Monitoring marine litter and generating fit-for-purpose data through a participatory science approach

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For more than twenty five years joining forces & building bridges in the Euro-Mediterranean area

MIO-ECSDE AT A GLANCE

Who we are

We are a non-profit Federation of **over 130** Mediterranean NGOs for Environment and Sustainable Development

What we do

We act as a technical and political platform for the intervention of NGOs in the Mediterranean scene

www.mio-ecsde.org

Our mission

Our mission is to protect the Natural Environment and Cultural Heritage and promote Sustainable Development in a peaceful Mediterranean

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MIO-ECSDE's KEY ROLE IN ADDRESSING MARINE LITTER IN THE MEDITERRANEAN

Raising public awareness

Promoting coresponsibility & consensus building

Building capacities

Filling in the knowledge gaps

Strengthening decision making & implementation

WHAT IS MONITORING

Monitoring is a **long term**, **standardized** measurement, observation, evaluation and reporting of the environment in order **to define status** and **trends**.

Marine litter monitoring aims to provide information on the **types**, **quantities**, **distribution** and **impacts** of marine litter; to **identify the sources** of marine litter; and to **assess the effectiveness of management measures** to address the issue.



PARTICIPATORY SCIENCE VS CITIZEN SCIENCE

CITIZEN SCIENCE mainly refers to the involvement of non-professional volunteers in the scientific process, commonly in data collection, but also in other phases of the scientific process, such as data interpretation, problem definition, or dissemination of results.

PARTICIPATORY SCIENCE is a more inclusive term that refers to research conducted in partnership between trained experts and members of a "community" or CSOs, including NGOs. Environmental NGOs are in many cases groups of professionals with strong competences in environmental research dedicated to the production of accurate, upto-date research and data on the most pressing environmental issues.





MARINE LITTER MONITORING & KEY LEGISLATIVE FRAMEWORKS

KEY LEGISLATIVE FRAMEWORKS

| EU | Barcelona Convention |
|---|--|
| Marine Strategy Framework Directive Plastics Strategy Single-Use Plastics Directive | Ecosystem Approach Regional Plan for Marine Litter Management in the Mediterranean |
| | |



MSFD GES TECHNICAL GROUP ON MARINE LITTER



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A MAJOR RECENT POLICY ADVANCE



A beach litter threshold value has been adopted

for every 100

Environmental

THE JOINT LIST OF LITTER CATEGORIES



9

THE JOINT LIST: A LIST FOR ALL MARINE COMPARTMENTS

Beach

Sea

surface

Seafloor

Biota

METHODOLODY FOR MONITORING MACROLITTER ON BEACHES

Beach

MACROLITTER ITEMS > 2.5 CM Fit-forpurpose data

Comparable data

Reliable data

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MARINE MACROLITTER MONITORING ON BEACHES | KEY ELEMENTS



SITE SELECTION



Site location

Site features

- \checkmark In the vicinity of ports or harbors;
- \checkmark In the vicinity of river mouths;
- In the vicinity of coastal urban areas;
- In the vicinity of tourists destinations;
- In relatively remote areas.

- ✓ 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.









A sampling unit is defined as a fixed section of a beach covering the whole area from the strandline to the back of the beach. Within this methodology one sampling unit is used: 100-metres stretch from the strandline to the back of the beach.

The back of the beach needs to be explicitly identified using coastal features such as the presence of vegetation, dunes, cliff base, road, fence or other anthropogenic structures such as seawalls



 Two (2) sections of a 100-metre stretch on the same beach should be monitored, separated at least by a distance of 50m.



HEAVILY LITTERED BEACHES | WHAT TO DO?



