

Freshwater balance of the Indonesian Seas

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The seas surrounding the Indonesian Archipelago receive one of the largest freshwater input around the globe. Where does this freshwater go? Our knowledge on the mass balance of the Indonesian Seas has significantly progressed over this decade or so but the freshwater balance remains an open question. Numerical model experiments that focus on the Indonesian Archipelago will be presented and they show that significant part of the precipitated water exits to the Indian Ocean as part of the Indonesian Throughflow. The monsoonal winds play a major role through Ekman transport. The Sunda strait is also found to play a comparable role as the other major straits, which matches well with recent satellite observations showing significant freshening at the surface near the Sunda strait. The origin of the freshwater for this outflow through the Sunda strait, however, appears to be the South China Sea or the Java Sea rather than the Indonesian Seas. Part of the freshwater input over the Indonesian Seas is likely exported to the Indian Ocean through Ekman transport or mixed down to subsurface water due to tidal mixing and exit as part of the Indonesian Throughflow.