

ZERO PLASTIC NEWS
#5

SEPTEMBER 2021

ZERO PLASTIC

WORLD NETWORK OF BIOSPHERE RESERVES



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NEXT STEPS FOR ZERO PLASTIC INITIATIVE

Here in the northern hemisphere we are starting to notice Summer's subtle shifts toward autumnal tendencies -- perfect timing to share the news and updates contained in this Zero Plastic News bulletin #5!

This fifth edition offers updates on efforts underway in Lanzarote, Mariñas Coruñas, Isle of Man, Karst and Reka River Basin, Iroise Islands, Menorca, and Jeju Island; all Biosphere Reserves working for a world without plastic pollution.

In the interview section, we present the perspectives of two researchers from France -Thierry Huck and Christophe Maes- conducting oceanographic modeling at a national and global scale, involved with Marine Sciences For Society in the study of plastic pollution. They also share recommended literature for diving deeper into the topics of their research.

We close this by edition mapping out next steps for the Zero Plastic initiative...

...And we warmly welcome all Biosphere Reserves to participate actively in this process.

MICRO as open-science platform

The aim of the MICRO web-based-platform is to celebrate the burgeoning community of researchers and policy-makers concerned by the Plastic Pollution challenge and this from Macro to nano.

With MICRO conference series as main action serving as a means to: (i) Identify current research limits and new challenges, (ii) Facilitate open access to the breadth of ongoing research and (iii) contribute a collaborative effort to our continuously expanding community.

The names of the conferences tell you something about the evolution of the conference series:

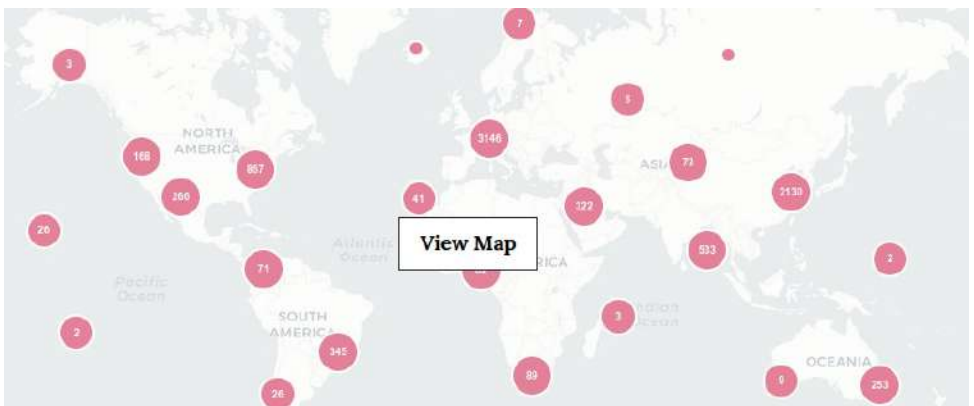
MICRO 2022, Outside... ;)

MICRO 2020, Fate and Impacts of Microplastics: Knowledge and responsibilities;

MICRO 2018, Fate and Impacts of Microplastics: Knowledge, actions, and solutions;

MICRO 2016, Fate and Impacts of Microplastics: From the coastline to the open sea.

So We leave it to you to take it from here... <https://www.micro.infini.fr>



Interview with Thierry Huck and Christophe Maes

We are honoured to share an interview with Thierry Huck (T.H.), at CNRS and Christophe Maes (C.M.) at IRD, both physical oceanographers in the Laboratory for Ocean Physics and Satellite remote sensing (LOPS) in Plouzané, France.

Why these two?

As oceanographers from the LOPS lab, Thierry (T.H.) has been a key contributor to the Marine Sciences For Society process since it began in 2007, and Christophe (C.M.) has become more and more involved through the MICRO conference series and beyond.

Enjoy their responses, question by question...

How does the work you do help us to understand plastic pollution?

C.M.

