JMP-EUNOSAT: towards joint monitoring and assessment of eutrophication in the North Sea using satellite products

Dimitry Van der Zande, *Royal Belgian Institute of Natural Sciences, OD Nature, Belgium*
Héloïse Lavigne, *Royal Belgian Institute of Natural Sciences, OD Nature, Belgium*

Contact: Dimitry Van der Zande: dvanderzande@naturalsciences.be, RBINS, Belgium

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Based on the initial MSFD assessment by all member states in 2012, the European Commission highlighted "the need for greater coherence with related EU legislation (WFD and Habitats and Birds Directive) and for more coherent and coordinated approaches within and between marine regions and sub-regions". While preparing for the second cycle of MSFD assessment, various OSPAR groups (Intersessional Correspondence Group on Eutrophication (ICG-EUT) and the Hazardous Substances and Eutrophication Committee (HASEC)) have identified incomparability of monitoring methods for chlorophyll as a main issue hampering a coherent assessment of the common indicator chlorophyll a in the greater North Sea. This results in different GES determinations across national borders that cannot be explained by differences in water quality. Satellite data from ocean colour sensors (i.e. SeaWifs, MODIS, MERIS, VIIRS, Sentinel-3) can provide spatially coherent data on chlorophyll concentrations using various type of algorithms (e.g. blue/green-ratios, neural networks, red-edge ratio). Still, to this point it is not officially used as a tool for MSFD eutrophication monitoring in the North Sea by the member states. To enable a coherent assessment of chlorophyll between all OSPAR member states bordering the North Sea it is necessary to develop a well validated coherent satellite-based chlorophyll product for the MSFD monitoring. To accomplish this we evaluated publicly accessible satellite-based chlorophyll products provided by different services (i.e. HIGHROC, CMEMS, ODESA) and determined the validity of these products for different water types (e.g. turbid, clear or absorbing waters) so that the choice of satellite product is determined by environmental conditions per (cross-border) assessment area, rather than national preferences of member states. In this work we will present the results of a validation exercise of the most important North Sea satellite-based chlorophyll products using the Coast Colour Round Robin data set.