

PHYTOPLANKTON BLOOMS IN THE SOUTH CHINA SEA AND THE WESTERN NORTH PACIFIC SUBTROPICAL GYRE AS OBSERVED BY MULTIPLE SATELLITE SENSORS – IMPACT OF EDDY, AEROSOL, TYPHOON, AND VOLCANO

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ABSTRACT:

Western north Pacific Gyre and South China Sea are oligotrophic subtropical oceans. To better understand the global biogeochemical cycle and carbon fixation of the ocean, it is intriguing to explore phytoplankton bloom occurrences and nutrient sources in these vast oligotrophic oceans. Using synergy of 5 types of remote sensing data including (a) ocean colour data (chlorophyll-a concentration and ocean colour spectra) from the NASA's SeaWiFS (Sea-viewing Wide Field-of-view Sensor) satellite (b) aerosol data from the NASA MODIS (MODerate Resolution Imaging Spectro-radiometer) satellite, (c) cloud-penetrating SST data from the TRMM (Tropical Rainfall Measuring Mission) satellite, (d) Sea Surface Height Anomaly (SSHA) data from the TOPEX/Poseidon and JASON-1 satellites, and (e) ocean surface wind vectors from the NASA QuikSCAT satellite, here we analysis a number of different phytoplankton blooms observed in these oligotrophic waters. It was found that indeed significant phytoplankton blooms could occur in these waters and the nutrient sources include: volcanic eruption, lateral transport from ocean eddy, aerosols, and typhoons.

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