

Satellite-Observed Multi-Scale Variability of Sea Surface Chlorophyll-a Concentration along the South Coast of the Sumatra-Java Islands

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| Abstract | <p>The southern coast of Java is known as one of the most productive fishing grounds for tuna, feeding by nutrient-rich water along the coast caused by the subsurface water upwelling. This primary productivity can be evidenced by the high sea surface chlorophyll-a concentration (SSC). Based on satellite remote sensing products, we investigate the multi-scale variability in SSC along the Sumatra-Java coast. The results show that seasonal variability of SSCs is primarily due to monsoon-driven upwelling and rainfall in the Indian Ocean and Indonesian seas sides of the Sumatra and Java Islands, respectively. Local Ekman pumping plays a secondary role, while rainfall input to the ocean has little effect. Coastally trapped Kelvin waves and mesoscale eddies are responsible for the intraseasonal SSC anomalies in regions along the south coast of Java and off the Sunda and Lombok Straits, respectively. The interannual variability in SSC is caused by the anomalous upwelling related to the Indian Ocean Dipole. There was a weak increasing trend of similar to 0.1-0.2 mg/m³ per decade, above the global averaged trend, which may be related to enhanced local Ekman pumping. These analyses provide an overall description of SSC variations based on satellite observations; however, further investigations based on in situ observations are needed to achieve better quantification.</p> |
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