



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no [289042].



# **MARine Litter in Europe Seas: Social Awareness and CO-Responsibility**

## **DELIVERABLE 6.8— MARLISCO MARINE LITTER DATABASE**



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This report provides a description of the process of developing the MARLISCO Marine Litter Database, an interactive database designed to collate the marine litter data gathered by partners during the clean-ups organised for awareness-raising purposes over the duration of the project. The Database is available on MARLISCO's website via <http://www.marlisco.eu/marine-litter-database.en.html>.

**Approvals**

Date	Partner
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**List of annexes**

Annex_
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## 1 EXECUTIVE SUMMARY

The “MARLISCO Marine Litter Database”, is the MARLISCO Project ‘MARine Litter in Europe Seas: Social Awareness and CO-Responsibility’ deliverable 6.8, an additional deliverable added at the end of the project as a means of further disseminating project products and activities. It is an interactive database, developed to collate all the litter data that partners have captured during the project as a result of the clean-up activities initiated to raise awareness about the marine litter issue. The database has been developed with an interactive map interface that allows the user to pinpoint the clean-up locations. The database also allows users to interrogate the data to get information on specific types of waste or specific locations.



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## 2 INTRODUCTION AND BACKGROUND

MARLISCO 'MARine Litter in Europe Seas: Social Awareness and CO-Responsibility', is an FP-7 funded project that aims to develop and evaluate an approach that can be used to address the problems associated with marine litter and that can be applied more widely to other societal challenges. Considering that marine litter is a key threat to marine habitats, species and ecosystem services, MARLISCO aims to achieve substantial benefits through better integration among researchers, stakeholders and society, ensuring a holistic approach to the issue towards a collective vision for the sustainable management of marine litter across all European seas.

One way of achieving this goal was a series of national awareness activities organised by all national partners, across the 15 countries that participate in MARLISCO. These activities varied greatly and ranged from art competitions, to presentations at schools, to participation at key events and conferences. One very popular awareness-raising activity was clean-ups of a specific stretch of beach, of an area near a waterway or of the seabed. Several of the partners who participated and/or organised clean-up activities, with schools, local community groups or volunteers, also used some type of protocol to help them measure and record the amount of litter collected. Therefore, P12 proposed to develop a database that would bring all the data together and would become an additional project deliverable.

Data have a very important role to play in addressing the issue of marine litter, since they allow us to understand which are the main types of litter found in specific beaches/ countries/ locations and how these may vary according to the season or other factors. This information allows the identification of the main sources of marine litter and thus the implementation of better and more targeted solutions to address litter from these sources. At the moment, the data that are collected by various organisations, including several project partners, are held remotely and are underutilised. By developing a database that would bring all the available data together in an interactive format, and which would allow users to interrogate the data to identify trends, MARLISCO has developed a very valuable tool. It is envisaged that this marine litter database will continue to be populated with data even after the end of the project and will thus become a very sustainable project deliverable.



### 3 METHOD

The first step in developing the MARLISCO Marine Litter Database involved the definition of the database requirements and the identification of a suitable subcontractor for its development. Once a suitable subcontractor, with experience in developing such tools, was selected, various options for the input of data were discussed, including allowing individual contributors to create login information that would allow them to input data. However, in the end it was decided that anyone wishing to contribute marine litter clean-up information should forward it to P12, who would then input the data into the database. This would allow for the quality control of the data, and that would increase the scientific validity of the data.

The database requirements were as follow:

- A web-based application that can be embedded on any site. This would allow the development and update of the database independently of MARLISCO's website, thus even after the end of the project, the website can continue to be updated and will remain an important sustainability element of the project.
- A back-end system that would allow the input of data. It was decided to base this system on the Ocean Conservancy data form for two reasons: (1) most of MARLISCO's partners use this form for recording marine litter data during their clean-ups, and (2) this is the form that is provided in the Educational Pack (Work Package 6 deliverable) for teachers and students to use during their clean-up activities. Figure 1 shows a part of the back-end system where clean-up data from several sites have been added (the Ocean Conservancy Clean-up Form can be found here <http://www.oceanconservancy.org/our-work/international-coastal-cleanup/data-form.pdf>).
- The geo-location of the clean-up data. Figure 2 demonstrates how each clean-up site can be geo-located on a map, through the input of coordinates in the back-end system (latitude and longitude). This in turn allows the display of this location on an interactive map on the front-end view of the database.

