



Mediterranean Ocean Colour Chlorophyll trend

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Monitoring chlorophyll (Chl) concentration, seen as a proxy for phytoplankton biomass, is an efficient tool in order to understand the response of marine ecosystem to human pressures. This is particularly important along the coastal regions, in which the strong anthropization and the irrational exploitation of resources represent a persistent threat to the biodiversity.

The aim of this work is to assess the effectiveness and feasibility of using Ocean Color (OC) data to monitor the environmental changes in Mediterranean Sea and to develop a method for detecting trend from OC data that can constitute a new indicator of the water quality within the EU Marine Strategy Framework Directive implementation. In this study the Mediterranean merged Case1-Case2 chlorophyll product, produced by CNR-ISAC and distributed in the framework of MyOcean, is analyzed. This product is obtained by using two different bio-optical algorithms for open ocean (Case1) and coastal turbid (Case2) waters; this improves the quality of the Chl satellite estimates, especially near the coast. In order to verify the real capability of the this product for estimating Chl trend and for selecting the most appropriated statistical test to detect trend in the Mediterranean Sea, a comparison between OC and in situ data are carried out.

In-situ Chl data are part of the European Environment Information and Observation Network (Eionet) of the European Environmental Agency (EEA). Four different statistical approaches to estimate trend have been selected and used to compare trend values obtained with in-situ and OC data. Results show that the best agreement between in-situ and OC trend is achieved using the Mann- Kendall test. The Mediterranean trend map obtained applying this test to the de-seasonalized OC time series shows that, in accordance with the results of many authors, the case 1 waters of Mediterranean sea are characterized by a negative trend. However, the most intense trend signals, both negative and positive, are found in case 2 waters in correspondence of the river deltas. These trend signals are frequently linked to the implementation or non-implementation of the legislation introduced to control the nutrient discharge into the sea from European rivers.