



The seasonal cycle of the oxygene minimum zone and the extra-tropical Rossby wave in the South Eastern Pacific

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The seasonal cycle of the OMZ in the southern Pacific is documented from the World Ocean Atlas 2001 (WOA01F). The focus is on the annual harmonic of the low O₂ concentration. The largest amplitudes are found in the surroundings regions of the limits of the OMZ although some latitudinal variability is observed: South of 20°S, the maximum variability is concentrated near the coast whereas, north of 15°S, it is located off-shore. In between, the variability is weak reflecting the observed low kinetic energy of this region. Observed winds (QuickSCAT), hydrographic data, altimetry (TOPEX/POSEIDON) and the outputs of medium-resolution general circulation model are used to document the large-scale ocean dynamics in the region at seasonal timescale. In particular, the variability associated to the extra-tropical Rossby wave is analysed. Assuming O₂ concentration as a passive tracer, an estimation of the transport of O₂ by the annual Rossby wave contribution to the zonal current is derived. In the light of the results, it is suggested that the seasonal westward expansion of the OMZ is to some extent associated to the advection of low O₂ concentration by the extra-tropical Rossby waves.