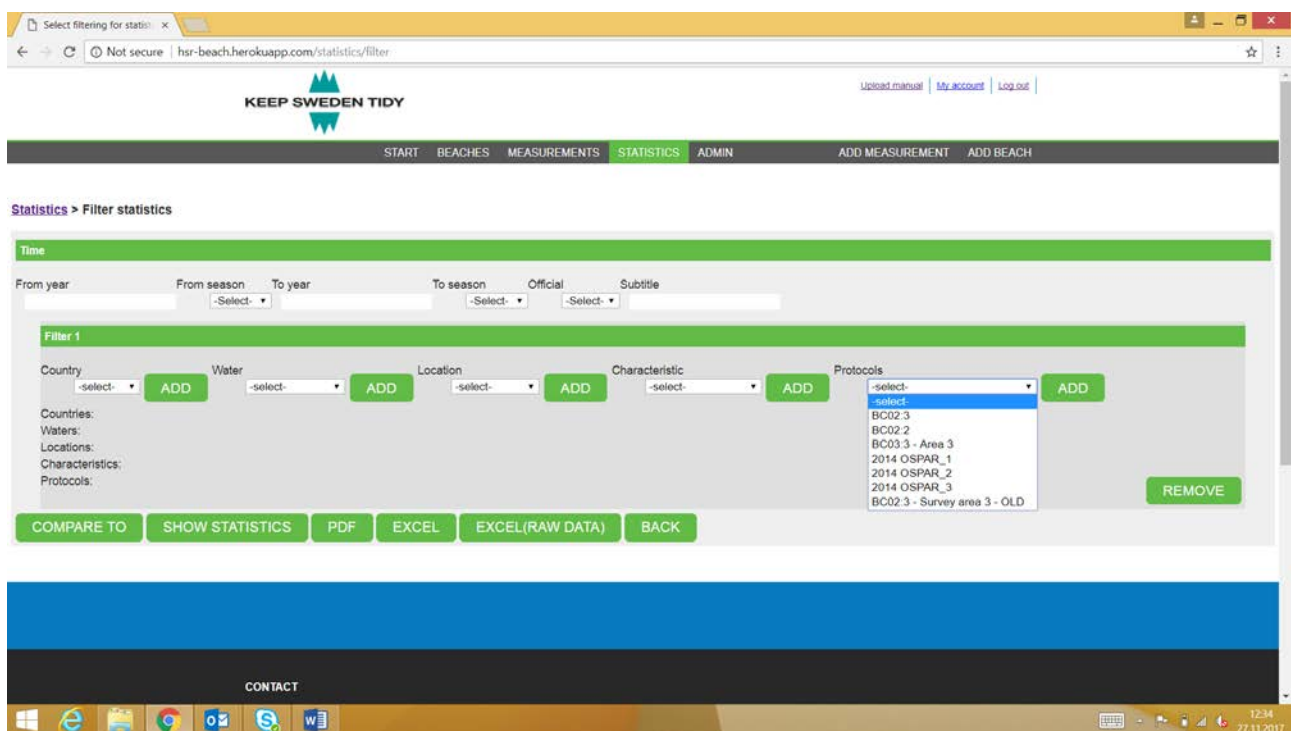


Figure 31. Statistics, litter data, different search filters

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).

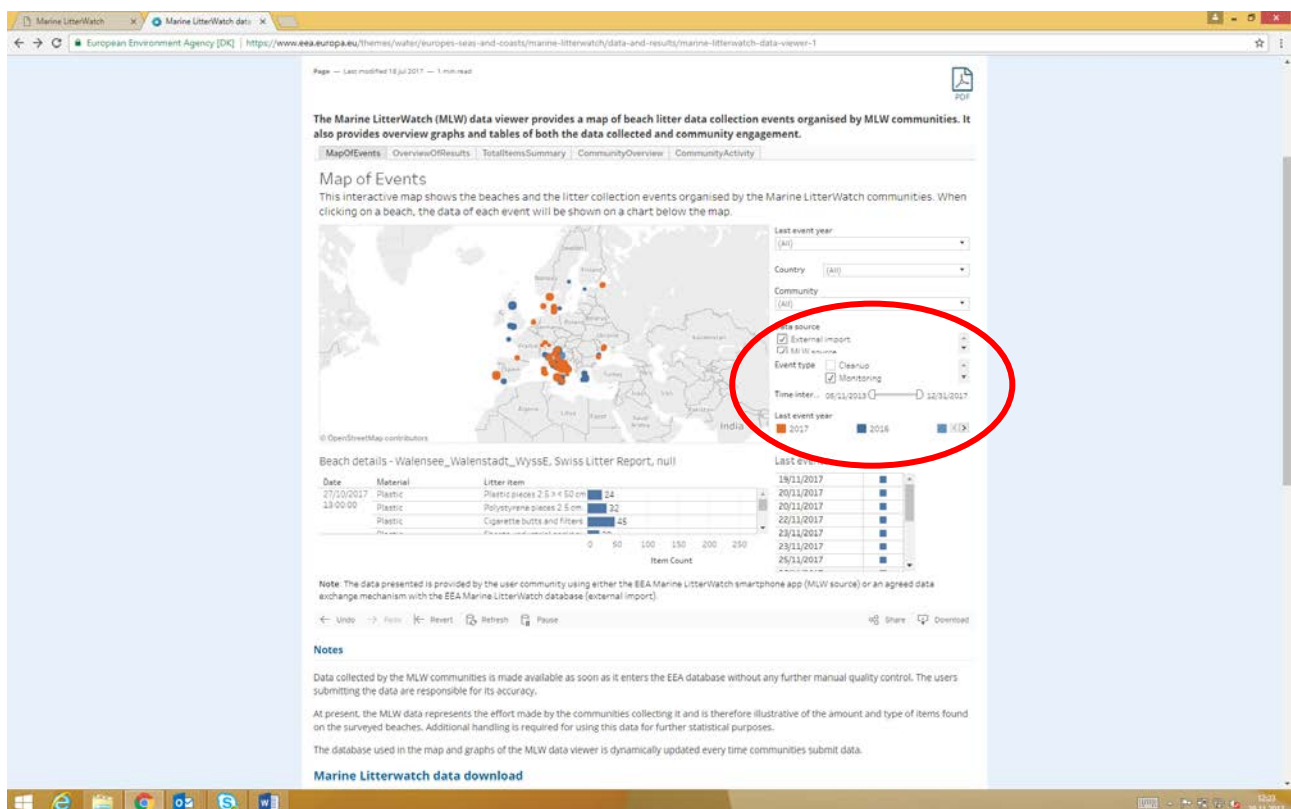


Figure 32. MLW, maps of events, statistics tool

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: <https://marinelitterwatch.discomap.eea.europa.eu/>

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.

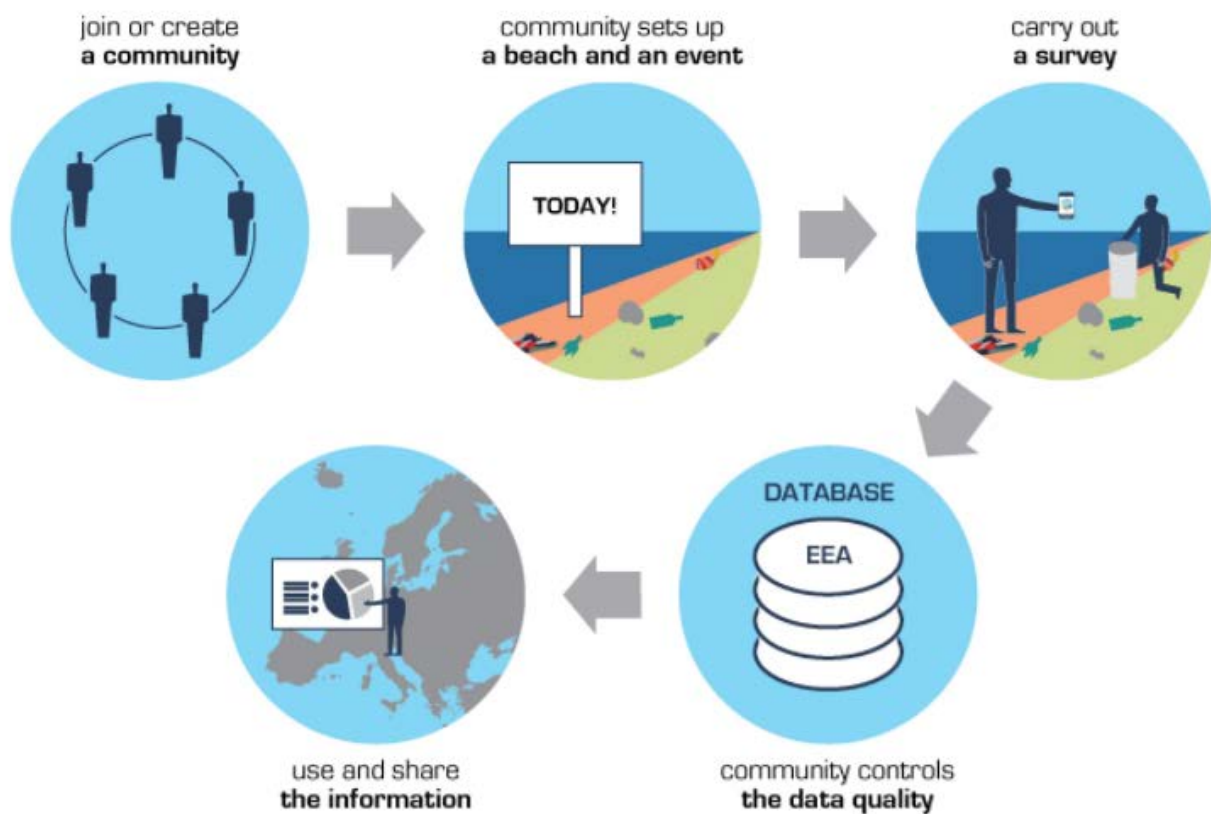


Figure 33. MLW process of collecting data into the database

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).