SIZE CLASSES



THE JOINT LIST OF LITTER CATEGORIES

 $\left\{ \right\}$



THE JOINT LIST & ITS HIERARCHICAL STRUCTURE



THE USE CATEGORIES

| | | | | ALC: NO. | Carana and |
|--------------------|-------------------------------------|-------------------------------------|-----------------|-------------------|------------|
| Type-code | Name | | | | |
| ag_ | agriculture related | | | | X |
| aq_ | aquaculture related | | | | |
| cl_ | clothing | | | - Martines | |
| co_ | building & construction related | | | | |
| fc_ | food consumption related | 2 | | | |
| fi_ | fisheries related | al and | | | - F |
| hy_ | personal hygiene and care relate | d Sala | | | |
| md_ | medical related | | | | |
| nn_ | undefined use | | | | |
| re_ | recreation related | Harmonized | Comparable | Reliable | |
| sm_ | smoking related | data | data | data | |
| vk_ | vehicle related | | | | |
| hu_ | hunting related | | | | |
| | | | Contract of the | | |
| CONTRACT OF MERINE | at you that I got a got a first she | and the second second second second | 》而我不能在FFF的。他们,总 | C Thomais Vlachog | jianni |

HOW DOES THE LIST LOOK LIKE?

| Litter type-codes | Litter type |
|---------------------|---|
| pl_ | artificial polymer materials |
| pl_fc_ | plastic food consumption related items |
| pl_fc_b&c_ | plastic food consumption related bottles and containers |
| pl_fc_b&c_dbot_ | plastic drink bottles |
| pl_fc_b&c_dbot_lage | plastic drink bottles > 0.5 l |
| pl_fc_b&c_dbot_smll | plastic drink bottles ≤ 0.5 l |

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THE J-CODE LIST

| ARTIFICIAL POLYMER MATERIALS | | | | | |
|------------------------------|---|-------------|-------|--|--|
| Code | Items name | Item counts | Total | | |
| J220 | plastic sheeting from greenhouses | | | | |
| J221 | plastic irrigation pipes | | | | |
| J222 | other plastic items from agriculture | | | | |
| 190 | plastic flower pots | | | | |
| J223 | trays for seedlings of foamed plastic | | | | |
| J46 | plastic oyster trays | | | | |
| J45 | plastic mussels/oyster mesh bags, net sack, socks | | | | |
| J47 | plastic sheeting from mussel culture (Tahitians) | | | | |
| J102 | plastic flip-flops | | | | |
| J136 | footwear made of plastic - not flip flops | | | | |
| J40 | plastic gloves (household/dishwashing, gardening) | | | | |
| J41 | plastic gloves (industrial/professional applications) | | | | |
| J252 | single-use plastic gloves | | | | |
| 169 | plastic hard hats/helmets | | | | |
| J256 | foamed plastic insulation including spray foam | | | | |
| 189 | plastic construction waste (not foamed insulation) | | | | |
| J8 | plastic drink bottles >0.5 l | | | | |
| J7 | plastic drink bottles ≤ 0.5 l | | | | |
| J224 | plastic food containers made of foamed polystyrene | | | | |
| J21 | plastic caps/lids drinks | | | | |
| J225 | plastic food containers made of hard non-foamed plastic | | | | |
| J1 | plastic 4/6-pack yokes & six-pack rings | | | | |
| J226 | cups and cup lids of foamed polystyrene | | | | |
| J227 | cups and lids of hard plastic | | | | |
| J228 | plastic cutlery | | | | |
| J229 | plastic plates and trays | | | | |
| J230 | plastic stirrers | | | | |
| J231 | plastic straws | | | | |
| J30 | plastic crisps packets/sweets wrappers | | | | |
| J31 | plastic lolly & ice-cream sticks | | | | |
| J85 | plastic commercial salt packaging | | | | |
| J58 | fish boxes - foamed polystyrene | | | | |

| METAL | | | | | |
|-------|--|-------------|-------|--|--|
| Code | Items name | Item counts | Total | | |
| J194 | metal cables | | | | |
| J175 | metal drinks cans | | | | |
| J176 | metal food cans | | | | |
| J181 | metal tableware (e.g. plates, cups & cutlery) | | | | |
| J184 | metal lobster/crab pots | | | | |
| J182 | metal fisheries related weights/sinkers, and lures | | | | |
| J180 | metal appliances (refrigerators, washers, etc.) | | | | |
| J187 | metal drums & barrels | | | | |
| J174 | metal aerosol/spray cans | | | | |
| J188 | other metal cans | | | | |
| J190 | metal paint tins | | | | |
| J178 | metal bottle caps, lids & pull tabs from cans | | | | |
| J195 | metal household batteries | | | | |
| J177 | metal foil wrappers, aluminium foil | | | | |
| J199 | other metal pieces > 50cm | | | | |
| J198 | other metal pieces 2.5cm $\geq \leq 50$ cm | | | | |
| J186 | metal industrial scrap | | | | |
| J191 | wire, wire mesh, barbed wire | | | | |
| J179 | metal disposable BBQs | | | | |
| J193 | metal vehicle parts / batteries | | | | |

