The Dead zone in Jakarta Bay

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Surveys of water quality distribution in Jakarta Bay were conducted 10 times between December 2015 and March 2018. In each survey, a multi-parameter water quality profiler was casted at 26 to 34 stations. The bottom sediment sampling was conducted in 12 stations in June 2017. The bottom water oxygen demands were measured by incubation experiment three times in different month. The hypoxic water mass (DO < 3 mg/l) was observed in all the surveys except in September 2017 suggesting that the hypoxic water mass was formed almost throughout the year. It would be the first finding of the quasi-permanent hypoxia in the tropical coastal ocean. The area of hypoxic water mass decreased in February (mid of the north-west monsoon season) when the wind became strong. The mean oxygen demand of bottom water at 7 stations were around 0.9 mg/l/day in September and December. These values are equivalent to Ariake Sea and Tokyo Bay where the serious hypoxia occurred in summer. The bottom sediment ORP was less than zero extensively mainly in the eastern area. We think that there are 3 reasons for the consistent formation of hypoxic water mass in this bay. 1) This bay tends to be stratified because of the weak tidal mixing (tidal range is less than 1 m) and enough river discharge. 2) As it is difficult to occur the continuous vertical convection due to the surface cooling under the equatorial climate, the water column tends to keep stratification. 3) The oxygen demand is quite high.

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