The screenshot shows the 'Marine Litter Database' interface. At the top, there are navigation tabs for 'Cleanups' and 'Users'. Below the tabs, there is a 'Cleanups' section with instructions: 'Here you can view, create, update and delete Cleanups. You can also use the filters on the right to tweak your selection.' A 'Create' button is visible on the right. The main content is a table with the following data:

<input type="checkbox"/>	<b>Id</b>	<b>Cleanup site name</b>	<b>Longitude</b>	<b>Latitude</b>	<b>Date</b>	<b>State</b>	<b>Zone</b>	<b>Country</b>			
<input type="checkbox"/>	1	Finikoudes Beach	34.9153	33.6394	20-09-2014	Lamaca		Cyprus	<a href="#">View</a>	<a href="#">Edit</a>	<a href="#">Delete</a>
<input type="checkbox"/>	2	Pharos Beach			13-05-2015	Lamaka	Pervolia	Cyprus	<a href="#">View</a>	<a href="#">Edit</a>	<a href="#">Delete</a>
<input type="checkbox"/>	3	Avdimou Beach	34.6512	32.7523	01-05-2015			Cyprus	<a href="#">View</a>	<a href="#">Edit</a>	<a href="#">Delete</a>
<input type="checkbox"/>	4	CTO Beach Lamaca	34.9782	33.7	01-05-2015			Cyprus	<a href="#">View</a>	<a href="#">Edit</a>	<a href="#">Delete</a>
<input type="checkbox"/>	5	Strunjan Nature Park	45.5393	13.6177	21-09-2013			Slovenia	<a href="#">View</a>	<a href="#">Edit</a>	<a href="#">Delete</a>
<input type="checkbox"/>	6	Torre del Cerrano Marine Protected Area	42.5914	14.0843	11-05-2013	Teramo		Italy	<a href="#">View</a>	<a href="#">Edit</a>	<a href="#">Delete</a>
<input type="checkbox"/>	7	Dasoudi Beach	34.6924	33.0855	28-05-2014	Limassol		Cyprus	<a href="#">View</a>	<a href="#">Edit</a>	<a href="#">Delete</a>
<input type="checkbox"/>	8	Lamaca Nautical Club	34.9529	33.6511	01-05-2015	Lamaca		Cyprus	<a href="#">View</a>	<a href="#">Edit</a>	<a href="#">Delete</a>
<input type="checkbox"/>	9	Athalassa National Park	35.143	33.4016	26-04-2015			Cyprus	<a href="#">View</a>	<a href="#">Edit</a>	<a href="#">Delete</a>

Figure 1 View of the back-end system of the MARLISCO Marine Litter Database, where the user can input clean-up data.



The screenshot shows the 'Creating a new Cleanup' form in the MARLISCO Marine Litter Database. The form is titled 'Creating a new Cleanup' and is located on the 'Cleanups' page. The form includes the following fields: Cleanup site name (required), Longitude, Latitude, Date (with a calendar icon), State, Zone, Country, Nearest crossroad or landmark, Volunteers adults, and Volunteers. The top navigation bar shows 'Cleanups' and 'Users' buttons, and the user is logged in as 'project@isotech.com.cy (administrator) | logout'.

**Figure 2 Creating a new clean-up asks the user to provide the coordinates of the site so that the data can be displayed on the interactive map (front-end).**

The above technical requirements involve mostly the back-end (data input) part of the database. However, it was important that the front-end (user interface) of the database would be as attractive and user-friendly as possible. Figure 3 shows a snapshot of the homepage of the MARLISCO Marine Litter Database. The top part of the Homepage includes an interactive map with pins showing the location of clean-ups that make up the database. The users can zoom in and out of the map and click on specific points, where they can get information for that specific clean-up. Right below the map, there is a section where users can apply filters to the data, thus viewing only those clean-up sites of interest. Data can be filtered based on location (at country and area level) and/ or on dates. Once filters are applied, the users can see a list of the filtered results, together with some key data: number of items and weight of marine litter collected.

For each of these filtered results, the users then have the option to click on 'Details' to see more detailed information from that specific clean-up. This opens a separate page (see Figure 4), which includes a more detailed map of the location, the detailed recorded data (numbers of each marine litter item collected, number of volunteers involved, type of clean-up (land, seabed, floating), distance cleaned etc.), as well as a photo gallery from that specific location/ clean-up, where available. This page also allows users to download a CSV file with all the data.