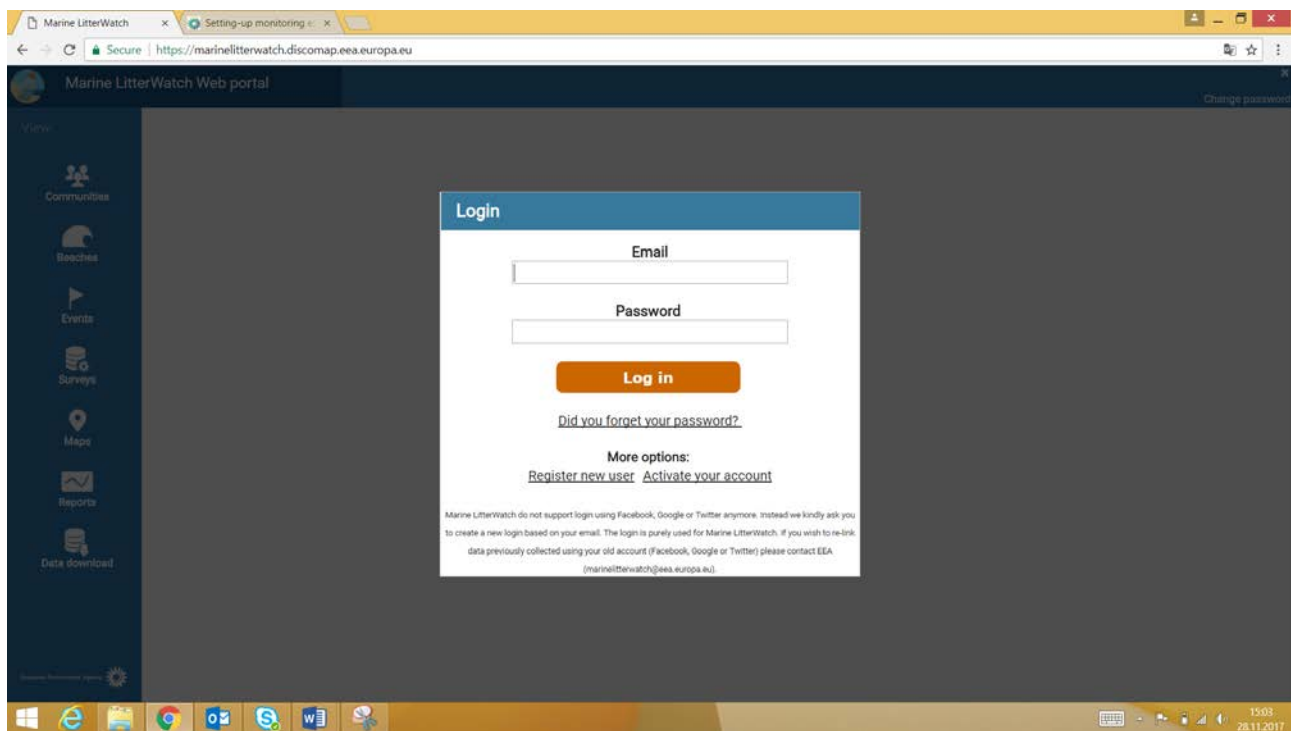


Figure 34. MLW startpage in the web interface

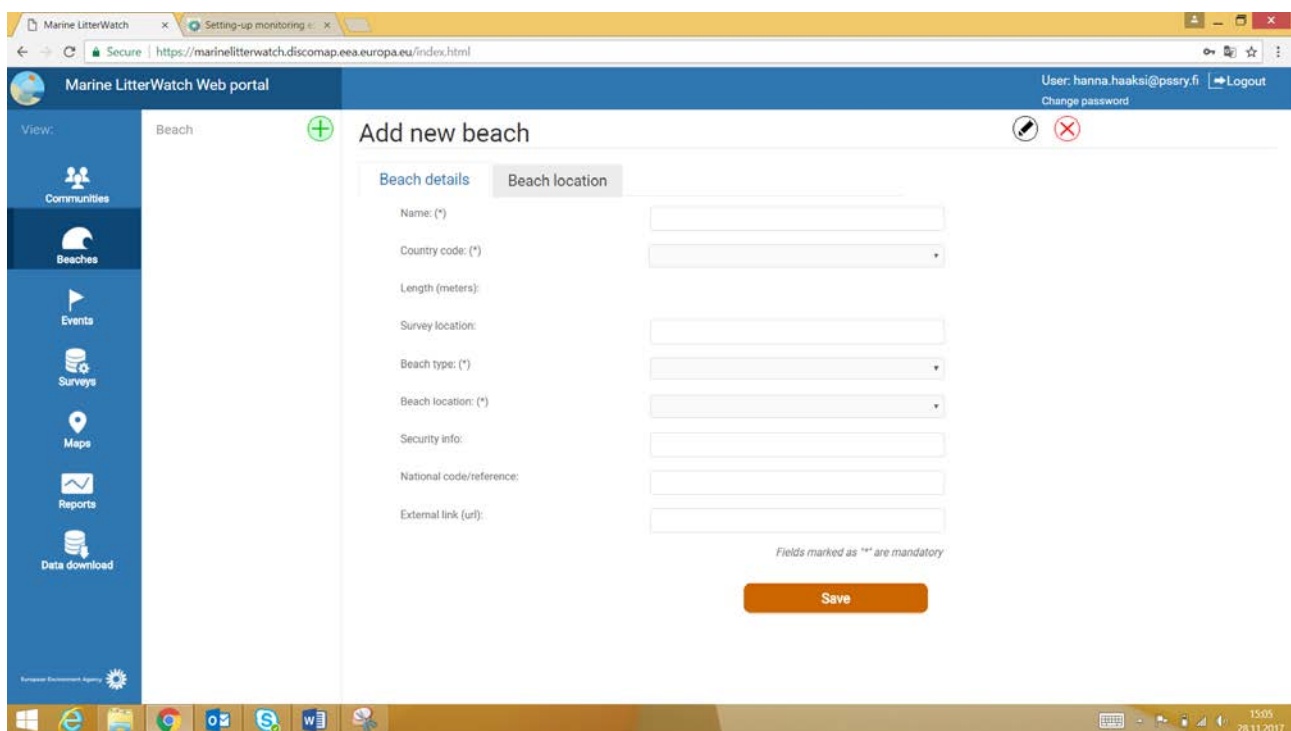


Figure 35. Adding a new beach into MLW in web interface

Marine LitterWatch Web portal

User: hanna.haaksi@psry.fi Logout
Change password

View: Beach

Add new beach

Beach details | Beach location

Name (*) Salmis

Country code (*) Finland

Length (meters):

Survey location:

Beach type (*)

Beach location (*)

Security info:

National code/reference:

External link (url):

Fields marked as "*" are mandatory

Save

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

Marine LitterWatch Web portal

User: hanna.haaksi@psry.fi Logout
Change password

View: Beach

Add new beach

Beach details | Beach location

Name (*) Salmis

Country code (*) Finland

Length (meters):

Survey location:

Beach type (*)

Beach location (*)

Security info:

National code/reference:

External link (url):

Fields marked as "*" are mandatory

Save

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

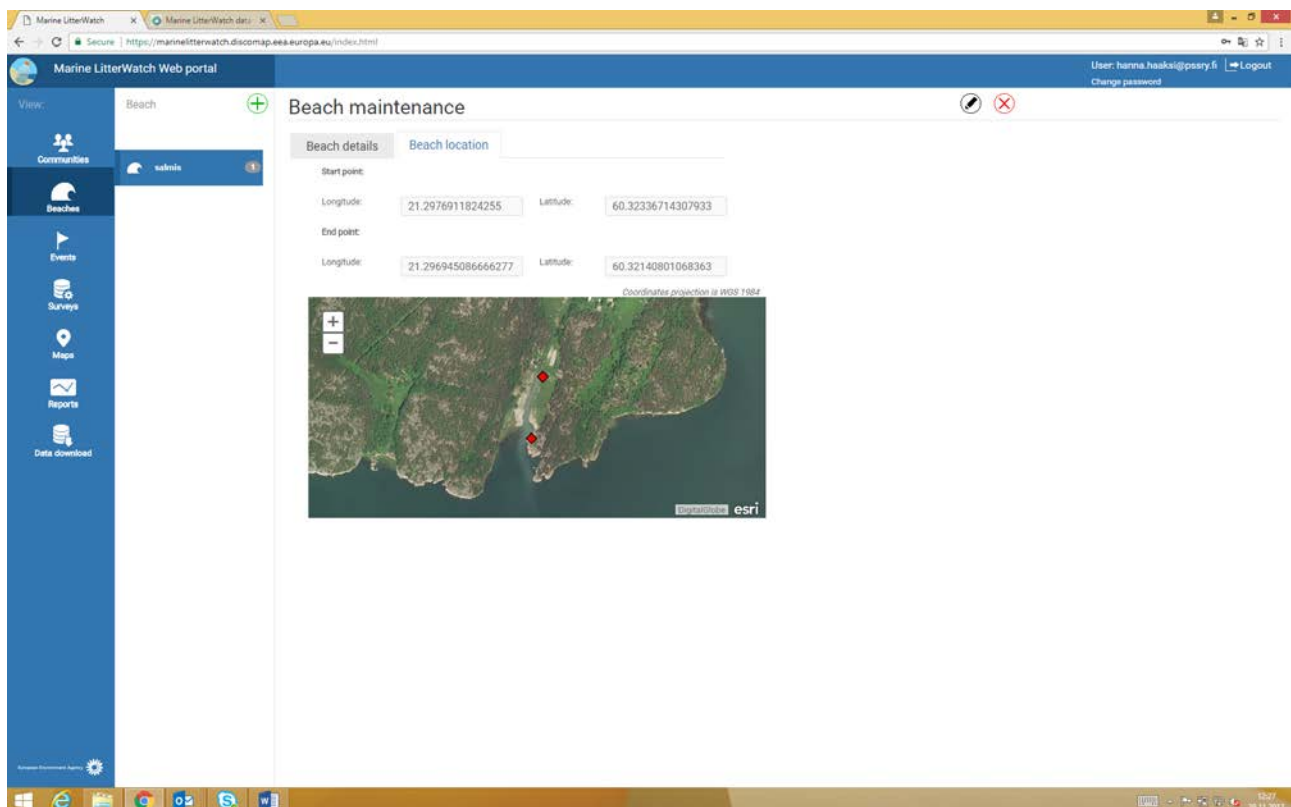


Figure 38. Adding a new beach into MLW in web interface

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).

The screenshot shows the 'Add new event' form in the Marine LitterWatch Web portal. The left sidebar contains navigation links: View, Communities, Beaches, Events (selected), Surveys, Maps, Reports, and Data download. The main content area is titled 'Add new event' and includes the following fields:

- Beach: (*) dropdown menu with 'salmis' selected.
- Start date: (*) date picker set to '2017-11-28'.
- End date: date picker set to '--/--'.
- Release date: empty text field.
- Visibility: radio buttons for 'Public' and 'Private'.
- Event type: radio buttons for 'Clean-up' (selected) and 'Monitoring'.
- Additional information: empty text area.
- Number of people attended: empty text field.
- Event summary: empty text area.

A 'Save' button is located at the bottom right of the form. The top right of the page shows the user 'hanna.haaksi@psry.fi' and a 'Logout' link. The bottom of the screen shows a Windows taskbar with various application icons and a system clock displaying '15:56' on '28.11.2017'.

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

The screenshot shows the 'Events details' page in the Marine LitterWatch Web portal. The left sidebar is identical to Figure 39, with 'Events' selected. The main content area is titled 'Events details' and displays the following information:

- Event code: TCMCW
- Beach: (*) dropdown menu with 'salmis' selected.
- Start date: (*) date picker set to '2017-11-28' and time set to '16:39'.
- End date: date picker set to '--/--'.
- Release date: empty text field.
- Visibility: radio buttons for 'Public' and 'Private'.
- Event type: radio buttons for 'Clean-up' (selected) and 'Monitoring'.
- Additional information: empty text area.
- Number of people attended: empty text field.
- Event summary: empty text area.

The top right of the page shows the user 'hanna.haaksi@psry.fi' and a 'Logout' link. The bottom of the screen shows a Windows taskbar with various application icons and a system clock displaying '16:05' on '28.11.2017'.

