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Validation of Ocean Colour Products

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Validation Methods

Within the validation process, parameters derived from remote sensing data are compared with ground truth and model data. This includes statistical analysis of the similarity of the distribution of the data sets, a point to pixel comparison, transect comparison or time series plots. These approaches provide an assessment of the reliability of measurements keeping in mind drawbacks like spatial extent of sampling, different measurement techniques or patchiness.

Point to Pixel comparison

In-situ data provided by the users are compared to EO water quality parameters. Plotting both data sets in a scatterplot and providing coefficients for the regression and correlation provides a first picture of the agreement of the data sets.

The Spatial Dimension

The surroundings of sampling stations is taken into account by plotting transects along a ship line plus the in-situ data points on the respective position in the transect. This enables the detection of trends and algal bloom events in both data sets although they might be spatially shifted due to time differences in acquisition.

The Temporal Dimension

Time series plots show the temporal evolution of a parameter at a dedicated position. Thus, events such as spring blooms can be detected as the MERIS data show the development of chlorophyll concentration during the season. The comparison of both measurement techniques show the agreement with in-situ at the dedicated dates of measurements.

Comparison with Model data

The Federal Waterways Engineering and Research Institute (BAW) in Germany is one Brockmann Consult GmbH user within Marcoast. The Institute receives MERIS data products of total suspended matter (TSM) and transparency for the German Bight and the North Sea. Within the project AufMod (http://www.kibi.de/prj-aufmod/en), the BAW develops a model for long-term morphodynamic processes in the German Bight. The MarCoast products are used for the validation of the modelled sediment transport. The presented figures show exemplarily the data sets, the availability of MERIS data for 2006 as well as preliminary validation results.

Conclusion

The different validation methods provide a unique insight into the relationship between in-situ/model and EO-data. Considering that point data are compared to 300m or 1.2km pixels and the high patchiness in the water, the results are very convincing and users have expressed their confidence in the data based on these analyses. The comparison with the BAW model data is an ongoing process and helps in understanding and learning more about the processes in the water body and the models. Validation will always be an important part of the services we provide and part of the results communicated to the users.