

Image Credit: Chiara Gambardella

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RESPONSE

Project Newsletter Issue No: 2

We are delighted to bring you our second project newsletter, that covers the period of March 2022 to March 2023. Our RESPONSE partners have been very active over the last twelve months as they participated in international conferences and workshops, all while organising and facilitating participatory activities, and publishing key research findings!

In this newsletter you will find an overview of our researcher's key outputs and activities from the field, to the lab.

The RESPONSE team!



The **RESPONSE** project is supported through the Joint Programming Initiative: Healthy and Productive Seas and Oceans (JPI Oceans).





RESPONSE Project Milestones 2022-23

Milestone 1

Publications

The RESPONSE project produced 13 peer-reviewed articles and reports since March 2022, and 24 to date.



Milestone 2

Posters

The RESPONSE project delivered 27 poster presentations across 8 international conferences and workshops.



Milestone 3

Presentations

The RESPONSE project has delivered 25 oral presentations across 11 international conferences and workshops.



Milestone 4

Awards

2 awards received by RESPONSE project researchers for their conference poster contributions.



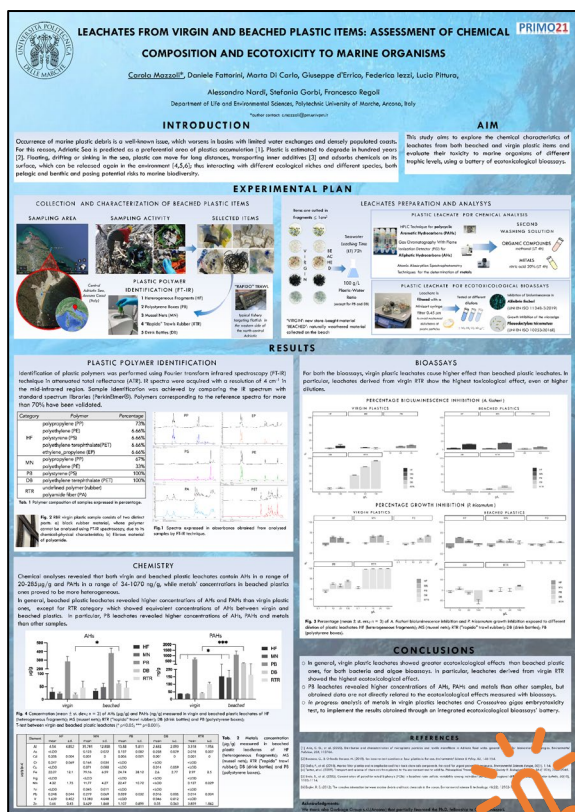
PROJECT ACTIVITIES

+ PRIMO21 Research Poster Award

Carola Mazzoli, Polytechnic University of Marche (UPM)

We would like to congratulate PhD student Carola Mazzoli from the Department of Life and Environmental Sciences, Polytechnic University of Marche (UPM) who received an award for her poster entitled **'Leachates from Virgin and Beached Plastic Items: Assessment of Chemical Composition and Ecotoxicity to Marine Organisms'** which was presented as part of PRIMO21 (Pollutant Responses in Marine Organisms) at Gothenburg (22-25 May 2022).

This poster details a study that aims to explore the chemical characteristics of leachates from both beached and virgin plastic items and evaluate their toxicity to marine organisms of different trophic levels, using a battery of ecotoxicological bioassays.



Click on poster to expand!

PUBLICATIONS

Pittura, L., Gorbi, S., León V.M., Bellas, J., Campillo, J.A., Albentosa, M., Regoli, F. (2023). Microplastics and nanoplastics in the marine environment. In: León V.M., Bellas J. (eds) *Contaminants of Emerging Concern in the Marine Environment: Current Challenges in Marine Pollution*. Elsevier Science.

