

Monthly E-Bulletin of the Project “Zero Waste Strategy for Good Environmental Status-BSB257”

E-Bulletin No:8

Common borders. Common solutions

This project is funded by the 1st Call for Proposal of the Joint Operational Programme “BLACK SEA BASIN 2014-2020”

Development of a Method for Marine (Beach) Litter Monitoring and Reporting under ZEWSGES Project

1. Introduction

Marine litter is the solid material thrown out to, left, lost, produced or processed in the sea or on the coast. This litter comprises solid matter mixed into the sea via rivers, rain discharge or water discharge. The litter, which is caused by huge amounts of solid wastes left into the seawater through river water, wastewater discharge as well as discharged rainwater, is a global environmental problem. The huge amount of litter left into the sea and ocean all over the world creates a global environmental problem threatening the survival of living sea creatures. The contamination of the coastal areas by marine litter affects ecological, social and economic conditions of those areas.

Marine litter devastates marine life while being a potential threat for biological diversity particularly when this litter is swallowed by or wrapped around living beings. The studies reveal that the species affected by swallowing or getting wrapped by marine litter has gone under fatal threat. Micro plastics are known to be aspirated easily by planktons and these contaminators are able to get into nutrition chain by this way.

In addition to the ecological effect of marine litter, its socio-economic impact can be seen in the increase of marine and beach treatment costs as well as the decrease of tourist attraction on those spots. Furthermore, the lost or thrown-away fishing nets negatively influence the fisheries.

It is necessary to recognize the quantity and quality of marine litter which gets into our marine areas in order to develop policies and strategies to decrease that litter or to raise the effectiveness of current precautions. For this purpose, a standardized protocol for OSPAR Pilot Project for Marine Litter Monitoring was developed in 2000 to monitor the marine litter amounts and sources in the northeastern zone. This protocol was developed, tested and utilized for the studies on the specified 100-metre or 1-kilometre-square areas. The initial pilot project, which was implemented in 9 countries during 2000-2006, was decided to be transferred to the standard OSPAR monitoring program.

The European Marine Strategy Framework Directive (MSFD), which has defined the marine litter to assess “The Good Environmental Status” of the sea environment, comprises the commitment of monitoring beach litter. The beach surveys carried out regarding this protocol are available to monitor the quantity and composition of the marine litter washed away to the land as well as the qualitative features of its sources.

OSPAR (OSPAR Commission, 2010) prepared the guidelines as a data collection tool for monitoring the marine litter with a standard methodology. Marine litter collected by standard monitoring methods provides an opportunity to compare and comment on the results at regional level. The Guideline, which has been designed to be applicable in all countries with sufficient quality assurance for the processed data, is based on the methodology of 2000-2006 OSPAR Pilot Project and it is equipped with the knowledge referring to the worldwide implementation of the tool.



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Marine litter monitoring activities have been planned for ZEWSGES Project on four coastal areas in four countries on the Black Sea Coastline including Turkey, Ukraine, Bulgaria and Georgia, regarding the detailed methodology specified as follows. The initial litter survey study of the project has already been carried out on selected beaches. The objective of the study is to gather data on marine pollution and share them publicly in those four countries located on the Black Sea coasts.

2. Methodology

2.1. Selecting the Coastal Areas to Treat

The criteria defined by the OSPAR Beach Monitoring Guideline (OSPAR Commission, 2010) to select the referral coasts are as follows:

- Having a minimum length of 100 m,
- Low to moderate slope,
- Clear access to sea,
- Accessible to survey teams throughout the year,
- Ideally the site should not be subject to cleaning activities,
- Survey activities posing no threat to endangered or protected species.

During the selection stage by marine environmental coordinators, the here-above criteria have been regarded as well as the expert opinions and experiences about the country-specific coastal area and marine litter conditions. The selected coasts to treat are listed below:

- Kiyıköy (Turkey)
- Kryzhansky, Odessa (Ukraine)
- Smrikite, Bourgas (Bulgaria)
- Kvavilnari (Georgia)

With the full consultation of all marine environmental coordinators representing the partners, a joint strategy has been defined prior to the monitoring activity. Furthermore, continuous negotiations and evaluations have been performed on issues such as extreme weather conditions, unexpected changes on local coasts as well as any cleaning activity done before the monitoring.

2.2. Sampling Areas

After selecting the appropriate beaches to monitor, a sampling unit has been formed on a constant zone in the area (Figure 1). The sampling unit represents the whole area while being a constant zone which starts approximately with the seawater line. Regarding OSPAR criteria, all the litter has been collected into waste bags within a 100-metre monitoring area parallel to the beach.

