

Interactive comment on “Pacific Decadal Oscillation and recent oxygen decline in the eastern tropical Pacific Ocean” by Olaf Duteil et al.

Anonymous Referee #1

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The authors investigate the effect of PDO on the oxygen concentrations in the eastern tropical Pacific. To do this, they used a GCM and carried out several simulations with several atmospheric forcings representing the mean state, PDO positive and negative phases. Their simulation is unique, and the results reveal that the oxygen concentration in the eastern tropical Pacific is decreased due to the shift from the PDO negative to positive phases. The paper is well organized and easy to follow. Below, I list several minor comments for consideration before publication of this paper.

1) The similar paper to theirs has already been published (Deutsch et al., 2011), in which the effect of PDO on oxygen levels in the eastern tropical Pacific was examined using a coarse resolution GCM. They argued that the respiration in the eastern tropical Pacific in the oxygen deficient zone is decreased during the PDO positive phase, and

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the dissolved oxygen concentrations tend to increase. The result by Deutsch et al. (2011) seems to be opposite to the result obtained in this study in that the oxygen levels decrease in the PDO positive phase. The authors cited the paper, but did not discuss the difference between their results and those by Deutsch et al. (2011). In this paper, the authors stated that Deutsch et al. (2011) showed that the depth of the thermocline regulates the oxygen levels in the coastal regions of the north eastern subtropical Pacific Ocean. However, to my knowledge, Deutsch et al. (2011) intended to state the effect of PDO on the oxygen levels in the larger spatial scale, i.e., the eastern tropical North Pacific. Thus, the comparison between both results should be needed and the discussion about the comparison is also needed.

2) Lines 130-131: I see that the zonal wind speed in WARM increases compared to MEAN in the mid-equatorial Pacific Ocean in Fig. 1b. Please clarify the point.

3) Line 194: COLD is mistaken for WARM?

4) Figs. 1e and 1g: please define the positive and negative values in the barotropic stream function and the meridional overturning.

5) Lines 684-685: “COLD minus WARM” is “WARM minus COLD”?

6) Line 702: 10°W is 10°S?

7) Line 705: “COLD and WARM” is “WARM and COLD”?

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