183 litter types

| Litter type | Description |
|---|---|
| Plastic shopping/carrier/grocery bags | Shopping bags are medium-sized bags, typically around 10–20 litres in volume (though much larger versions exist, especially for non-grocery shopping), that are used by shoppers to carry home their purchases. Shopping bags can be made of a variety of plastics; polyethylene (LDPE, LLDPE, etc.) is the most common one. They usually have handles. |
| Plastic mussels/oysters mesh bag, net sack, sock | A special bag or sack made of extruded net which is used for growing (underwater) mussels, oysters and other shellfish species. These bags can have different sizes and shapes, e.g., sack-like or tubular, and the mesh net can have a different thickness. |
| Plastic gloves (household/dishwashing, gardening) | Gloves used to perform household chores such as dishwashing, gardening, etc. They are typically made of different polymers including latex, nitrile rubber, polyvinyl chloride. Less heavy-duty than industrial gloves. |
| Plastic string and filaments exclusively from dolly ropes | Strings and filaments from blue, black or orange string that are used to protect bottom trawling nets against wear and tear. A dolly rope consists of around 30 strings; each string has around 25 threads. |
| Plastic mesh bags for vegetable, fruit and other products | A special mesh bag made of polypropylene, polyethylene or high-density polyethylene used for packaging and transporting agricultural products such as vegetables, fruit, bird feed, etc. |
| Plastic injection gun containers/cartridges | A cartridge made of plastic for devices that are used to inject grease, silicone, or other fluids. |
| ata @ Thomais Vlachogianni | |

LITTER ITEMS DESCRIPTIONS





Online Photo Catalogue of the Joint List of Litter Categories

Example images to support the monitoring of macro litter in different environmental matrices

This page is under construction

Plastic crates, boxes, baskets

Plastic containers typically used to transport or store different types of items and products, other than fisheries and aquaculture related.

J-Code: J18

Category: Artificial polymer materials => Undefined use =>







Example images to support the monitoring of macro litter in different environmental matrices

This page is under construction

Plastic single-use face-mask

Single-use facemask used to protect against for example dust, chemicals and pathogens (e.g., COVID-19 pandemic).

J-Code: J253

Category: Artificial polymer materials => Medical related =>



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LITTER ITEMS & FRAGMENTS



Pieces of litter that are recognizable e.g. as a shopping bag should be registered as such.
Pieces of materials that are not recognizable as an item e.g. plastic and/or polystyrene pieces should be counted according to their size.

FIELD TIPS

- Items that easily break or get entangled and are weathered must be sorted and classified on-site to avoid errors.
- To speed up the survey, the items can be first grouped in categories according to the Joint List and then to be counted together.
- Arranging the litter types on the field list according to the most frequent items found can facilitate the recording of the litter items found.
- Unusual or not recognizable litter items can be photographed for further evaluation .



GENERATING FIT-FOR-PURPOSE MARINE LITTER DATA



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Plastic pollution on the Mediterranean coastline: generating fit-for-purpose data to support decision-making via a participatory-science initiative

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7 environmental NGOs: AKTI PROJECT AND RESEARCH CENTRE (Cyprus), MAREVIVO (Italy), HELMEPA (Greece), MIO-ECSDE (Greece), SEAQUARIUM MARINE INSTITUTE (France), SUNCE (Croatia) and U MARINU (France).

