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Particulate and Dissolved Primary Production in the Southern East China Sea

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This is the first report of both particulate and dissolved primary production (PPP and DPP, respectively) in the southern East China Sea. The survey was carried out on 16-21 May, 2018. Total of 24 photosynthesis-irradiance (P-E) curves and photosynthetic parameters (maximum photosynthetic rate [P_m^B] and initial slope [α]) for DPP and PPP were obtained. For PPP, P_m^B ranged from 2.84 to 28.56 mgC (mgChl)$^{-1}$ hr^{-1} with a mean value of 8.87 $\pm$ 7.23 mgC (mgChl)$^{-1}$ hr^{-1}, while the α ranged from 0.0054 to 0.0183 mgC (mgChl)$^{-1}$ hr^{-1} (μE m^{-2} s^{-1})$^{-1}$ with a mean value of 0.0107 $\pm$ 0.0043 mgC (mgChl)$^{-1}$ hr^{-1} (μE m^{-2} s^{-1})$^{-1}$. For DPP, P_m^B ranged from 1.17 to 21.71 mgC (mgChl)$^{-1}$ hr^{-1} with a mean value of 7.80 $\pm$ 7.09 mgC (mgChl)$^{-1}$ hr^{-1}, while the α ranged from 0.0028 to 0.0217 mgC (mgChl)$^{-1}$ hr^{-1} (μE m^{-2} s^{-1})$^{-1}$ with a mean value of 0.0089 $\pm$ 0.0064 mgC (mgChl)$^{-1}$ hr^{-1} (μE m^{-2} s^{-1})$^{-1}$. Photosynthetic parameters in the surface were generally higher than those in the deep.

The integrated particulate primary production ranged from 162 to 1192 mgC m^{-2} d^{-1} with a mean value of 555 $\pm$ 484 mgC m^{-2} d^{-1}, while the integrated dissolved primary production ranged from 68 to 1720 mgC m^{-2} d^{-1} with a mean value of 571 $\pm$ 707 mgC m^{-2} d^{-1}. The percent extracellular release (PER) were calculated from 28.7 to 69.7% with a men value of 40.8 $\pm$ 12.1 %. The PER in the southern ECS was generally located in a higher level of the world's range. PER in the station 9 and 11 were higher than 50%, indicating the photosynthetic carbon flux to the microbial loop could be more important than we thought before.