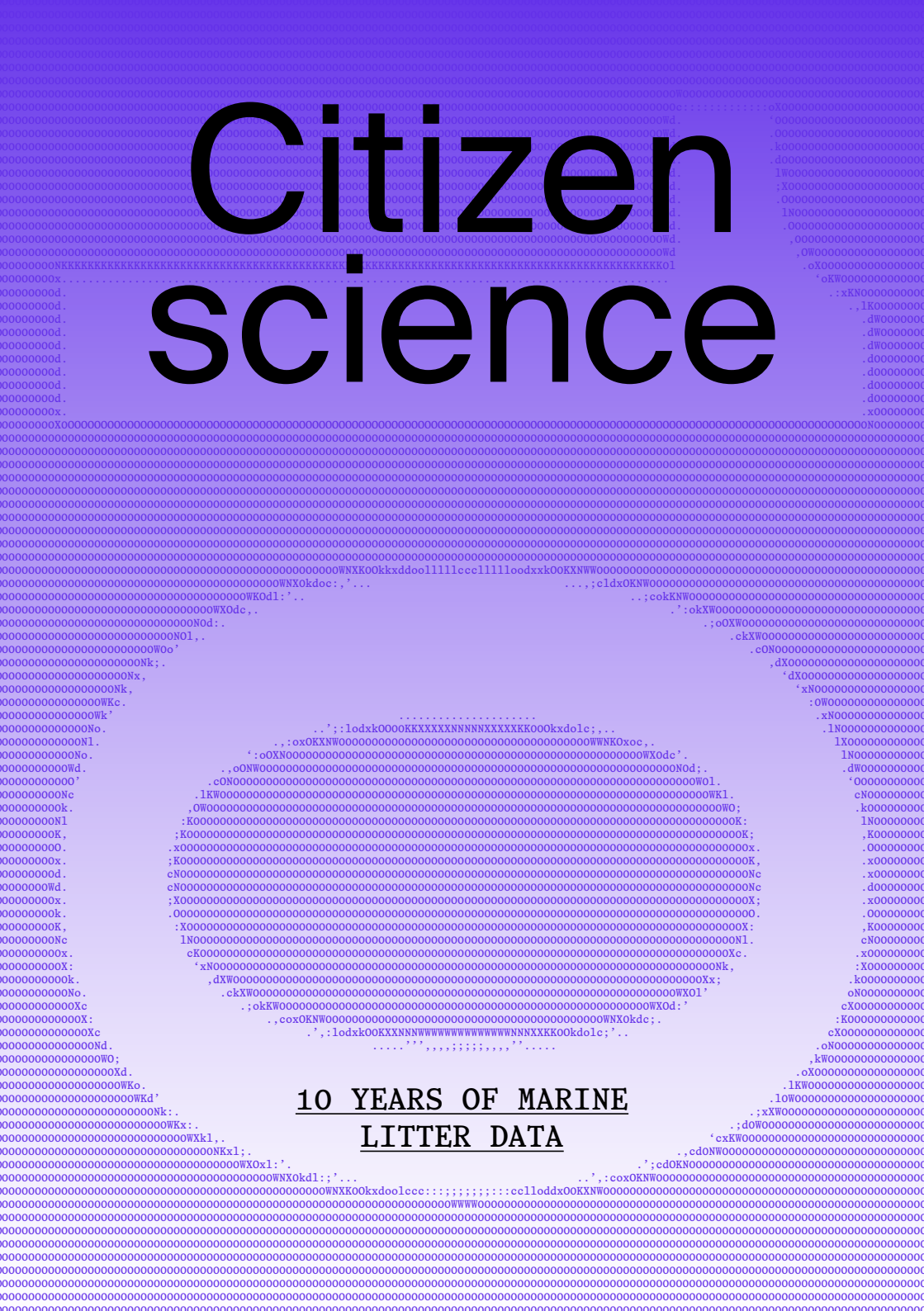
Citizen science



10 YEARS OF MARINE LITTER DATA

Context

Since 1990, Surfrider Foundation Europe has put the fight against marine litter at the forefront of its action. Surfrider Europe acts to better understand this pollution and to reduce both the quantitative amount of litter entering the marine environment and its impacts on the marine environment and on humans.

Citizen action is part of Surfrider Europe's DNA.