[LEARN MORE](#)

Martins, A., da Silva, D.D., Silva, R., Carvalho, F. and Guilhermino, L., 2022. Warmer Water, High Light Intensity, Lithium and Microplastics: Dangerous Environmental Combinations to Zooplankton and Global Health. *Science of the Total Environment*, 831, 158649.

[LEARN MORE](#)

Alkimin, G. D., Gonçalves, J. M., Nathan, J., & Bebianno, M. J. (2022). Impact of Micro and Nanoplastics in the Marine Environment. In S. Joo (Ed.), *Assessing the Effects of Emerging Plastics on the Environment and Public Health* (pp. 172-225). IGI Global.

[LEARN MORE](#)

PROJECT ACTIVITIES

+ Interfaces Against Pollution Research Poster Award

Jenevieve Hara, ECOSPHERE,
University of Antwerp (UA)

We would also like to congratulate RESPONSE researcher Jenevieve Hara from the University of Antwerp who received an award for her joint poster entitled '**Automated Quantification of Apoptosis Signals in Bivalve Hemocytes as a Proxy for Micro-and Nanoplastic Risk Assessment**' which was presented as part of the Interfaces Against Pollution: Chemical and Biological Perspectives conference held in September 2022!

This study presented in this poster aims to validate and apply a microscopy-based method for determining whether MPs/NPs exposure induces apoptosis/necrosis (cellular death) in the hemocyte of mussels *M. edulis* as a proxy for micro-and-nanoplastic risk assessment.



Jenevieve Hara receiving her best poster award
(Image Credit: Raewyn M. Town)

PUBLICATIONS

Xu, J., Rodríguez-Torres, R., Rist, S., Nielsen, T.G., Hartmann, N.B., Brun, P., Li, D. and Almeda, R., 2022. Unpalatable Plastic: Efficient Taste Discrimination of Microplastics in Planktonic Copepods. *Environmental Science & Technology*, 56 (10), 6455-6465.

[LEARN MORE](#)

Gonçalves, J. M., Beckmann, C., & Bebianno, M. J. (2022). Assessing the effects of the cytostatic drug 5-Fluorouracil alone and in a mixture of emerging contaminants on the mussel *Mytilus galloprovincialis*. *Chemosphere*, 305, 135462.

[LEARN MORE](#)

Page, T.S., Almeda, R., Koski, M., Bournaka, E. and Nielsen, T.G., 2022. Toxicity of Tyre Wear Particle Leachates to Marine Phytoplankton. *Aquatic Toxicology*, Volume 252, November 2022, 106299.

[LEARN MORE](#)

Pittura, L., Gorbi, S., Mazzoli, C., Nardi, A., Benedetti, M., Regoli, F., 2023. Microplastics and Nanoplastics. In: Blasco, J., Tovar-Sánchez, A. (eds) *Marine Analytical Chemistry*. Springer.

[LEARN MORE](#)

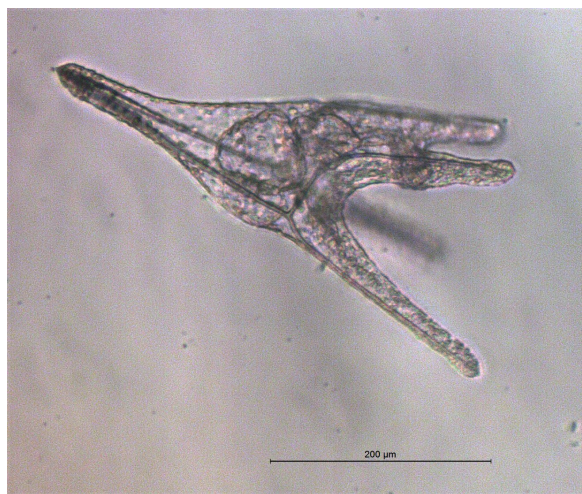
PROJECT ACTIVITIES

+ Aquatic Toxicity Tests With Environmental Samples

Beatriz Noya-Mariño, ECOTOX Group, University of Vigo (UVIGO)

Several laboratory bioassays with sea urchin larvae were conducted to evaluate aquatic acute effects of environmental plastics. A portion of the samples utilised in this work were collected by the ECOTOX group along the NW coast of Spain, while other samples were sent by RESPONSE partners.

