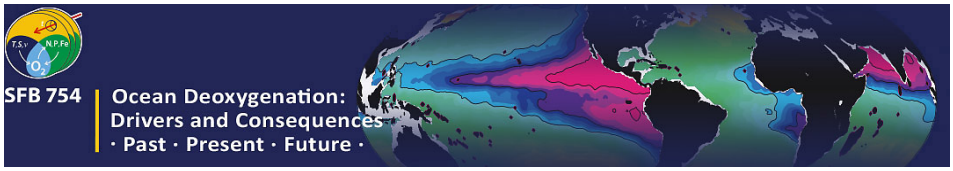

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Low-oxygen mesoscale eddies in the eastern Soouth Pacific

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The highly productive eastern boundary upwelling system of the South Pacific is characterized by the presence of an intense and shallow oxygen minimum zone (OMZ). Near the coast of South America these oxygen depleted waters are advected poleward by the Peru-Chile Undercurrent extending the southern limit of the OMZ along the coast as far south as ~40°S. Off central Chile (30°S-40°S) mesoscale eddies play an important role in the flux of heat and dissolved substances in the coastal transition zone, impacting directly the dynamics the OMZ. In this work we analyze the impact of a special class of eddies: namely subsurface (intratermocline) anticyclonic mesoscale eddies (SAMEs), on the OMZ dynamics. These eddies have a well defined core characterized by very low-oxygen waters and high salinity, and can be clearly identified from a Temperature-Salinity-Oxygen diagram. Based on underwater glider observations, along with satellite data we describe the oceanographic characteristics of SAMEs along with some of their cinematic and dynamic properties. Based on a high-resolution numerical model simulations we analyze the generation mechanisms of SAMEs and their relationship to the poleward undercurrent variability.

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