SOUND THE ALARM & TAKE ACTION

Since 2010, Surfrider has developed European wide citizen science initiatives to collect data on marine litter and get people involved in the effort to protect the ocean. Because we are convinced that citizens have valuable knowledge of their territories, we ask them to report essential data on marine litter pollution (characteristics, distribution, pathways and potential impacts on wildlife and humans) through data acquisition protocols. Citizens take part in collecting litter but above all in collecting data. These data provide information on the types and sources of litter that were picked up, and help us shape both national and European policymaking. Information and data on the amounts and composition of marine litter are essential to tackle the problem at source and to monitor and assess the effectiveness of preventive measures.

EUROPEAN WIDE CITIZEN SCIENCE INITIATIVES

BEACH, LAKE, AND RIVER CLEAN-UPS

This report is based on data concerning the beach litter collected and reported during the period 2014-2023 by our community, following two protocols used during Surfrider's "Ocean Initiatives" programme. This programme carries out beach, lake, and river clean-ups in order to better understand and to raise awareness on marine litter pollution. One protocol is used to collect data on cigarette butts; the other, to collect data on a list of thirty commonly found items[2].

The data presented here are the result of close collaboration with the scientific community to establish appropriate monitoring, and to ensure proper analysis of the information gathered in various research and monitoring programmes.

DATA COLLECTED OVER MORE THAN 10 YEARS

Surfrider Foundation has succeeded in involving its community in the collection of a significant amount of data on aquatic litter and in providing an overview of the state and composition of waste and plastic pollution on European beaches, while at the same time generating data that complements official monitoring programmes thanks to its wide spatial and temporal coverage.

The data collected over the last 10 years have helped to draw decision makers' attention to the situation on the ground and to bring about the adoption of the very first measures against plastic pollution.

1.https://www.initiativesoceanes.org/2022/fichebilans/Fichebilan_simple_2020_EN.pdf
2.https://www.initiativesoceanes.org/wp-content/uploads/2024/10/Fichebilan_intermediaire_2020_EN.pdf

