MIO-ECSDE

Sustainable Mediterranean

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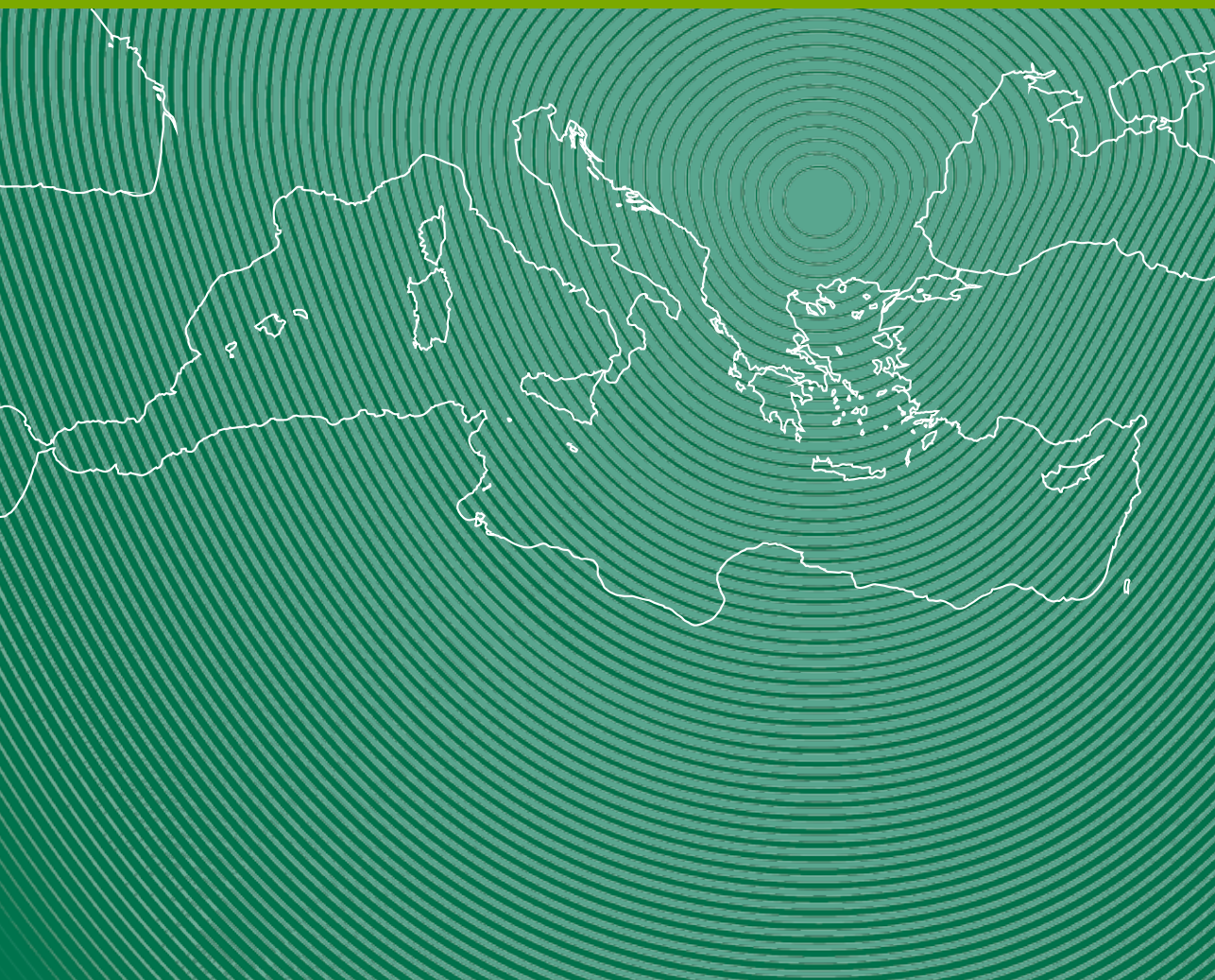
Issue No 76

Participatory Science:

engaging communities in filling in environmental knowledge data gaps
and contributing to effective environmental decision-making



EDITORIAL


Photo © Thomais Vlachogianni

This issue of *Sustainable Mediterranean* is dedicated to the 2019 Mediterranean Action Day campaign of MIO-ECSDE.

The Mediterranean Action Day is an activity of MIO-ECSDE that gives the opportunity to environmental NGOs to take action in the field and tackle each year a different environmental issue of common interest in the region. There isn't a specific day of the year to plan towards, rather each participating NGO plans its own campaign.

The Annual General Assembly of the MIO-ECSDE Federation decides the theme of each year's Mediterranean Action Day. For the year 2019, it was dedicated to '**Participatory Science: engaging communities in filling in environmental knowledge data gaps and contributing to effective environmental decision-making**'.

The issue features the participatory science activities performed by 8 NGOs from 6 EU countries: AKTI (Cyprus), iSea (Greece), Lalitsa (Greece), MEDASSET (GREECE), LEGAMBIENTE (Italy), LPN (Portugal), DPPVN (Slovenia) and SUBMON (Spain). It is a symbolic tribute to the efforts of these NGOs and their capability and creativity in taking a small amount of seed money and carrying out actions with a significant impact on their target groups. The 2019 Mediterranean Action Day was supported mainly by the LIFE+ Operating Grant for NGOs.