The database also allows users to view marine litter trends (Figure 5), as follows:

- Trend of the number of a specific marine litter items (e.g. cigarette butts) for a specific country (e.g. Cyprus) for all the years that data exist within the database. This is particularly useful for detecting whether the implementation of specific practices/ policies etc. for reducing a particular marine litter item in a specific country has had an impact on the numbers of that item, and in general to see how trends in marine litter items vary year on year.
- Ratio/ percentage of marine litter items collected in a specific country within a particular year. This is important for reporting marine litter trends year on year, and having a general overview of how marine litter composition might change.



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- Ratio/ percentage of marine litter data items collected during a specific clean-up. A dropdown menu, containing a list of all the recorded clean-ups, allows users to view a graphical representation of the data from that specific clean-up.

Concurrently to the definition of requirements and development of the database, P12 asked MARLISCO partners to share their clean-up data for inclusion in the database. Only two partners responded to this request, and thus the database includes some data from clean-ups taking place in Slovenia and Italy. Additionally, data from the simultaneous clean-ups organised by P12 and the RotaractMED clubs, in Euro-Mediterranean countries (including Egypt and Lebanon) on 1<sup>st</sup> May 2015, will also be included as soon as they are received. The database is available via: <http://www.marlisco.eu/marine-litter-database.en.html>.



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The screenshot shows the Marine Litter Database homepage. At the top, there is a header with the title "MARINE LITTER DATABASE" and a logo. Below the header is a map of Europe and the Mediterranean region, with several red location pins indicating cleanup sites. Below the map is a filter section with the following fields:

- Country:** A text input field containing "Cyprus" and "Greece". Below it, a note states "Multiple country selection is supported".
- Area:** A dropdown menu with "Finkouides - Lamaka" selected. A note below states "Area selection is disabled for multiple countries".
- From Date:** A date input field with "1/1/2014".
- To Date:** A date input field with "31/12/2014".

Below the filters is a section titled "List of cleanups Filtered" containing a table with the following data:

Location	Date	Items	Weight	
Finkouides Beach - Lamaka - Cyprus	3/1/2014	8946	28 kg	<a href="#">Details</a>
Lara Beach - Paphos - Cyprus	4/3/2014	1203	14 kg	<a href="#">Details</a>
Pharos Beach - Pervolia - Cyprus	6/7/2014	1639	19 kg	<a href="#">Details</a>
<b>Totals:</b>		<b>4879</b>	<b>61 Kg</b>	

Below the table is a section titled "Need even more info?" with a button labeled "SEE TRENDS" and a right-pointing arrow.

Figure 3 The Marine Litter Database Homepage.



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**MARINE LITTER DATABASE**

### Finikoudes Beach Cleanup

**BASIC INFORMATION**

<b>Location:</b>	Finikoudes Beach - Lamaka - Cyprus
<b>Date:</b>	3/1/2014
<b>Number of Items collected:</b>	8946
<b>Total Weight collected</b>	28 Kg

**Items Collected**

**MOST LIKELY TO FIND ITEMS**

Cigarette butts	8103
Food wrappers	139
Take out containers plastic	18
Take out containers foam	4
Bottle caps plastic	114
Bottle caps metal	86
Lids plastic	31
Straws	104
Forks knives spoons	9

**FISHING GEAR**

Fishing buoys pots traps	
Fishing net pieces	
Rope	6
Fishing line	

**OTHER TRASH**

Appliances	
Balloons	3
Cigar tips	
Cigarette lighters	1
Construction materials	69
Fireworks	
Tires	1

**MOST LIKELY TO FIND ITEMS cont.**

Beverage bottles plastic	52
Beverage bottles glass	18
Beverage cans	77
Grocery bags plastic	59
Other plastic bags	76
Paper bags	8
Cups plates paper	10
Cups plates plastic	73
Cups plates foam	1

**PACKAGING MATERIALS**

Six pack holders	
Other plastic foam packaging	11
Other plastic bottles	
Strapping bands	40
Tobacco packaging wrap	28