For many people, it seems it should be easy to predict where floating marine plastic and debris will be transported once it enters the open ocean; ocean currents have been well-known for centuries, haven't they? And, in any case, we have been using satellite data like altimetry, which allows us to indirectly derive surface currents, since the 1990s. However, the question of transport in the ocean, even only considering the surface level, remains open and it forces this point-of-view to be challenged by present knowledge and observations of ocean dynamics. Within the context of ocean dispersal, for the last few years we have worked to understand the role and impact of small scales, for example, at the scale of 10-100 km, studying characteristics of ocean eddies called "mesoscale dynamics". When we look at the global distribution of floating "fictive" particles, those trajectories are determined with computers. The "eddies gate" also opens to smaller scales, called "sub-mesoscale dynamics" (typically around 1km and below), where local convergence and fronts could occur in the oceans between the material transported by two eddies, but studies of such dynamics remain in their infancy...

T.H.

We try to understand the pathways of plastic pollution into the three-dimensional ocean and ultimately the fate of plastic pollution entering the ocean. As physical oceanographers, we firstly consider the role of ocean currents, but these are not the whole story since plastic particles have their own vertical dynamics because of the type of polymer, the size and shape of the particles, and their history through degradation, fragmentation and biofouling. For now, we feel our expertise is mostly useful at deciphering the processes influencing the fate of plastics at sea, and eventually evaluating the uncertainties in our physical models. For instance, questions we would like to answer are: where do plastic particles found on a particular beach come from? Such statistics could help targeting the right preventative measures to reduce pollution in some specific areas, because of their ecological importance or sensitivity.

**In the data and models you have looked at from the Oceans,
what has caught your attention?**

C.M.

In 2018 we conducted a simple numerical experiment where the trajectories of the “fictive particles” within the ocean currents reproduced by a global ocean model were computed on each point of the ocean grid. This is what was, at the time, one “academic” scenario for the sources of the plastic particles in the ocean, and had been used by many previous studies focused on the dynamic response of marine dispersion. Nevertheless, our results (i.e., Maes et al. 2018) show that such a specific pathway connecting the south tropical convergence zones of the Indian and Pacific Ocean, due in large part to the specific role of the ocean eddies, was not reported in the literature. It was a surprise for us to think that similar results based on the simplest scenario for the particle sources were not discussed or reported before. It gives some strength to the idea that acquired and quite well-known results could, and should, be challenged regularly.

T.H.

We have mostly looked at numerical experiments of lagrangian tracking of particles at the ocean surface, on the global scale. Every study we have launched has come with its surprises. One of our first surprise was the global teleconnection between ocean basins, for instance between the North Indian basin towards the South Pacific convergence zone and the South Atlantic. Another surprise was the large influence of wave-induced surface Stokes drift on the location of the convergence zone in the South Indian basin, that could influence the fate of a large fraction of floating plastic debris entering the ocean from Asia. But the real trouble is there are too few observations of plastics at sea available to validate the numerical results, and the large uncertainty in the estimates of the actual sources of plastic entering the ocean. Without more observations, both at the surface and in the water column, it will be difficult to make progress on the reliability and accuracy of our modeling efforts.

How should we approach the complexity of plastic pollution and its impacts on Biosphere Reserves?

C.M.

The plastic litter problem in the oceans is complex -ocean dynamics are turbulent by nature- and implies a strong interplay between the physical dynamics, the evolution of the polymer materials themselves and the “human” factor of our perception of the environment as seen by our civilization. The nature of the challenges for resolving the plastic crisis in the ocean, as we are not able to predict the long-term consequences of “filling” the different levels of the ocean compartments from the surface down to the sediments at the bottom with plastics, should force the scientific community to act in synergy.

T.H.

There is probably a large diversity of situations for the Biosphere Reserves around the world. In France for instance, my feeling from observations on the beach and snorkeling is that the level of plastic pollution is much higher along the Mediterranean French coasts than along the Atlantic coast, like in Brittany, and the priority actions are much different.