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

The screenshot displays the Marine LitterWatch mobile application interface. The top navigation bar is blue with a back arrow, the text 'Marine LitterWatch', and icons for adding items, searching, and a menu. Below the navigation bar, there are two tabs: 'Event details' (selected) and 'Survey details'. The 'Event details' section on the left lists the following information: Code: TCMCW, Event name: salmis 2017-11-28, Community: salmis, Beach: salmis, Start Date: 2017-11-28 16:39, End Date: (empty), Visibility: Private, Event information: (empty), Number of People Attended: 0, and Event (empty). At the bottom of this section is an orange 'Start survey' button. The 'Survey details' section on the right is titled 'PLASTIC' in a red header. It contains a list of litter items with corresponding photos and counts. The items are: G3 Shopping Bags (0), G4 Small plastic bags, e.g. freezer bags (0), G7 Drink bottles (0), G8 Drink bottles >0.5l (0), and G10 Food containers incl. fast food containers (0). Each item has a minus button, a count field, and a plus button. At the bottom of the survey section are three orange buttons: 'Save', 'Submit', and 'Submit'.

Code: TCMCW

Event name: salmis 2017-11-28

Community: salmis

Beach: salmis

Start Date: 2017-11-28 16:39

End Date:

Visibility: Private

Event information:

Number of People Attended: 0

Event

Start survey

Survey details

PLASTIC

G3 Shopping Bags 0

G4 Small plastic bags, e.g. freezer bags 0

G7 Drink bottles 0

G8 Drink bottles >0.5l 0

G10 Food containers incl. fast food containers 0

G21

Save **Submit** **Submit**

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.

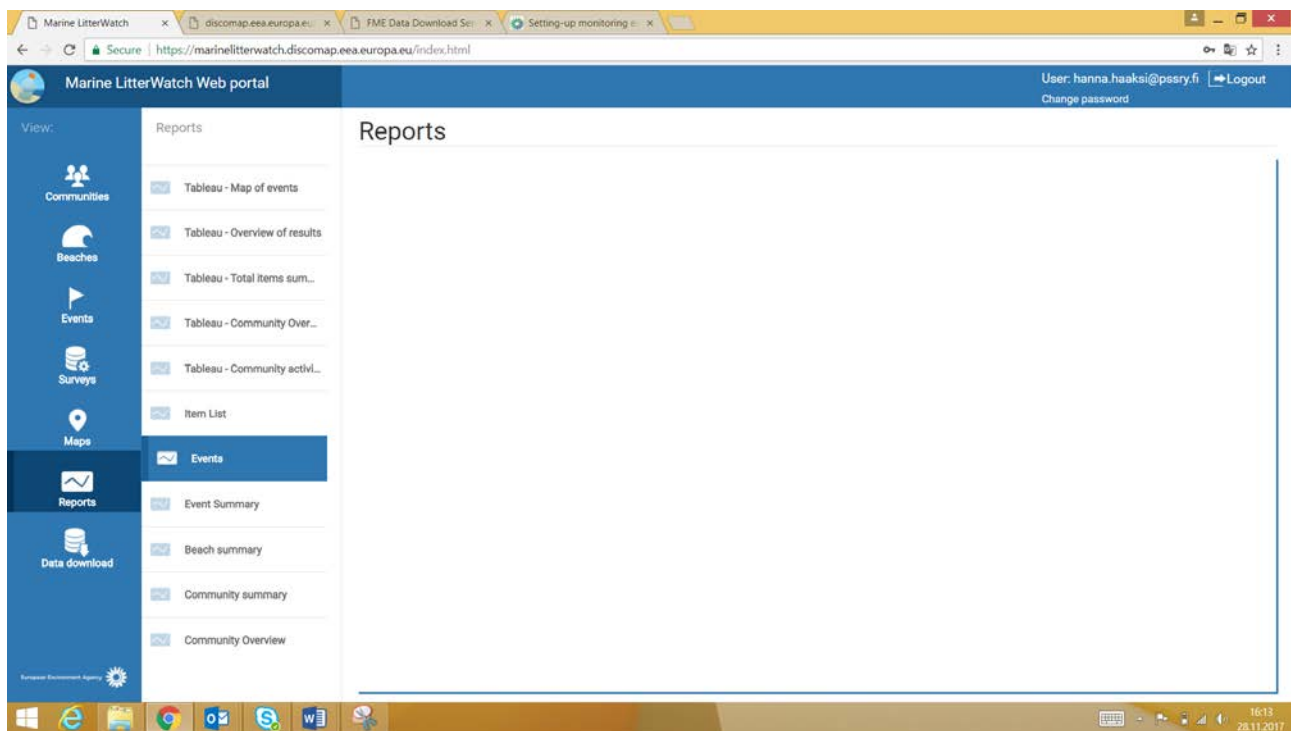


Figure 42. Studying a single survey litter report, web interface

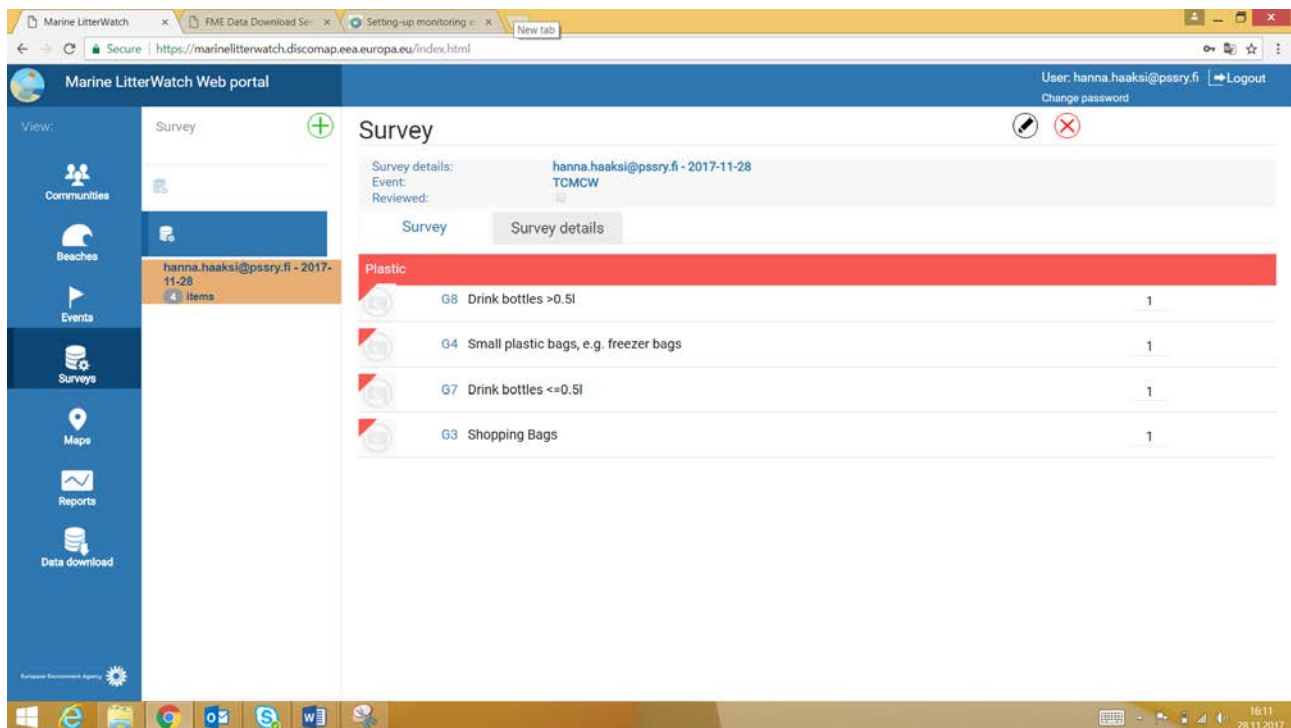


Figure 43. Studying a single survey litter report, web interface

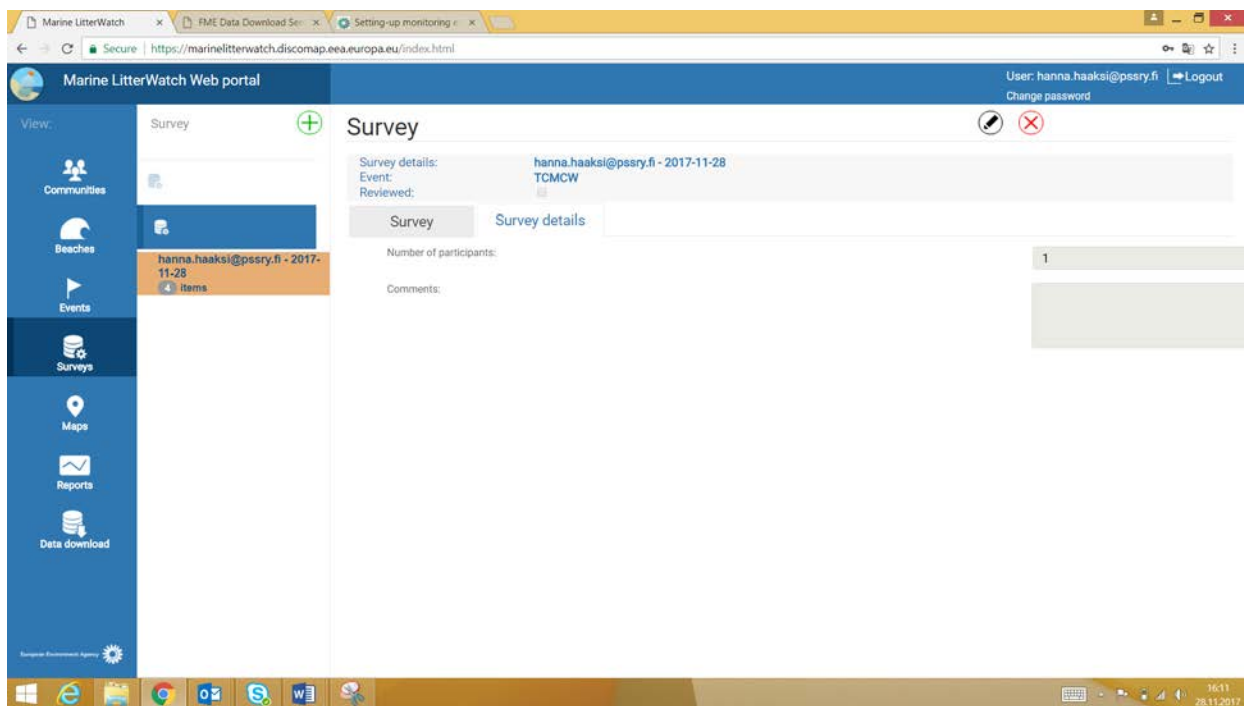


Figure 44. Studying a single survey litter report, web interface

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).

