How ocean color radiometry can help us to monitor the global coastal waters? Results from the past GlobCoast and ongoing CO2Coast projects.

Hubert Loisel, Vincent Vantrepotte, Daniel Jorge, and Cédric Jamet, Laboratory of Oceanology and Geosciences - LOG- France

Satellite remote sensing now allows for the collection of various physical and biological parameters at regional and global scales and at different temporal resolutions which are not accessible to other sampling methods. Monitoring the bio-optical status of coastal waters over long time period and at global scale is only feasible from ocean color radiometry (OCR). Based on specific algorithms and metrics adapted to cover the whole coastal waters heterogeneity, the temporal variability patterns of some bio-optical properties have been estimated over the global coastal waters over the MERIS time period (GlobCoast project). Hotspots of significant changes, have been revealed and analyzed as a function of physical forcing parameters and human activity. Based on the GLobCoast results, the CO2Coast project has just been launched to analyze the spatio-temporal variability of pCO2 and air-sea flux of CO_2 over the global coastal ocean over the past two decades (1997-2020). This unique data set will allow the controversial contribution of estuaries and the coastal shelf areas to be scrupulously analyzed. The methodology is based on the combination of the in situ SOCAT data set of fugacity of CO_2, OCR and SST observations using a neural net algorithm coupled with a water class-based approach.