10 years of citizen action to tackle marine litter

10
years of data collection

17,447
clean-ups

180,153
active citizens

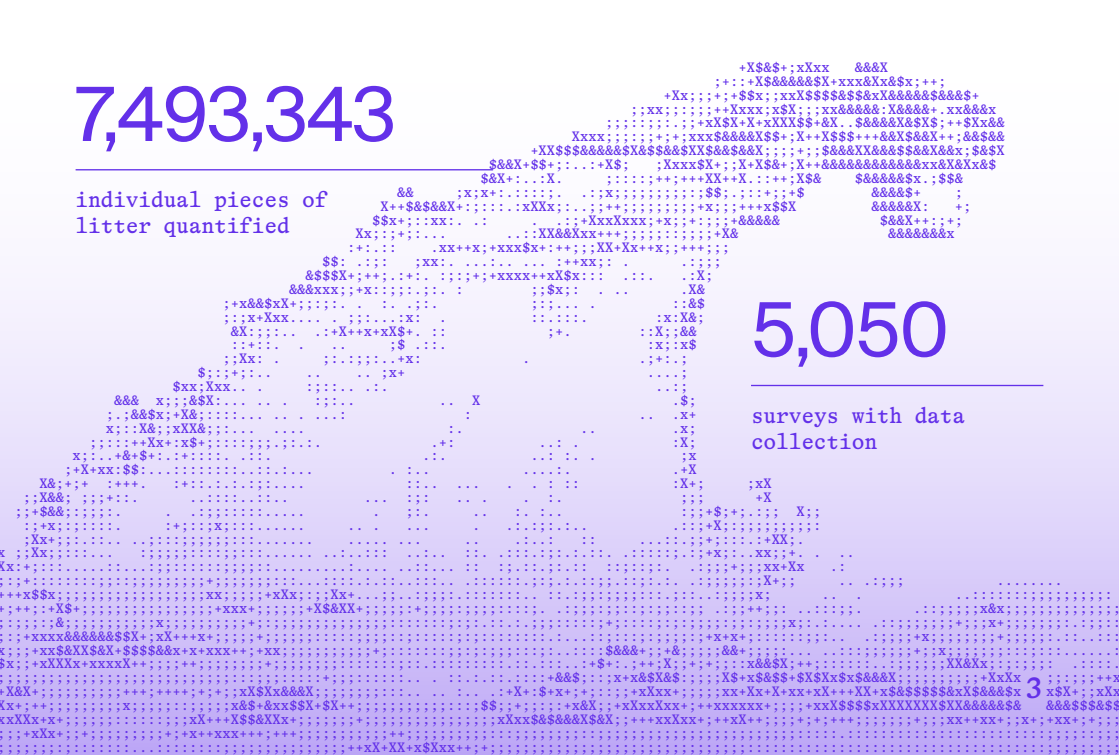
54
countries

20
European countries

4,832
KM monitored

7,493,343
individual pieces of litter quantified

5,050
surveys with data collection



Marine Strategy Framework Directive

The Marine Strategy Framework Directive (MSFD) is the EU's legal framework to protect the health of our ocean and marine ecosystems. The goal of the MSFD is to achieve or maintain Good Environmental Status (GES) in EU marine waters. It sets out 11 descriptors which describe what the environment will look like when GES has been achieved. On marine litter pollution (descriptor 10), the GES will be reached when "properties and quantities of marine litter do not cause harm to the coastal and marine environment".

A threshold value for coastline litter has been developed by the MSFD Technical Group on Marine Litter, to help Member States have tangible objectives and monitor the efficiency of their programme to reduce harm from coastline litter. To stay under the threshold and reach Good Environmental Status, a beach must have less than 20 litter items for every 100 meters of coastline.

A BEACH MUST HAVE LESS THAN 20 LITTER ITEMS FOR EVERY 100 METERS OF COASTLINE

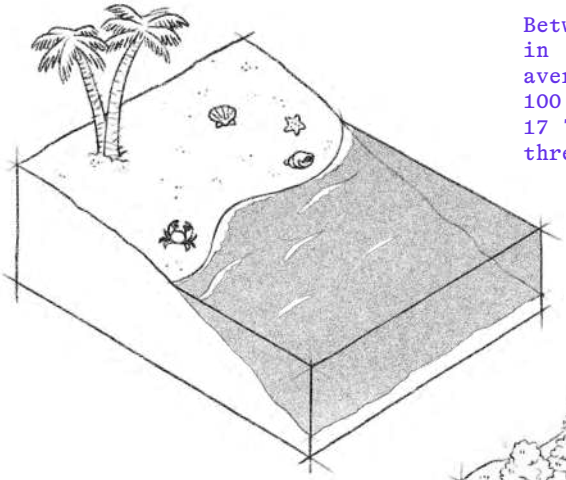
Applying this threshold value to Surfrider Europe's citizen science programme data set shows that the overall average value of beach litter abundance substantially exceeds the threshold set at EU level.

363

PIECES OF LITTER/100 M OF EUROPEAN BEACHES

Between 2014 and 2023, participants in beach clean-ups collected an average of 363 pieces of litter per 100 m of European coastlines. This is 17 TIMES HIGHER than the acceptable threshold.

Fig. 1: Beach



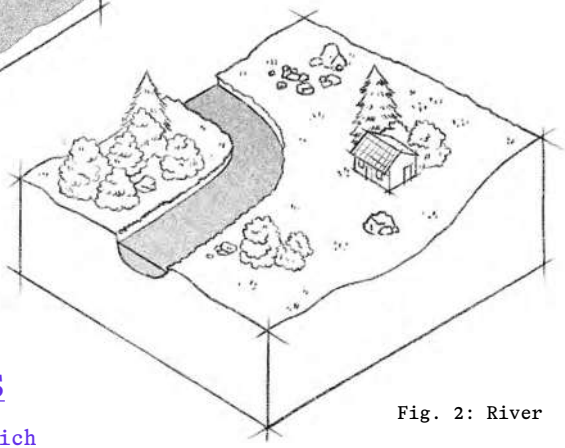


Fig. 2: River

317

PIECES OF LITTER/100 M OF EUROPEAN RIVERBANKS

Rivers are the main channels by which litter is transported from inland to the seas. However, there is still little data available on the riverine inputs of litter to the ocean. The diversity of river flow regime and riverbank types, as well the type of litter involved, heavily influence the amount of litter that can accumulate on land.