The issue closes with a feature on an innovative participatory science project MIO-ECSDE is a partner in, that aims to reverse the way in which odour pollution is commonly tackled.

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PARTICIPATORY SCIENCE: WHAT IS IT ALL ABOUT?

Photo © Thomais Vlachogianni

Environmental agencies have nowadays massive data requirements; national research funds are drying up while emerging technologies are constantly advancing. These three factors are driving participatory science to boom around the world. Among the different disciplines of participatory science, environmental science attracts the majority of initiatives and the most dedicated volunteers.

Participatory science is a method of undertaking scientific research whereby community groups and science professionals work together in a meaningful way on locally-relevant scientific research projects. Participants/volunteers gain new skills and a deeper understanding of the scientific work at hand during the activity.

Participatory science brings economic, social, scientific and political added value to EU and regional policies also in the context of an Open Science Agenda towards making research findings accessible and available free of charge.

The 2019 Mediterranean Action Day of MIO-ECSDE, was dedicated to the theme of **'Participatory Science: engaging communities in filling in environmental knowledge data gaps and contributing to effective environmental decision-making'** in order to support and strengthen Mediterranean environmental NGOs' understanding and capacity in engaging in participatory science activities.

PARTICIPATORY SCIENCE PROJECTS:

- are collaborative research projects that have scientific or technological value and pedagogical rigor;
- engage community groups with science and technology professionals;
- build on the popularity of citizen science, but re-balance the relationship between citizens and scientists within a highly collaborative approach;
- offer researchers opportunities to become involved in locally relevant lines of enquiry, where high-quality scientific or technological outputs can be created through harnessing the local knowledge and contribution of community groups;
- are a cost-effective way to gather required evidence and detect emerging issues and thus support public authorities to improve efficiency with less administrative burden.

SURVEYING LITTER AND PLASTIC POLLUTION ON MEDITERRANEAN COASTLINES AND RIVERBANKS

MAD activity 2019, Italy. Photo © Romina Bicocchi, LEGAMBIENTE

Marine plastic pollution has become the new millennium's tragedy of the commons. Marine litter, the vast majority of which is made of plastics, is a global problem and reliable, coherent and comparable data are essential for targeted mitigation strategies. Despite the fact that beach litter surveys are the most common mode of marine litter monitoring, in the Mediterranean the number of beach litter studies published to-date, remains limited.

Throughout the years Mediterranean NGOs have significantly contributed to providing data and information on the temporal and spatial distribution of marine litter found stranded on beaches and participatory-science campaigns have proven to be an essential tool to fill in the marine litter knowledge gaps.

Within the scope of the 2019 Mediterranean Action Day, 3 environmental NGOs from Italy, Spain and Portugal set up and implemented a participatory-science campaign in order to fill in the knowledge gaps with regards to marine litter found on Mediterranean beaches and riverbanks. The results provide fit-for-purpose data for the effective management of marine litter in the region. The NGOs which opted to carry out such an activity were: LEGAMBIENTE (Italy), SUBMON (Spain) and LPN (Portugal).

LEGAMBIENTE organized two beach litter surveys on the beaches of Cala Violina and Bagno Medus located in Tuscany. The activities brought together some 40 and 60 students and volunteers, respectively.

The students and volunteers were introduced to the theme of marine litter, its sources and impacts, as well as the main legislative frameworks relevant to the countries sharing the Mediterranean Sea and the key actions undertaken at European and Regional Sea Conventions levels to combat marine litter. The participants had the opportunity to get acquainted step-by-step with the methodology for monitoring marine macro-litter on beaches and gained hands-on experience on how to perform beach litter surveys. The beach litter methodology deployed was in line with the beach litter monitoring guidelines of the Marine Litter Technical Group of the Marine Strategy Framework Directive and the results obtained provide valuable baseline information on the amounts and sources of marine litter at the surveyed beaches.

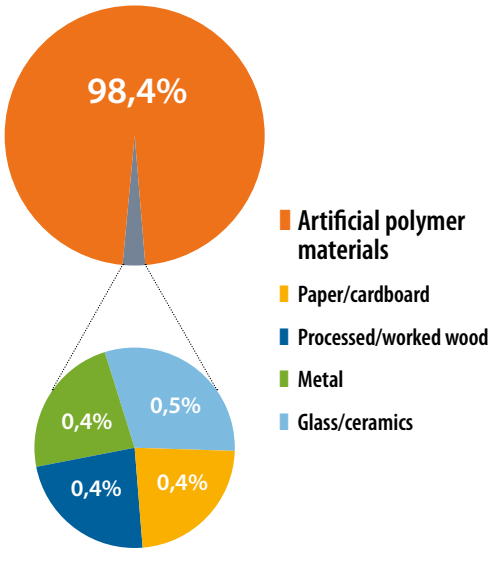
With regards to the methodological approach of the beach litter survey, the site was selected taking into consideration the following criteria: it had a minimum length of 100 meters in order to allow a fixed 100-meter stretch to be surveyed; it was characterized by a low to moderate slope (~1.5-4.5°); it had clear access to the sea. The sampling unit used was a 100-meter stretch from the strandline to the back of the beach. The back of the beach was identified using coastal features such as the presence of vegetation, dunes, cliff base, road, fence or other anthropogenic structures such as seawalls (either piled boulders or concrete structures). During the survey, all macroscopic beach litter items larger than 2.5cm in the longest dimension were collected, counted and categorized in accordance with the 'MSFD TG10 Master List of Categories of Litter Items'.

