



Northward intrusion of South Pacific intermediate water along the Philippine coast as seen from a global GCM

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Taking advantage of the rapid advance in ocean modeling, this study investigates the variability of western boundary current and its role in conveying the South Pacific intermediate water along the Philippine coast, using results from the OGCM for the Earth Simulator (OFES). The results show two subsurface velocity cores in the mean within the depth range between 400 and 1000 m off Mindanao. One is confined to the inshore edge, and the other takes place somewhat offshore, being closely related to the intrusion of South Pacific intermediate water. This northward flow, referred to as the Mindanao Undercurrent (MUC) by previous studies, is highly variable with a dominant time scale of 50-100 days. An ensemble of these meso-scale fluctuations provides a significant northward freshwater flux and explains why water of South Pacific origin appears to extend farther northward than the mean MUC. On the offshore edge of Mindanao coast, eddy induced freshwater flux is equivalent to a mean current of about 0.3 m s⁻¹ in the intermediate depth, which is significantly greater than the mean MUC.