



MARINE  
REMOTE SENSING  
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# Towards plastic litter detection from space: a proposal for calibration and validation infrastructure

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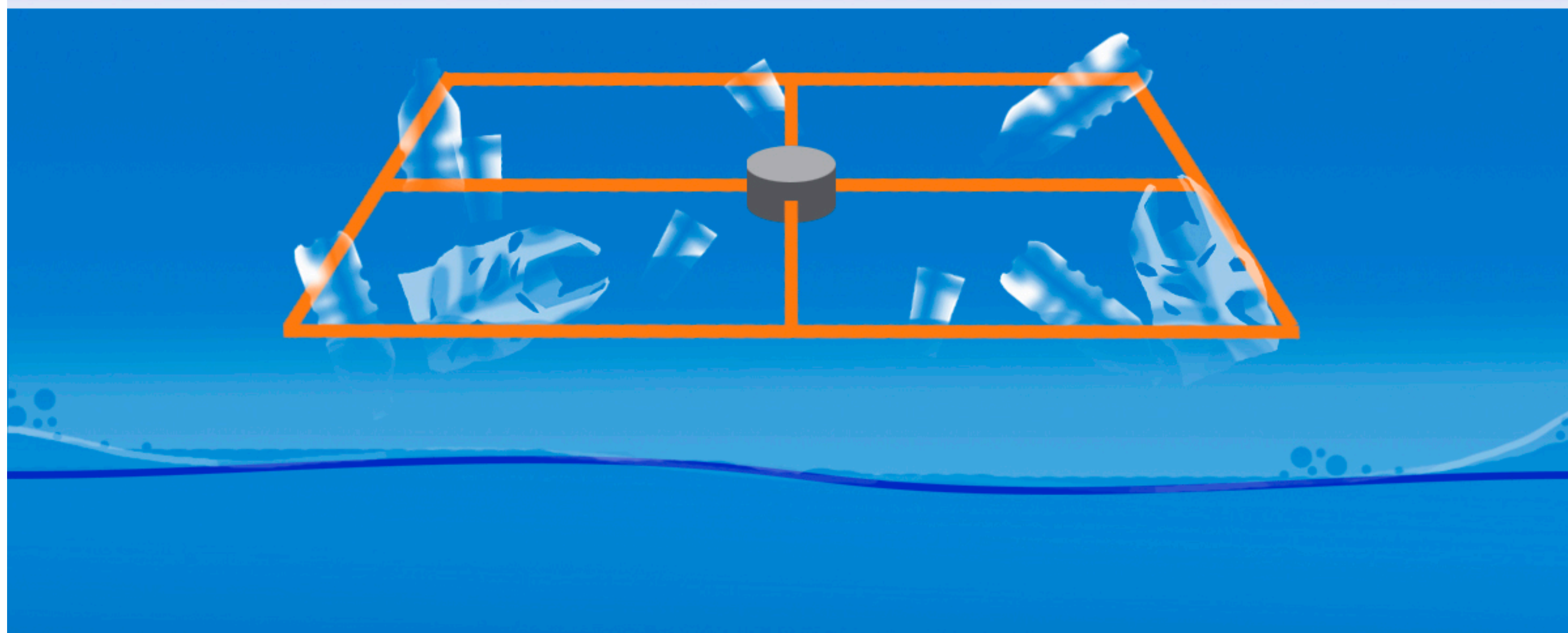
## Abstract

Marine litter is a global problem affecting all the oceans of the world. Millions of plastics end up in the seas affecting the marine ecosystem. State of the art techniques is needed for the detection and quantification of the marine plastics in the sea water. Satellite images and Unmanned Aerial Systems (drones) can be used. In this direction we present a concept for a constant infrastructure on calibration and validation of the plastics in the marine environment from space.