A total of 821 marine litter items were recorded; this amounts to an average litter density of 821 items/100 meter stretch. The majority of litter items were made of artificial polymer materials and accounted for 98.4% of all litter. The most frequently found items included cotton bud sticks accounting for 35% of the total litter items recorded in all surveys, plastic pieces 2.5 cm > < 50cm with 19.7%, followed by cigarette butts and plastic caps from drinks with 13.8%.

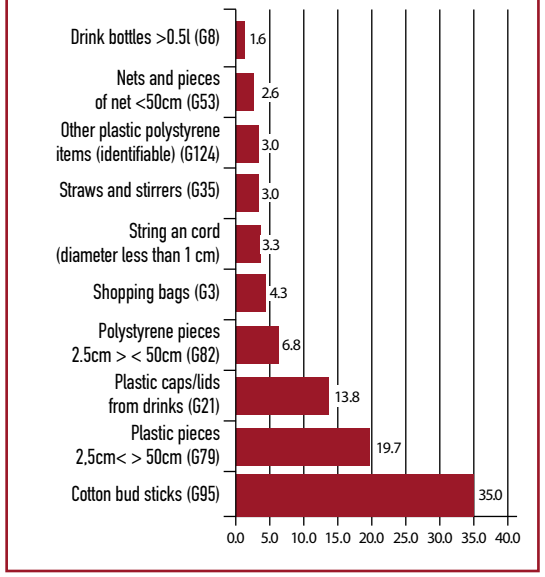
The majority of litter items were made of artificial polymer materials

Beach litter monitoring during MAD 2019, Barcelona. Photo © SUBMON

PERCENTAGE OF TOTAL LITTER ITEMS PER CATEGORY TYPE



TOP 10 ITEMS FOUND ON THE BEACHES OF TUSCANY

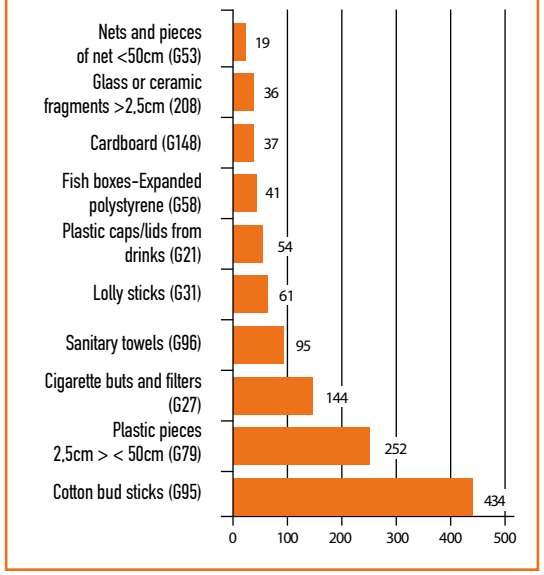


SUBMON organized a beach litter monitoring activity at La Pineda located in the vicinity of the delta of Llobregat River, the second longest river in Catalonia.

The beach is under protection status and it is part of the Natura 2000 network. Some 60 parents and schoolchildren participated in surveying marine litter on two 100-meter transects of the beach, extending over 4.300 m^2.

A total of 1.374 marine litter items were recorded; this amounts to an average litter density of 687 items/100 meter stretch or 0.3 items per square meter. The majority of litter items were made of artificial polymer materials and accounted for 86% of all litter. The most frequently found items included cotton bud sticks accounting for 32% of the total litter items recorded in all surveys, plastic pieces 2.5 cm > < 50cm with 18%, followed by cigarette butts and filters with 11%.

TOP 10 ITEMS FOUND ON LA PINEDA



Litter and plastic emission estimations into the sea remain uncertain as field data are still limited

Photo © Thomais Vlachogianni

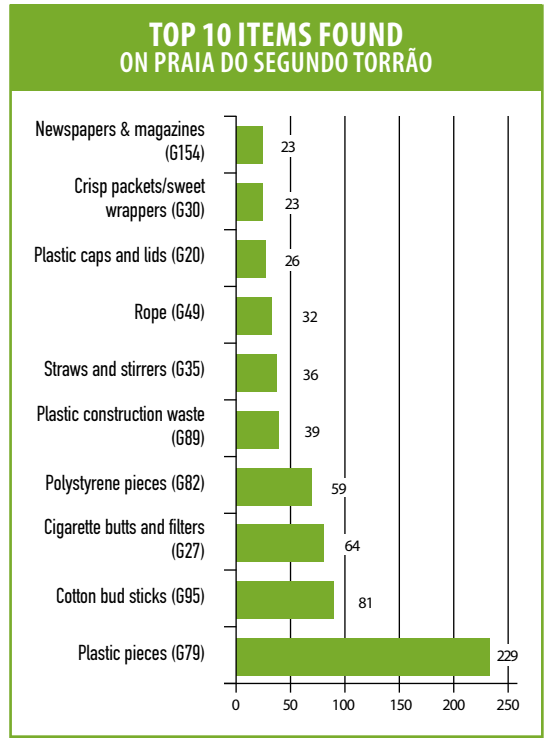
LPN organized three riverine litter monitoring activities on the banks of the Tagus river, the longest river in the Iberian Peninsula.

