



# SeaClear2.0

[www.seaclear2.eu](http://www.seaclear2.eu)

Robotic and participatory solutions for  
marine litter prevention and remediation

Contact us: [info@seaclear2.eu](mailto:info@seaclear2.eu)

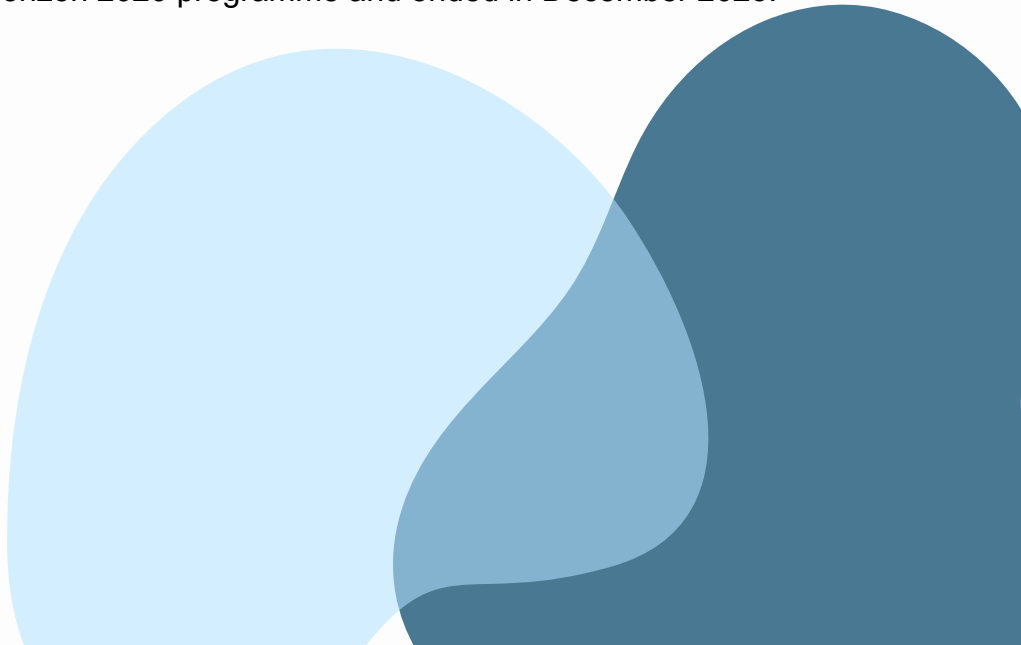


Co-funded by  
the European Union

Between 150,000-500,000 tons of macroplastics and 70,000-130,000 tons of microplastics enter European waters and seas every year. Plastic marine pollution is particularly acute in the Mediterranean Sea. Its semi-enclosed basin and intense coastal human activity result in a high accumulation of litter. Marine litter is often found on beaches or floating on water; yet most of it is located on the seafloor where it remains mostly uncollected, continuing to pollute our ocean and endanger marine wildlife.

## **About SeaClear2.0**

SeaClear2.0 is co-funded by the European Union through the Horizon Europe Programme and is among the cross-cutting projects supporting the objectives of the EU MISSION RESTORE OUR OCEAN AND WATERS, to restore, protect, and preserve the health of our ocean, seas, and waters by 2030. SeaClear2.0 began in January 2023 and will run until December 2026. It builds upon the pioneering work of the SeaClear project, which was co-funded by the Horizon 2020 programme and ended in December 2023.



**SeaClear2.0** offers a novel solution for the restoration and protection of our ocean and waters from marine litter through a combination of technological and social innovations.



## **Pioneering Technological Solutions**

The SeaClear2.0 system comprises a team of autonomous and heterogeneous robots engineered and trained to work collaboratively for in-situ mapping, detection, classification, and collection of marine litter from the seafloor and sea surface. Capable of operating at depths of up to 100 metres and lifting items weighing up to 250 kilograms, SeaClear2.0's pioneering technological solutions represent a paradigm shift in ocean restoration.

