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Simulating ENSO in an eddy-resolving coupled ocean-ecosystem model

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Most coupled models still have significant biases in simulating ENSO variability, and these biases have been associated with difficulties in the simulation of the mean state of the tropical Pacific.

In the present study the influence of both different atmospheric forcing and of the biological component is investigated with respect to the mean state, seasonal cycle and interannual variability of an eddy permitting model of the Pacific Ocean. The model which we use is SPFLAME, an extended version of the GFDL MOM-2.1 code at 1/4° resolution. A pelagic ecosystem model (NPZD) is coupled to the regional ocean model. The oceanic response to prescribed atmospheric forcing is investigated with and without biological components. Furthermore the difference between different atmospheric forcing is explored. Special attention is payed to a simple model of the lowest layer of the atmosphere to calculate the turbulent and latent heat instead of using bulk formula. This model was suggested by Seager (1994) to allow for a realistic representation of the feedbacks between SST and the fluxes. Here it's performance is tested and compared with other formulation of the surface forcing.