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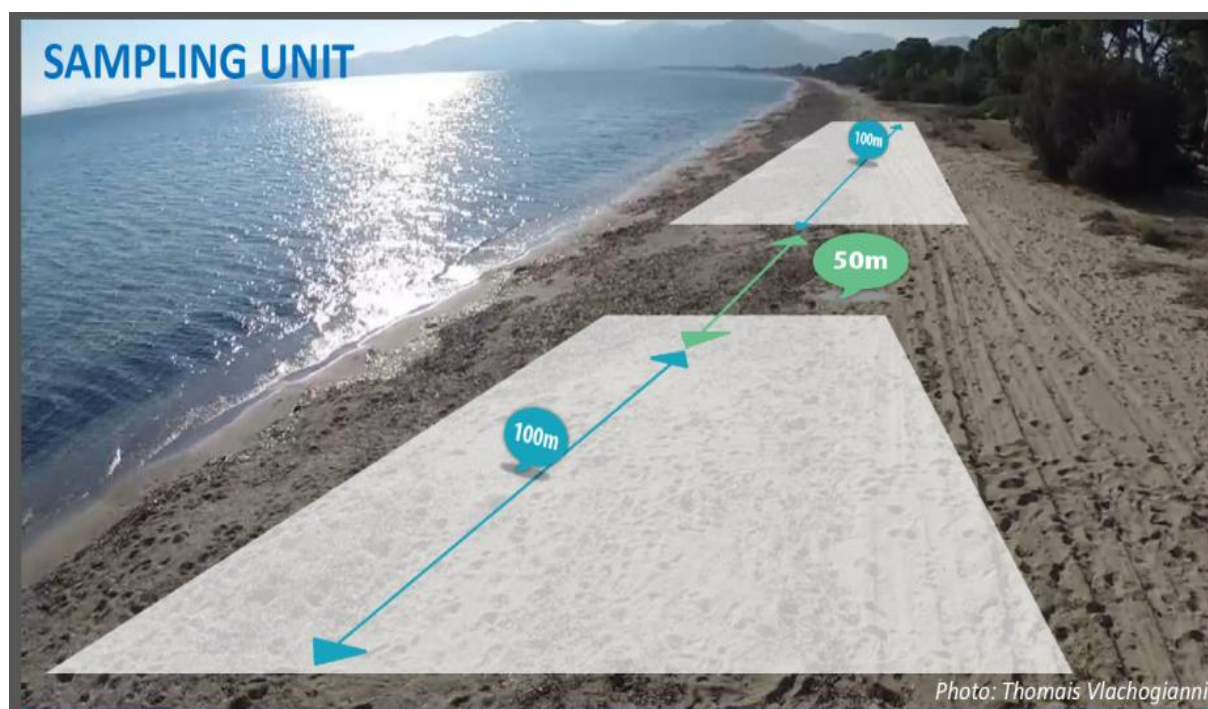


Figure 1. Marine litter monitoring unit.

2.3 Monitoring frequency and period

The above-mentioned beaches are monitored four times a year. However, the weather conditions such as stormy winds, rain, snow and froze may cause no access for surveillance. Due to one or several conditions, there may be some postponed or even cancelled beach surveys.

The survey periods are as follows:

- Winter: Mid-December - mid-January
- Spring: April
- Summer: Mid-June - mid-July
- Autumn: Mid-September - mid-October

The initial monitoring activity of ZEWSGES project was implemented in January, 2019.

2.4 Item classification

The litter has been classified according to OSPAR Guidelines (Guideline for Monitoring Marine Litter on the Beaches in the OSPAR Maritime Area, OSPAR scoring lists (OSPAR Commission, 2010). The litter items on the OSPAR lists are connected to different sources. Litter is categorized under shipping, fisheries, tourism, sanitation and a category labeled as ‘other’ for litter items that cannot be related to a source, for instance small unidentified pieces of plastic.



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2.5 Collection, identification and registration of litter

All the items of the sampling have been recorded on OSPAR survey forms. Each item has been given an OPRAR identification number while unknown litter or unidentified items by OPRAR have been put into “other item box” with a short description.

2.6 Data Management

Proceeding the first monitoring activity, each national coordinator filled in a survey form about the referred beaches. The survey includes the proximity of potential litter sources as well as the location, geographical and physical characteristics of the beaches. The survey form also includes some questions about factors helping to describe the amounts, types and compositions of marine litter.

Beach litter monitoring data have been recorded on the database after the activity in order to process the results. The copied monitoring surveys have also been scanned and saved in digital format.