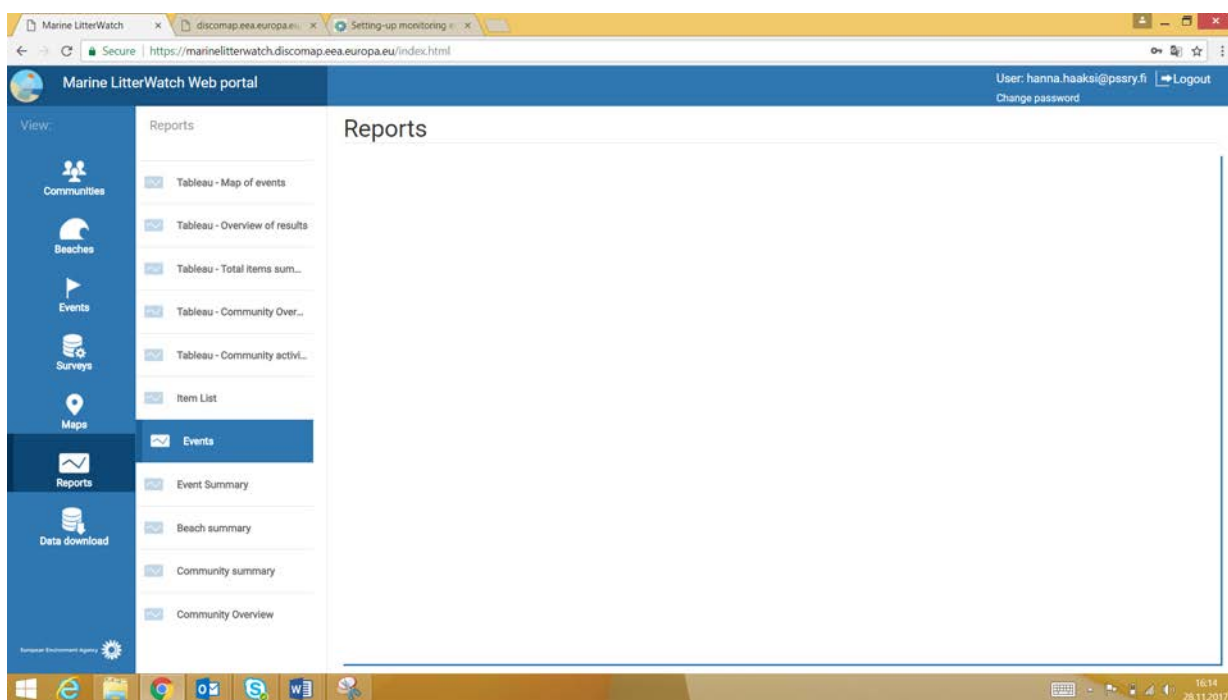


Figure 45. Litter report tools

Marine LitterWatch

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	lädéman_gland_kubela	28-11-2017 07:00	28-11-2017 07:41	Public	
VMIBS	lädéman_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	Immat_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_schoenenbergerf	26-11-2017 10:15		Private	3
BWFSG	Sense_Torshaus_g-cubes	25-11-2017 09:00		Private	60
MTGGL	test	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_domatens_foppa_f	23-11-2017 12:25	23-11-2017 12:50	Private	26
FLSQK	Immat_zuerich_suterd&glauserp	23-11-2017 11:00	23-11-2017 11:10	Public	10
HZVUO	langete_langenthal_geiserp	22-11-2017 14:00	22-11-2017 14:30	Private	22
XOKDQ	SpotX	21-11-2017 23:00		Private	
CCGEY	zurichsee_wollishofen_langendorfm	20-11-2017 12:00	20-11-2017 13:32	Public	

Figure 46. Litter report, list of events

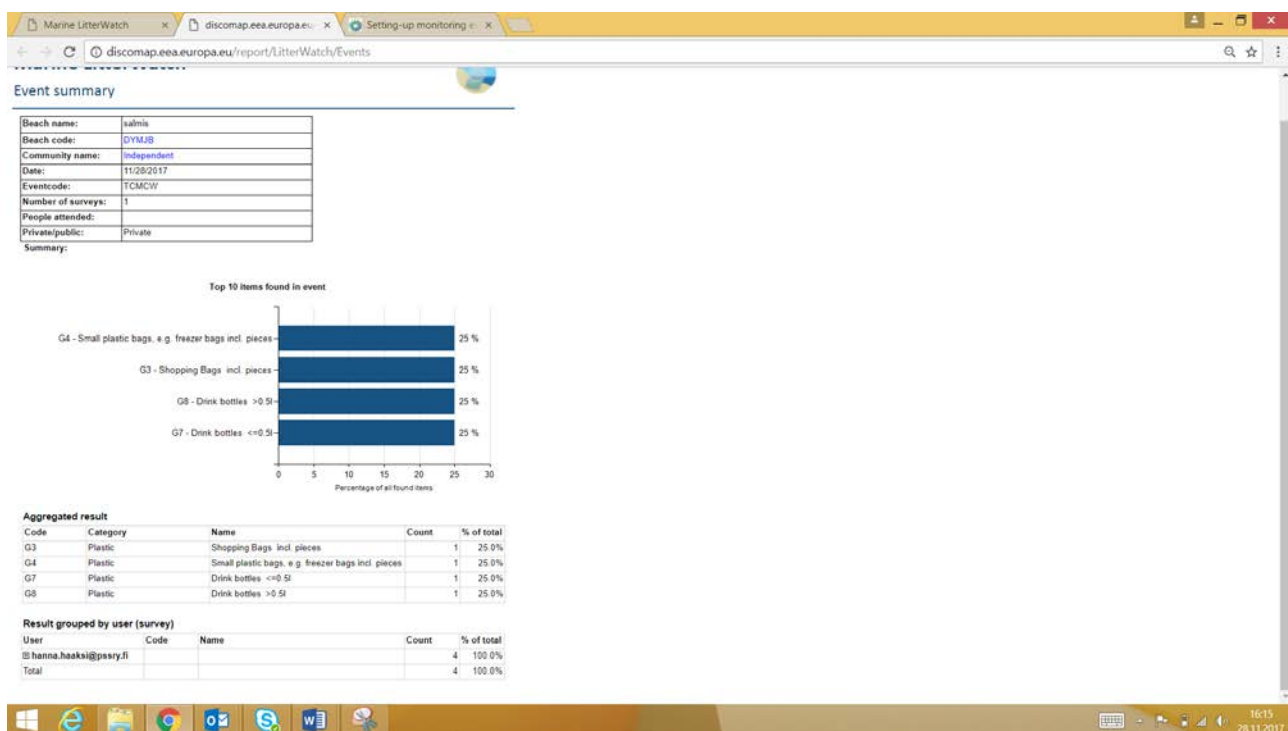


Figure 47. Litter report, web browser view

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: <https://www.mcsuk.org/ospar/>. 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.

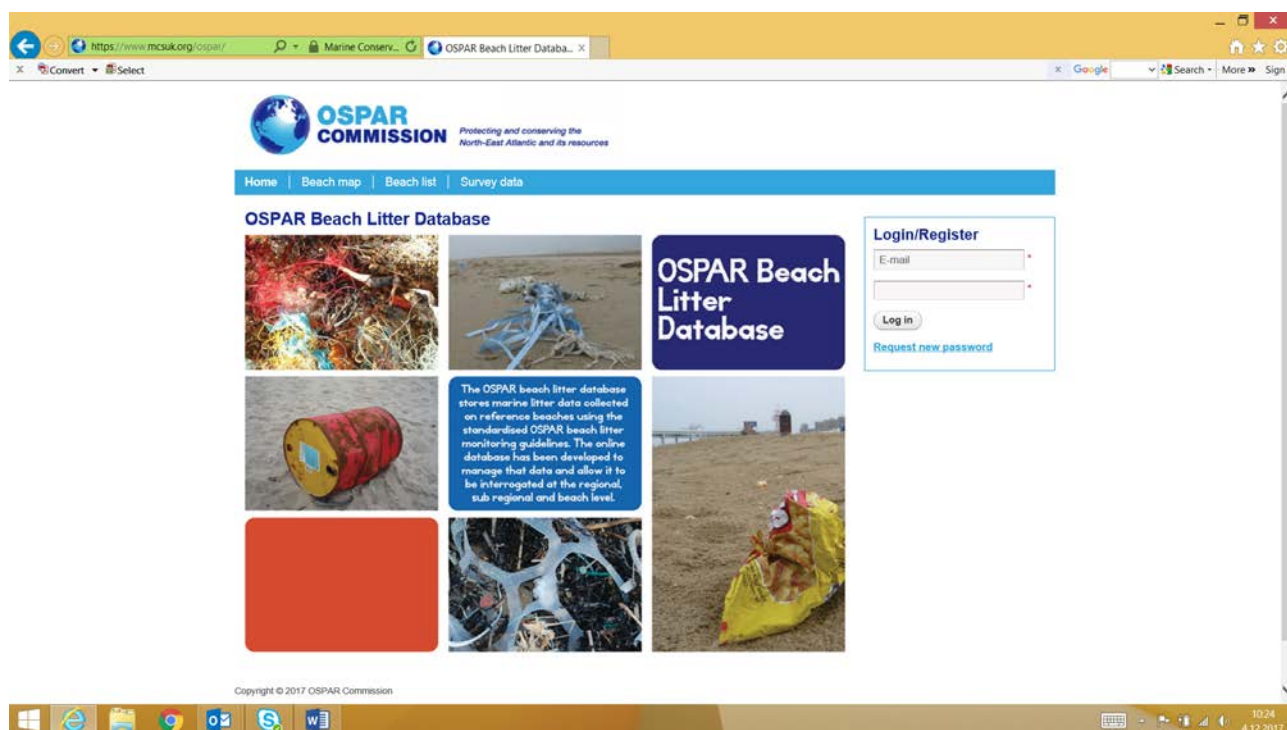


Figure 48. Start page of OSPAR database web application

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

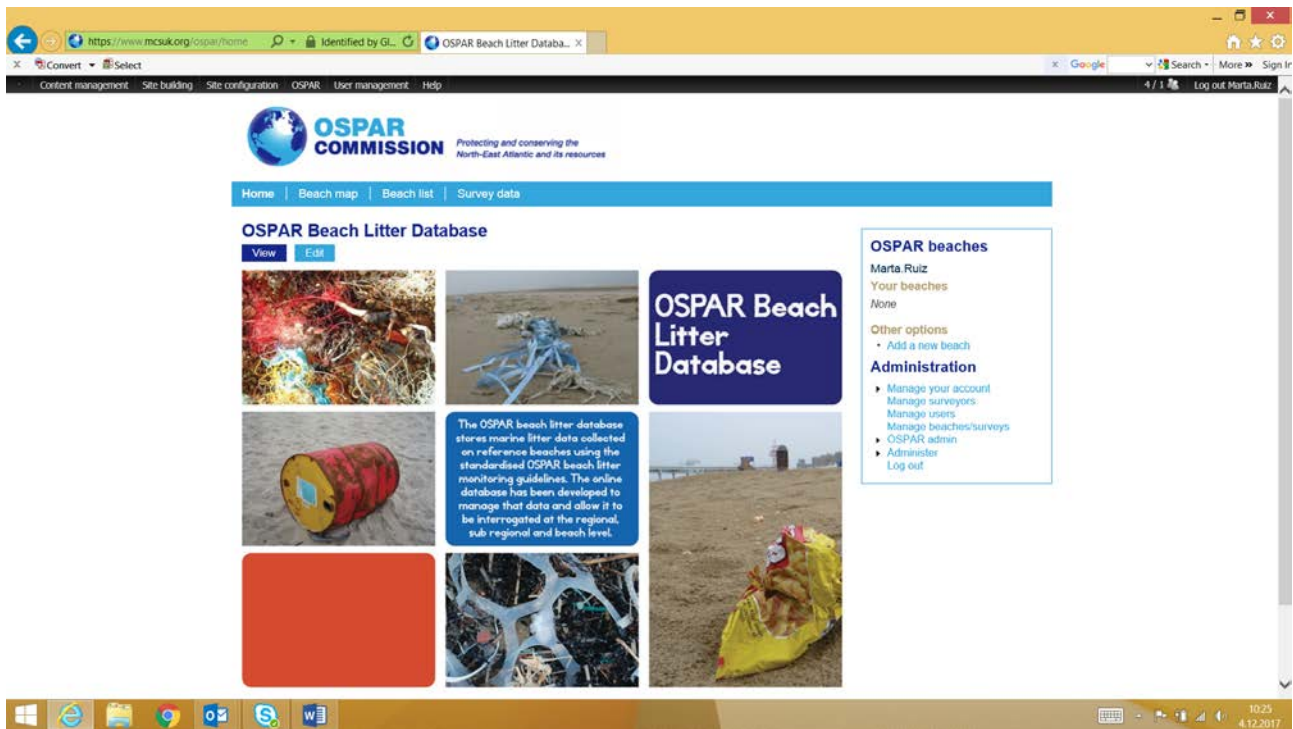


Figure 49. Start page of the OSPAR database web application when logged in as a user

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).