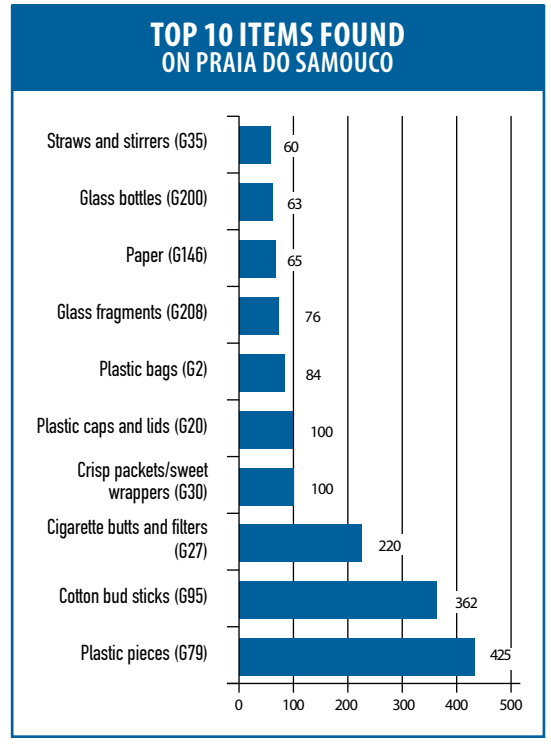
The activities brought together some 267 students and educators who joined forces to investigate the amounts and types of litter found in the Tagus. It is widely acknowledged that riverine inputs of marine litter are substantial. However, litter and plastic emission estimations into the sea remain uncertain as field data are still limited. The selected survey sites were located at: Praia do Segundo Torrão (Trafaria) characterized by illegal constructions and insufficient waste management; Praia do Samouco (Alcochete) characterized by intensive fishing activities of clams; and the Praia dos Pescadores (Póvoa de Santa Iria) characterized by recreational activities and small-scale fishing activities.

Due to the high density of marine litter items on the Praia do Segundo Torrão, the surveyed stretch was reduced to 50 meters. In total, 806 litter items were removed, recorded and classified. The litter density was calculated to be 1.612 items/100m. More than one fourth of the items were plastic fragments (229 items, 29%), followed by cotton buds (81 items, 10%) and cigarette butts (64 items, 8%).

In total 2.434 litter items were collected at the Praia do Samouco (density: 2.434 items/100m). Almost one fifth of the items were plastic pieces (17.5%), followed by cotton bud sticks accounting for 15% of all items and cigarette butts and filters accounting for 9%.

At Praia dos Pescadores a total of 650 meters of river bank were surveyed and 2.405 litter items were removed, classified and recorded. The litter density was calculated to be 370 items/100m and more than one fourth of the items were cigarette butts and filters (29%) which are indicative of the usage of the riverbank. Balloons followed with a total of 419 items accounting for 17%.





USING COLLECTIVE INTELLIGENCE FOR SHORTLISTING MEASURES AGAINST MARINE PLASTIC POLLUTION

Photo © Thomais Vlachogianni

AKTI organized a collective intelligence workshop aiming to shortlist feasible and effective measures against plastic pollution.

The workshop built upon the results and findings of AKTI's regular beach litter surveys that provide fit-for-purpose beach litter data for Cyprus; these data feed into the National Marine Litter Database of Cyprus. The collective intelligence workshop focused on consensus decision-making with regards to measures that can prevent and minimize the use of single-use plastics in coastal businesses. The workshop brought together different stakeholder groups who interacted and collaborated in an effort to identify and shortlist relevant measures that could be operationalized by coastal businesses. The Deposit Return Scheme and the replacement of single-use plastic items with eco-friendly alternatives were among the most popular measures. The follow-up steps of this workshop include meetings with the Deputy Minister of Tourism, the local authorities and the Responsible Coastal Business Network in order to pave the way for the implementation of the shortlisted measures.

Group of people attending AKTI's collective intelligence workshop Photo credit:AKTI

CITIZEN SCIENCE FOR BIODIVERSITY MONITORING

Testing biodiversity application in the field, Nea Skioni, Chalkidiki. Photo © Ioannis Giovos, iSea

Biodiversity is a crucial natural asset and component of terrestrial, freshwater and marine ecosystems directly or indirectly providing or contributing to the maintenance of important ecosystem goods and services and thus underpinning human well-being. Despite the substantial efforts at international and EU level to protect, conserve and enhance the natural capital, assessments show that biodiversity is still being lost and that most ecosystems are seriously degraded.

Data collection and the monitoring of habitats and species is of crucial importance to dynamically fill in the knowledge gaps on key emerging threats and participatory science has a key role to play.