In each situation, there are several issues to address:

- What are the most important impacts we observe? (and the importance is probably not objective, and depends on one's sensitivity – tourism, wildlife, biodiversity...)
- What is the origin of the pollution?
- What can we do to reduce it?

Maybe on the short term, actions can be undertaken and work locally, like beach cleaning. But very likely, on the longer term, plastic pollution is really a global problem and action must be considered at the global level. Hence people's awareness worldwide is a key step, along with global policy.

Is there anything more you would like to share about the objectives and intentions of Zero Plastic in Biosphere Reserves?

C.M.

To give a long-term perspective to our actions based on theoretically and numerically understanding ocean dynamics. It is also very important to consider solutions and so, to support associations and organizations that want to efficiently clean and minimize human impact on the oceans. Among many others, we support innovative project like the Manta one lead by the “The Sea Cleaners” association who designed a ship to collect floating marine debris in zones where it collects in large volumes before it disperses and permanently enters the marine ecosystem. Our objectives against the atrocity of ocean pollution should also be convergent...

T.H.

Estimating all the sources of plastic to the ocean is a critical issue, and we need more than a few academic papers to build on solid ground. We also need to estimate the uncertainties. Without accurate estimates, we have no indicators of things are going -- just like for CO2 emissions, we need to be able to define quantitative objectives, I think it can be a very motivating. Of course, the variety of sources and pathways (rivers, atmosphere...) and their reliable estimates is a real challenge, I really acknowledge the efforts that have been made in this direction, and I hope these estimates will be challenged in the future.

Their top references related to plastic pollution:

Chenillat, F., T. Huck, C. Maes, N. Grima, and B. Blanke, Fate of floating plastic debris released along the coasts in a global ocean model, *Mar. Pollut. Bull.*, <https://doi.org/10.1016/j.marpolbul.2021.112116>, 2021.

Dobler D., T. Huck, C. Maes, N. Grima, B. Blanke, E. Martínez and F. Arduin, Large impact of Stokes drift on the fate of surface floating debris in the South Indian Basin. *Mar. Pollut. Bull.*, <https://doi.org/10.1016/j.marpolbul.2019.07.057>, 2019.

Geyer, R., J.R. Jambeck, K. Lavender Law, 2017: Production, use, and fate of all plastics ever made. *Science Advances*, 3, (7) e1700782, DOI: 10.1126/sciadv.1700782.

Jambeck, J. R., R. Geyer, C. Wilcox, T. R. Siegler, M. Perryman, A. Andrady, R. Narayan, and K. L. Law, 2015: Plastic waste inputs from land into the ocean. *Science*, 347, (6223) 768-771, DOI: 10.1126/science.1260352.

