

## **Seasonal and interannual dynamics of nutrient and chlorophyll-a in coastal area of the East Sea**

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The nutrient and chlorophyll-a dynamics in coastal area of Hupo in the East Sea were studied during the four seasons from 2012 to 2016. The seasonal hydrological regime changed from winter mixing to strong stratification in summer and fall. Nitrate was depleted in the surface layer during summer and fall, and re-supplied to surface layer during winter mixing. The ratio of nitrate to phosphate was 12.3~16.8 in the mixed layer(ML) and 12.6~13.9 below ML, which indicate a general tendency to N-limitation. Seasonal chlorophyll-a dynamics were characterized as phytoplankton biomass, and related to hydrological conditions and nutrients availability. The surface layer(0-20m) integrated chlorophyll-a during 4 years was highly variable from ND to 14.4 $\mu\text{g/L}$ . Surface layer concentrations of chlorophyll-a were higher in Summer than other seasons, and these results showed typical seasonal boom patterns in the coastal areas. The concentrations of nitrate relative to those of phosphate and silicate decreased exponentially as the chlorophyll-a, which indicate these areas were N-depleted condition. Although the nutrient concentrations in the ML were lower than below the ML, the supply of nutrients for phytoplankton growth seems to be associated with physical processes, such as coastal upwelling and discharge water from coastal inland. Also, relatively low nutrient levels were observed in lower salinity condition, and the correlation between salinity and chlorophyll-a was negative during summer in low salinity condition. These results suggested that the nutrients and chlorophyll-a distribution were dynamic during summer and fall compared with other seasons, which indicate supply of nutrients were relative with upwelling and freshwater discharge from coastal areas.