Ferrybox Data in the German Bight: Their Contribution to the Improvement of State Estimates and Numerical Model Predictions

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In this work, we want to quantify the usefulness of and problems associated with the usage of FerryBox along track sea surface temperature (SST) and salinity (SSS) data. We analyse the feasibility of an assimilation of FerryBox data based on data from numerical models, up-to- date remote sensing products, and classical in-situ observation, and give estimates of the corresponding errors. Our analyses show that the variations of SSS along the FerryBox track are too small in comparison to the measurement errors and the errors resulting from the specific FerryBox sampling and can not justify an assimilation under the given circumstances. On the contrary, the assimilation of SST data is possible within an acceptable error range. Output from two model runs of a German Bight 3-D primitive equation numerical model, both assimilating FerryBox data, however one of them with constant relaxation and another one with a variable relaxation based on the temporal and saptial variability of the estimated reconstruction error, are analysed. It is demonstrated that the constant relaxation performs slightly better due to a better compensation of drifting effects in the inner part of the basin, however it produces high errors in the tidal dominated regions near the coast.