Developments in operational biogeochemical forecasting at the Met Office

The Met Office provides a daily 5-day forecast and a multi-decadal reanalysis for chlorophyll, primary production, nutrients, oxygen, and pH, covering the Northwest European Shelf Seas. Both are produced by running the biogeochemical model ERSEM coupled to the hydrodynamic model NEMO, with assimilation of ocean colour chlorophyll, sea surface temperature, and temperature-salinity profiles. The forecasts are available as a dedicated Met Office service and the reanalysis via the Copernicus Marine Service. We provide an update on current developments and plans for these products. Recent work has focussed on data assimilation: a move from assimilation of total chlorophyll to plankton functional type chlorophyll in the reanalysis, assimilation of sea level anomaly both on and off the shelf, and introduction of revised error covariances for ocean colour chlorophyll. We have also been investigating an issue with modelled nutrient values in shallow waters of the southern North Sea and Irish Sea, which seems to be associated with changes to the assimilated ocean colour products. For the future we will be focussing on a move from 7 km resolution to 1.5 km: the Met Office already runs operational physics-waves forecasts at this resolution, and we discuss progress towards introducing a biogeochemical component which has much higher computational demand. We are also developing the capability to assimilate biogeochemical data from gliders, Biogeochemical-Argo, and other new platforms, and have been assessing the impact of this new data. We are always interested to hear from users and potential users of our products, and we would welcome any feedback from attendees about the usefulness of our products and what you would like to see in future.

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