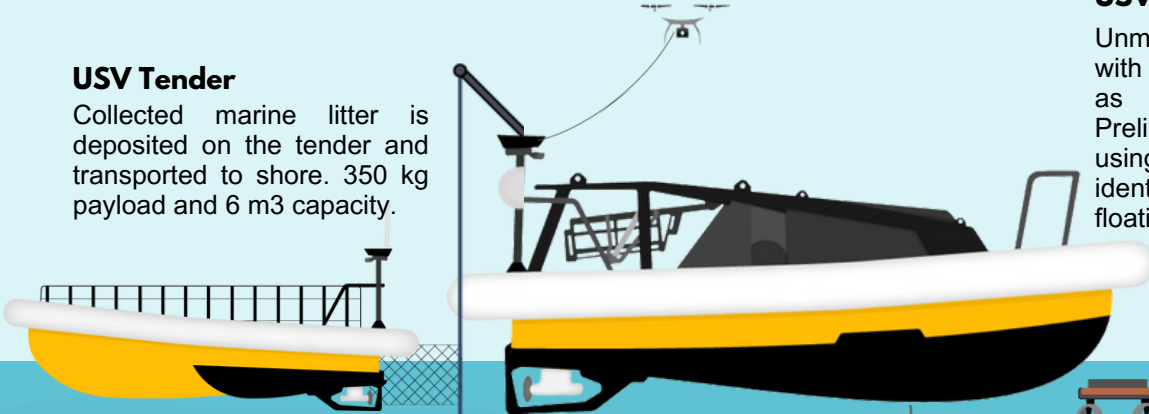
# The SeaClear2.0 Robotic System

## Tethered drone

Facilitates litter hotspot identification and robotic system localization.

## USV Tender

Collected marine litter is deposited on the tender and transported to shore. 350 kg payload and 6 m<sup>3</sup> capacity.



## USV Seacat2.0

Unmanned surface vehicle, with catamaran design, acting as the system's hub. Preliminary scan of the area using various sensors to identify litter hotspots. Collects floating litter while navigating.



## Smart grapple

Robotic grapple for lifting litter items weighing up to 200 kg from depths over 100 m. Larger in size for lifting heavier litter items. Designed to be able to grab, hold and lift items of various shapes and dimensions. Spatial positioning for litter location and localisation. Thrusters for hovering over the litter item.

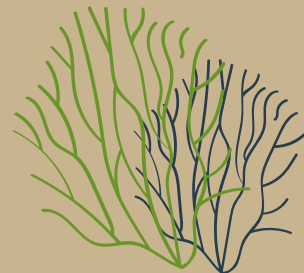


## USVs mini-drones

Compact mini-drones adept at navigating tight spaces, collecting litter with nets, and depositing it into SeaCat's catamaran structure.

## ROV miniTortuga

Performs a detailed scan of hotspot areas to detect individual litter items.



## **Social Innovation Activities**

SeaClear2.0 fosters a sense of collective responsibility towards ocean preservation through participatory social innovation activities including comic art challenges for children and youth, art exhibitions, calls-to-action, a storytelling tool for marine litter reporting, a gamified application for marine litter collection, outreach events, and participatory workshops that will feed into policy analysis and recommendations.

## Public mobilization and citizen engagement



- › GAMIFIED SEACLEAR2.0 APP AND PORTAL
- › PARTICIPATORY DECISION MAKING WORKSHOPS
- › COMIC CHALLENGE
- › COMMUNITIES OF PRACTICE
- › PHOTOGRAPHY COMPETITION
- › BEACH CLEANUPS



## **Our Objectives**

- **Reduce litter pollution in the Mediterranean and beyond through a full-cycle strategy.**

Through a 'Reduce, Analyze, Restore, Collect, Repurpose' strategy SeaClear2.0 will identify site-specific solutions for preventing and minimising marine litter, evaluate litter collection according to potential impacts on the seafloor and marine wildlife, sort and analyse collected litter, and assess its valorization through recycling or repurposing.

- **Develop and demonstrate the innovative SeaClear2.0 solution.**

Specific components of the SeaClear2.0 robotic system will be pilot-tested in Ashdod (Israel), Venice (Italy), and Hamburg (Germany). The entire system will be demonstrated in Dubrovnik (Croatia), Marseille (France), and Tarragona (Spain). A call for associated regions will award five grants of up to €100,000 each to public bodies in selected regions demonstrating the scaling and replication capabilities of our work.

- **Demonstrate the dual-system collaboration between the SeaClear and SeaClear2.0 systems.**

Dual-system collaboration between SeaClear and SeaClear2.0 is key for more efficient marine litter identification and collection, and the collection of heterogeneous litter (larger and smaller items) from diverse seafloor environments.