**PERSONAL HYGIENE**

Condoms	1
Diapers	
Syringes	
Tampons applicators	2

**TINY TRASH LESS THAN 2.5CM:**

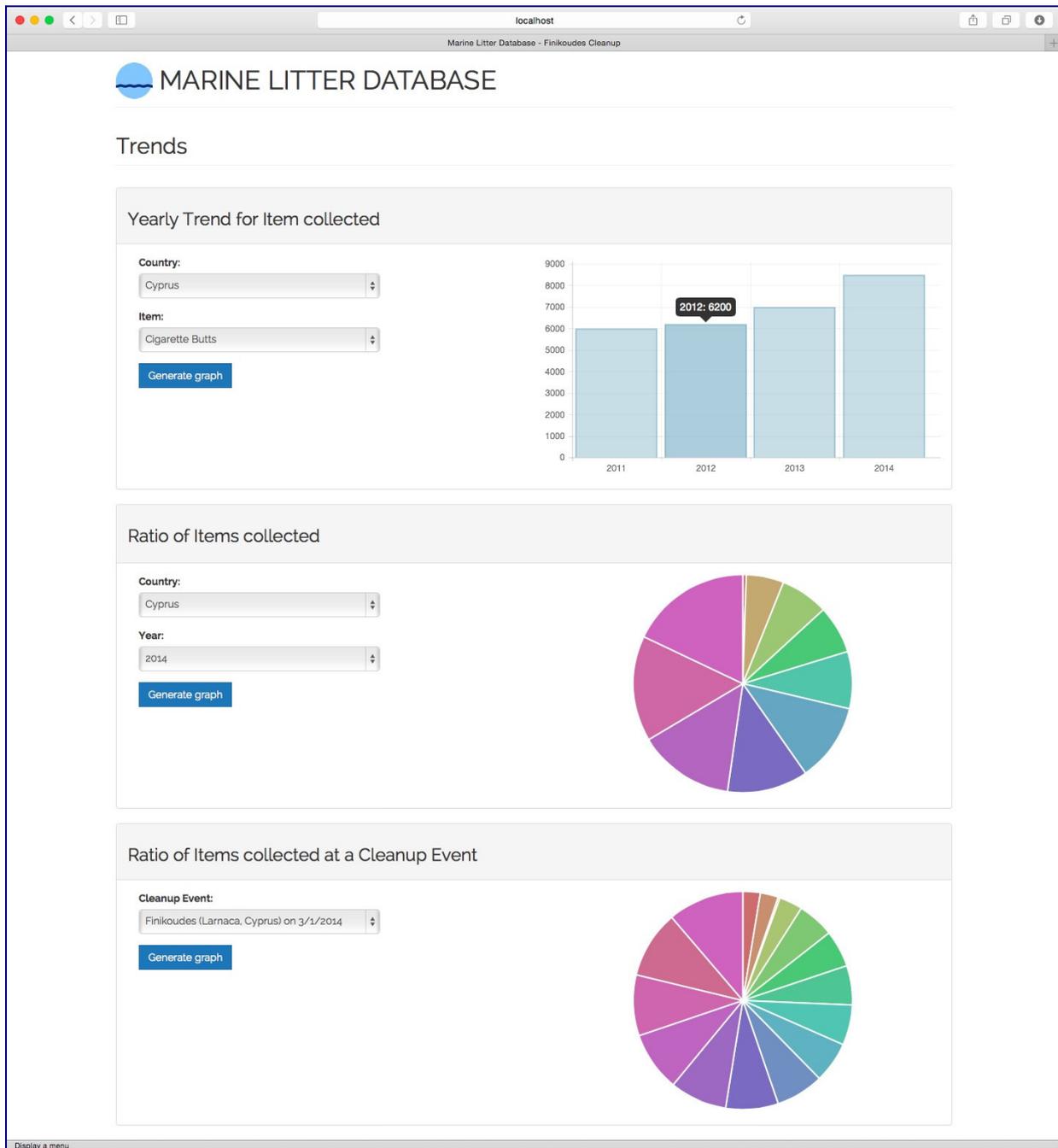
Foam pieces	21
Glass pieces	29
Plastic pieces	172

**Photo Gallery**

**Figure 4 View of the details available to the user for each of the clean-up sites.**



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**Figure 5** The database also allows users to view marine litter trends.



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## 4 CONCLUSION

The interaction between science and society has been a very important part of the MARLISCO project, and the project has tried all along the way to find the most suitable means of translating scientific findings into information that key target groups and stakeholders can understand and integrate into their activities. The MARLISCO Marine Litter Database contributes to this effort by taking marine litter data, resulting primarily from the participation of volunteers in clean-up activities (i.e. the promotion of co-responsibility), and hosting it together in one location. The database offers the opportunity to the users to view the data in a variety of formats (e.g. raw data downloaded as a CSV file for further user manipulation, or trends resulting from a specific clean-up or for a specific marine litter item), thus more technical data can be 'translated' into easy-to-understand trends. As such, the database also offers an additional tool that can be used by educators around Europe to raise awareness about the marine litter issue.

Despite the fact that the project is coming to an end, many partners will continue their marine litter awareness-raising activities, including the organisation and implementation of clean-up events. Therefore, it is envisaged that the MARLISCO Marine Litter Database will continue to be updated in the years to come, thus greatly contributing to the sustainability of the project products.