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Is there a correlation between chlorophyll-a concentration and wave climate?

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An exploratory study was carried out using satellite remotely sensed data to investigate possible correlations between the variance of chlorophyll-a concentration and wave climate. The latter has been characterized by significant wave heightH_s and the fourth wave spectral momentumm_4 which is related to whitecapping.

The chlorophyll-a concentration measurements (level 2) were provided by the Moderate Resolution Imaging Spectroradiometer (MODIS) on board the Aqua satellite, and the ocean wave measurements were obtained by the altimeter mission Topex/Poseidon, for the time period of 2003 to 2006. The study region comprises part of the Northeast Atlantic (32º – 41.5º N and 12º – 19º W). Within this region 13 (1ºx1º) areas were defined whose centre coincides with crossing points of Topex ascendant and descendent tracks. Important limitations of remote sensing data used in this study are discussed. The altimeter data present a small temporal coverage (10-day repeat period), and the ocean color data suffer from cloud contamination. Nevertheless, the spring bloom was consistently detected in the ocean color data and on some instances appeared to be associated with the significant wave height in the period prior to the blooms.