

Near real-time monitoring of coastal phytoplankton

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Phytoplankton comprises a phylogenetically diverse array of photosynthesizing organisms which account for approximately half of the primary production on earth. In many regions worldwide, fluxes of nutrients, organic matter and sediment to coastal seas have been strongly altered as a result of human activities on land, altering resource availability and growing conditions for coastal plankton. In particular, the increasing frequency of blooms of nuisance or toxic algae has been associated with these profound changes in coastal environments. High resolution spatial and temporal monitoring of plankton communities represents a powerful approach to gain a better understanding of phytoplankton blooms dynamics and to identify key drivers underlying them.

The aim of this project is to implement near real-time monitoring of phytoplankton in the Belgian Coastal Zone as part of the marine observatory being developed within the context of the LifeWatch programme. Within this framework, a CytoSub flow cytometer (FCM) was recently installed on board of the RV Simon Stevin. This device provides the opportunity of automated routine collection and analysis of marine plankton samples. Based on size and fluorescence characteristics, specifically designed software allows determining the size structure and composition of phytoplankton. During the start-up phase of the project, data collected by the CytoSub FCM will be compared with other types of information on phytoplankton community structure, including pigment fingerprinting (HPLC), *in situ* fluorescence, microscopical identification and amplicon sequencing.