

# **microplastix**

Integrated approach on the fate of microplastics  
towards healthy marine ecosystems

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Project leader

## Background

- MicroplastiX is an international collaborative and interdisciplinary project formed by a team of 15 partners from 7 countries



- whose main goal is to improve the understanding of the **degradation and fragmentation mechanisms** that affect **microplastics** in the environment
- This project combines a holistic approach from field data collection to laboratory assays to understand MP interaction with biota in different environmental matrices. Data gathered in this project will contribute to advanced multiscale models to predict fate and pathways.



## Background

- **MicroplastiX** aims to contribute to the understanding of microplastic weathering, degradation and fragmentation processes through:
  - The **identification and characterisation** of microplastics
  - Understanding fate based on **case-studies** in environmental compartments
  - Understanding the **impacts** on marine organisms
  - Assessing hotspots and accumulation areas based on **multi-scale modelling**



# Motivation & Rationale

- **Microplastics** are commonly reported in the marine environment and have been found in all environmental matrices from bottom sediment to ice on mountain tops
- It is a known fact that, affected by solar radiation, abrasion and salinity, plastic items have the tendency to break-down into ever smaller pieces increasing the number of **fragments** available
- It is also known that influenced by winds, oceanic currents and animals microplastics are widely distributed in the environment from the North to the South pole, being addressed as **ubiquitous**
- Microplastics also have the ability to sorb persistent organic pollutants and trace metals from the surrounding environment, **potentially** increasing their **toxicity**



Credits: <https://unsplash.com/photos/HfgMyrPrLxI>

**Microplastic fragments are ubiquitous and potentially toxic**







## Motivation & Rationale

- **MicroplastiX** aims to overcome knowledge gaps concerning processes that affect microplastic distribution, dispersal and effects on the marine environment. Those processes are:
  - **Weathering**
  - **Degradation**
  - **Fragmentation**
- **MicroplastiX** will explore:
  - Horizontal and vertical distribution of MP
  - How turbulence affects distribution and fragmentation
  - The impacts and fate of MP in aquatic organisms
  - Weathering and biofouling of MP and how these play an important role on particle density

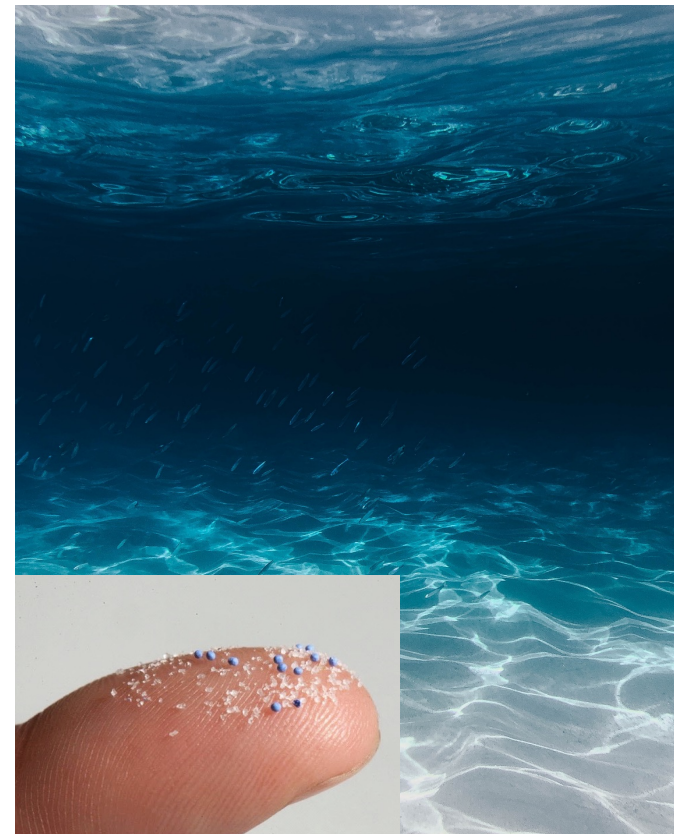


Photo credit: Stephan Glink | BundSource: JPI-Oceans website  
<https://unsplash.com/photos/K785Da4A-1A>