Based on the initial results from this work which indicated low acute toxicity effects of the micronized plastic leachates, research will now focus on the acute effects of biopolymers. This work is being undertaken in collaboration with other RESPONSE researchers with new findings on this being available very soon!



Sea urchin larvae (Image Credit: Beatriz Noya-Mariño)



PUBLICATIONS

Bebianno, M.J., Mendes, V, M., O'Donovan, S., Carteny, C. C., Keiter, S., Manadas, B. (2022). Effects of microplastics alone and with adsorbed benzo(a)pyrene on the gills proteome of *Scrobicularia plana*. *Science of The Total Environment* 842 (2022): 156895.

[LEARN MORE](#)

Martins, A., da Silva, D.D., Silva, R., Carvalho, F. and Guilhermino, L., 2022. Long-term Effects of Lithium and Lithium-microplastic mixtures on the Model Species *Daphnia magna*: Toxicological Interactions and Implications to 'One Health'. *Science of the Total Environment*, 831, Part 1, 155934.

[LEARN MORE](#)

Pittura, L., Garaventa, F., Costa, E., Minetti, R., Nardi, A., Ventura, L., Morgana, S., Capello, M., Ungherese, G., Regoli, F. and Gorbi, S., 2022. Microplastics in Seawater and Marine Organisms: Site-Specific Variations Over Two-Year Study in Giglio Island (North Tyrrhenian Sea). *Marine Pollution Bulletin*, Vol. 181(1) :113916.

[LEARN MORE](#)



Information tables at Omero Museum exhibition "Plastics Culture: Art, Design, Environment" (Image Credit: Maura Benedetti).



PROJECT ACTIVITIES

+ Omero Museum Exhibition – “Plastics Culture: Art, Design, Environment”

Department of Life and
Environmental Sciences,
Polytechnic University of
Marche (UPM)

UPM was an active partner and participant in the exhibition “Plastic Culture: Art, Design, Environment” which was held from May 20th to August 31st 2022, at The State Tactile Museum Omero (Ancona). This exhibition which was designed for audiences with visual, hearing, and cognitive difficulties, focused on the pervasive issue of plastic pollution in our environment, and featured works from well-known contemporary designers utilizing plastic materials.

In this context UPM was involved in dissemination activities and workshops aimed at explaining plastic pollution, impacts and solutions through tactile experiences, and was delivered as a workshop entitled: "Collect, sieve and recycle" for children and young adults.

The Omero Museum is a permanent museum created to enable people with visual disabilities to learn about art through a direct tactile approach.

Full details of the event are available [here!](#)

PROJECT ACTIVITIES

+ Joint *Mytilus galloprovincialis* Microplastic Experiments

Department of Life and Environmental Sciences,
Polytechnic University of Marche (UPM)

UPM is currently running an experiment designed to establish the biological effects of microplastics on model organisms. The microplastics utilised in this experiment were obtained through the micronization of plastics collected from joint beach cleaning activities, conducted by RESPONSE partners.

The experiments being undertaken will compare the effects of a mix of “environmental” microplastics with a commercial-virgin one, in order to investigate the alteration of immune-response, antioxidant system, and lipid metabolism in the model organism *Mytilus galloprovincialis*.



Mytilus galloprovincialis experiment tanks and apparatus (Image Credit: UPM)

PUBLICATIONS

Di Giannantonio, M., Gambardella, C., Miroglio, R., Costa, E., Sbrana, F., Smerieri, M., Carraro, G., Utzeri, R., Faimali, M. and Garaventa, F., 2022. Ecotoxicity of Polyvinylidene Difluoride (PVDF) and Polylactic Acid (PLA) Microplastics in Marine Zooplankton. *Toxics*, 10, 479.