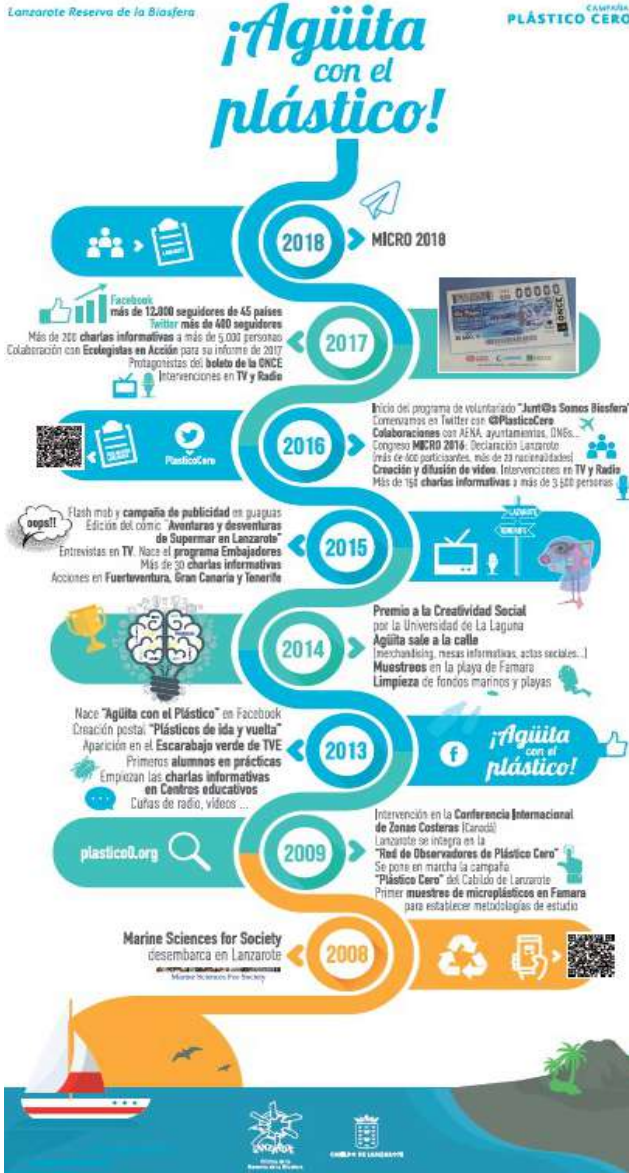
Lebreton, L., and A. Andrady, 2019: Future Scenarios of Global Plastic Waste Generation and Disposal. *Nature*, Palgrave Communications, DOI: 10.1057/s41599-018-0212-7.

Schmidt, C., Krauth, T., Wagner, S. (2017). Export of plastic debris by rivers into the sea. *Environmental Science and Technology*, 51, 12246-12253. doi: 10.1021/acs.est.7b02368.

Viatte, C., C. Clerbaux, C. Maes et al., Air Pollution and Sea Pollution Seen from Space, *Surv. Geophys.* <https://doi.org/10.1007/s10712-020-09599-0>, 2020.

Zero Plastic initiative in Lanzarote as starting point

Lanzarote's Biosphere Reserve was the starting point of the Zero Plastic initiative in 2008. Since then, Lanzarote's efforts addressing plastic pollution have been ongoing, bringing a point of balance in the initiative between local and network efforts. The figure below shares key milestones along the road, from the local perspective.



In the past three years, 2019-2021, Lanzarote has continued these efforts:

- . 179 talks to 5975 students;
- . 60 sampling days on Famara Beach, continuing the long-term microplastics monitoring process started in 2008;
- . MICRO 2020 conference;
- . **FB group** with more than 13.000 members and...

...much more ;)

