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Skill assessment of a high-resolution global marine biogeochemical model

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Here we present the skill assessment of the PELAgic biogeochemistry for Global Ocean Simulations (PELAGOS) model against different observational products, encompassing gridded climatological fields, satellite and in-situ datasets. PELAGOS is a coupling between the NEMO general circulation model and the Biogeochemical Flux Model (BFM). In particular, BFM is based on a biomass continuum description of the marine ecosystem and it solves the fluxes of multi-nutrients among selected biological functional groups representing the major components of the lower trophic levels.
We illustrate the model validation for major inorganic nutrients (nitrate, phosphate, silica), oxygen, and chlorophyll utilizing a multi-decade (1980–2013) hindcast experiment realized at 1/4° horizontal resolution in the framework of MyOcean project. Model-data residuals were analysed to asses the reliability of time-mean spatial patterns and seasonal cycles at both global and regional scales and, where in-situ data from sustained observations are available, long-term dynamics were also addressed. Overall performances of the model were satisfactory, especially for inorganic nutrients and oxygen spatial distributions. Although the timing of the phytoplankton dynamics is well reproduced in some oceanic regions, a systematic bias affected the simulated amplitude of chlorophyll in comparison to the ESA-CCI satellite observations.