



## **Monitoring oil spills at sea with optical satellite sensors: the PRIMI project Optical Observation Module**

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The PRIMI project funded by the Italian Space Agency (ASI) has implemented an observation and forecast system to monitor marine pollution from hydrocarbon oil spills (OS) in the Italian Seas. The system consists of four components, two of which for OS detection via multi-platform SAR and optical satellite imagery, an OS displacement forecast subsystem based on numerical circulation models and a central archive that provides WEB-GIS services to users. The system also provides meteorological, oceanographic and ship detection information. The Optical Observation Module, based on MODIS and MERIS imagery, is described here. The idea of combining wide swath optical observations with SAR monitoring arises from the necessity to overcome the SAR reduced coverage of the monitoring area. This can be done now, given the MODIS and MERIS higher spatial resolution with respect to older sensors (250-300 m vs. 1 km), which consents the identification of smaller spills deriving from illicit discharge at sea. The procedure to obtain identifiable spills in optical reflectance images involves removal of natural variability to enhance slick - clean water contrast, image segmentation/clustering and a set of criteria for the elimination of those features which look like spills (look-alikes). The final result is a classification of oil spill candidate regions by means of a score based on the above criteria.