Effect of inter-monthly variation of Kuroshio upwelling on primary production in the southern East China Sea north of Taiwan in summer

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Primary production is the base of marine food chain and also plays a key role in the regulation of earth climate. Therefore, it is important to understand the variation of primary production under nature variability of ocean environment before we can assess the impact of climate change on marine ecosystem. In the present study, primary production in the southern East China Sea extending from the mainland China coast to the offshore Kuroshio region were investigated within a month in the summer cruises of 2010 (August 2-5 and August 25-27) to understand the short term variation of primary production. On board incubation of P^B-E curve experiments were conducted to obtain primary production. We found the values of primary production were ranging from 703 to 2060 mgC m^{-2} d^{-1} and 362 to 1341 mgC m^{-2} d^{-1} in the early and the late month cruise, respectively. Although very high spatial variation of primary production were found in each cruise, spatial average of primary production (1303±495 mgC m^{-2} d^{-1}) in the early month cruise was about 2 times higher than the value (704±298 mgC m^{-2} d^{-1}) in the late month cruise. The intensification of Kuroshio upwelling observed in the early month was the key force for the enhancement of primary production. The results suggested it is crucial to understand the mechanism of Kuroshio upwelling under climate change.

Keywords: Kuroshio upwelling; primary production; southern East China Sea.