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Influence of temperature and chlorophyll data assimilation on a biogeochemical ocean model for the North and Baltic Seas

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The forecasting of physical and biogeochemical variables has always proven to be a challenge in marginal and coastal seas. Over the years, data assimilation has played a significant role in improving model accuracy for operational forecasting. In this study, we assess the impact of assimilating satellite sea surface temperature and chlorophyll data, and in-situ profile temperatures in an operational forecast model with the aim to improve the forecast of ocean variables in the North and Baltic Seas. For this purpose, we use the data assimilation software PDAF coupled to the biogeochemical ocean model HBM-ERGOM, which is used operationally at the BSH, and perform data assimilation using an ensemble Kalman filter. We conduct data assimilation experiments for a one-year period from October 2018 to September 2019. The study will discuss and quantify the effects of the data assimilation on the oceanographic and biogeochemical variables in the model and on the coupled interaction of ocean physics and biogeochemistry.