

## Primary Production in the South China Sea: A Comparison between Ocean-color Derived Estimates and Coupled-model Output

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### ABSTRACT

Monthly depth-integrated primary productions (P<sub>Peu</sub>) in the South China Sea (SCS) have been estimated from the SeaWiFS ocean-color data and from a coupled physical-biogeochemical model. Both sets of results show the trend of elevated P<sub>Peu</sub> in winter and summer and low values during inter-monsoon periods, primarily explained by the upwelling in the SCS induced by the East Asia Monsoons, but the basin-wide primary productions derived from ocean-color data are considerably higher than those from the coupled-model. According to observed data in the coastal zone, on the one hand the ocean-color derived P<sub>Peu</sub> values are overestimated in the coastal zone, and, on the other hand, the coupled-model predicted P<sub>Peu</sub> values are underestimated in the coastal zone. This is why the basin-wide primary productions derived from ocean-color data are considerably higher than those from the coupled-model. Following the example of Longhurst *et al.* (1995), we adjust the ocean-color derived P<sub>Peu</sub> values in the coastal zone by reducing the original values by half, and obtain the average annual P<sub>Peu</sub> of 412 mg C m<sup>-2</sup> d<sup>-1</sup>, which may be regarded as the current best estimate. Improvements in the derivation of chlorophyll concentration from ocean-color data and the biogeochemical processes in the coupled-model together with more field observations are needed to refine the estimate.

(Key words: ocean color, coupled model, South China Sea, primary production)

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