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Integration of satellite data and in situ measurements to improve coastal water quality monitoring

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Coastal areas are “sensitive” zones exposed to different natural hazards and anthropic risks. The increasing level of urbanization, the even more irrational exploitation of those areas and, more generally, climate changes are some of the most relevant phenomena able to strongly change such sites. For these reasons, it is necessary to implement an adequate water quality monitoring system able to give a reliable description of water status for reducing the negative effects which coastal marine waters are exposed to. Remote sensing data offer a relevant contribution in this framework, providing, with a quite good level of accuracy, information about the spatial distribution of sea water constituents over large areas with high temporal rates and at relatively low costs. On the other hand, in situ measurements allow to analyze the history of these elements at a very small scale, both in terms of investigated area and period. The integration of these two kind of information may improve the monitoring in the space-time domain of a specific area, allowing also for a calibration, at local scale, of the satellite data/products.
In this paper results achieved in such a context while carrying out two projects on Mediterranean Sea water quality will be described. More than 15 years of MODIS Ocean Colour data have been analyzed and compared with different specific in-situ and airborne data concerning different areas of Mediterranean Sea collected in the framework of the following projects: IOSMOS (IOnian Sea water quality MOnitoring by Satellite data, OP ERDF Basilicata) and MOMEDAS (MOnitoraggio delle acque del mar MEditerraneo mediante DAti Satellitari, OP Basilicata ESF). Specifically, preliminary achievements regarding the analysis of Chlorophyll-a (Chl-a) and diffuse attenuation coefficient at 490 nm (Kd 490) products as well as suspended sediment material (SSM) transport phenomena and the Sea Surface Temperature (SST) variations occurring in the analyzed areas will be described.