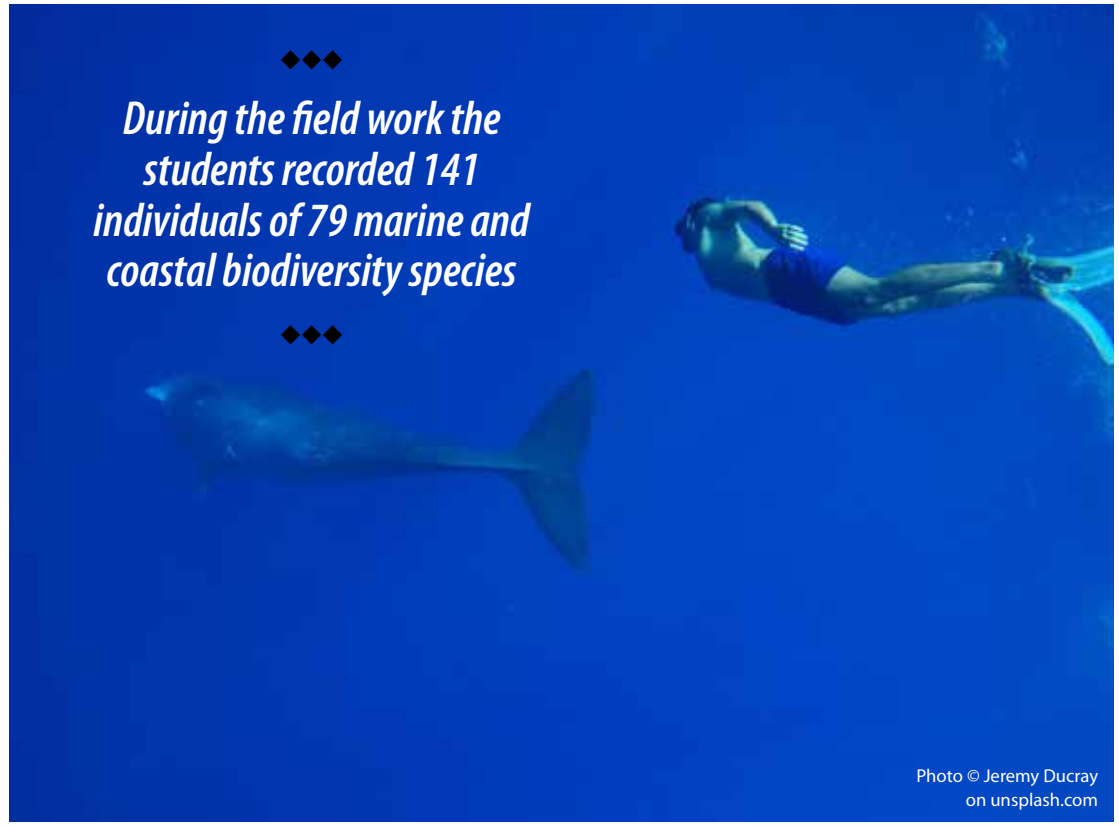
Within the scope of the 2019 Mediterranean Action Day, 4 environmental NGOs from Slovenia and Greece set up and implemented participatory science campaigns in order to fill in the knowledge gaps with regards to biodiversity, in particular with regards to birds, bats and various marine species. The NGOs which opted to carry out such an activity were: DPPVN (Slovenia), iSea (Greece), Lalitsa (Greece) and MEDASSET (Greece).

Within a four-month period, citizens observed and recorded 22 species of waterbirds

Tachybaptus-ruficollis, Slovenia.
Photo © Milan Vogrin, DPPVN

DPPVN organized a citizen science activity to monitor the waterbird species population of the fishponds of the Landscape Park of Rače Ponds – Požeg, a Natura 2000 site.

The monitoring activity was carried out every weekend from the beginning of February 2019 till the end of May 2019 with the participation of the local community, guided by an experienced ornithologist. Prior to any observation, the participants were trained on how to conduct point counts and transect counts as these are the most commonly used survey methods for birds. The activity aimed at monitoring the temporal variability of the waterbirds community in the park; within a four-month period, citizens observed and recorded 22 species of waterbirds. The greatest number of species was observed in April.



During the field work the students recorded 141 individuals of 79 marine and coastal biodiversity species

Photo © Jeremy Ducray
on unsplash.com

iSea organized a 5-day Summer School focusing on citizen science for marine biodiversity monitoring.

The field activities of the summer school were carried out in 8 areas located in the Peninsula of Chalkidiki, 3 of which are Natura 2000 sites. The summer school familiarized the university students with the concept of participatory/ citizen science and its role in data collection and policy-making and promoted the use of participatory science platforms/tools that allow the collection, recording and analysis of environmental data.

The students were trained on how to use different related platforms/tools such as: the iNaturalist App; the IUCN Med-MIS platform for monitoring invasive species in Mediterranean Marine Protected Areas (MPAs); the MyNatura2000 App; and, the SEAlly App for sharks and sea turtles. During the field work the students recorded 141 individuals of 79 marine and coastal biodiversity species.