## Geographical area of intervention

A wide study area of ecologic and economic relevance, including two upwelling hotspots, while covering extensive coastal and open-ocean areas in the central and south Atlantic, where Microplastics dynamics are less studied than in their northern counterparts

- **Atlantic Ocean**
  - Ireland
  - Brazil
  - coast of Africa (Germany)
- **Mediterranean Sea**
  - France
  - Italy
- **Baltic Sea**
  - Sweden





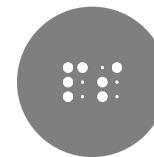
## Work packages (WP)

The project is going to be explored in a set of 5 WP focused on:

- 1. **Overall coordination**
- 2. **MP characterisation and identification**
- 3. **Case-studies** on the fate of MP in the environment
- 4. **Impacts** on marine organisms
- 5. **Multi-scale modelling**



1. COORDINATION,  
INTEGRATION AND  
SYNTHESIS



2. CHARACTERISATION  
AND IDENTIFICATION  
OF MICROPLASTICS



3. CASE-STUDIES ON  
THE FATE OF  
MICROPLASTICS IN  
DIFFERENT  
ENVIRONMENTAL  
COMPARTMENTS



4. MICROPLASTIC  
IMPACTS ON MARINE  
ORGANISMS

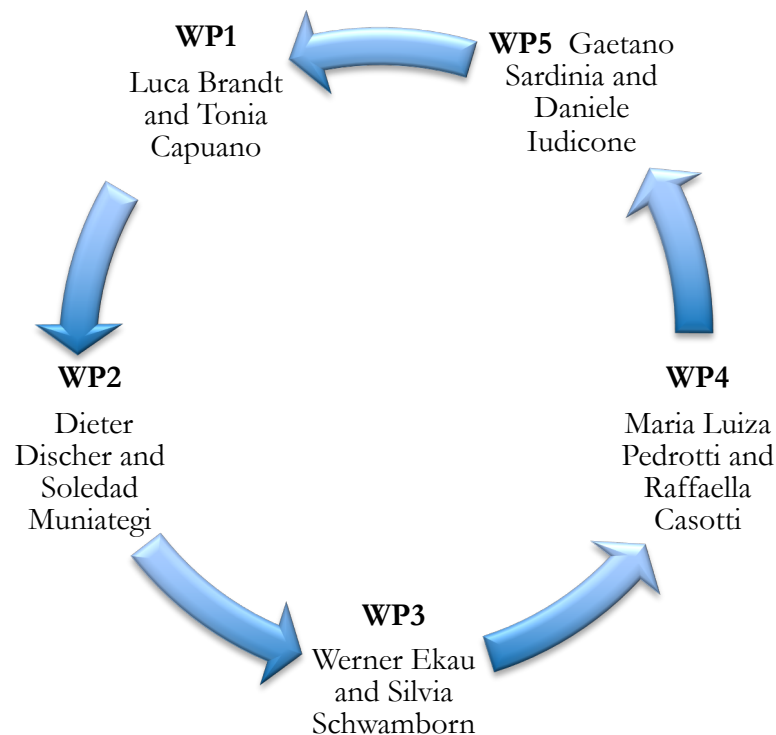


5. MULTI-SCALE  
MODELLING

# Progress

## Shared management of tasks to achieve milestones and targets

- **MicroplastiX** progress will be ensured by the core project team and work package leaders who will ensure that milestones and deadlines described in the proposed Gantt chart are achieved within reasonable time frames and will enough quality
- **Contingency, Communication and Dissemination, Data Management and Quality Control/Quality Assurance plans** will be developed to ensure progress advances towards targets
- Work packages leaders are already working closely with overall consortium team despite of the challenges of the coronavirus outbreak in Europe and Brazil