2.7 Data analysis procedures

2.7.1 Data preparation: item clustering

The data collected from 100-m² plots have been analyzed according to the categories defined in surveys.

2.7.2 Data preparation and analysis

Data preparation processes such as clustering and tabling have already been initiated. The analysis procedures will include descriptive statistics, trend analysis and referencing.

2.7.3 Trend analyses

The data gathered about beach litter will be used to have trend analysis on annual basis. The trends will be acquired via Mann Kendall Trend Analysis which is a non-parametric calculation of several specific data items related to yearly surveys.

2.7.4 Calculation of total item counts

The calculation of total item counts of beach surveys will be done using the mode and mean scores of the items. The mean will be acquired from total litter calculation for each monitored beach.

2.7.5 Source analysis

Source analysis will be carried out for litter collected on each monitored beach to identify the potential source categories. It is complicated and sometimes non-apparent to define the exact sources of beach litter. Therefore source analysis for this study will be to an extent an identification procedure for the collected materials and their possible sources.

2.7.6 Material analysis

It is important to define the litter composition after monitoring. The rate of plastic or synthetic material particularly gives significant information about the plastics in the sea and oceans. Thus,



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the relative contribution of each litter material will be determined during the project implementation period.

2.7.7 Unknown items

Photographs of all the unknown items collected during the monitoring sessions are stored on the database.

3. A Sketch from the initial beach litter monitoring in Kiyikoy Turkey



Figure 2. A view from the Kiyikoy beach litter monitoring 31 January 2019

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4. A Sketch from the initial beach litter monitoring in Sandy Strip" in Pomorie, Bulgaria

On 22 April (Monday), on the International Earth Day, a first volunteer campaign was held to clean the beach of "Sandy Strip" in Pomorie, Bulgaria. The campaign is being carried out within the framework of the project "Strategy for Zero Waste for Good Environmental Status -BSB257", funded under the Black Sea Basin 2014-2020 Program. It is organized by the Tourism Development Council -Nesebar, with the assistance of Pomorie Municipality and the active participation of students and teachers from the Hristo Botev Primary School in Pomorie.

The goal of the campaign is not only to clean the beach, but also to describe the collected waste types as well as their quantity. 220 kg of waste was collected, 80% of which were plastic bags, glass, bottles, straws, beads. On the beach there were also discarded fishing nets, glass, boxes of automotive oil, paper.

The campaign was opened by Mr. Ivan Alexiev - Mayor of Pomorie. The cleaning included students from grades III, IV and VII, teachers from "Hristo Botev" Primary School in Pomorie, specialists from the Department of Ecology in Pomorie Municipality, non-governmental organizations and citizens. The campaign was also attended by the Members of Bulgarian parliament Dimitar Boychev and Ivelina Vassileva. Ms Ivelina Vassileva is Chair of the Environment and Water Commission and Deputy Chair of the Committee on European Affairs and Control of the European Funds in the Parliament.



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Figure 3. A view from "Sandy Strip" in Pomorie, Bulgaria during marine litter cleaning campaign

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5. Site selection and litter monitoring initiation at Kvavilnari Beach, Guria Region, Georgia

First marine/beach litter monitoring action in Guria Region, Black Sea coast of Georgia, within the framework of the European funded BSB-257 project ZEWSGES, was initiated on 26-27 January 2019. Marine litter monitoring was preceded with beach site selection work per OSPAR guidelines (9 sites assessed). Marine Litter Watch community named 'MLW-Georgia' was established and the selected Kvavilnari beach litter monitoring site was registered into the MLW Portal developed & maintained by European Environment Agency at <https://marinelitterwatch.discomap.eea.europa.eu> (see Figure 4).

