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Interannual variability of hypoxia and related hydrodynamic processes in the East China Sea

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The large area of hypoxia adjacent to the Changjiang River Estuary in the East China Sea has been reported several times since 2002. The hypoxic zone shows a significant interannual variability, which implies multiple factors responding to eutrophication conditions. Nutrients from Changjiang River effluent is a major source of eutrophication, while Kuroshio intermediate water is also a great contributor to this phosphorus deficient area. So the variability of the Changjiang Diluted Water and Kuroshio volume transport as well as the volume transport in the Taiwan Strait are of essential importance to the hypoxia study. According to the occurrence of hypoxia in recent years, several dynamical factors along with hydrographical properties which may influence this area are examined in a comparative way, i.e. the runoff of the Changjiang River, Wind fields, Kuroshio transport, density fields and vertical stratification. The in situ data collected in August 1999 and 2006 are concentrated as typical cases and analysized at first as an attentive approach to verify variations of the water mass configuration and their competing status during these periods. The distribution of satellite observed sea surface chlorophyll a provides supporting evidence for the changes of waters masses. This study suggests that more attention need to be paid to understand the roles of hydrodynamics played upon the hypoxia formation and evolutions in such complicated areas.