- **Engage stakeholders, transfer knowledge, and empower citizens.**

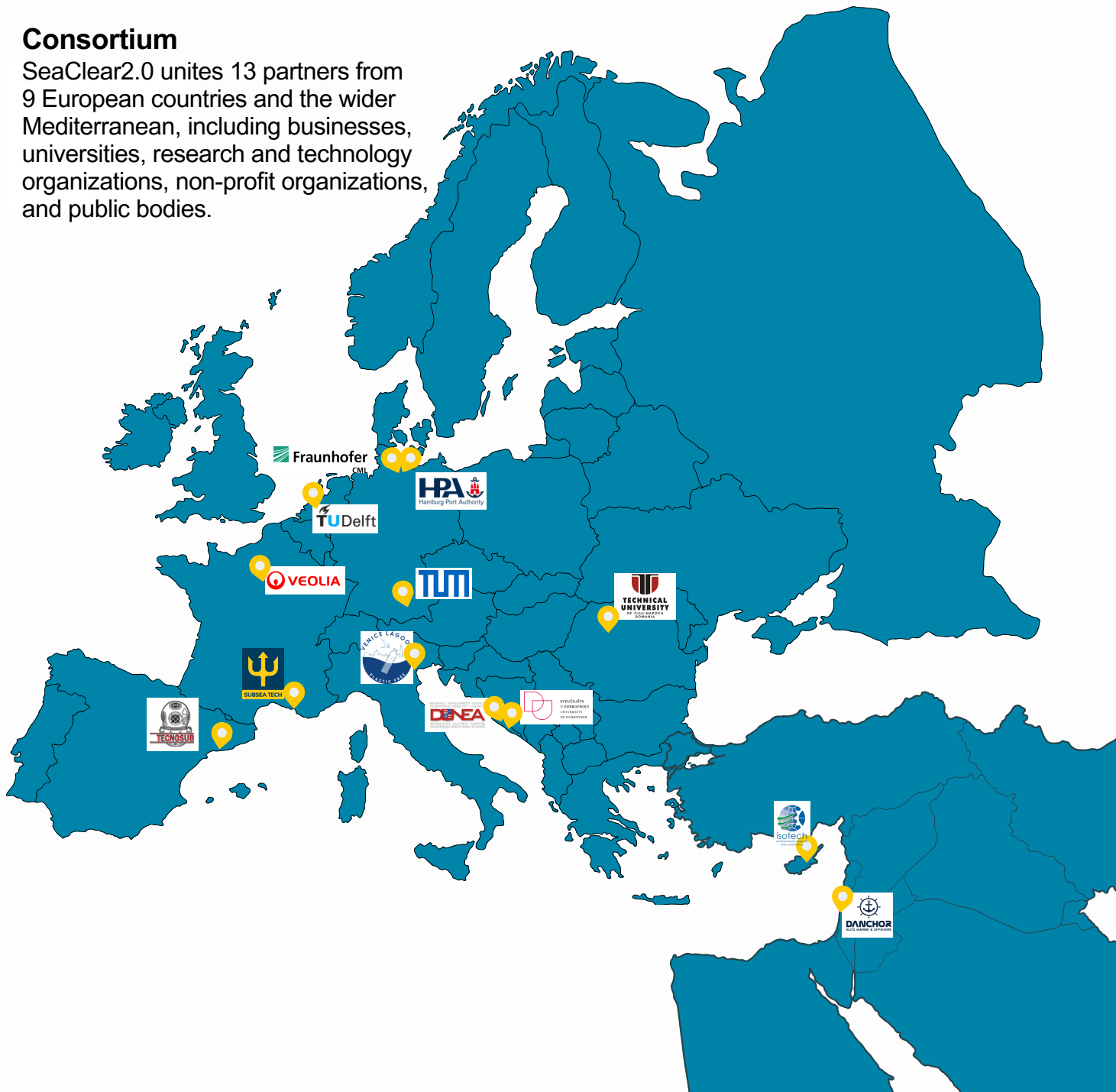
SeaClear2.0 will contribute to an ocean literate society through citizen and targeted stakeholder engagement activations at the project's demonstration and pilot sites, including the establishment of six Communities of Practice. Local stakeholders, and those that can affect and be affected by the SeaClear2.0 project activities, will be the main community members.

- **Outline policy recommendations and develop a plan for taking forth SeaClear2.0 at a local and EU level.**

SeaClear2.0 will engage stakeholders, within local Communities of Practice and beyond, in the identification of solutions for minimising marine litter at the project's demonstration and pilot sites. At the EU level, SeaClear2.0 will map and analyse policies to identify barriers, opportunities, synergies and coherence problems, including key factors and interactions that can support the uptake and wider use of our innovative solution.

## Consortium

SeaClear2.0 unites 13 partners from 9 European countries and the wider Mediterranean, including businesses, universities, research and technology organizations, non-profit organizations, and public bodies.





**EU  
MISSIONS**

RESTORE OUR OCEAN AND WATERS

## Robots for the ocean. Together we **SeaClear2.0**

Follow SeaClear2.0  
to find out more!



Co-funded by  
the European Union