OSPAR COMMISSION Protecting and conserving the North-East Atlantic and its resources

Home | Beach map | Beach list | Survey data

Survey beaches

Country: Region: Search Reset

Beach name	Latitude	Longitude
001 Oostende	51.241552777778	2.9371111111111
002 Kokopje St. André		
003 Raversijde	51.204569444444	2.8514555555556
MSFD Nymindsgab Strand	55.841508333333	8.1638027777778
MSFD Skagen Skagen Strand	57.748630555556	10.581861111111
Hyde Sands	55.836421666667	8.1654005555556
Suggan Streymor Island (FO)	61.952718055556	-6.7988177777778
Dagmar Island North St	81.686416666667	-17.563722222222
Henriksland - East Greenland	69.607916666667	-23.639966666667

OSPAR beaches
Marta Ruiz
Your beaches: None
Other options: Add a new beach
Administration: Manage your account, Manage surveys, Manage users, Manage beaches/surveys, OSPAR admin, Administer, Log out

Figure 50. Measurement data search

OSPAR COMMISSION Protecting and conserving the North-East Atlantic and its resources

Home | Beach map | Beach list | Survey data

Survey beaches

Country: Region: Search Reset

Country	Region	ID	Beach name	Latitude	Longitude
Belgium	3. Southern North Sea	BE001	Kokopje St. André	51.241552777778	2.9371111111111
Belgium	3. Southern North Sea	BE002	Raversijde	51.204569444444	2.8514555555556
Belgium	3. Southern North Sea	BE003	MSFD Nymindsgab Strand	55.841508333333	8.1638027777778
Denmark (incl. the Faeroe Islands)	1. Northern North Sea	DK001	MSFD Skagen Skagen Strand	57.748630555556	10.581861111111
Denmark (incl. the Faeroe Islands)	1. Northern North Sea	DK005	Hyde Sands	55.836421666667	8.1654005555556
Denmark (incl. the Faeroe Islands)	1. Northern North Sea	FO002	Suggan Streymor Island (FO)	61.952718055556	-6.7988177777778
Denmark (incl. the Faeroe Islands)	0. Arctic Seas	GRL001	Dagmar Island North St	81.686416666667	-17.563722222222
Denmark (incl. the Faeroe Islands)	0. Arctic Seas	GRL002	Henriksland - East Greenland	69.607916666667	-23.639966666667

OSPAR beaches
Marta Ruiz
Your beaches: None
Other options: Add a new beach
Administration: Manage your account, Manage surveys, Manage users, Manage beaches/surveys, OSPAR admin, Administer, Log out

Figure 51. Measurement data search

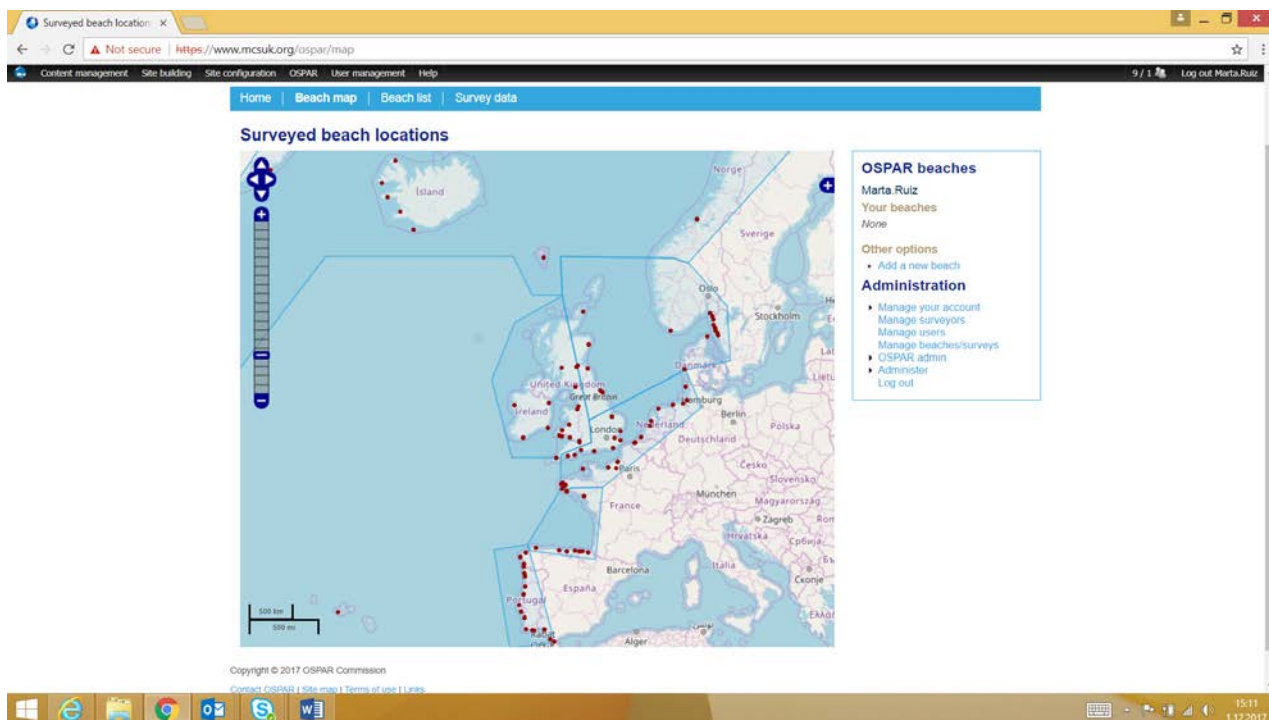


Figure 52. Measurement data search, map tool

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 [Earth Point tool](#) provided by Google (Figure 54 – Figure 59).

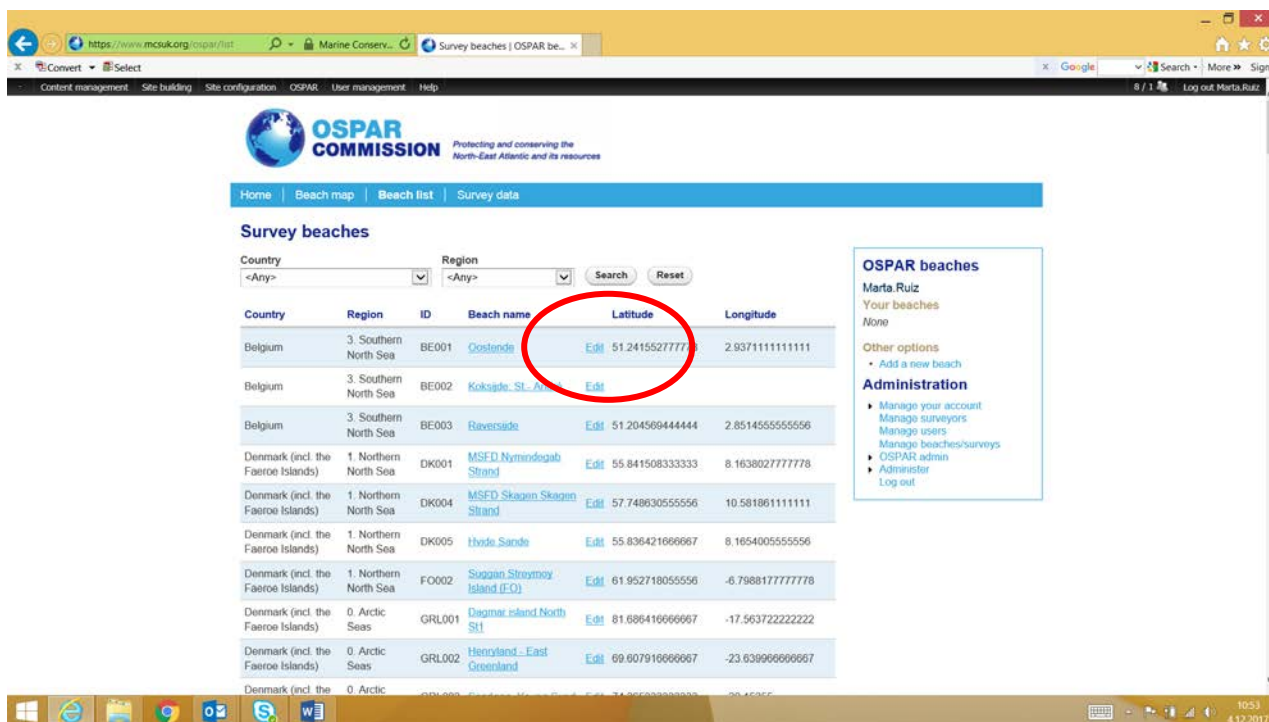


Figure 53. Beach list, edit tool

Convert Select

Content management Site building Site configuration OSPAR User management Help

OSPAR COMMISSION Protecting and conserving the North-East Atlantic and its resources

Home Beach map Beach list Survey data

Oostende

View Edit Signups

Name of beach *
Oostende

OSPAR beach ID *
BE001
e.g. ES006

Country *
Belgium

Region *
3. Southern North Sea
[View a map of the regions](#)

Summary information

Tourism: *
☒ Yes
☐ No

Cleaned: *
☒ Yes
☐ No

Litter collection: *
☐ Yes
☒ No

Beach factsheet: *

OSPAR beaches
Marta Ruiz
Options for this beach
Submit 100m survey
Submit 1km survey

Your beaches
None

Other options
Add a new beach

Administration
Manage your account
Manage surveys
Manage users
Manage beaches/surveys
OSPAR admin
Administer
Log out

1056
4.12.2017

Figure 54. Beach information

Convert Select

Content management Site building Site configuration OSPAR User management Help

OSPAR COMMISSION Protecting and conserving the North-East Atlantic and its resources

Home Beach map Beach list Survey data

Oostende

View Edit Signups

Name of beach *
Oostende

OSPAR beach ID *
BE001
e.g. ES006

Country *
Belgium

Region *
3. Southern North Sea
[View a map of the regions](#)

Summary information

Tourism: *
☒ Yes
☐ No

Cleaned: *
☒ Yes
☐ No

Litter collection: *
☐ Yes
☒ No

Beach factsheet: *

Beach geography

back of beach

beach

sea

100 m

1000 m

Beach width at mean low spring tide
(1) 300 m

Beach width at mean high spring tide
(2) m

Total length of beach
(3) m

Back of beach
Dunes (4)

Prevailing currents off the beach:

1057
4.12.2017

Figure 55. Beach information

Content management Site building Site configuration OSPAR User management Help

☐ S
☐ W
 Tick one or two boxes.
 Prevailing winds:
☐ N
☐ E
☒ S
☒ W
 Tick one or two boxes.
 Direction the beach is facing when looking from the beach to the sea:
☒ N
☐ E
☐ S
☒ W
 Tick one or two boxes.