The summer school was organized back-to-back with the BioBlitz; an international event that focuses on finding and identifying as many species as possible in a specific area over a short period of time. To motivate the students, iSea set up a contest during the BioBlitz day and awarded those students with the highest observation records of species; the winners had the opportunity to attend the final event of the Marine ECOMED Summer School where they shared their experiences with students from other Mediterranean countries.

Photo ©
Thomais Vlachogianni

Photo © John Hoffman

Lalitsa dedicated its participatory science activity to bats.

Bats are perhaps among the most misunderstood of animals, routinely feared and loathed as sinister denizens of the night. Aiming to dispel the myths about bats and highlight the importance of bats to ecosystems and humans, Lalitsa organized a one-day activity in Kastoria, Greece to engage the public in protecting bats.

Greece has the highest bat species diversity in Europe, but yet very few organizations and/or institutions focus their research on bats. Kastoria, a small town in Northern Greece, located on a lake, was chosen for the participatory science activity because local communities have voiced concerns about the presence of bats in their attics.

To prepare the participants for the field work, a workshop was organized on bat monitoring methods with a focus on acoustic monitoring (using sound recorders). Professional bat sound recorders used for scientific research or conservation monitoring, illustrations of bat call sonograms and the software used to identify the species from their calls were displayed. Ultrasounds of bats made audible for the human ear were also played. Lastly, the use of the bat detectors purchased within the scope of MAD 2019 was explained.

Bats are nocturnal species, they emerge from their dark roosts after the sun sets. So, after the sunset, the participants visited a wooden house where bats roost and observed the bats emerging and flying in the open space around the house and near the trees along the lake, while they were hearing their sounds using the detectors. Though this can be more characterized as an awareness raising activity, it constitutes the first step towards the implementation of citizen science for bats, where volunteers from different towns will be equipped with Echometer modules (bat detectors) to monitor and record, according to protocols, the impact of urbanization and pollution on bat communities.

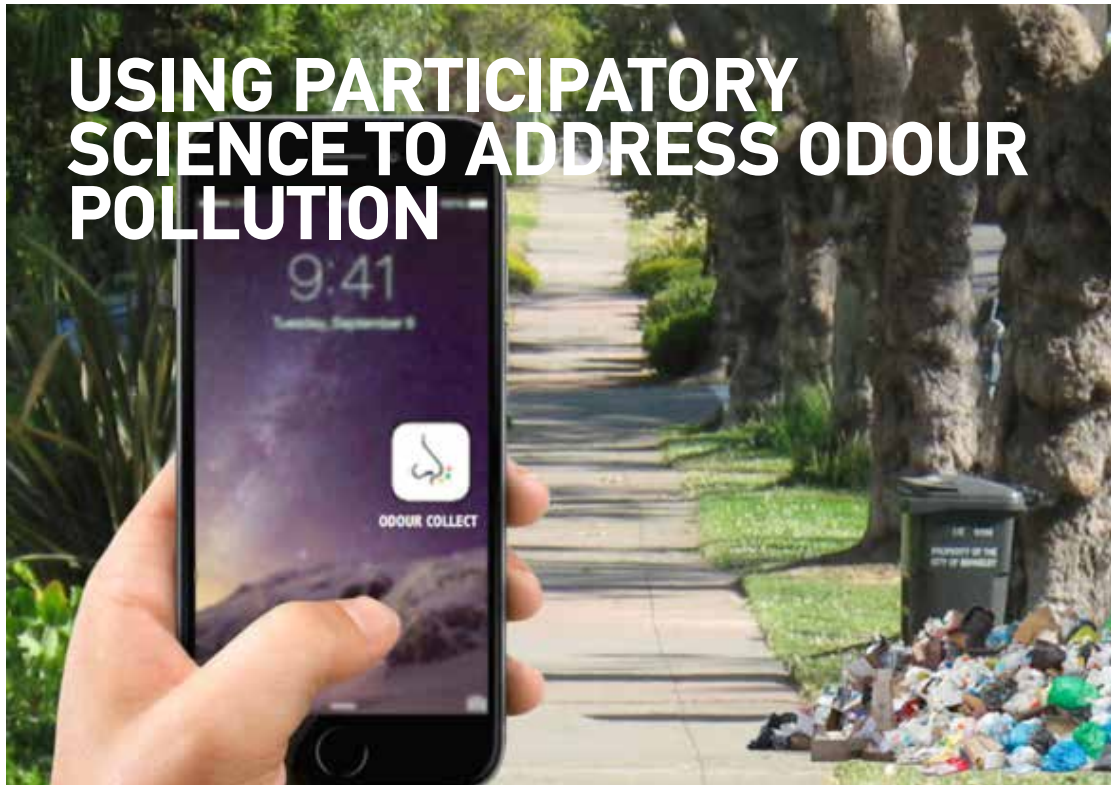
Delphinus Delphis observed in the Saronic Gulf, Greece. Photo © MEDASSET

MEDASSET celebrated the MAD 2019 by officially communicating SEAlly©, the first mobile application that allows multi-taxa recording (sea turtles and sharks) whose abundance is not well known in the Mediterranean Sea.