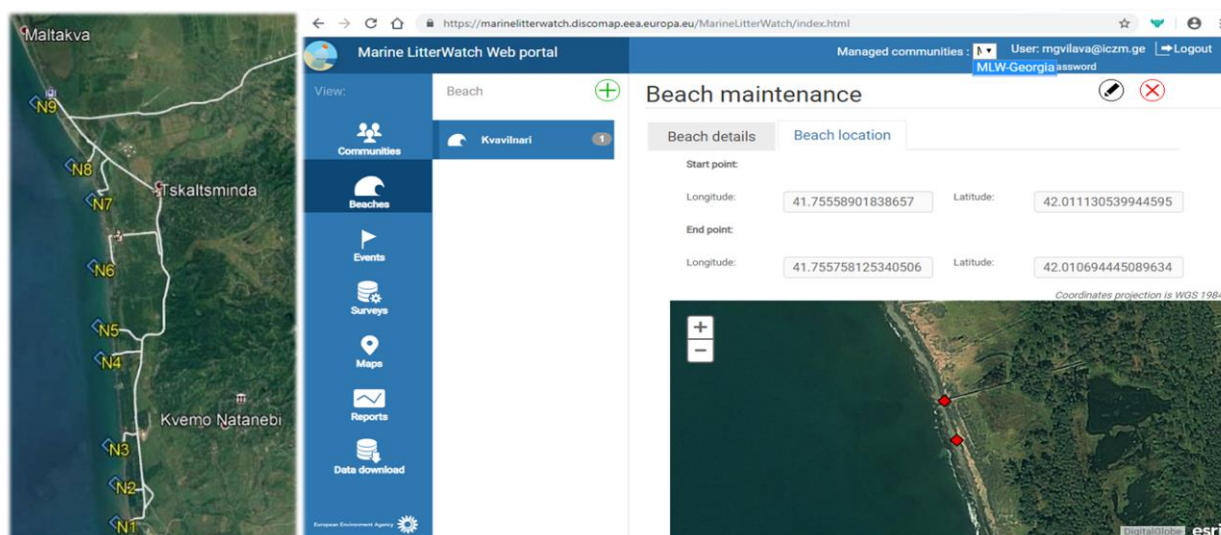


Figure 4. Selected Kvavilnari beach (left) registered into EEA’s Marine Litter Watch portal (right)

Next day the first training was conducted for teachers and students from Lanchkhuti and Ozurgeti Municipality schools. Representatives of three schools from Ureki, Supsa and Tskaltsminda (one teacher and two advanced students from each school), as well as the Lanchkhuti municipality and local NGO were trained by experts from the ZEWSGES project partner in Georgia Civitas Georgica and engaged in Kvavilnari reference beach litter monitoring on 27 January 2019 (see Figure 5). Majority of beach litter data recorded included all forms of plastic and various items, notably shoes.



Figure 5. Kvavilnari beach litter monitoring by school students and teachers from Guria



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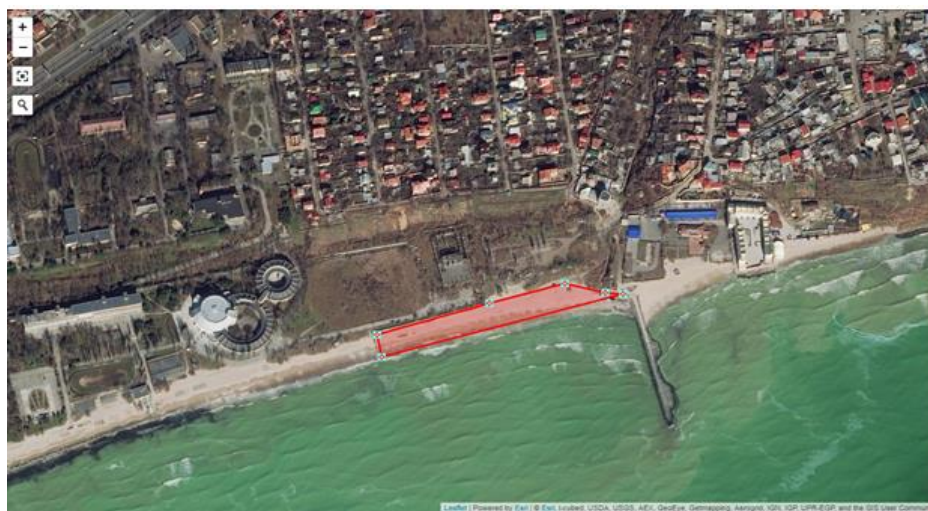
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6. Site selection and litter monitoring initiation in Ukraine

UKRMEPA turned to the Department of Ecology and Development of the recreational zones of the Odessa City Council with a request to advise on a step-by-step procedure for selecting /fixing the beach along the Black Sea coast of Odessa in order to further monitor the quantitative and qualitative composition of garbage formed on the beach.

Department of Ecology and Development of Recreation Areas of the Odessa City Council, having familiarized with the beach requirements, which are put forward in the framework of the implementation of the international ecological project “Zero Waste Strategy For Good Environmental Status”, BSB_257, supported by the joint Operational Program “Black Sea Basin” 2014-2020, offered by Kryzhanivsky beach.

Territorially the beach is located on the border of the Suvorov district of Odessa with the Kryzhanivsky village council. At present, the beach is one of the most problematic and clogged in Odessa.