▼ Beach coordinates

All GPD coordinates must be entered in WGS84 format e.g.
 N/S: 51°14'29.59"N
 E/W: 2°56'13.60"E

[Online coordinates converter](#)

GPS coordinate 100m Start N/S 51°14'29.59"N (5)	100m Start E/W 2°56'13.60"E (5)
Must be in WGS84 format e.g. 54°47'26.68" N	
GPS coordinate 100m End N/S 51°14'31.03"N (6)	100m End E/W 2°56'17.64"E (6)
GPS coordinate 1km Start N/S 51°14'21.55"N (7)	1km Start E/W 2°55'52.31"E (7)

Figure 56. Beach information

Content management Site building Site configuration OSPAR User management Help

Manage users
 Manage beaches/surveys
 OSPAR admin
 Administer
 Log out

▼ Beach coordinates

All GPD coordinates must be entered in WGS84 format e.g.
 N/S: 51°14'29.59"N
 E/W: 2°56'13.60"E

[Online coordinates converter](#)

GPS coordinate 100m Start N/S 51°14'29.59"N (5)	100m Start E/W 2°56'13.60"E (5)
Must be in WGS84 format e.g. 54°47'26.68" N	
GPS coordinate 100m End N/S 51°14'31.03"N (6)	100m End E/W 2°56'17.64"E (6)
GPS coordinate 1km Start N/S 51°14'21.55"N (7)	1km Start E/W 2°55'52.31"E (7)
GPS coordinate 1km End N/S 51°14'38.05"N (8)	1km End E/W 2°56'36.22"E (8)

Date position measured
 16/04/2014
 Format: 04/12/2017

▼ Beach location

Island Norge Sverige

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).

The screenshot shows the OSPAR Commission website interface. The top navigation bar includes links for Home, Beach map, Beach list, and Survey data. The main content area is titled "Oostende" and features a "100m Survey data" table with columns for survey dates and a "1km Survey data" table below it. Both tables list various survey dates from 2002 to 2017. To the right, there are buttons for "Submit 100m survey" and "Submit 1km survey". Below the survey tables, there is a "Summary information" section with details about the beach ID, country, region, and tourism status. On the far right, a sidebar contains links for "OSPAR beaches", "Your beaches", and "Administration".

14 January 2017	13 October 2016	22 July 2016	23 June 2016	24 April 2016
24 January 2016	01 November 2015	11 July 2015	22 April 2015	03 February 2015
09 November 2014	23 July 2014	21 April 2014	01 February 2014	21 September 2013
30 June 2013	05 May 2013	15 December 2012	02 September 2012	01 July 2009
01 April 2009	01 January 2009	01 October 2005	01 July 2005	01 January 2005
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
01 April 2002				

14 January 2017	13 October 2016	22 July 2016	23 June 2016	24 April 2016
24 January 2016	01 November 2015	11 July 2015	22 April 2015	03 February 2015
09 November 2014	23 July 2014	21 April 2014	01 February 2014	21 September 2013
30 June 2013	05 May 2013	15 December 2012	02 September 2012	01 July 2009
01 April 2009	01 January 2009	01 October 2005	01 July 2005	01 January 2005
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
01 April 2002	01 January 2002	01 October 2001	01 July 2001	

OSPAR beach ID: BE001
Country: Belgium
Region: 3. Southern North Sea
Summary information
Tourism: Yes

Figure 58. Beach information, list of surveys conducted

The screenshot shows the OSPAR Commission website interface, specifically the "Oostende - Survey 100m 14 Jan 2017" page. The page displays the survey details, including the date of the survey (14 January 2017) and the survey summary. The "Additional information" section contains details about the weather conditions (Wind: Exceptionally high tide) and the litter collected during the survey. The "Plastic/Polystyrene" section lists various types of litter collected, such as 4/6 pack yokes, bags, plastic bag ends, drinks, cleaner, food containers, cosmetics, engine oil containers, and jerry cans.

Additional Information

Was litter collected during this survey? **No**

Did any of the following weather conditions affect the data of the surveys: **Wind** Exceptionally high tide

Did you find any stranded or dead animals? **No**

Were there any events that lead to unusual types and/or amounts of litter?
storm and high tide

Plastic/Polystyrene

4/6 pack yokes: **0**
Bags (e.g. shopping): **2**
Small plastic bags e.g. freezer bags: **0**
Plastic bag ends: **0**
Drinks (bottles, containers & drums): **1**
Cleaner (bottles, containers & drums): **1**
Food containers incl. fast food containers: **3**
Cosmetics (bottles & containers e.g. sun lotion, shampoo, shower gel, deodorant): **0**
Engine oil containers & drums < 50cm: **0**
Engine oil containers & drums > 50cm: **0**
Jerry cans (square plastic containers with handles): **0**

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=.

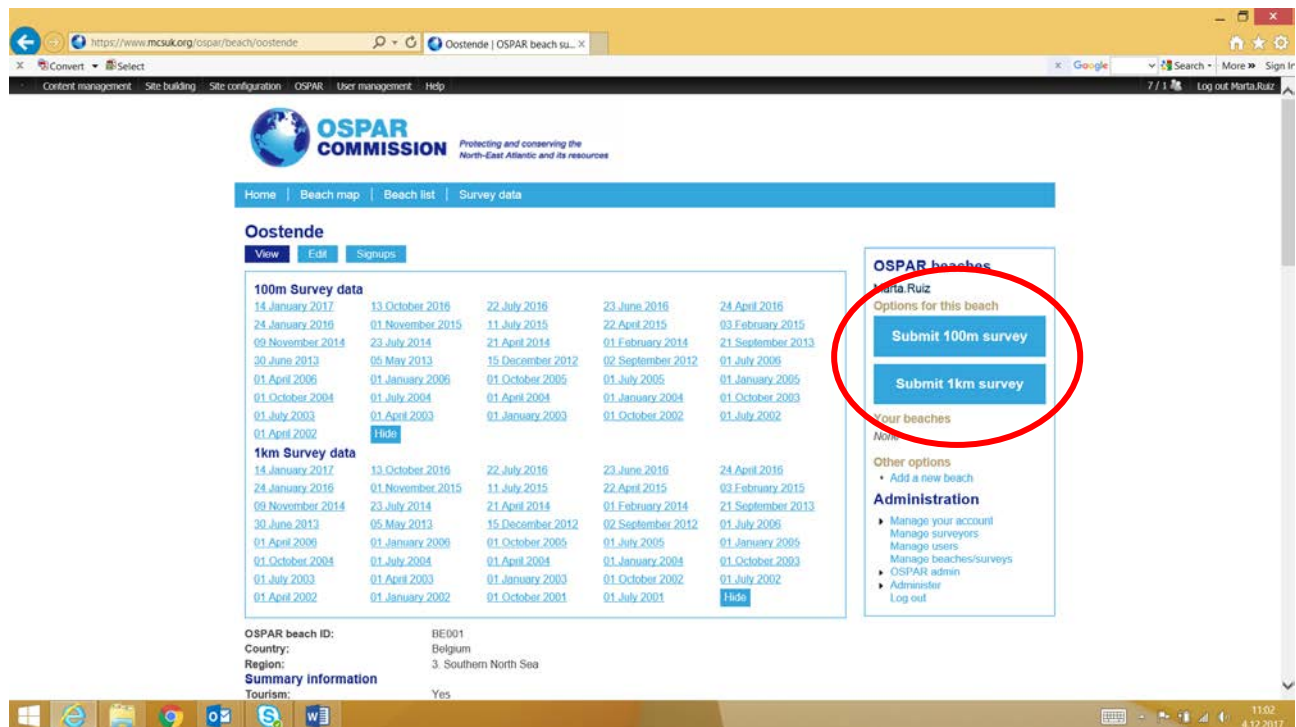


Figure 60. Collecting litter data

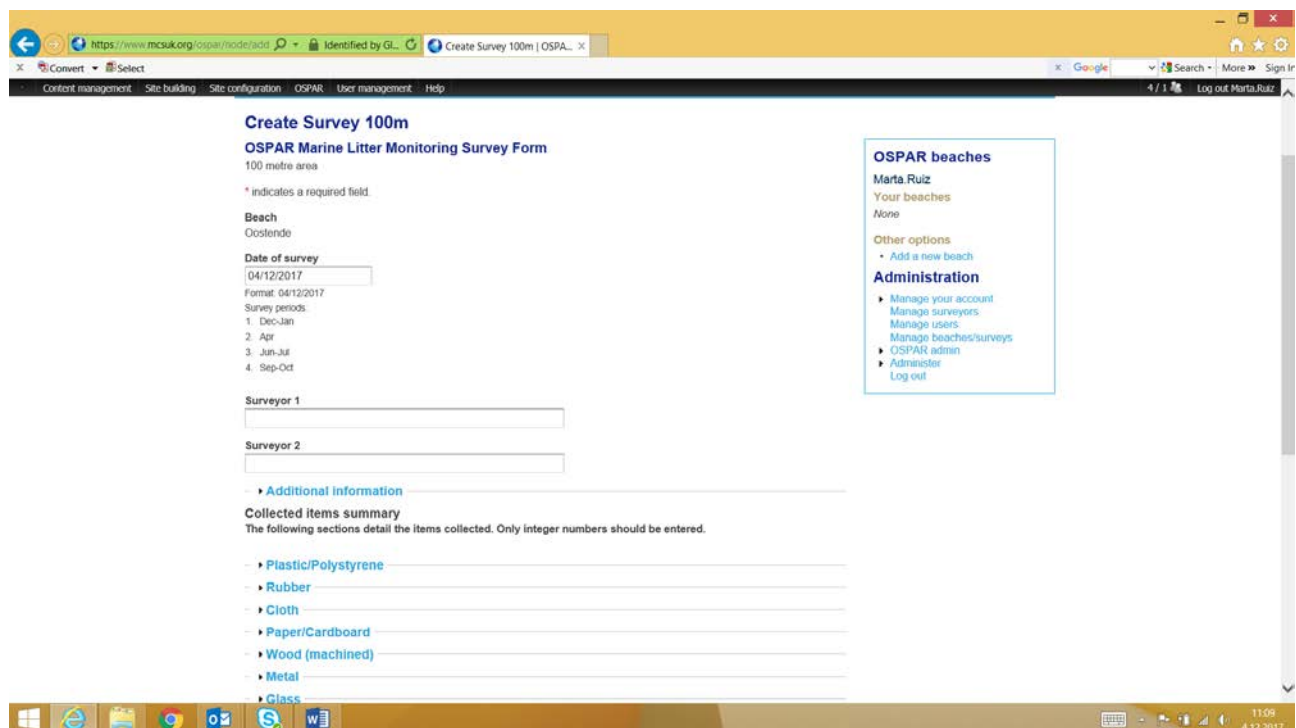


Figure 61. Collecting litter data

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
0
[OSPAR ID 76]
 - Bottle caps
0
[OSPAR ID 77]
 - Drink cans
0
[OSPAR ID 78]
 - Disposable BBQs
0
[OSPAR ID 120]
 - Electrical appliances
0
[OSPAR ID 79]
 - Fishing weights
0
[OSPAR ID 80]
 - Foil wrappers
0
[OSPAR ID 81]

Figure 62. Collecting litter data

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.

