



A simple method of observation impact analysis for operational storm surge forecasting systems

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In this work, a simple method is developed for analyzing the impact of assimilating observations in improving forecast accuracy of a model. The method simply makes use of observation time series and the corresponding model output that are generated without data assimilation. These two time series are usually available in an operational database. The method is therefore easy to implement. Moreover, it can be used before actually implementing any data assimilation to the forecasting system. In this respect, it can be used as a tool for designing a data assimilation system, namely for searching for an optimal observing network. The method can also be used as a diagnostic tool, for example, for evaluating an existing operational data assimilation system to check if all observations are contributing positively to the forecast accuracy. The method has been validated with some twin experiments using a simple one-dimensional advection model as well as with an operational storm surge forecasting system based on the Dutch Continental Shelf model version 5 (DCSMv5). It has been applied for evaluating the impact of observations in the operational data assimilation system with DCSMv5 and for designing a data assimilation system for the new model DCSMv6.

References: Verlaan, M. and J. Sumihar (2016), Observation impact analysis methods for storm surge forecasting systems, *Ocean Dynamics*, ODYN-D-15-00061R1 (in press)

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