The App aims to increase the scientific knowledge on these populations to be eventually used as a useful scientific and policy making tool to mitigate bycatch and ghost fishing on sea turtle and shark populations in Greece. Its target groups are fishermen, port authorities, divers, the sailing community and all sea lovers interested in the protection of marine ecosystems.

The participatory science action was implemented on a sailing boat that sailed off into the Saronic Gulf. During the trip, the participants including fishermen, NGOs, foundations, sailors and others were introduced to the App and to the bycatch and ghost fishing problems and the urgent necessity to mitigate them. During the field trip the participants encountered one of the rarest marine species, which used to be very common (hence the name), the common dolphin (***Delphinus Delphis***) and had the chance to observe and record some of its behaviors like sleeping, mating and feeding.

USING PARTICIPATORY SCIENCE TO ADDRESS ODOUR POLLUTION



MIO-ECSDE is promoting participatory science as the most effective way for people or communities to solve odour problems.

Most people don't know that odour pollution is the second leading cause of environmental complaints after noise! The existence of odour nuisance is usually an indicator of larger environmental issues linked to air, water and soil pollution and to sanitary problems e.g. poor solid waste management or inadequate function of a wastewater treatment plant. Evidence shows that persistent exposure to malodours can cause headaches, throat and eye irritation, nausea, sleeplessness, anxiety, stress, and respiratory problems.

Oddly enough, there is no harmonized regulation at local or national level almost anywhere in the world. Part of the reason is that detecting and measuring odours, pinpointing sources and estimating effects can be tricky.

All of the above are reasons why MIO-ECSDE became a partner in the EU H2020-SwafS

(Science with and for Society) project "Distributed Network for Odour Sensing, Empowerment and Sustainability" (D-NOSES).

D-NOSES aims to implement principle 10 of the Rio Declaration by engaging citizens and building capacity for action based on a bottom-up approach. The project relies on the best possible sensor to measure odours: People's own nose. In D-NOSES participatory science approach, citizens do not only monitor their surrounding environment and analyze their findings, but they also define the problem, co-design methodologies and tools that enable them to own, share and act on their results.

The project follows a quadruple helix model bringing together communities, authorities, private enterprises and research institutions into a constructive dialogue. The aim is to provide a platform where creative, effective and balanced solutions can be found, with improved communication and transparency. The D-NOSES model is being tested in 10 cases from around the world.

The lessons learned from the project will eventually be distilled into a handbook to facilitate the replication of the method in other odour affected communities. By first establishing a standardized approach to citizen led interventions, the project will also produce a roadmap for improved odour pollution regulation at the local, national and international levels.

1 IDENTIFY THE ISSUES
Are there any odour issues in the area affecting the communities?

2 STAKEHOLDER MAPPING
Which stakeholders are and should be involved in the issue? How to engage them?

3 FRAME THE PROBLEM
How can the problem be better understood?

4 PILOT DESIGN
How can the pilot help to improve the issue and benefit the affected communities and other stakeholders involved? Which data needs to be gathered? How will it be gathered? What skills are needed?

5 DATA COLLECTION
Deployment of a data collection protocol and data gathering tools for the stakeholders identified.

6 DATA ANALYSIS
What does the data tell us?

7 ACTION
What solutions can we co-create to tackle the odour problem?

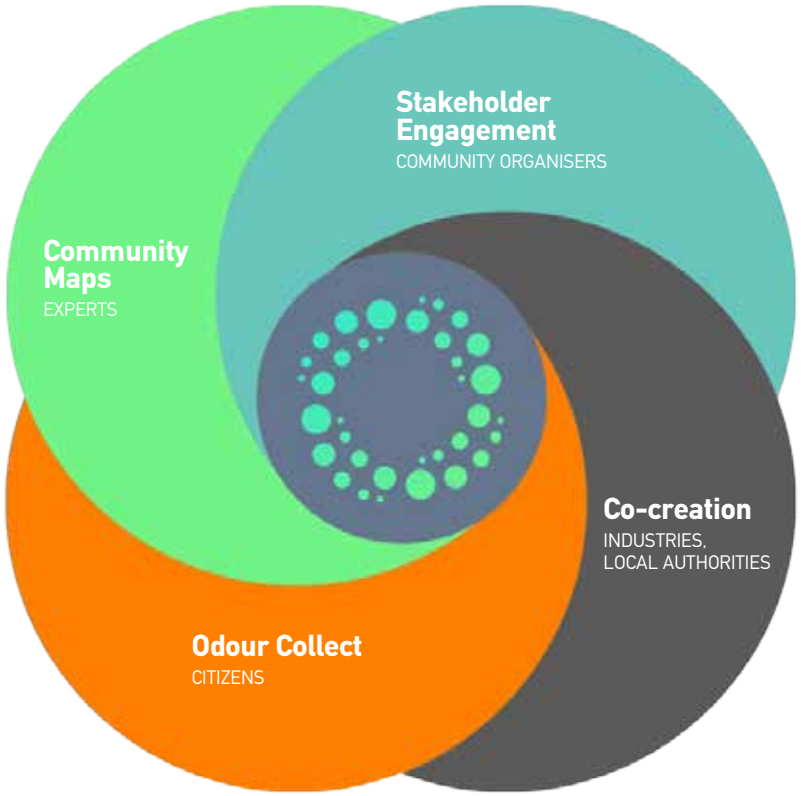
8 OUTCOMES
Which actions have been undertaken? What are the lessons learnt during the process?