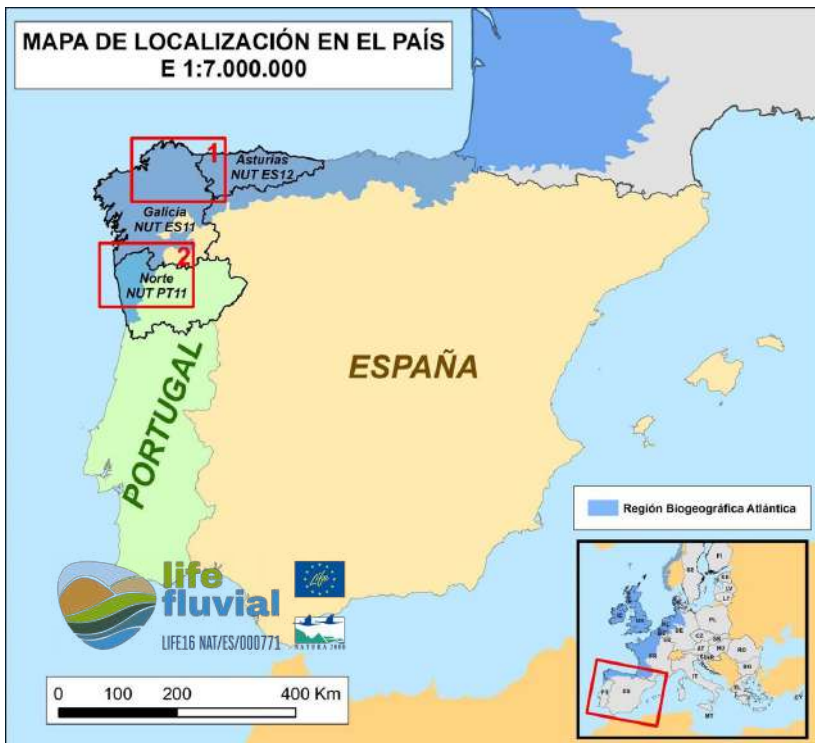


Famara 2021, photo by Rafael Mesa.

Contributed by Lanzarote BR, Spain

Collecting plastics through environmental volunteer activities

LIFE Fluvial focuses on improving environmental conservation of river corridors in the Atlantic Region through a transnational collaboration strategy aimed at promoting river conservation and sustainable management. For this, conservation and restoration activities have been designed for different estuarine, fluvial and lagoon wetlands distributed among three Biosphere Reserves: Mariñas Coruñas e Terras do Mandeo, Terras do Miño and the Reserve of the Río Eo, Ocos y Terras de Burón.



The project brings together an extensive team of people from the Universities of Oviedo (INDUROT), Santiago (IBADER) and Lisbon (ISA), as well as from different entities (Mariñas Coruñas, INTEREO, EMALCSA, Tragsa and the Ribadeo City Council), involved in the processes of preparation, land acquisition, monitoring, awareness-raising, and dissemination.

The LIFE Fluvial project and environmental volunteering opportunities contribute to disseminating practices aimed at preserving and improving the environment among the region's population.

These volunteer activities focus on raising awareness about the threats affecting river corridors, among which is pollution from plastic waste.



Collecting microplastics on the beach of O Pedrido (Bergondo):

On May 14, 2021, the Biosphere Reserve organized a volunteer day in collaboration with the "CEIP Sada y sus Contornos" School Center, involving two of its 6th grade classes in Primary Education. A location was chosen that allowed students to witness the problem of waste in the aquatic environment caused by the use of plastics. For this, O Pedrido Beach (municipality of Bergondo), in the Ría de Betanzos, was considered the best place. This area is included in the Betanzos Mandeo SAC ES1110007, of the Natura 2000 Network.

After two hours of work, the 26 participating students combed a total surface area of 3,500 m², and removed 30 kg of plastic waste. The activity was complemented with a talk about the importance of reducing the use of plastic containers, as well as their correct treatment through recycling.

Removal of plastic in Monte das Moas (Irixoa):

On 6 June 2021, another volunteer day was carried out, this time in Monte das Moas (Irixoa municipality), located in the basin of the Mandeo River (SAC ES1110007).



This area is in the “Community of Neighborhood Forests San Antón”, which, in addition to managing cattle in a semi-extensive regime, is also in the process of environmental recovery by reforesting native species.

One of the day's activities included removing plastic waste generated through farming and raising livestock. Thanks to the collaboration between the Biosphere Reserve, the National Association GN Environment, and DECATHLON, more than 50 volunteers managed to remove around 100 kg of waste (mainly plastic, glass and scrap metal) in an area of 3.7 hectares.

For more information:

www.lifefluvial.eu

www.marinasetanzos.gal

**Contributed by J. Blanco
Mariñas Coruñasas e Terras do Mandeo BR, Spain**

Think B-I-R-D-S in the Isle of Man

UNESCO Biosphere Isle of Man and Beach Buddies Isle of Man have teamed up to help minimise the disturbance of nesting birds caused by people while cleaning beaches around the Island.

Beach Cleaning Guide - Nesting Birds

Wild birds, their nests, eggs and young are protected by law under the Wildlife Act 1990

Lots of birds nest on beaches above the high-tide line. Their nests eggs and chicks are very well camouflaged; so they can easily be trodden on. Follow this guide to help protect nesting birds while beach cleaning.