Surfrider's citizen science European data acquisition programme on riverbanks, which has been running since 2014, shows that the average number of litter items per 100 m is 317.

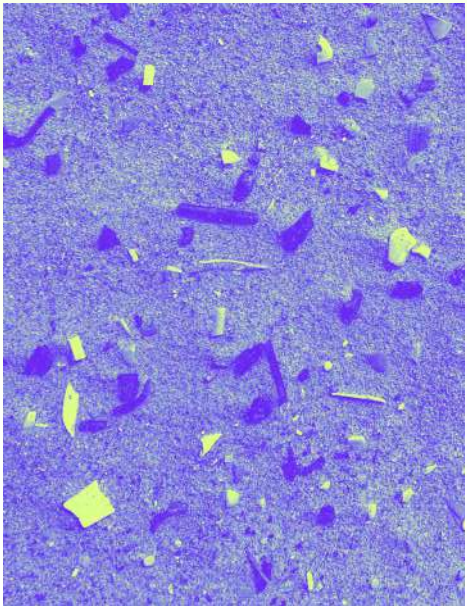
Unidentifiable fragments

The degradation of larger plastic products in the ocean is a growing environmental issue and a threat to marine ecosystems.

Once in the marine environment and under the action of sunlight and UV radiation, as well as abrasion by waves, plastics break apart. Each piece gradually fragments into smaller and smaller particles until it reaches micro- and nanoparticle size. Removal or collection from the environment is then impossible.
Plastics contain many chemical substances (additives), which leach into the environment.

Microplastics are of particular concern in the environment because they are ingested by all the marine species even the smaller ones (planktons, mussels...) with proven negative effects on their development and reproduction. Because of their small size, they are transported over long distances carrying chemical agents, pathogens, persistent organic pollutants etc.

The continuous release of microplastics contributes to persistent pollution in ecosystems, food chains and human bodies.



21%

of quantified litter consists of fragments (plastics including polystyrene, glass, metal, textile)

17%

of quantified litter are plastic pieces (all types)

Cigarette butt pollution

Cigarette butts are the most prevalent form of litter collected (both in urban and beach settings).

Cigarette butts are a toxic bomb which generate two major types of pollution:

CHEMICAL POLLUTION

because the filters capture over 2500 toxic chemical substances which slowly leak into soils, waterways, lakes, and the ocean.

PLASTIC POLLUTION

as the filters are made out of cellulose acetate. The filters fragment in the water and turn into micro- and nanoparticles.

82.7%

of clean-ups reported the presence of cigarette butts (4 out of 5 clean-ups)

7/10 m

7 cigarette butts are collected per every 10 m

100

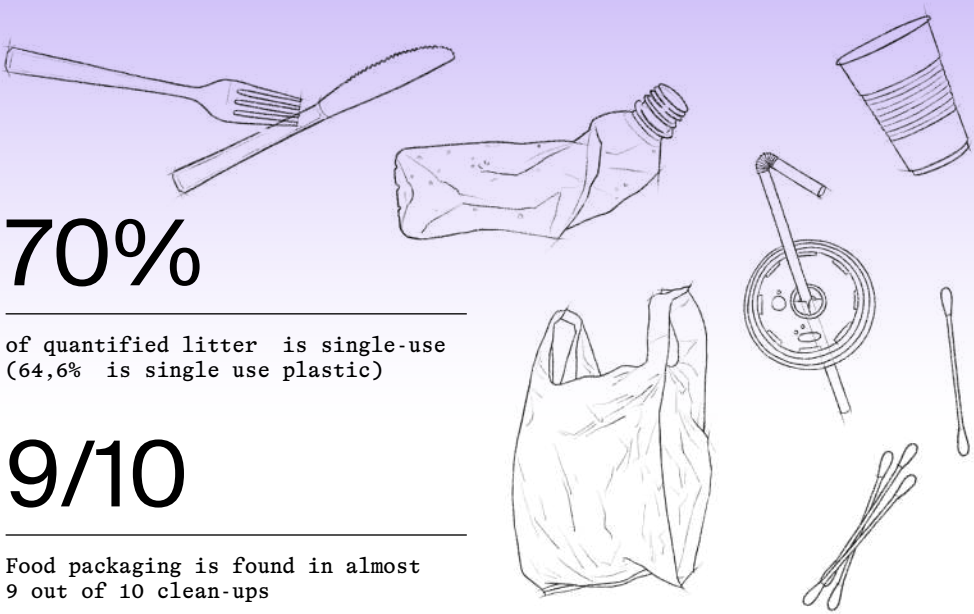
The median is 100 cigarette butts per clean-up

Read more: https://www.surfrider.eu/wp-content/uploads/2023/08/Surfrider_info_tabac_EN.pdf

Single-use products

Single-use items (particularly those made of plastic) account for a large percentage of the identifiable litter quantified, making up 70% of all collected litter.

