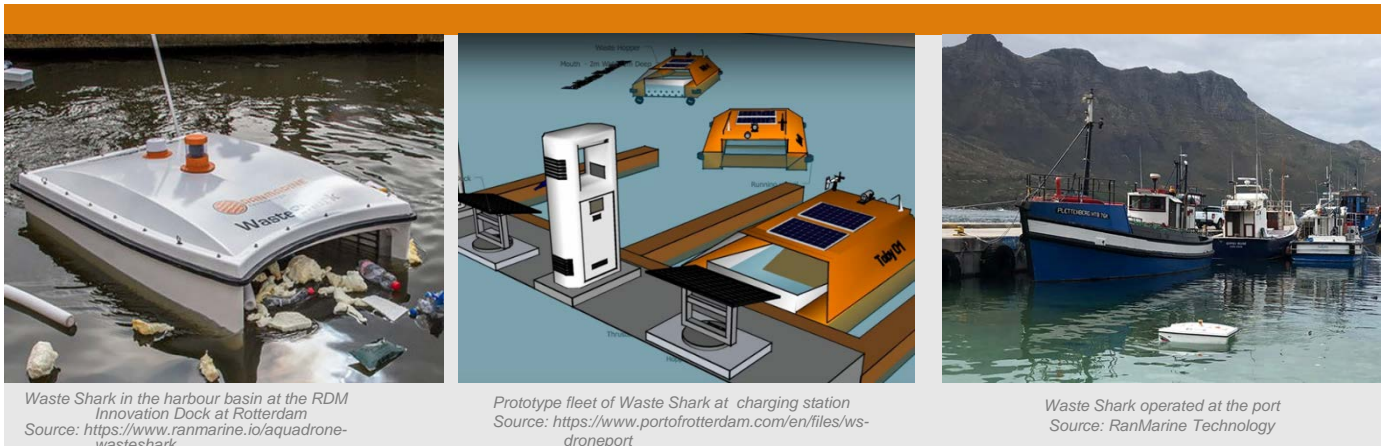


# WasteShark

## Autonomous aquadrone to remove floating plastic wastes in ports



### A Catamaran to Clean Independent Docks, Canals and Estuaries of Floating Plastic

The WasteShark is an aquadrone that removes plastics and other floating debris from the water surface. It was designed especially for use in ports. Shaped like a catamaran, WasteShark can collect up to 350 kg of trash at a time. The electrically propelled drone produces zero carbon emissions and is compact and agile. RanMarine Technology, a Dutch/South African start-up, developed the design and prototype within a start-up accelerator programme for port innovators in Rotterdam.

Within the EIT funded activity “18181 Autonomous Harbour Cleaning”, the DFKI Robotics Innovation Center” supports RanMarine Technology and EIT-partner Nobleo Technology (also from the Netherlands) in the development of an autonomous docking system for the WasteShark. This system will enable the drone to find its way back from the harbour basin to a docking station, where it can deposit the collected waste and recharge its batteries.

The development contributed by DFKI is an important improvement of the current system and a significant step forward towards a marketable product.

### Robot Specifications

Waste Shark has the following technical specifications (source: RanMarine Technology)

- **capabilities:** 16 hours a day waste collection; data collection & transmission
- **waste types:** plastics, micro-plastics, alien vegetation (e.g. duckweed), floating debris
- **application areas:** harbor basins, canals, other semi-confined water bodies with ship traffic
- **control:** remote control (today) or autonomous (future)
- **power source:** battery

- **thrust:** 5.1 kgf (forward), 4.1 kgf (reverse) @ 16V
- **weight:** 39 kg unloaded
- **dimension:** 190 cm x 140 cm x 45 cm
- **carrying capacity:** 550 litres, ~ 350 kg
- **on-board sensors:** camera, lidar, depth sounder, temperature sensor
- **water-quality sensors (optional):** pH, ORP, conductivity, dissolved oxygen, turbidity, ammonium, chloride, nitrate, salinity, mV, ORP, TDS, Resistivity

### Autonomous and Eco-Friendly

The 2018 activity will implement algorithms for the autonomous return of the vessel to the docking and recharging station, once the maximum load capacity of the WasteShark is reached.

However, the final result of the development (to be funded by a follow-on activity) will be a system that operates fully autonomous and is able to optimize operation by taking into account the observed and predicted distribution of waste in harbour basin.

Duration: 01/2018 – 12/2018

Partners:



Funded by:



Grand no. 18181

### Contact:

DFKI GmbH & University of Bremen  
Robotics Innovation Center

Director: Prof. Dr. Frank Kirchner

Phone: +49 421 - 17845 - 4100

E-mail: [robotics@dfki.de](mailto:robotics@dfki.de)

Website: [www.dfki.de/robotics](http://www.dfki.de/robotics)