Heey there, I'm an Oystercatcher, I'm often seen with a partner and have a loud 'Peep-ing' call!

Hello, I'm a Ringed Plover, I'm very small and run up and down the beach very quickly! I'm protected from disturbance while nesting, please don't come near!

If people and dogs get too close to a nest it scares the adult birds which stops them from going back to the nest to incubate eggs or feed and protect their chicks.

High Water Mark

Breeding Season

	J	F	M	A	M	J	J	A	S	O	N	D
												
												

THINK: B-I-R-D-S!

Brief volunteers about nesting birds and signs to look out for; some birds make their presence obvious but others quietly move off hoping nests remain undetected.

In breeding season, walk below the High Water Mark (HWM) if you can, to avoid trampling nests.

Remove only plastic and rubbish, leave wood and seaweed (they create food and shelter)

Don't drag any materials along areas above the HWM.

Stay away if you know, or suspect nesting birds to be present.

Many species will lay their eggs above the high water mark in coming months, but birds, eggs and nests can be well camouflaged, and disruption can cause nests to be abandoned.

Beach Buddies Isle of Man is a local charity that hosts beach cleaning events and provides bins around the Islands coastline for the proper disposal of beach and marine litter. Beach Buddies has over ten thousand volunteers, around 10% of the Islands population.

Minister for the Department of Environment, Food and Agriculture, Hon. Geoffrey Boot MHK said 'It's fantastic that so many people actively help to clean our beaches, this guidance will help to ensure that our precious nesting birds are left undisturbed during these activities'.

THINK: B-I-R-D-S!

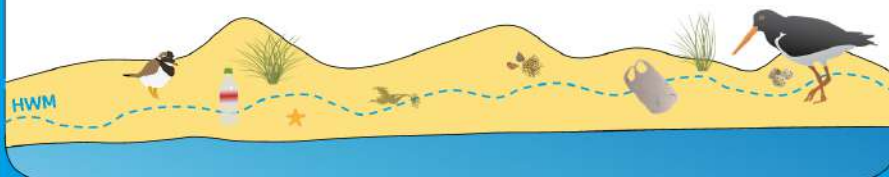
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The ‘Think B-I-R-D-S’ guidance can be found on Beach Buddies brightly coloured bins and provides beach goers with helpful tips for the nesting season on the Island, which runs until 31st August.

Think **B-I-R-D-S**

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**Contributed by Rowan Henthorn
Isle of Man BR**

Change your habit – Preserve the nature

We humans in developed countries live very comfortable lives. We do not even realize how comfortable. Other species on Earth have to fight to survive. Each day. They have to make an effort to find food, water, shelter and to stay safe from predators. Yet it is getting harder for them. Why? Because we shrunk their habitat, polluted their waters and land. Plastic is one of the biggest pollution problems. It is literally everywhere and it affects us, humans as well. It is in our food, in our water, in the air we breathe, in our body. Only if we put our comfort behind our planet's health (ours included), we can make a difference.

ZAMENJAJ NAVADO
OHRANI NARAVO

Plastične vrečke močno ogrožajo okolje. Veliko jih vsakdanje stvarne primere. Naša potreba vrečk je prevelika, pri čemer jih povprečno potrebujemo le 10 minut. Nevarna se ne nosijo in končajo v naravi. Plastične desetine in stoletja razpadajo na manjše delce, ogrožajo živali, zastruplja vodo in s hrano ter vodo vstopa v naše telo.

Reci NE plastiki za enkratno uporabo.

- Uporabi trpežne vrečke za večkratno uporabo, cekarje, torbe.
- Kadar se enkratni uporabi ne moreš izogniti, uporabi biorazgradljive vrečke.



We have a long history of clean up events in the Karst and Reka River BR. Different societies, local communities, our park, etc., we clean every year. Yet each year there is new thrash to clean, because as there are those who clean there are those who pollute as well. Instead of going on with Sisyphus' clean up work only, this year we opted for a local sincere and objective propaganda approach with posters, flyers and FB announcements, as propaganda seems to have been a “success story” for influencing people’s minds in the 20th century.

