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Role of eddies on intensity of oxygen minimum zone in the Bay of Bengal

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Abstract

One of the strongest oxygen minimum zones (OMZ) in the world oceans occurs in the Bay of Bengal (BoB) with no systematic trends in dissolved oxygen (DO) since past half a century. An evaluation is made here to examine the influence of cyclonic (CE) and anticyclonic eddies (ACE) on OMZ in the BoB. Cyclonic eddy (CE) injected nutrients to photic zone leading to increase in integrated Chl-a to upper 100 m compared to ACE and Transition zone (TZ) region resulting in decrease in DO in the OMZ. In contrast, increase in DO concentrations, by 3 to 4 times, was observed between 100 and 200 m depth in the ACE compared to TZ region associated with vertical and horizontal supply of DO. This study suggested that CE intensify OMZ through increase in organic matter production and its subsequent decomposition whereas ACEs ventilate DO and weaken the OMZ in the BoB.

Key words: Cyclonic eddy, Anticyclonic eddy, dissolved oxygen, oxygen minimum zone, ventilation, Bay of Bengal.

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