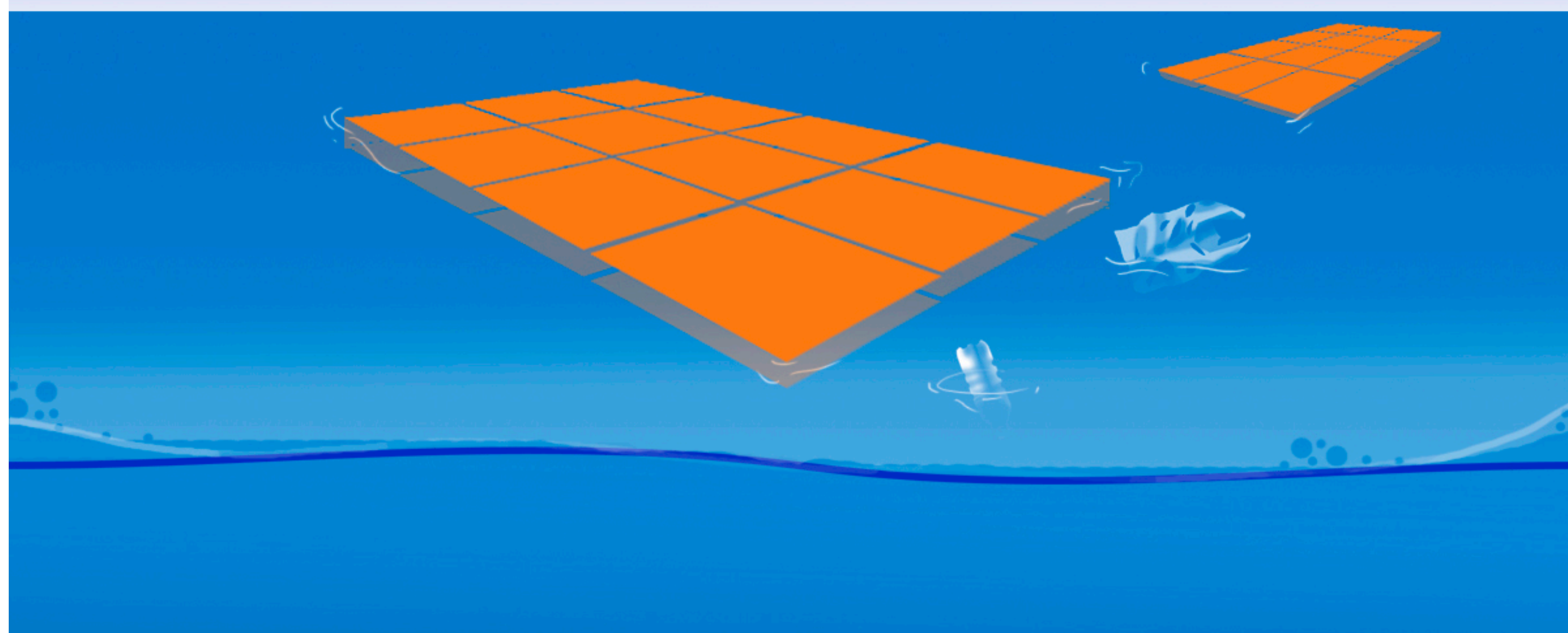
## Methods Proposed

Although the scientific community is working towards the specifications of sensors detecting and quantifying marine litter, no reliable validation/calibration data can be found in a given space/time. Therefore, it is essential to work towards the calibration of detection algorithms and to check the reliability of the known models.

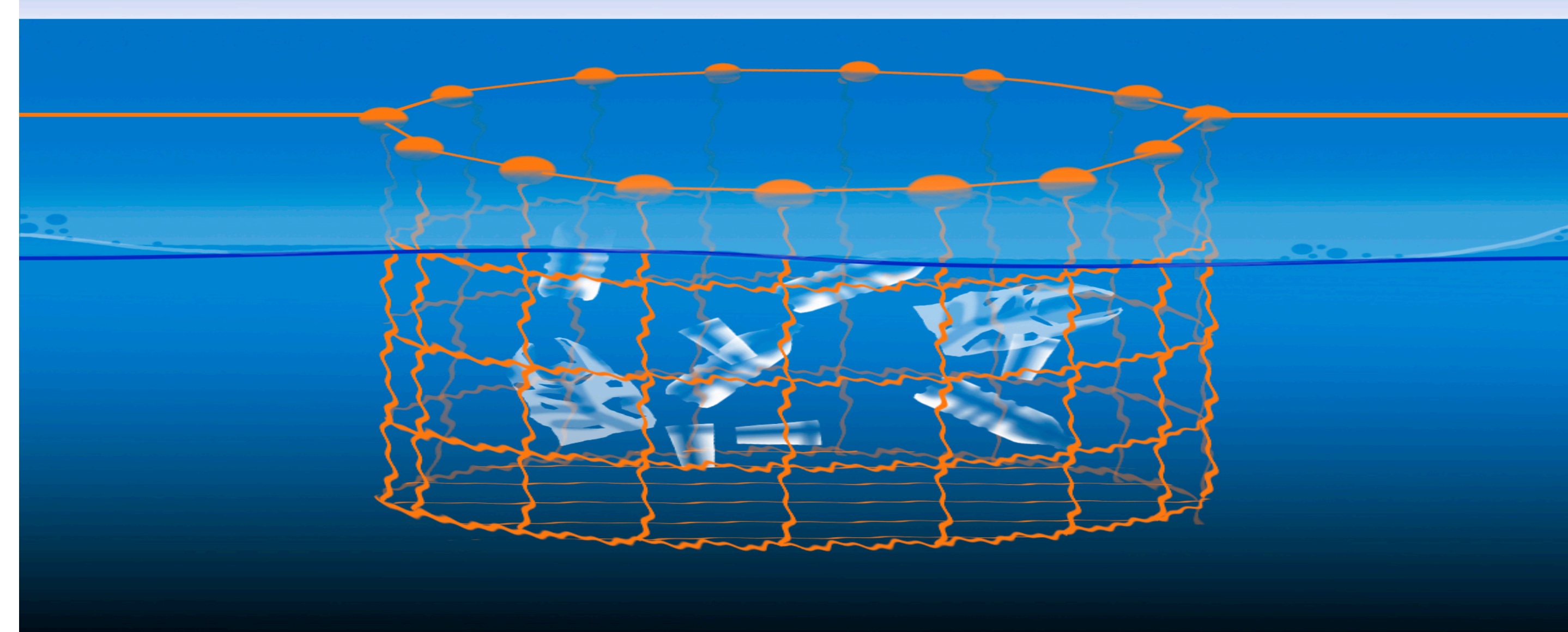
### Plastic movement (models)



### Plastic concentration (surface)



### Plastic volume (sea column)



## Plastic Litter Project (PLP 2018)

PLP2018 was a test project on detecting artificial plastic targets on the sea surface, using satellite images and Unmanned Aerial Systems (drones). Drones used to detect and quantify the volume of the litter on the sea surface with dedicated cameras. Three artificial plastic “targets” created, 10 x 10 m wide, containing: a) 3700 plastic bottles, b) 138 plastic bags and c) 200 sqm fishing net from the Marine Remote Sensing Group (<https://mrsg.aegean.gr>), Department of Marine Studies, University of the Aegean. The project designed to examine the ability of marine litter detection from the European satellites Sentinel-2 and Sentinel-1.

### UAV data acquisition



### Sentinel-2 image



## Conclusions

The PLP2018 experiment proved the usefulness of satellite technology in fighting marine litter and delivered the need for more extensive experiments on the cumulative sea areas.

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