



Co-funded by the LIFE programme
Environment and Resource Efficiency



LEMA

Intelligent marine Litter removal and
Management for local Authorities

NEWS LETTER #4



EDITORIAL

Welcome,

We bring you the **#4 LifeLEMA newsletter** to keep you informed of the progress and evolution of the project. We have entered the “final stages” of this European project, because LifeLEMA is ending during summer 2019. This means that we are closer to obtain results and tools for a better management of floating marine litter.

Nevertheless, we have still lots to do and for now, we continue to focus on providing you the progress we have made. In this newsletter, we want to introduce you to our monitoring actions about the transportation of floating litter by rivers. These actions are of great interest due to the fact that the 80% of floating marine litter is land based, and much of it enters the oceans through the rivers.





MONITORING OF THE FLOATING LITTER THROUGH CAMERA STATIONS IN RIVERS

The objective of LifeLEMA Project is to provide solutions to the local authorities with the aim of answering, among others, to the Marine Strategy Framework Directive 2008/56/EC which objective is to reach a good environmental state of marine waters before the end of the year 2020. For this purpose, one of the indicators commonly used in the monitoring programs to detect the good state is marine litter (10 descriptor).

One of the actions developed is the installation of two video cameras in the estuaries of the Oria and Adour rivers with the aim of monitoring the transportation of litter and research the capacities of the technology by applying terrestrial

videometric techniques. Thus, it will provide a quantitative indicator in real time of the FML (floating marine litter) released by rivers to the coastal areas. The principal specific actions include on one hand, the installation of the technological solution selected, which is a system of the NIR camera (NearInfraRed), in the mouth of one of the pilot zones. Thus, in August 2017 AZTI installed a NIR camera in the estuary of the Oria river in Gipuzkoa, Spain. On the other hand, as well as the installation of the cameras, the other project's challenge is the development of an algorithm which can detect the floating litter and calculate their size and speed.



The first version of the algorithm developed is based on image processing (video sequence or frames) which allows the automatic detection of floating litter that passes through a predefined area on the river. The detection of the floating litter or blobs (pixel groups more bright or dark than the image range) is done comparing every frame of the camera with an average range, which is calculated and modified in regular intervals. Once detected the possible floating litter on the image, a monitoring of the object is done using a tracker. The algorithm calculates also the size of the objects and their speed, thus, allowing the final estimation of the floating solid volume which the river provides.

Thus, in the beginning of 2018 the first algorithm has been set up (in Python programming language) to manage the processes of capturing, detecting and monitoring of the floating objects in the mouth of the Oria river. As direct result of the algorithm a report is generated where all the floating objects detected are listed and characterized by their speed and size. Taking advantage of previous experience and having set up the algorithm in the pilot place of the Oria river estuary, during 2018 a second camera station has been set up in the Adour river estuary (France). Currently, both camera systems are carrying out the monitoring of the detection of floating objects automatically. We continue working on a second version with the objective of optimizing the detection of floating particles to increase the speed and the effectiveness of the actual algorithm and to apply techniques of image

processing to minimize the noise linked to the detection of brightness, reflections and foam. Thus, we expect an improvement of the results of the calculation of particles detected, their distribution, size and speed.




The results obtained seem to point out that the camera systems could be a useful source of information to estimate the quantity of floating marine litter which travels through the rivers and is discharged into the sea. This information will be useful in the future, to estimate better the entrance sources of floating litter and the areas of high density both in rivers and in the sea, to optimize its collection.



AGENDA

05/03

TECHNICAL COMMITTEE LIFE LEMA

-  Event with invitation needed
-  AZTI installations, Pasaia (Spain).
-  <https://goo.gl/maps/PBscn4vYvMy>

As every 6 months, it is time for Life LEMA partners to gather and review the technical progress of the project and assess the results obtained, as well as making a detailed planning for next months. This time the meeting will be held in AZTI, Pasaia.

April




OSPAR SPRING CAMPAIGNS

-  Event with volunteer groups and volunteer schools
-  Gipuzkoa beaches
-  <https://www.facebook.com/surfriderespana/>

Inside the project, every season groups of volunteers join to pick up marine litter from beaches and then characterize and count the objects they collect, following the OSPAR protocol. Thus, Life LEMA gathers information about marine litter arriving to the beaches through Citizen Science.

10-12/04

MARLICE FORUM 2019 ON CIRCULAR ECONOMY AND MARINE LITTER

-  Event with inscription
-  Seville, Spain.
-  http://marlice2019.aebam.org/home_798745194.html

This cross-sectoral and multi-stakeholder event on marine litter is going to gather public authorities, research institutes, private sector and environmental organizations. As the ML problem is transboundary, it implies cooperation between countries. This forum will serve as a platform for Mediterranean and Atlantic areas to promote synergies between countries and regions.






XABIER IRIGOIEN
AZTI Scientific Director

¿Which is the role of AZTI regarding plastic pollution in the oceans?

A technologic centre like AZTI, specialized in the sea, is essential to provide solutions with a global vision of the impacts. Having a global vision of marine ecosystems is helpful to avoid solutions that can be harmful in other aspects and allows an optimization of the resources dedicated to management.

¿Which benefits can provide LifeLEMA?

I think that the biggest benefit LifeLEMA can provide is the tools for the management of marine plastics that are developing. The resources of public administrations are limited and all the tools which help deciding when, how and where to act are going to result in a significant reduction of plastics.

¿Is scientific data decisive for environmental policies?

Not only the data but the scientific approximation also should be the key to define the environmental policies. The scientific method determines one action and visualizes its effects, which have to be replicable. In the environmental policies, there is often not enough following-up of the cause-effect relations determined by a scientific method.

¿Is there alarmism or is it necessary?

I don't think there is alarmism but a lack of information. Plastic contamination is real and has a big impact in marine ecosystems. Nevertheless, sometimes we put the focus on problems that are not the most important; and direct impacts like the death of macrofauna due to macroplastics has a second place in relation to microplastics, which impact is difficult to determine. The same happens with the emphasis we are putting in the collection of plastics in the sea, they is a management problem at land and the management on the source is more efficient than when plastics are already in the seas.

¿What does an integrate transboundary management imply?

There are no frontiers for plastics or fishes and as we already talk, the problem is the management on the source. Having a good management of waste in one region without having it on the nearby region, doesn't make any sense. It is important that transboundary regions have common indicators and that they share management measures.





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