2019 was a turning point in the fight against plastic pollution with the adoption of the European Single-Use Plastics Directive. It was the first EU Directive requiring Member States to ban a series of single use plastic items and to adopt strong waste prevention measures, such as consumption reduction or product design requirements. The legislation targeted the 10 most commonly found single-use plastic items on European beaches. This victory was achieved thanks to the combined efforts of citizens and NGOs throughout Europe to collect data and litter. However, the measures to curb plastic pollution at source must be adequately implemented by the Member States, and regulation efforts against single-use plastics must be continued.



70%

of quantified litter is single-use (64,6% is single use plastic)

9/10

Food packaging is found in almost 9 out of 10 clean-ups

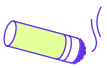
21%

of counted litter items is from food-related single-use objects (food packaging including beverage bottles, food wrappers and containers, as well as straws).

The negotiations around the Packaging and Packaging Waste Regulation (PPWR) also presented opportunities to significantly reduce single-use packaging, particularly in the HoReCa (hotel, restaurant, and catering) sector. However, as the adopted measures fell short of the necessary ambition, Member States will have the chance to implement more stringent regulations and go further in tackling this issue.

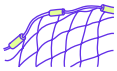
Most common types of marine litter items found

ON EUROPEAN COASTLINES


Cigarette butt


Plastic pieces


Polystyrene pieces


Fishing nets/ tangled ropes


Food containers


Pieces of glass

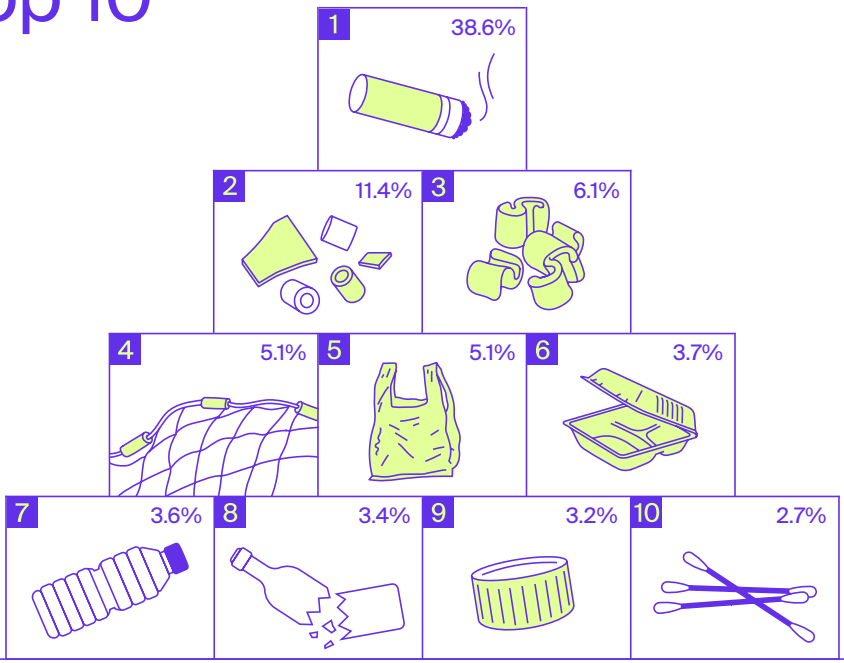

Plastic caps/ lids drink


Plastic bottles


Cotton bud sticks

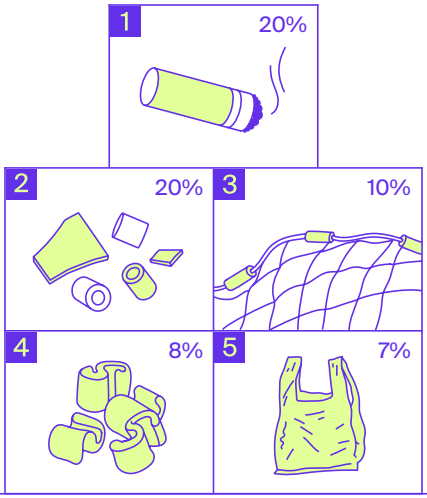

Plastic bags including fragments

top 10

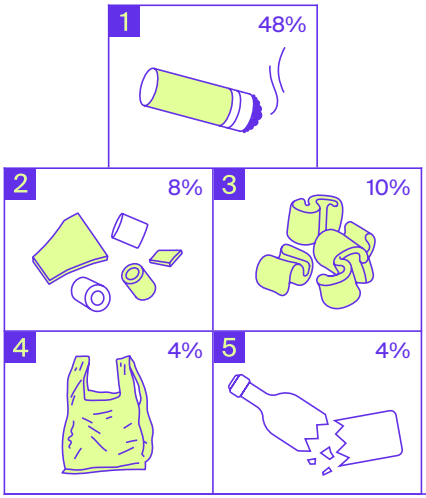


top 5 per marine sub region

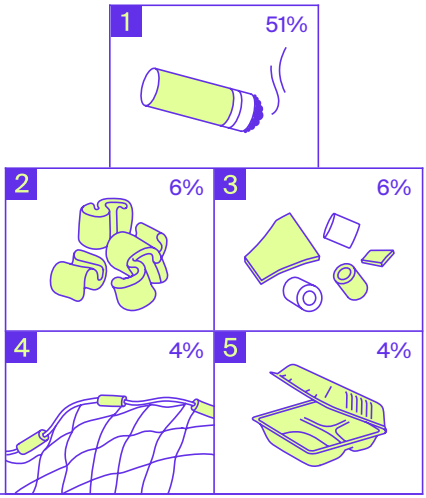
BAY OF BISCAY



MEDITERRANEAN SEA



GREATER NORTH SEA

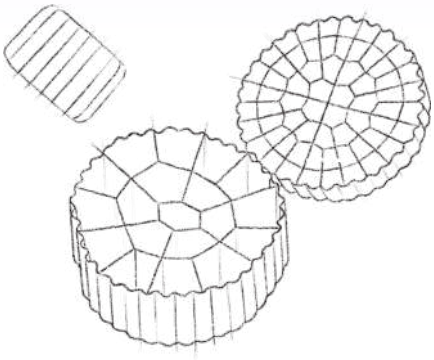


Biocarriers