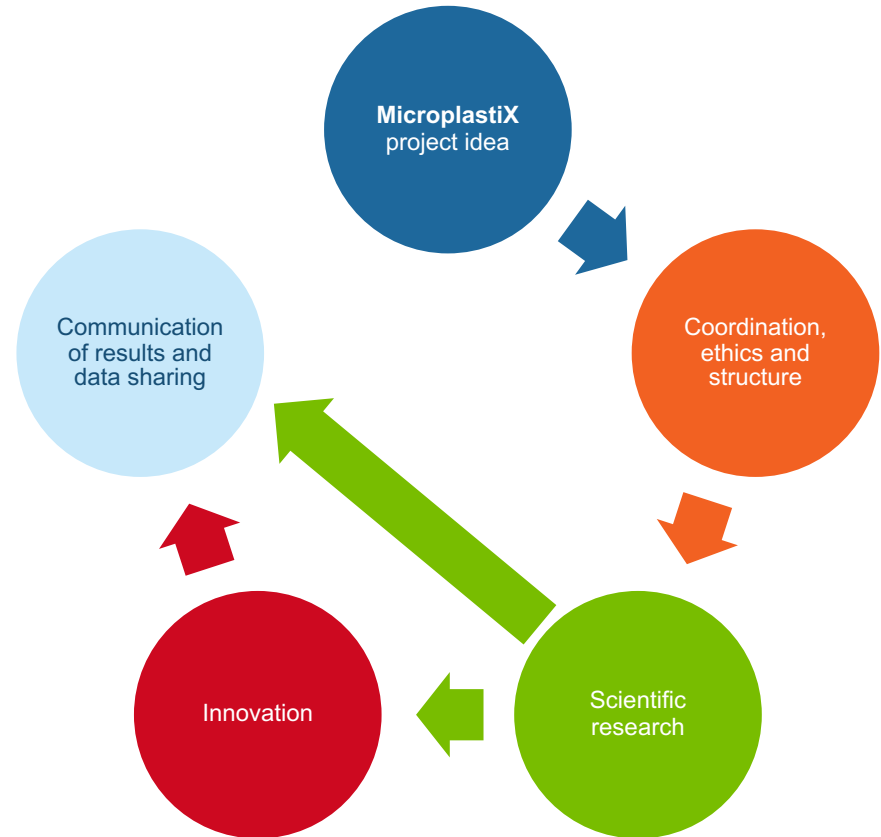




# Impact

Contributing to filling knowledge gaps and advance topics within this research field

- **MicroplastiX** intends to contribute to the understanding of weathering, fragmentation and degradation processes in the open ocean, its pathways and sinks and overcome the current knowledge gaps associated with these environmental processes
- Publications will be aimed at high impact peer-reviewed scientific journals in the fields of expertise from the consortium
- Innovation will be addressed to advance methodologies and modelling processes
- Communication of results and open data sharing will contribute to further advance the research field of microplastic pollution



# Dissemination & outreach

## Communication as a form of information sharing

- **MicroplastiX** *Communication and Dissemination Plan*
  - A plan will be developed focused on Science **communication and dissemination** of project results
  - Papers and reports **will be tailored** to peers or relevant stakeholders
  - A dedicated **project website** and respective **social media platforms** will be developed
  - **Open-Science peer-reviewed publications**, data repositories and open source codes are expected with this project
  - It is estimated that the project will produce **at least 5 peer-reviewed publications** and will engage with **at least 2500 people**



Dissemination, outreach and awareness  
Science Communication  
Networking, Policy Briefs



Credits: Jordan Graphics

# Contribution to

International policy programmes



**SUSTAINABLE  
DEVELOPMENT  
GOALS**



**BUILDING AN ALL ATLANTIC  
OCEAN COMMUNITY**  
Implementing the Belém Statement



**2021  
2030** United Nations Decade  
of Ocean Science  
for Sustainable Development



THANK YOU

Luca Brandt