The D-NOSES engagement process being tested in 10 case studies from around the world: Barcelona (Spain), Thessaloniki (Greece), Sofia (Bulgaria), Porto (Portugal), Castellanza (Italy), Schermbeck (Germany), Los Alamos (Chile), Sao Joao de Madeira (Portugal), Kampala (Uganda), Royal Docks (United Kingdom).

One of the lasting results from the D-NOSES project will be the **International Odour Observatory** (*https://odourobservatory.org/about-us/#whatistheOO)*. It has been designed to fill the gap in accessing information in relation to odour issues. This resource has been created to help anyone who has a part to play in causing or addressing odour pollution such as individuals and communities; policy makers and regulators; researchers and industries. It includes information on odour issues, regulations, research, data collection methods and potential mitigation measures or solutions. The platform itself was initially co-created to ensure it suits the needs of all the stakeholders and will continue to be a dynamic site where all those involved can provide input on how to improve the methods, the data and the end results.

ODOUR OBSERVATORY

One of the lasting results from the D-NOSES project



The International Odour Observatory has been designed to fill the gap in accessing information in relation to odour issues (https://odourobservatory.org/about-us/#whatistheOO). It will host the D-NOSES tools developed to equip citizens with scientific and validated data and to empower them to become their own driving force for change.

Collecting Data - The OdourCollect Application

One of the main objectives of the Odour Observatory is to make as much data available about odour issues worldwide. Following Principle 10 of the Rio Declaration, free and transparently available data about the environment is the first step to empower citizens to take responsibility for their own environment. **OdourCollect** is an application that allows citizens to contribute odour data from their communities and allows the project partners to call attention to the identified problems and to put odour issues on the map.

See at *https://odourcollect.eu/ how easy OdourCollect is to use, and start using it yourself!*

Data to Information - Community Maps

Once data is collected and validated, it is transformed into information logged in the **Community Maps**, accessible through the Odour Observatory. Community Maps has been created to enable anyone to share their odour stories so that others can feel motivated or inspired, and policy makers can better understand the overall situation.

Read more about Community Maps and their role in the Odour Observatory: *http://dnoses.eu/2019/07/21/community-maps/*

Raising Awareness on Odour pollution - MOOC

The **D-NOSES Massive Open Online Course (MOOC)** aims to raise awareness on the issue of odour pollution and to familiarize citizens with the tools to deal with it, particularly with the tools and methodologies created by D-NOSES promoting the citizen-science approach.

Register and complete that D-NOSES MOOC here: *https://dnoses.envirolearning.net/catalog/info/id:132*

D-NOSES

Distributed Network for Odour Sensing, Empowerment and Sustainability

This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No 789315.

MIO-ECSDE

The Mediterranean Information Office for Environment, Culture and Sustainable Development, is a Federation of Mediterranean Non-Governmental Organizations (NGOs) for the Environment and Development. MIO-ECSDE acts as a technical and political platform for the intervention of NGOs in the Mediterranean scene. In cooperation with Governments, International Organizations and other socio-economic partners, MIO-ECSDE plays an active role for the protection of the environment and the sustainable development of the Mediterranean Region.

Background

MIO-ECSDE became a federation of Mediterranean NGOs in March 1996. Its roots go back to the early 80s, when the expanding Mediterranean membership of the European Community encouraged the European Environmental Bureau (EEB) to form its Mediterranean Committee supported by Elliniki Etairia (The Hellenic Society for the Protection of the Environment and the Cultural Heritage). The Mediterranean Information Office (MIO) was established in 1990 as a network of NGOs, under a joint project of EEB and Elliniki Etairia and in close collaboration with the Arab Network of Environment and Development (RAED). The continuous expansion of MIO-ECSDE's Mediterranean NGO network and the increasing request for their representation in Mediterranean and International Fora, led to the transformation of MIO-ECSDE to its current NGO Federation status. Today it has a membership of 130 NGOs from 28 Mediterranean countries.

Our Mission

Our mission is to protect the Natural Environment (flora and fauna, biotopes, forests, coasts, natural resources, climate) and the Cultural Heritage (archaeological monuments, and traditional settlements, cities, etc.) of the Mediterranean Region. The ultimate goal of MIO-ECSDE is to promote Sustainable Development in a peaceful Mediterranean.

Major tools and methods

Major tools and methods used by MIO-ECSDE in order to achieve its objectives are the following:

- Promotion of the understanding and collaboration among the people of the Mediterranean, especially through their NGOs, between NGOs and Governments, Parliaments, Local Authorities, International Organizations and socio-economic actors of the Mediterranean Region.
- Assistance for the establishment, strengthening, cooperation and co-ordination of Mediterranean NGOs and facilitation of their efforts by ensuring the flow of information among relevant bodies.
- Promotion of education, research and study on Mediterranean issues, by facilitating collaboration between NGOs and Scientific and Academic Institutions.
- Raising of public awareness on crucial Mediterranean environmental issues, through campaigns, publications, exhibitions, public presentations, etc.

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