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Seasonal and interannual ecosystem variability in the South East Asian region: Results of an eddy-resolving physical-bio Seasonal and interannual ecosystem variability in the South East Asian region: Results of an eddy-resolving physical-bio

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An eddy-resolving coupled physical-biological ocean model has been employed to investigate physical influences on the marine ecosystem variability in the South East Asian region. The region is characterized by various temporal and spatial oceanic phenomena (e.g., mesoscale eddies, ocean currents, throughflow, coastal upwelling and tidal mixing). Additionally, the Asian-Australian monsoon, El Nino Southern Oscillation (ENSO), and the Indian Ocean Dipole (IOD) also affect this region. The model captures the seasonal and interannual variability of chlorophyll distribution associated with the mesoscale eddies, ocean circulation and upwelling generated by the monsoon. The model reproduces the high chlorophyll concentrations along the north-western coast of Luzon and Kalimantan during the winter monsoon and along the southern coast of Java-Sumatra, along the coast of Vietnam and in the Arafura Sea during the summer monsoon. In these regions, the upwelling generated by the monsoon uplifts the nutrient-rich waters and increases biological production. During boreal summer-fall, the phytoplankton bloom along the southern coast of Java-Sumatra extends westward by the surface current and to offshore in the southeastern tropical Indian Ocean by the cyclonic eddy. The spreading of phytoplankton bloom is strongly linked to anomalous winds associated with the ENSO and IOD events.

キーワード: Indonesian archipelago, marine ecosystem, coastal upwelling, Asia-Australian monsoon, high-resolution ocean model

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