

Real-time ecological modelling of nutrients and phytoplankton on the French shelf of the Bay of Biscay: present and future Previmer products.

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Satellite remote sensing now provides repetitive and reliable surface maps of temperature, inorganic suspended matter and total chlorophyll content. This real-time observation of the surface signature of interesting oceanographic features (gyres, plumes, fronts, upwellings, blooms) can take advantage of 3D models run in an operational mode to explain the emergence and origin of some of these features.

This communication will present a three year running experiment of providing on the <http://www.previmer.org/> web-site the real-time spatial distribution of temperature, salinity, turbidity, 3 main nutrients and 3 types of phytoplankton over the French Atlantic coastal shelf (http://www.previmer.org/previsions/production_primaire/modele_eco_mars3d_gascogne). As the coastal zone is the most impaired by eutrophication episodes triggered by excessive nutrient river loadings, zooming the operational model in coastal areas under pressure can be used to improve the reliability of simulation in embayments and regions of freshwater influence, and to introduce some algal state variables specifically important in the eutrophication process. The operational zoom provided by Previmer on the French Brittany (http://www.previmer.org/previsions/production_primaire/modele_eco_mars3d_bretagne) aims at assessing the risk of hypoxia in case of strong accumulation of dead phytoplanktonic matter in the bottom layer, and of ASP toxin accumulation in bivalves in case of silicon limitation of the *Pseudo-Nitzschia* diatom group. Some real time information about the effective role of a particular nutrient source in the phytoplankton proliferation is illustrated by the on-line mapping of the fraction of phytoplanktonic nitrogen stemming from the Loire river. An extension of this operational ecological model to the English Channel as well as to the Mediterranean French coast is in progress, with two additional harmful phytoplankton species: the ichthyotoxic *Karenia mikimotoi* dinoflagellate and the mucus-producing, colonial nanoflagellate *Phaeocystis globosa*.

Keywords :

biogeochemical model, operational modelling, eutrophication, hypoxia risk, *Pseudo-Nitzschia*, Amnesic Shellfish Poison, Previmer.