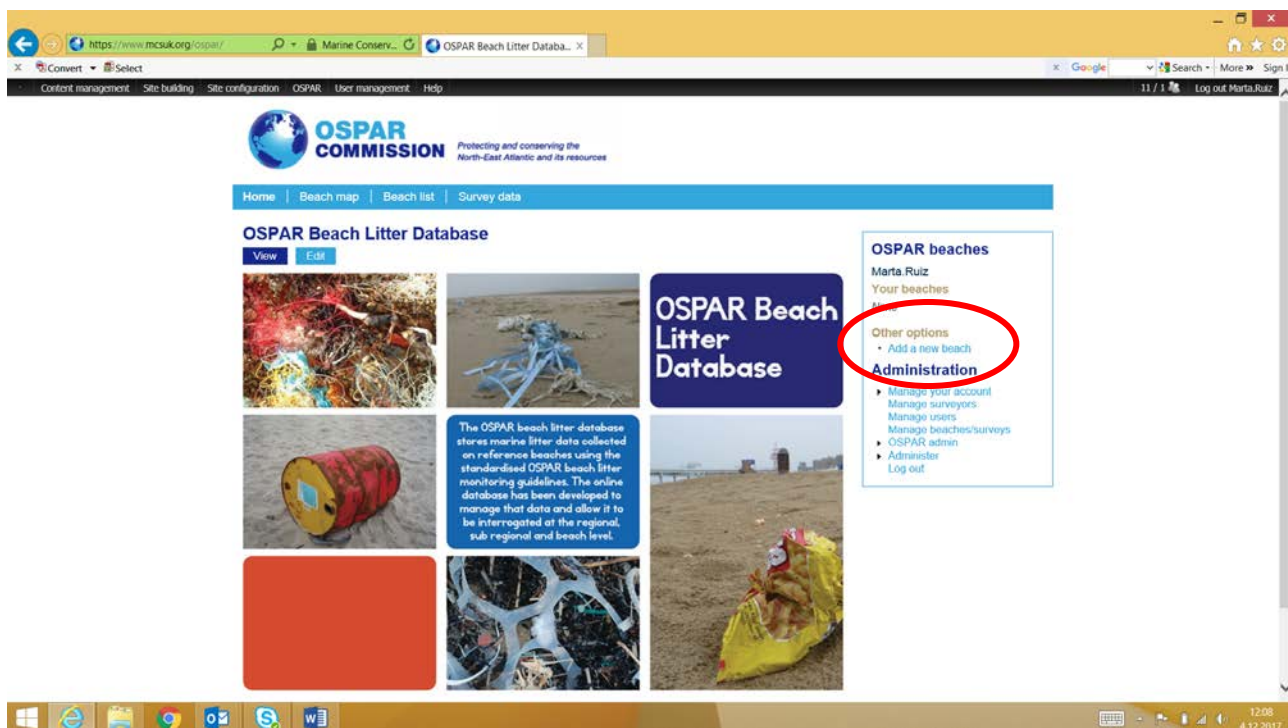


Figure 63. Creating a new monitoring beach

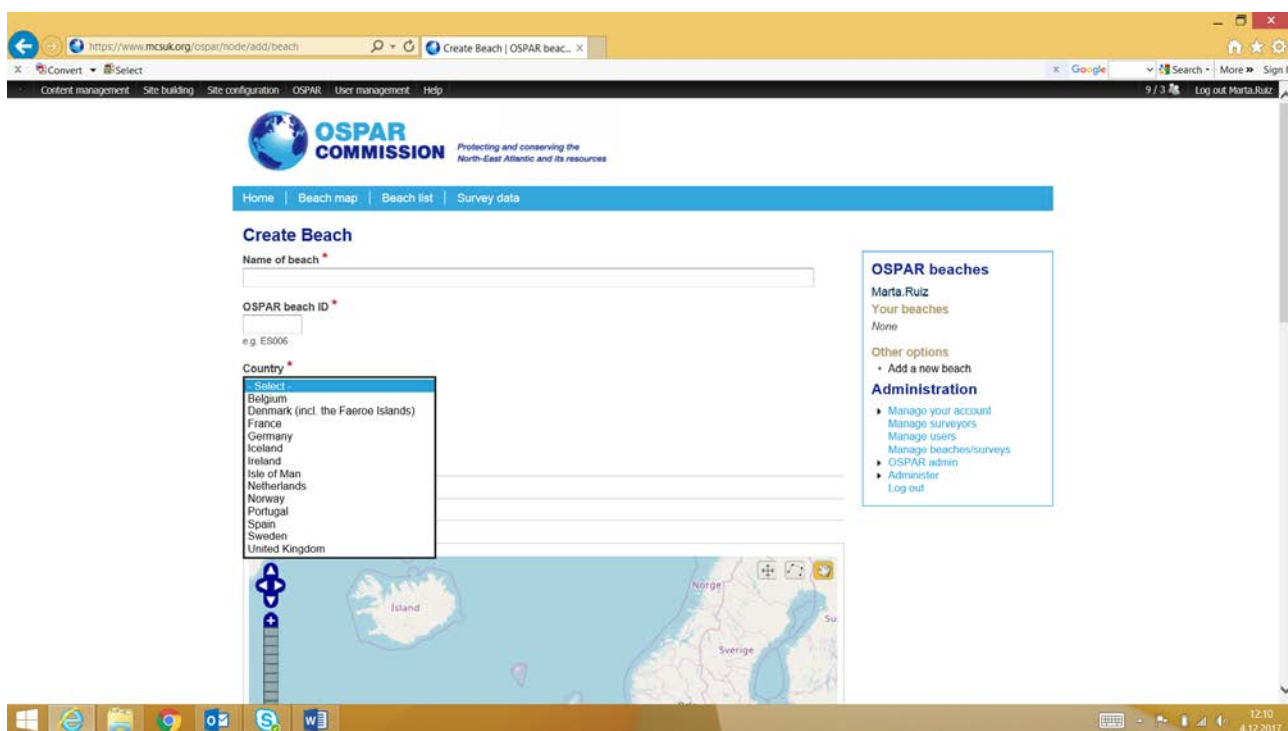


Figure 64. Creating a new monitoring beach

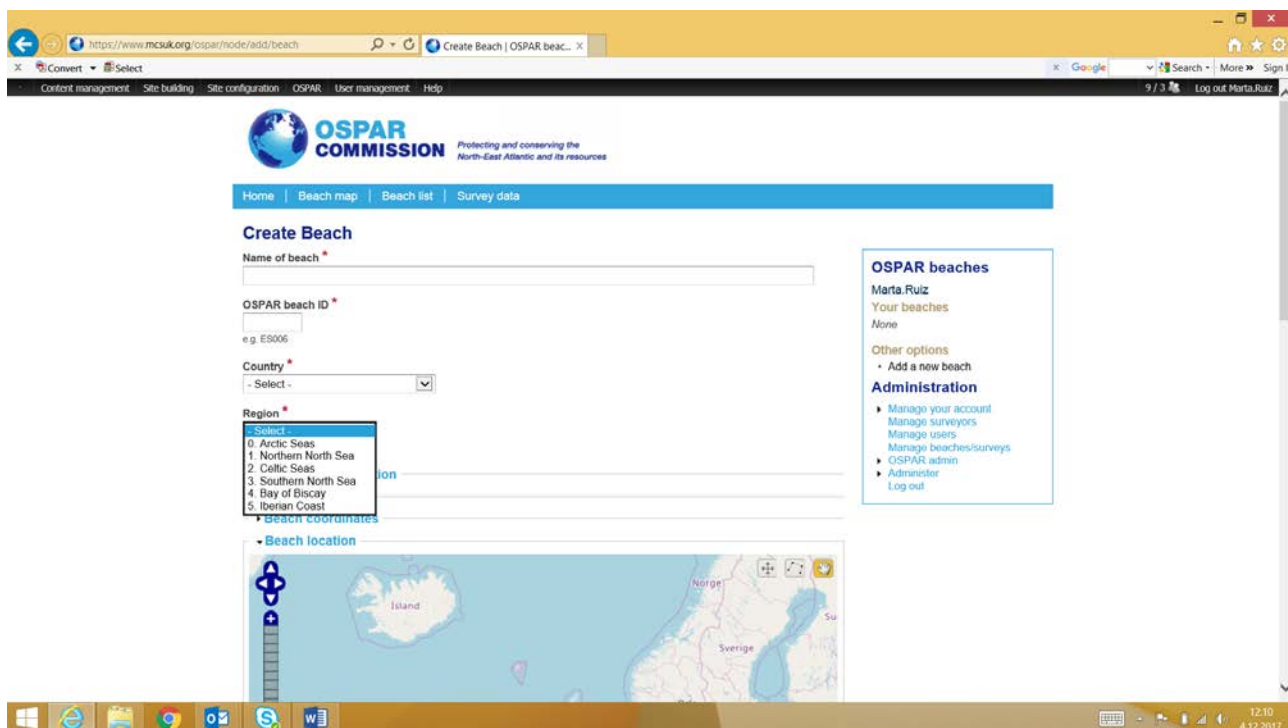


Figure 65. Creating a new monitoring beach

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.

