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Climatological characterization of sea level, air-sea interactions and primary productivity of the South China Sea

This paper reviews the dynamics of air-sea interactions of the climate in the region with the surface features of the South China Sea such as sea level anomaly and upwelling. Among the dynamical influences of sea level are the influences of ENSO, cold surges, Borneo vortex and surface currents. This paper also presents some projections of sea level rise as reported by a study undertaken by NAHRIM due to climate change. This paper will try to show that sea level rise associated with climate change though may appear to be small (3 mm/year) but when combined with changes in the synoptic circulations can amplify the threats to the coastal regions of the South China Sea.

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Taking advantages of the improved spatial and temporal satellite-remote sensing data, a recent 9-year climatological overview of the surface atmospheric and oceanic features in the equatorial South China Sea during the northeast monsoon is presented to identify the dominant air-sea processes in influencing and modulating the primary production of the region during this period. Chlorophyll-a concentration (a proxy for phytoplankton) is used as a rough indicator of monthly variation and distribution of primary production potential. High concentrations of chlorophyll-a are noted to hug the coastline but the open sea area has a low concentration. This observed feature could be due to the enhancing process associated with the interactions of sea surface currents and the coast that confine the nutrient or the role of river discharges and normal diffusion from the coast to the open sea.