Under the slogan “Change your habit – Preserve the nature”, each household in our BR received in their mailboxes our appeal for concrete small steps to reduce single-use plastic, and each bulletin board in our BR was plastered with them.

With our promotional material, we tried to demonstrate how by changing habits, each individual can contribute to a positive change. We based our campaign on individual concrete and current cases (masks, candles for All Saints' Day). To raise awareness of the problem related to the featured plastic products, we included concrete data and practical solutions, i.e. alternatives that should become new habits. Visually, we wanted to show the contrast between nature and plastic, which does not really belong in nature, but due to human “ignorance” there is more and more of it.

The results of this “modern” effort are yet to be evaluated. Please do keep your fingers crossed.

**Contributed by By Pika-Barbara Ciuha and Darja Kranjc
Karst and Reka River BR, Slovenia**

End-of-life ship management in the Iroise Islands

In 2020 and 2021, the Iroise marine natural park has been leading an operation to support the recycling of end-of-life ships on the islands of Sein, Molène and Ushant. These boats require specific management to prevent plastics from degrading, and to preserve the quality of the environment. Because of their island location, these communities face logistic and economic constraints for waste management, especially for end-of-life ships.

APER is a Producer Responsibility Organization which manages end-of-life dismantling and recycling for recreation and sport boats. The dismantling costs are covered by APER. The ship owner pays for transporting the ship to an approved dismantling center. The marine natural park has therefore offered to take charge of transporting these vessels from the islands to the dismantling center. This action is financed through the Interreg project: "Preventing Plastic Pollution".



This effort took place on Sein and Molène between November 2020 and April 2021. It has been ongoing on Ushant since May 2021. The communities are assisting the owners who wish to participate by helping them submit applications for dismantling to the marine natural park and then organize the removal of the vessels. On Sein and Molène, 38 boats have been evacuated and dismantled, representing nearly 15 tons of material. This action aims to initiate sustainable management of end-of-life for recreation and sport boats, by giving communities and owners the necessary tools to act by themselves going forward.

**Contributed by Patrick Pouline
Iroise Islands BR, France**

Preventing Plastic Pollution on the Iroise Islands

The Iroise Islands and Sea Biosphere Reserve is also facing waste management issues, including plastic pollution. In the frameworks of different projects, like Preventing Plastic Pollution or Bio-Cultural Heritage Tourism INTERREG projects, we aim to raise awareness among the local stakeholders, schools, inhabitants and visitors through plastic-related initiatives. For example, we rely on the Biosphere eco players network as intermediary to share good practices for limiting or recycling plastic with their clients and relatives.

For the World Oceans Day on the 10th of June, local partners offered a public workshop about fighting plastic pollution on Ushant Island. An experimental tool was demonstrated for the participants. It is used to collect microplastic present in the sand. This tool can be easily made from recycled materials. The high school students are interested to build one and create their own experience!



After this workshop, participants exchanged ideas for different alternatives we could develop on the island to limit or recycle plastic, like establishing a second-hand shop, donation boxes, organising clean up days, etc.

**Contributed by Camille Bélurier
Iroise Islands BR, France**

Plastic Free Balearics certification in Menorca

The Plastic Free Menorca* partnership launches in Menorca the new Plastic Free Balearics certification, a designation for hotels and restaurants avoiding or reducing their use of single-use plastic products and packaging. The Plastic Free Balearics Certification (PFB) is an environmental brand granted by local civil society organizations (Save The Med in Mallorca, Plastic Free Ibiza & Formentera, and Plastic Free Menorca) and is in the pilot phase of implementation. To ensure the alternatives to plastic that are used instead have positive impact, they are assessed by the honest alternatives to plastics indicator (HAPI), a methodology developed for this purpose. The certification aims to go a step beyond the regulations established by the new Balearic Waste Law, and aims to eliminate plastic products with high environmental impacts that are not yet banned, foster reusable products, and avoid bioplastics as an alternative. The Menorca Biosphere Reserve Agency is working to incorporate the new certification into the procedure for granting the Biosphere Reserve Brand.



