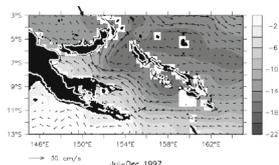


The Solomon Sea is a key region in the Pacific Ocean where equatorial and subtropical circulations are connected. The region exhibits the highest levels in sea level variability in the entire south tropical Pacific Ocean. Altimeter data was utilized to explore sea level and western boundary currents in this poorly understood portion of the ocean. Since the geography of the region is extremely intricate, with numerous islands and complex bathymetry, specifically reprocessed along-track data in addition to standard gridded data were utilized in this study. Sea level anomalies (SLA) in the Solomon Sea principally evolve at seasonal and interannual time scales. The annual cycle is phased by Rossby waves arriving in the Solomon Strait, whereas the interannual signature corresponds to the basin-scale ENSO mode. The highest SLA variability are concentrated in the eastern Solomon Sea, particularly at the mouth of the Solomon Strait, where they are associated with a high eddy kinetic energy signal that was particularly active during the phase transition during the 1997–1998 ENSO event. Track data appear especially helpful for documenting the fine structure of surface coastal currents. The annual variability of the boundary currents that emerged from altimetry compared quite well with the variability seen at the thermocline level, as based on numerical simulations. At interannual time scales, western boundary current transport anomalies counterbalance changes in western equatorial Pacific warm water volume, confirming the phasing of South Pacific western boundary currents to ENSO. Altimetry appears to be a valuable source of information for variability in low latitude western boundary currents and their associated transport in the South Pacific.



This figure shows the signature for the 1997 El Niño in the Solomon Sea with a large patch of negative SLA inducing northwestward surface geostrophic velocity anomalies that increase the North Guinea Coastal Current (NGCC) to compensate for the depletion of the warm water volume in the western equatorial Pacific. The low pass filtered (half power at 18 months) SLA anomalies during the 1997 El Niño averaged for the July to December 1997 period are in gray shading. Superimposed are the corresponding anomalies of surface geostrophic currents. The land and the first 500 m oceanic depth are in black; the white line delineates the coastline.

Ref : Melet, A.; Gourdeau, L. & Verron, J. Variability of the Solomon Sea circulation from altimetry sea level data. *Ocean Dynamics*, 2010, 60(4), 883-900.