Geophysical Research Abstracts
Vol. 18, EGU2016-9454, 2016
EGU General Assembly 2016

Improving the spatial and temporal resolution with quantification of uncertainty and errors in earth observation data sets using Data Interpolating Empirical Orthogonal Functions methodology

Ghada El Serafy (1,2), Sandra Gaytan Aguilar (1), Alexander Ziemba (1,2)
(1) Deltares, Delft, Netherlands, (2) Delft University of Technology, Delft, Netherlands

Abstract

There is an increasing use of process-based models in the investigation of ecological systems and scenario predictions. The accuracy and quality of these models are improved when run with high spatial and temporal resolution data sets. However, ecological data can often be difficult to collect which manifests itself through irregularities in the spatial and temporal domain of these data sets. Through the use of Data INterpolating Empirical Orthogonal Functions(DINEOF) methodology, earth observation products can be improved to have full spatial coverage within the desired domain as well as increased temporal resolution to daily and weekly time step, those frequently required by process-based models[1]. The DINEOF methodology results in a degree of error being affixed to the refined data product. In order to determine the degree of error introduced through this process, the suspended particulate matter and chlorophyll-a data from MERIS is used with DINEOF to produce high resolution products for the Wadden Sea. These new data sets are then compared with in-situ and other data sources to determine the error. Also, artificial cloud cover scenarios are conducted in order to substantiate the findings from MERIS data experiments. Secondly, the accuracy of DINEOF is explored to evaluate the variance of the methodology. The degree of accuracy is combined with the overall error produced by the methodology and reported in an assessment of the quality of DINEOF when applied to resolution refinement of chlorophyll-a and suspended particulate matter in the Wadden Sea.

References

[1] Sirjacobs, D.; Alvera-Azcárate, A.; Barth, A.; Lacroix, G.; Park, Y.; Nechad, B.; Ruddick, K.G.; Beckers, J.-M. (2011). Cloud filling of ocean colour and sea surface temperature remote sensing products over the Southern North Sea by the Data Interpolating Empirical Orthogonal Functions methodology. J. Sea Res. 65(1): 114-130. Dx.doi.org/10.1016/j.seares.2010.08.002