Beach litter surveys in **5** Mediterranean countries; a total of **23** sites surveyed; a total of **62** beach transects performed, extending over a distance of 6,200 m and covering an area of 113,780m²

Photo: Thomais Vlachogianni

PROFILES OF THE STUDIED BEACHES

| Surveyed Site | Country | Beach type | River in the | | | Economic Activities | | |
|-------------------------------------|---------|----------------|--------------|-------------------------|------------|---------------------|------------|-------------|
| | | | vicinity | Tourism & recreation | Fisheries | Aquaculture | Shipping | Agriculture |
| Pervola | Cyprus | semi-rural | no | medium/low | medium/low | n/a | n/a | high |
| Lara | Cyprus | remote/natural | no | n/a | n/a | n/a | n/a | n/a |
| Faros | Cyprus | urban | yes | high | n/a | n/a | n/a | n/a |
| Legrena - Saronikos Gulf | Greece | semi-rural | no | high | medium/low | medium/low | high | n/a |
| Psatha - Korinthian Gulf | Greece | semi-rural | no | high | high | n/a | medium/low | n/a |
| Varnavas - Evoikos Gulf | Greece | semi-rural | no | medium/low | medium/low | n/a | medium/low | n/a |
| Galazia Akti - Saronikos Gulf | Greece | urban | no | high | n/a | n/a | n/a | n/a |
| Lagonisi - Saronikos Gulf | Greece | urban | no | high | n/a | n/a | n/a | n/a |
| Almyros (Agios Nikolaos) - Crete | Greece | urban | yes | high | n/a | n/a | n/a | n/a |
| Ammoudara (Malevizi)- Crete | Greece | urban | no | high | n/a | n/a | n/a | n/a |
| Navarchou Nearchou - Crete | Greece | urban | no | high | n/a | n/a | n/a | n/a |
| Zaglav - Island Vis | Croatia | semi-rural | no | medium/low | medium/low | medium/low | medium/low | medium/low |
| Punta - Omis | Croatia | semi-urban | yes | high | medium/low | medium/low | medium/low | medium/low |
| Neretva river delta | Croatia | semi-rural | yes | high | medium/low | medium/low | medium/low | medium/low |
| Bovo Marina | Italy | remote/natural | yes | medium/low | n/a | n/a | n/a | n/a |
| San Marco | Italy | semi-urban | no | high | medium/low | n/a | n/a | medium/low |
| Siculiana Marina | Italy | semi-rural | no | medium/low | n/a | n/a | n/a | medium/low |
| Boucanet | France | semi-urban | yes | high | medium/low | n/a | medium/low | n/a |
| Seaquarium | France | urban | no | high | medium/low | n/a | medium/low | n/a |
| Espiguette | France | remote/natural | no | high | high | n/a | medium/low | medium/low |
| Mucchiatana | France | semi-rural | yes | medium/low | n/a | n/a | n/a | medium/low |
| Stella Mare | France | semi-rural | no | medium/low | n/a | n/a | n/a | medium/low |
| Arinella | France | semi-urban | no | high | medium/low | n/a | high | medium/low |

COMPOSITION OF MARINE LITTER



| 10.47 | The second s | | and the second second |
|-------|--|------------------------------------|-----------------------|
| | Item code | Item name | |
| 1 | G79 | Plastic pieces 2.5 cm > < 50cm | |
| 2 | G27 | Cigarette butts and filters | |
| 3 | G21 | Plastic caps/lids from drinks | |
| 4 | G95 | Cotton bud sticks | |
| 5 | G82 | Polystyrene pieces 2.5 cm > < 50cm | |
| 6 | G35 | Straws and stirrers | |
| 7 | G80 | Plastic pieces > 50 cm | |
| 8 | G83 | Polystyrene pieces > 50 cm | |
| 9 | G200 | Bottles, including pieces | |
| 10 | G30 | Crisps packets/sweets wrappers | |



Photo © Thomais Vlachogianni

SINGLE-USE PLASTICS AT BEACH LEVEL



Plastic pieces 2.5 cm > < 50cm (G79)



Cigarette butts and filters (G27)



■ SUPs % ■ NON-SUPs % ■ NON-PLASTICS



Plastic caps/lids from drinks (G21)

Cotton bud sticks (G95)



Straws and stirrers (G35)



Glass bottles (G200)



Crisps packets/sweets wrappers (G30)

String and cord (diameter less than 1cm) (G50)



For more than twenty five years joining forces & building bridges in the Euro-Mediterranean area

THANK YOU FOR YOUR ATTENTION!

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