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# The assimilation of phytoplankton functional types for operational forecasting in the North-West European Shelf

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The presentation focuses on operational forecasting of biogeochemistry on the North-West European (NWE) Shelf. We explicitly compare the 5 day forecasting skill of three runs of a physical-biogeochemical model: a) a free reference run, b) a run with daily Data Assimilation (DA) of total surface chlorophyll (ChlTot) and (c) a run with daily DA of surface chlorophyll split into phytoplankton functional types (PFTs), taken from a recently developed satellite product. We show that within the 5 day forecasting period the PFTs DA substantially outperforms both ChlTot DA and the free run in forecasting both PFTs chlorophyll and total chlorophyll. Furthermore the skill of ChlTot DA to represent total chlorophyll degrades more rapidly with the forecasting day than the skill of PFTs DA. This is because the ChlTot DA does not correctly split the assimilated total chlorophyll into the four functional types used in the biogeochemical model, which are important variables for the simulation of ecosystem dynamics. We validate our results with in situ data and we demonstrate that (in both DA cases) the DA improves the model representation of nitrate, $CO_2$ fugacity, and also phosphate. The impact of DA on silicate remains ambiguous.