



Sea surface salinity and temperature seasonal changes in the Solomon and Bismarck Seas

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Small SST and SSS (an indicator of iron-rich Papua New Guinea river outflows) changes in the Solomon and Bismarck Seas may be transported to the equatorial Pacific and have strong climatic and biological impacts. We analyze mean and seasonal change of SST and SSS in the Solomon and Bismarck Seas, using 1977-2009 in situ data collected from Voluntary Observing Ships. Co-variability of these two variables with surface wind, altimeter-derived current anomalies, precipitation, and Sepik river discharge is examined. SST and SSS show large annual oscillations in the Solomon Sea, with the coldest and saltiest waters occurring in July/August mainly due to horizontal advection. In contrast, they show large semi-annual oscillations in the Bismarck Sea. There, the coldest and saltiest waters happen in January/February, when the northwest monsoon winds drive coastal upwelling, and in July/August, when the New Guinea Coastal Current advects cold and high-salinity waters from the Solomon Sea through Vitiaz Strait. The low SSS values observed in April/May, stuck between the two SSS maxima, are further enhanced by the Sepik river discharge annual maximum. A high-resolution model strengthens the conclusions we derive from observations. The impacts of ENSO on SST and SSS are also discussed.