

Study on influence of abnormal environmental changes on phytoplankton biomass in the South China Sea

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The South China Sea (SCS), located in the western Pacific Ocean, is one of the largest marginal seas in the world. In the present paper, we used satellite remote data, such as SeaWiFS-derived Chlorophyll-*a* data, Quikscat wind data and Tmi_Amsre SST data (the fused products of SST of The TRMM Microwave Imager (TMI) and Advanced Microwave Scanning Radiometer for EOS (AMSR-E)) for a period as long as data is available, to analyze the spatial variation of phytoplankton/chlorophyll and related environmental factors for the SCS. This study may help us to get a better understanding of influences of abnormal environmental changes on marine primary productivity.

The results showed increase of phytoplankton biomass/chlorophyll concentrations in the west SCS after the events of strong winds/typhoon and high marine biomass on the surface maintained about one week or longer period. Phytoplankton biomass/chlorophyll *a* concentrations increased remarkably near the area of strong wind or typhoon passage, indicating strong wind may strengthen the mixture between upper and lower layer of ocean and also induce Ekman pumping upwelling, which brought rich nutrients from deep water layers to surface reflecting on increase of phytoplankton. There were good positive correlations between marine primary productivity and wind intensity. In 1998 summer with very weak summer winds, Chl-*a* concentrations in the SCS were the lowest among 7 years, and significant low in the western SCS; This anomalous event of low phytoplankton biomass in the SCS coincided with weak wind speed of an El Nino year in 1998.

Keywords: Chlorophyll *a*, Ekman pumping, El Nino, satellite remote sensing, South China Sea, summer monsoon, upwelling

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