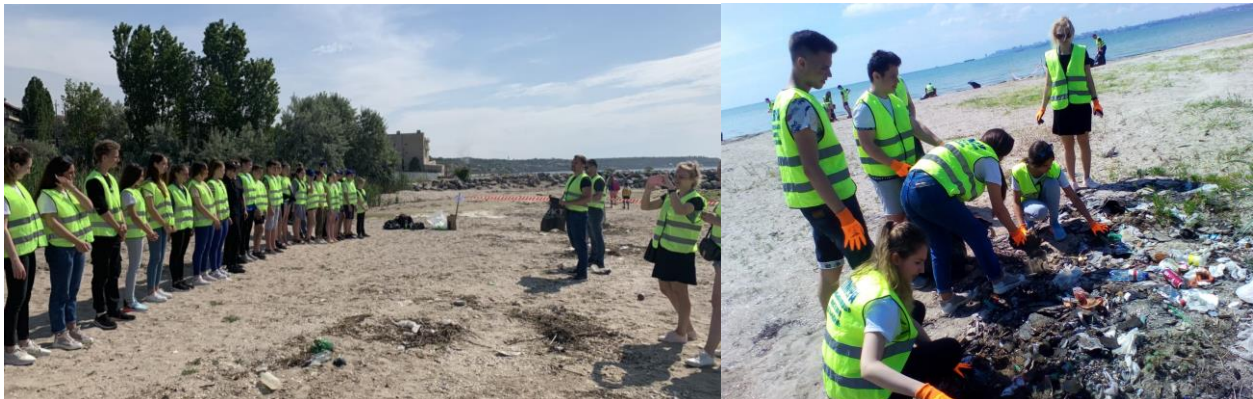


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distance:
320 yards (293 metres) :
193 m - fence (fence), beyond the fence the territory of the abandoned construction site;
100 m is an open area where a storm sewage collector passes the sea, with a pipe diameter of about 0.5 m and an unidentified water object up to 3 m wide and about 70 m long, along the sides a reed grows



distance:
37 yards (34 metres)

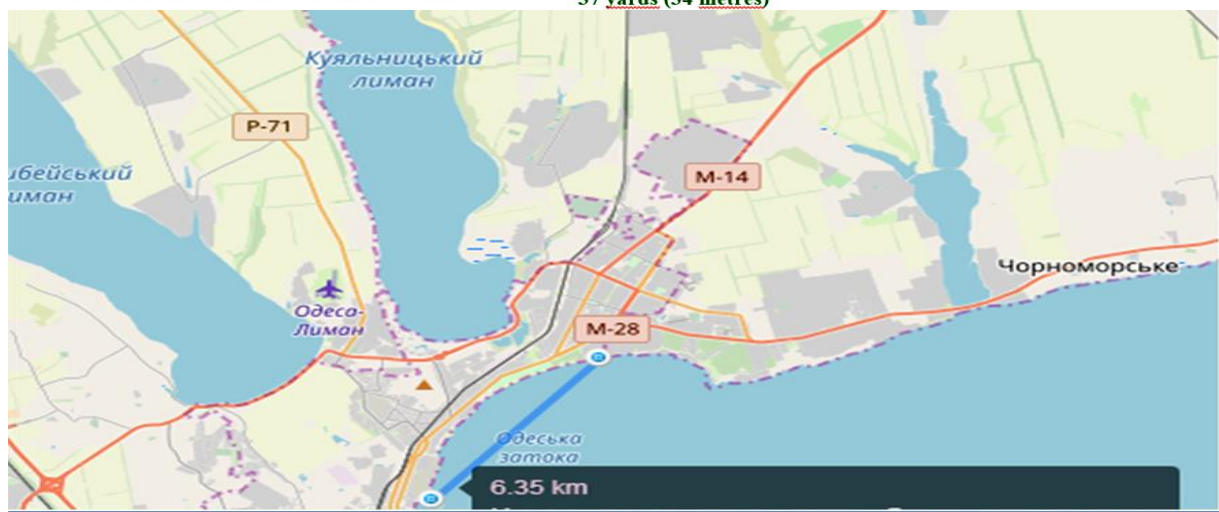


Figure 6-Distance from the beach to the near port



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The third action of beach cleaning took part students and teachers of the Odessa general education school number 44, Odessa general education school number 71 and representatives of the public organization "YMCA-Odessa". Approximately 50 participants were involved. As a result, 105 bags of beach garbage (70 and 120 liters) with a total weight of 2100 kilograms were collected. The action was held with the support of: Suvorov District Administration of Odessa, Employees of the National Police of the Suvorov District Council, which ensured the rule of law during the action.

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