[LEARN MORE](#)

Bebianno, M. J., Rocha, T. L., Pinheiro, J. P., Teixeira, M. R., Cassio, F., 2022. Ecosafety of Nanomaterials in the Aquatic Environment. In: Williams, Marc A. *Toxicology of Nanoparticles and Nanomaterials in Human, Terrestrial and Aquatic Systems*, Wiley Professional, Reference & Trade, 20220627. VitalBook file, 21-52..

[LEARN MORE](#)

Pittura, L., Nardi, A., Cocca, M., De Falco, F., d’Errico, G., Mazzoli, C., Mongera, F., Benedetti, M., Gorbi, S., Avella, M. and Regoli, F., 2022. Cellular Disturbance and Thermal Stress Response in Mussels Exposed to Microfibres. *Frsynthetic and Natural ontiers in Marine Science*, 9:981365.

[LEARN MORE](#)



Image Credit: Alessandro Nardi

PROJECT ACTIVITIES

+ RESPONSE Project Collaborations with Industry

Department of Life and
Environmental Sciences,
Polytechnic University of Marche
(UPM)

UPM is currently carrying out research activities and collaborations with two Italian companies, IRIS and ESO, both focused on waste management and circular economy strategies.

ESO Collaboration

ESO is an Italian company that offers waste management services according to values of the Circular Economy including upcycling: a conversion process that transforms waste into new resources, materials, objects or substances that are completely different from the original waste, and which can be used for new purposes. UPM is currently characterizing plastic material intended for, and obtained by, this process, testing moreover their toxicity.

Learn more [here!](#)



IRIS Collaboration

[IRIS](#) is specialized in the development of innovative technologies for circular economy approaches in small-scale industrial and civil institutions. Their GreenPlasma, a Waste-to-Energy device, can convert non-recyclable waste of secondary raw materials (as, for instance, stranded plastics collected by UPM clean-up activities) into a clean hydrogen-rich synthetic gas with a very small carbon footprint that can then be either immediately used or stored into batteries as those used by electric vehicles.

Preliminary tests with stranded plastic items revealed a yield of approximately 5 kWh of electricity generated for every 5 kilos of plastics processed.

Read more [here!](#)

PROJECT ACTIVITIES

+ RESPONSE Project's Final Consortium Meeting in Ancona

Department of Life and Environmental Sciences, Polytechnic University of Marche (UPM)

The RESPONSE project held its final consortium meeting at the Department of Life and Environmental Sciences, Polytechnic University of Marche (UPM). This was also the first time the consortium had the opportunity to meet in person!

The event itself took place over three days from the 29th – 31st March, and was attended by representatives from all participant institutes.

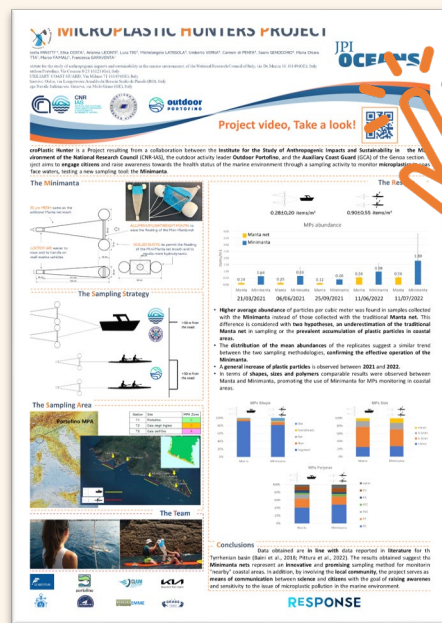
This event provided research partners with the opportunity to highlight their research and achievements to date, and also featured a range of posters focusing on communication and dissemination activities that have taken place across the project lifecycle.

You can learn more about these activities by clicking on the posters in the adjoining panel!



DISSEMINATION ACTIVITIES SPOTLIGHT!

