

## **Water quality monitoring in a bathing area of Civitavecchia (Latium, Italy) using Chromophoric Dissolved Organic Matter (CDOM) as a tracer of faecal contamination**

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Coastal urban bathing areas are often affected by events of faecal contamination, caused by the discharge of untreated wastewaters during the bathing season that can increase the risk for public health. Monitoring the quality of recreational waters is still closely linked to time-consuming seawater sampling and laboratory analysis, not allowing promptly management interventions. To face this issue, the European environmental policies strongly promote the development of coastal observing systems, above all in the Southern European Seas (SES). Chromophoric Dissolved Organic Matter (CDOM) has been increasingly used as a tracer of bacterial loads, since wastewaters are characterized by a large amount of organic compounds.

The aim of this work was to study the relation between CDOM and *Escherichia coli* abundance, giving relevance to bacterial physiological state detected using both the standard culture method and the innovative fluorescent antibody technique. Attention has been paid also on the expression of extracellular enzymatic activity by the total microbial community to explore the role of bacteria in the decomposition processes of dissolved organic matter. Data were collected during summer 2015 and 2016 in a bathing area of Civitavecchia at increasing distances from the discharge point.

The results confirm the usefulness of CDOM measurements as a proxy of faecal pollution in bathing areas. In this perspective, the low-cost stand-alone systems equipped with CDOM fluorescence sensors developed by the Laboratory of Experimental Oceanology and Marine Ecology (Tuscia University) (Marcelli et al., 2014) could allow the continuous monitoring of water quality, increasing the capabilities of the Civitavecchia Coastal Environmental Monitoring System (C-CEMS) in the analysis of pollution events. Thanks to the integration of in situ fixed stations, high-resolution satellites imagery and numerical models, C-CEMS provides a management tool to support the stakeholders for timely decision making (Bonamano et al., 2016).