Land-Ocean Atmosphere Interactions - OA12

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Eddies in the Indonesian Seas

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Anticyclonic and cyclonic eddies are an integral part of the Indonesian Throughflow (ITF). Upstream, the Halmahera and the Mindanao eddies are situated next to the flows which enter the passages from the south and north. In the center, fresh water "plugs", which probably have some sort of anticyclonic circulation, are pushed by the wind into the Makasar Strait. Downstream, light anticyclonic eddies are formed as the ITF exits the Timor strait.

In this review, the formation mechanism for these three different kinds of eddies will be discussed. First, it will be shown that the Halmahera and Mindanao eddies are due to the nonlinearity of their parent currents (i.e., the New Guinea Coastal current and the Mindanao Current) and the variation of the Coriolis parameter with latitude. In contrast to what has appeared in the literature so far, these eddies do not seem to be terribly important to the ITF. They are simply a by-product of the Mindanao and New Guinea Coastal Current collision. It will then be shown that the so-called Teddies (ITF eddies associated with outflow from the Timor Strait) are a result of the outflow's bifurcation which again is forced by nonlinearity and the variation of the Coriolis parameter with latitude. We shall see that, in this particular case, the models suggest that 7/8th of the Timor strait outflow goes to the Leeuwin Current and the remaining 1/8th goes to the Teddies.

References

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