Consiglio Nazionale delle Ricerche
ISMAR - Istituto di Scienze Marine
Sede di Lerici
Forte Santa Teresa – 19032 Lerici (SP), Italy
Tel +39 0187 1788900 Fax +39 0187 970585
segreteria@sp.ismar.cnr.it - protocollo.ismar@pec.cnr.it
www.ismar.cnr.it
C.F. 80054330586 - P.IVA 02118311006

Seminar

Marco Paterni
Istituto di Fisiologia Clinica del CNR
Area della Ricerca di Pisa
&
Silvia Merlino
ISMAR - La Spezia

11:00 - 14 Oct 2020 - Webex platform

Title

Monitoring marine debris in protected coastal areas: an UAV approach

Abstract

Unmanned aerial vehicles (UAVs)are becoming increasingly accessible tools with widespread use as environmental monitoring systems. They can be used for anthropogenic marine debris survey, a recently growing research field. In fact, while the increasing efforts for offshore investigations lead to a considerable collection of data on this type of pollution in the open sea, there is still little knowledge of the materials deposited along the coasts and the mechanism that leads to their accumulation pattern. UAVs can be effective in bridging this gap by increasing the amount of data acquired to study coastal deposits, while also limiting the anthropogenic impact in protected areas.In this study, UAVshave been used to acquire geo-referenced RGB images in a selected zone of a protected marine area (the Migliarino, Massacciuccoli, and San Rossore park near Pisa, Italy), during a long-term (ten months) monitoring programme. A post processing system based on visual interpretation of the images allows the localization and identification of the anthropogenic marine debris within the scanned area, and the estimation of their spatial and temporal distribution in different zones of the beach. These results provide an opportunity to investigate the dynamics of accumulation over time, suggesting that our approach might be appropriate for monitoring and collecting such data in isolated, and especially in protected, areas with significant benefits for different types of stakeholders.

Keywords: unmanned-aerial-vehicles; UAVs; anthropogenic-marine-debris; AMD; beached-marine-litter; BML; marine-protected-areas; MPA; ortho-photo; marine-pollution; accumulation-rate