Click on the below images to learn more about the amazing communication and dissemination activities undertaken as part of the RESPONSE project!



Poster 1 developed by CNR-IAS



Poster 2 developed by UPM

PROJECT ACTIVITIES

+ JPI Oceans Communicators Workshop

Kathrin Kopke & Orla-Peach Power, MaREI, the SFI Centre for Energy, Climate and Marine Research (UCC)

Jella Kandziora of JPI Oceans facilitated an online workshop that was attended by representative members from each of the 6 projects funded under the **JPI Oceans Joint Action Ecological Aspects of Microplastics** call (RESPONSE, ANDROMEDA, FACTS, HOTMIC, microplastix, and i-plastic).

This workshop was organised to highlight the range of communication and dissemination activities being undertaken by the 6 projects and to plan for potential joint communication activities in the coming months.

Kathrin Kopke presented an overview of the RESPONSE project's key activities in 2022 focusing in particular on potential synergies with the attending projects in our upcoming stakeholder workshops (see Page 13) which aim to address scientific knowledge in the public domain.

MEDIA & OUTREACH

+ PlasticWater Documentary Launch

Polytechnic University of Marche (UPM)

Prof. Francesco Regoli, Prof. Stefania Gorbi, Dr. Lucia Pittura and Dr. Alessandro Nardi (UPM) took part in a documentary on plastic and microplastic pollution impacts, produced and directed by Alessandro Nicoletti and Francesco Menghini. The premier of the docufilm 'PlasticWater' took place on September 29th at the Teatro Le Muse in Ancona as part of the annual SHARPER (**SH**aring **R**esearchers' **P**assion for **E**nhanced **R**oadmaps) programme. As well as contributing interviews to this film, UPM researchers and scientists were observed undertaking plastics sampling and laboratory activities.



+ RTP 1 Television Interview

Lúcia Guilhermino, CIIMAR

Lúcia Guilhermino gave an interview to RTP 1 (a public television channel) on the paradigm of microplastics and its implications to environmental, animal, and human health. The interview included images of other researchers, students and lab activities carried out as part of her research.



PROJECT ACTIVITIES

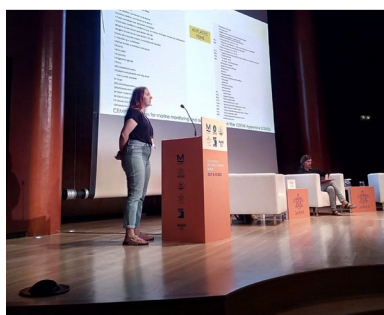
+ VIII International Symposium on Marine Sciences, Las Palmas

Beatriz Noya-Mariño,
ECOTOX Group, UVIGO

The ECOTOX group participated in the VIII International Symposium on Marine Sciences held in Las Palmas (Canary Islands, Spain), from the 6th to the 8th of July 2022.

In Olalla Alonso's presentation, entitled 'Marine Plastic Litter Risk Assessment: A Proposal Based on Chemical and Physical Properties of Plastic', she presented a conceptual proposal based on the work done within the RESPONSE project. The team is now preparing a research paper based on the work presented.

Ricardo Beiras and Filipe Laranjeiro, members of the RESPONSE project team (partner: ECOTOX-UVIGO), also participated in this highly rewarding event by exchanging ideas and promoting future collaborations with other participants



Olalla Alonso speaking at the VIII International Symposium on Marine Litter (Image Credit: Beatriz Noya-Mariño)

MEDIA & OUTREACH

+ Plastic Pirates Project

National Research Council Institute for the Study of Anthropogenic Impacts and Sustainability in the Marine Environment (CNR-IAS)

'Plastic Pirates – Go Europe!' is a European citizen science campaign, in which school classes and youth groups collect plastic samples from streams and rivers and document their findings.

The collected data from these sampling events is then analysed by scientists and researchers. In this way, young European citizens are making an important contribution to researching the state of European rivers and helping us understand to what extent pollution is caused by plastic waste.

