Geophysical Research Abstracts
Vol. 20, EGU2018-17369, 2018
EGU General Assembly 2018

SYMPA, an innovative tool based on earth observation and modeling for the safeguard of Marine Protected Areas

Chiara Lapucci (2), Carlo Brandini (1), Bartolomeo Doronzo (2), Maria Fattorini (2), Stefano Taddei (1), Samantha Melani (1), and Alessandra Settin (3)

(1) Consorzio LaMMA Italy (brandini@lamma.rete.toscana.it), (2) CNR Ibimet - Italy, (3) Vitrociset Belgium

Marine protected areas (MPAs) are an important tool in protecting and maintaining marine biodiversity, and in achieving the long-term conservation of nature and ecosystems. MPAs are not only a biodiversity shelter, but they also promote economic development connected to tourism, and cultural heritage protection. Maintaining MPAs, which means preserving their beneficial effects on environment and economic growth, needs efficient monitoring of physical and biogeochemical parameters as well as of potentially harmful human activities (such as navigation). SYMPA is an ESA ARTES20 IAP demonstrator project, aimed at providing innovative services for needs of governance and protection of MPAs, as it includes tools for monitoring the marine traffic (including leisure boats) as well as a combined satellite and modelling based assessment of water quality and water renewal time. The latter was developed as a CMEMS downstream service. Physical and biogeochemical dynamic maps from high-resolution models compensate in Sympa the inherent limitation of satellite data such as revisiting time and cloud coverage.

Earth Observation (EO) data such as Chlorophyll a, Water Clarity and Sea Surface Temperature, acquired from new generation satellites, such as Sentinel 3, are particularly suitable for coastal areas analysis because of their high spatial resolution and improved atmospheric correction, as for instance concerning coastal aerosols. Waiting for Sentinel 3 L2 data to be calibrated in Mediterranean area, MODIS and VIIRS data were used, but the operational chain was already implemented for Sentinel 3 data.

Sympa modelling component is constituted by a chain of very high-resolution nested models, whose boundary and initial conditions are extracted from CMEMS ocean and biogeochemical models. Finally in-situ data for the calibration and validation of the modeling and EO components are provided to an innovative use of an autonomous surface vehicle (Wave Glider).

Biogeochemical and physical water quality data derived both from satellites and models are produced daily as an input to an application called Traffic Light, that gives information to MPAs managers about the risk level for the environment, combining those data with sea traffic monitoring data derived from innovative vessel detection algorithms.