



Water forecasts, data assimilation and validation

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The Water Forecast (<http://www.waterforecast.com>) has been operated since year 2002 providing daily 5-days forecast on physical parameters such as wave climate, water levels, currents, salinity and temperature. However, also biogeochemical parameters have been included in the forecasts since 2002 providing similar 5-days forecasts for parameters such as dissolved oxygen and chlorophyll-a.

Until now, data assimilation has not been carried out systematically. However, through the MarCoast project new assimilation techniques have been implemented and tested. We have now successfully applied data assimilation of MODIS and Envisat (AATRS and MERIS RR) sea surface temperature and chlorophyll-a to provide updated and improved forecasts on the state of the Baltic Sea, North Sea and interconnecting waters.

By combining the data sources available with a process based modeling framework, the resulting integrated use of the available information can supply a consistent and in many respects a superior interpretation of the state and evolution of physical and biogeochemical parameters. When model and measurement errors (including the representativeness) are complex, the key ingredients in a successful assimilation strategy are first order error description and robust assimilation scheme.

The approach is validated through the recognized validation protocol developed by the MarCoast Validation Bureau combining statistical analysis of product delivery and accuracy with user utility as well as a technical description. In addition an online Water Forecast QA module monitors basic statistical inter-comparison measures of model, earth observation and in situ data.