*Plastic Free Menorca is an alliance between five local entities joining efforts to fight plastic pollution: Menorca Preservation Fund, Per la Mar Viva, the LEADER Association, the Socio-Environmental Observatory of Menorca and the GOB Menorca. <https://www.plasticfreemenorca.org/>

**Contributed by Eva Cardona
Menorca BR, Spain**

Jeju 2021 International Environment Forum for Zero Plastic Society

On 8-9 July, the 2021 Jeju Plus International Environment Forum took place in Jeju in the form of a “webinar” including both on-site participation and video conferencing. The forum was co-hosted by the Jeju Special Self-Governing Province, Korea Environment Corporation, Jeju Research Institute, and News 1; it was sponsored by the Ministry of Environment of Korea.



It gathered experts, business people, activists, and all those concerned both at home and abroad to identify the fundamental causes and solutions to excessive plastic use. Five Biosphere Reserves in our Network were invited to participate in the International Protected Area Session, "The Role of International Protected Areas to Reduce Plastics", on 9 July: Menorca, Fuerteventura, Principe, Commander, and Archipelago Sea. These BRs had the opportunity to share the main steps taken on their islands to face plastic pollution, as well as the main challenges and threats of plastic abuse in protected areas. The session was chaired by Dai-Yeun Jeong, Director of the Asia Climate Change Education Center and of the Jeju Secretariat for the Network of Island and Coastal Biosphere Reserves.

For more information and recorded sessions:

<http://jplusforum.kr/eng>

<https://www.youtube.com/watch?v=nXL0W66hmAU>

Contributed by Jeju BR, Korea

Spotlight: New Zero Plastic structure coming November 2021

This September 2021, with this fifth edition of the Zero Plastic News, we achieved our first shared milestone! Our first set of newsletters #1-5. Now it is time to rethink the process, with the intention to reshape Zero Plastic, find preferred options for next steps, and improve how we all can engage to bring about Biosphere Reserves free from plastic pollution. In November we will participate in the celebration of the 50th anniversary of the MaB programme, and we will celebrate by launching the new Zero Plastic structure and intentions. Please send us your ideas, hopes, visions, desires -no matter how simple or grandiose; be bold!- by 21 October. You can reach us here: zero.plastic@islandbiosphere.org

**THAT'S ALL FOR NOW FROM THE
ZERO PLASTIC NEWS #5
SEPTEMBER 2021**

Growing from the Zero Plastic campaign in Lanzarote, which has been ongoing since 2009, the “Zero Plastic” working group was launched in May 2018 by Marine Sciences For Society at the annual meeting for the World Network of Island and Coastal Biosphere Reserves in Menorca. The Zero Plastic working group is an alliance between the World Network of Island and Coastal Biosphere Reserves and the Marine Sciences For Society researchers’ network. Biosphere Reserves, researchers and society as a whole sharing efforts to eradicate plastic pollution.

The Zero Plastic Working Group members include the following Biosphere Reserves: Archipelago Sea Area, Blekinge Archipelago, Cat Ba Archipelago, Commander Islands, Fuerteventura, Gran Canaria, Islands of Iroise sea, Isle of Man, Jeju, Karst and Reka River Basin, La Hotte, Lanzarote, Mariñas Coruñas e Terras do Mandeo, Menorca, Ometepe, Palawan, Península de Guanahacabibes, Terres de l’Ebre and Urdaibai.

If your Biosphere Reserve would like to become involved in the Zero Plastic Working Group, please contact Us at: zero.plastic@islandbiosphere.org

To learn more and watch as We evolve, visit our website: <http://zeroplastic.islandbiosphere.org>

ZERO PLASTIC

WORLD NETWORK OF BIOSPHERE RESERVES