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*Spatial patterns of chlorophyll *a* variability in the North East Atlantic*

The North East Atlantic (NEA) comprises a high diversity of marine systems within a relatively small geographical area: shallow and well-mixed systems, stratified systems, coastal upwelling systems, continental shelf and deep ocean. Across these systems, different seasonal and interannual patterns of chlorophyll *a* (Chl) variability may be observed. Characteristic features of the Chl dynamics are used to identify typical areas across the NEA, in a way similar to Longhurst provinces classification. Remote sensing observation of Chl (ENVISAT-MERIS, 2nd reprocessing, full mission) offers a comprehensive picture of the spatial dynamic of surface phytoplankton biomass over almost a decade (2003-2011). An existing multiplicative method of Chl signal decomposition was applied to every pixel separating the Chl signal into four components: 1) the grand mean, 2) the interannual, 3) the seasonal and 4) the residual components for the considered 9-years period. In this way, the method assumes no trend over the considered period where the standard deviations of each component are compared in a relative fashion to describe the local dynamics of Chl. The pixel-wise calculated components are represented in individual maps to depict the spatial patterns of chlorophyll *a* variability and outline areas of high or low seasonal and interannual variability. Subsequently the decomposed Chl signal is used in a K-means cluster analysis to classify the NEA region into different categories of Chl dynamics for the considered period 2003-2011 providing a governance tool for policy makers.