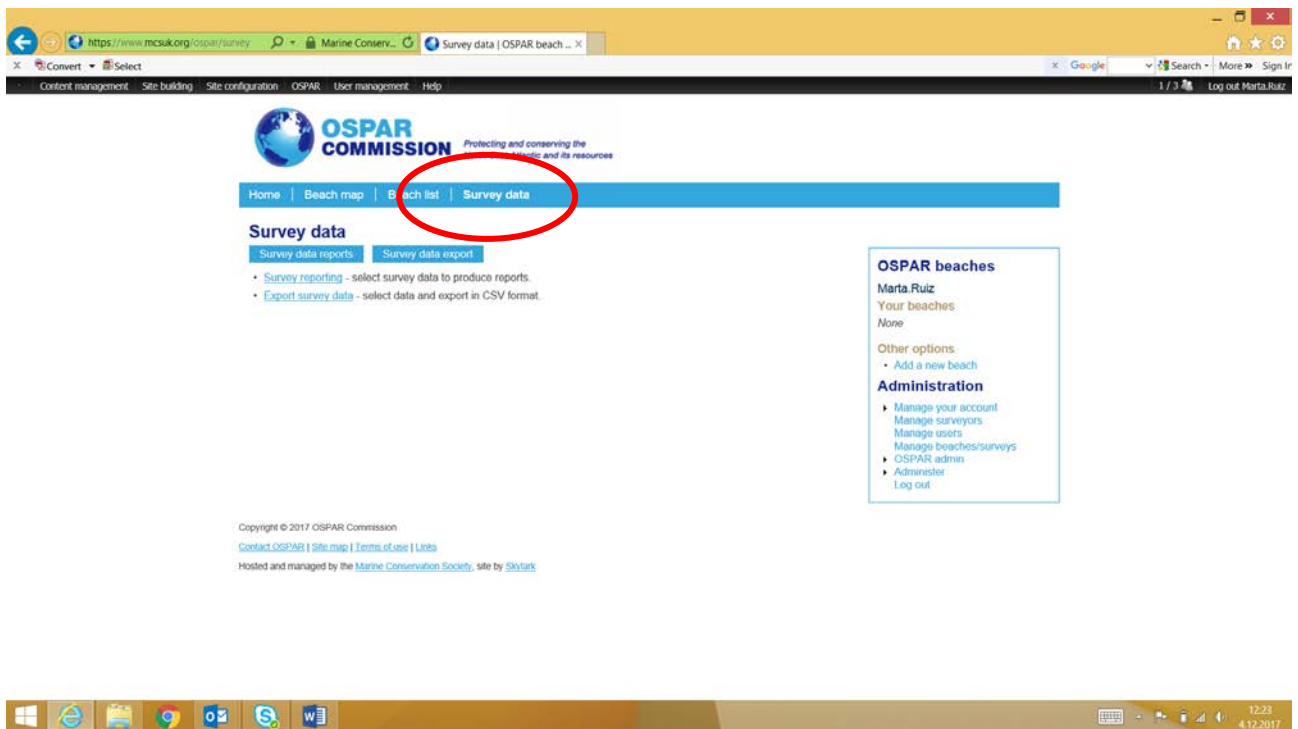


Figure 66. Studying litter data

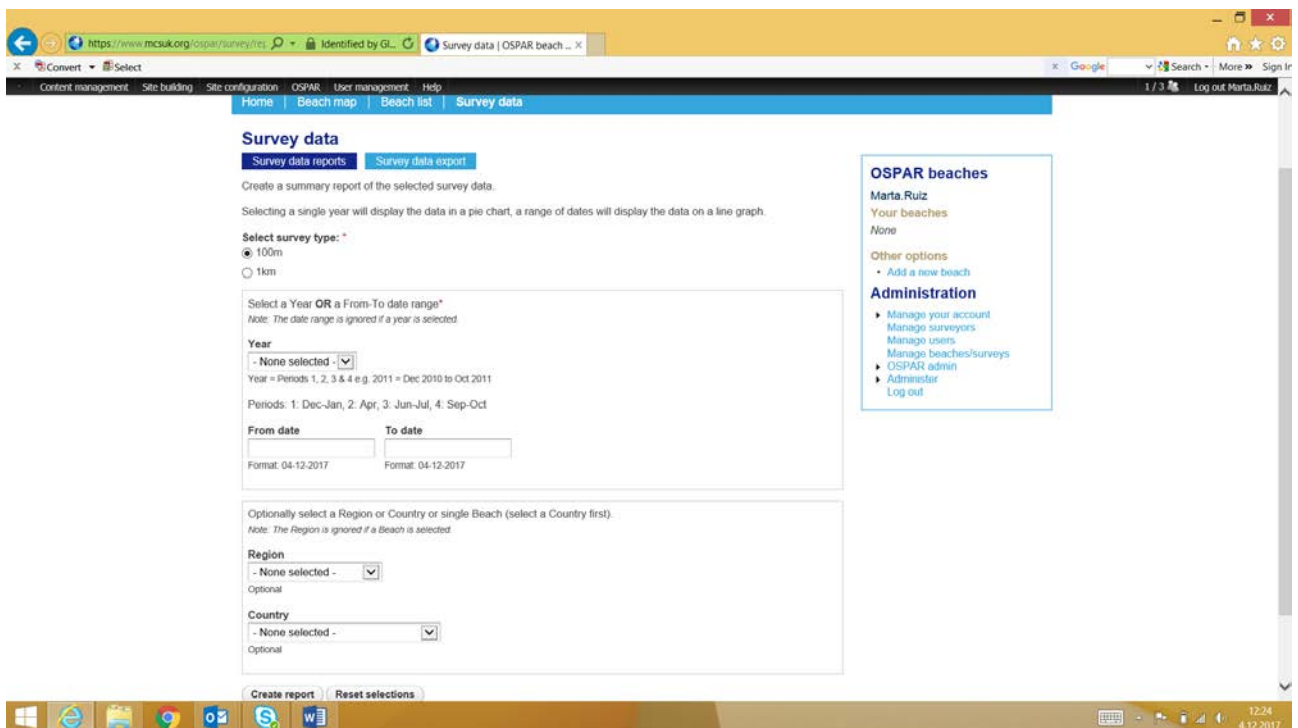


Figure 67. Studying litter data

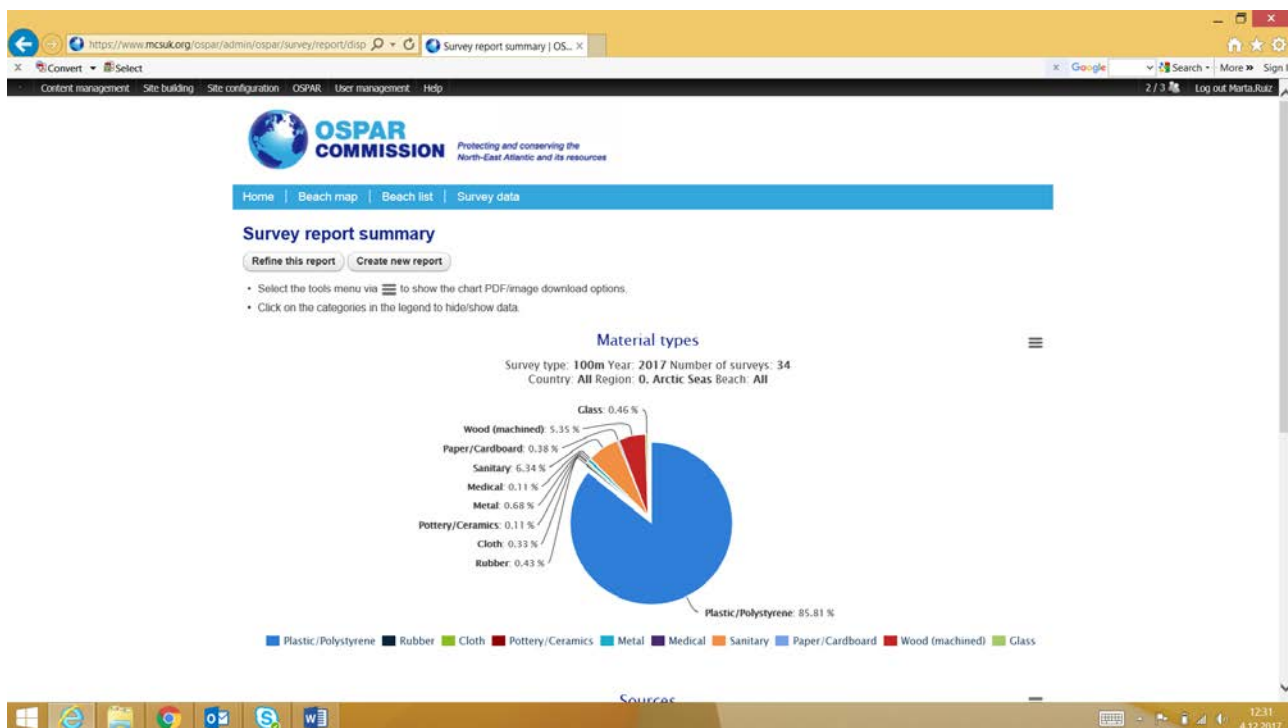


Figure 68. Litter data report

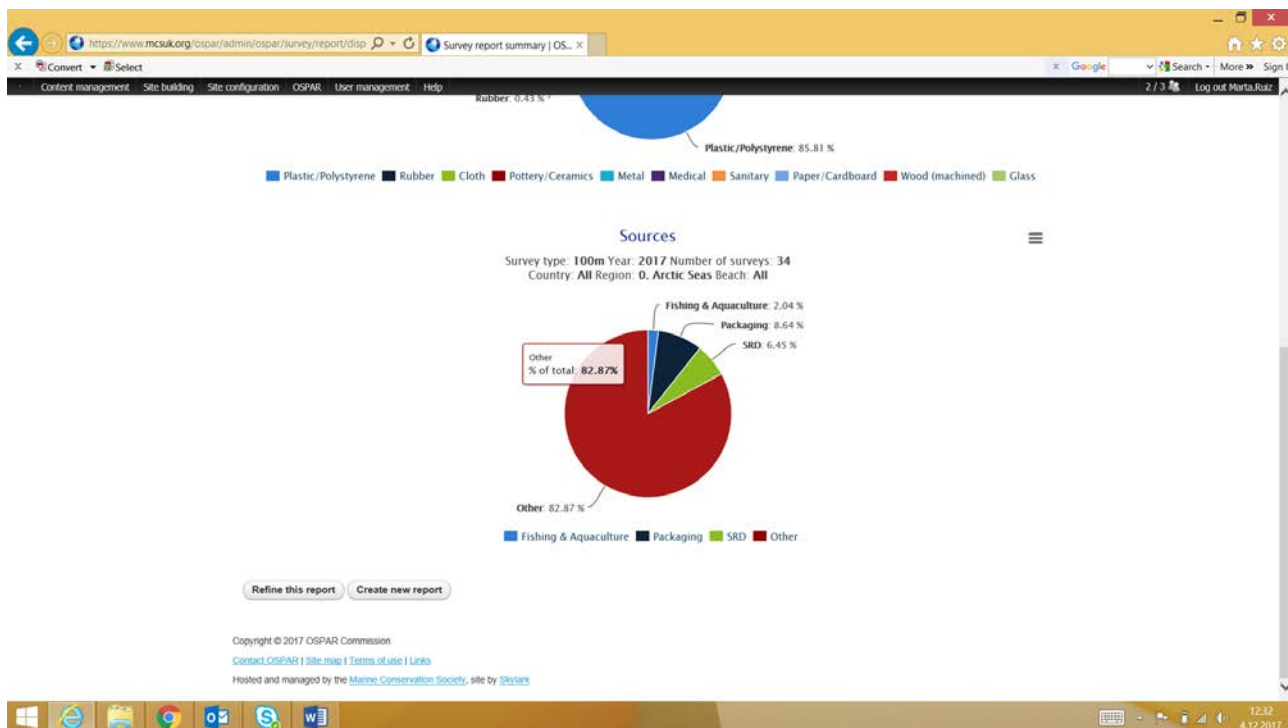


Figure 69. Litter data report

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).

The screenshot shows the OSPAR Commission website's 'Survey admin' section. The main heading is 'Survey admin' with sub-links for 'Survey reports' and 'Export survey data'. Below this, there's a section for 'Export a CSV file of survey data'. The form includes a 'Select survey type' dropdown with '100m' selected. A date selection section allows choosing a 'Year' (2017) or a 'From date' to 'To date' range. Below this are 'Country' and 'Region' dropdowns. The 'File name' field is pre-filled with 'Arctic 2017.csv'. At the bottom are 'Export CSV' and 'Reset selections' buttons. A sidebar on the right titled 'OSPAR beaches' lists 'Marta Ruiz' and 'Your beaches' (None). Below this is an 'Administration' menu with options like 'Manage your account', 'Manage surveyors', 'Manage users', 'Manage beaches/surveys', 'OSPAR admin', 'Beach export', 'Survey admin', 'Administer', and 'Log out'.

Figure 70. Litter data export

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

Summary of key elements

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

Top litter item list -report, which calculation method	Yes Simple method	No, Separate software developed for this, Litter Analyst available at https://www.amo-nl.com/software/litter-analyst/	Yes
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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
Mobile application	Yes, especially important for the field work iPhone, Android
Special software	No, only mobile and web application
Usertypes	Main, country manager, beach manager, litter collector
Map tool	Yes E.g. Google maps
Coordinates given automatically	Yes
Upload data	Yes
Download raw data	Excel, CSV
Upload and download template	Used in HELCOM data call on marine litter, May 2017
Top litter item list -report, which calculation method	Yes Simple method Rank method
Litter reports	pdf, Excel, web interface

Table 5. Requirements of HELCOM database, basics

	HELCOM database, litter reports
Number of litter items	100m, 1km length 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	
By protocol	The ones in use in the HELCOM region at that point. There needs to be the possibility to modify 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.