Our research partners at CNR will be undertaking sampling activities as part of this citizen science campaign which will start on November 7th, 2023, and will take place along the Aniene River, in Lazio.



MEDIA & OUTREACH

+ The Water Code (TWC) Education Project

National Research Council Institute for the Study of Anthropic Impacts and Sustainability in the Marine Environment (CNR-IAS)

The Water Code, is a global citizenship and sustainability education project that aims to spread knowledge, skills, attitudes, and behaviours for the promotion of sustainable development, environmental protection, and mitigation of anthropogenic impact on the world's rivers, lakes, and seas.

This project will mobilise student from elementary, middle, and high schools, along with broader school communities, local administrators and citizens across 9 Italian regions and autonomous provinces.

As part of this project, our partners at CNR-IAS will participate in editorial board activities to develop a Digital Teaching Kit to promote sustainable development. They will also participate in the organization of outdoor educational activities designed to engage both students and citizens. This will be achieved through microplastics sampling activities and the monitoring of coastal surface waters.

You can read more about the project [here!](#)

THE
WATER
CODE



La formula per una gestione sostenibile
delle risorse idriche del mondo.
(AID 012618/02/1)

Regional Distribution:



1. Liguria
2. Piemonte
3. Umbria
4. Toscana
5. Lazio
6. Calabria
7. Sicilia
8. Prov Autonoma
Trento
9. Lombardia
10. Puglia

Expected Results:

- ▶ Increase teachers' capacity to educate students on sustainable development & active global citizenship.
- ▶ Increase student knowledge of causes & effects of water pollution, & their skills to promote sustainable development.
- ▶ Increase citizen awareness of the negative consequences of anthropogenic impacts on the natural environment.
- ▶ Increase knowledge of the correct behaviours to reduce the negative impact on rivers, lakes, & seas of the world.



Jellyfish larva with microplastics on the gelatinous body (Image Credit: Chiara Gambardella)

WHAT'S NEXT FOR RESPONSE

+ ASLO Aquatic Sciences Meeting 2023

RESPONSE will participate in a special session entitled '**JPI Oceans Joint Action Ecological Aspects of Microplastics – What is needed to transfer the scientific findings into political knowledge for action?**' as part of ASLO 2023. This session was submitted in collaboration with the JPI Oceans secretariat, and the 6 projects funded under the **JPI Oceans Joint Action Ecological Aspects of Microplastics** call.

+ RESPONSE Workshops

A series of workshops are being developed as part of the RESPONSE project, to address the issue of scientific knowledge and misinformation in the public domain, which will take place in May and June 2023.

These workshops will be coordinated by our partners at University College Cork, and will be attended by researchers, scientists, and policy and decision makers in project partner countries.

+ JPI Oceans Final Event

JPI Oceans will host their closing event from the 14th – 15th September in Galway, Ireland and will be attended by all 6 projects funded under the **JPI Oceans Joint Action Ecological Aspects of Microplastics** call.

Follow us for more!



[@Response_JPIO](https://twitter.com/Response_JPIO)



response-jpioceans.eu/

Response is funded by the Joint Programming Initiative for Healthy Oceans and Seas (**JPI Oceans**) through support from the following national funding agencies: Belgium - The Belgian Science Policy Office (**BELSP0**); Denmark - The Innovation Fund Denmark (**IFD**); Estonia - The Ministry of the Environment of the Estonian Republic (**MoE**) and the Estonian Research Council (**ETAgz**); Germany - The Federal Ministry of Education and Research (**BMBF**); Ireland - The Marine Institute (**MI**) and the Department of Housing, Planning and Local Government (**DHPLG**); Italy - The Ministry of Education, University and Research (**MIUR**); Norway - The Research Council of Norway (**RCN**); Portugal - The Science & Technology Foundation (**FCT**); Spain - The Spanish State Research Agency (**AEI**); Sweden - The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (**FORMAS**).