Biocarriers are bacterial supports used in some types of wastewater treatment plants. These small plastic cylinders, only a few millimeters thick, support the growth of microorganisms that settle, multiply, and break down suspended matter in the water.

However, accidents and malfunctions during their lifecycle can lead to the spill of biomedia into the environment. The consequences of a single leak can be catastrophic as there can be hundreds of millions of them in a single facility. Once in the environment, the pollution can continue for years and spread widely beyond borders.

Surfrider Foundation Europe was among the first organisations to raise the issue of biocarrier pollution in the marine environment. Since then, the organisation has initiated a monitoring programme of biomedia pollution at the European scale. The information collected has served as a reference for integration of targeted measures to prevent the loss of biomedia into the environment, both in the new version of the EU Urban Wastewater Treatment Directive (UWWTD) and in the regional action plan for marine litter of the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention).



With the technical help of over 100 WasteWater treatment professionnals, Surfrider has worked on Guidelines aiming at reducing the risk of pollution.

141,256

biocarriers collected

35

different models identified

1,780

reports

44

major pollution events identified since 2014

Read more: https://biomedia.surfrider.eu/wp-content/uploads/2024/07/rapport_biomedias-Surfrider-2023-EN.pdf

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The NGO Surfrider Foundation Europe is a group of positive activists who take concrete action on the ground every day to pass on a preserved ocean to future generations. Our mission: to make the voice of the ocean heard loud and clear! Our weapons? Raising awareness and mobilizing citizens, children and adults alike (thanks to 48 volunteer branches throughout Europe), using our scientific expertise to lobby and transform companies. Find out more about the association at: https://surfrider.eu/en or via this video.

SURFRIDER FOUNDATION

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