

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

**Anonymous Referee #2**

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This paper presents an analysis of idealized experiments conducted with an ocean general circulation model coupled to a simple ocean biogeochemical model. The authors construct idealized forcing representative of positive and negative phases of the PDO, as well as a mean forcing, which is a climatological year from which high-frequency variability has been removed. The difference between the circulation and oxygen fields in the model forced by the warm and cold forcings are suggestive of differences generated by transitions in the PDO. In particular, the warm phase of the PDO is characterized by lower oxygen and larger suboxic volumes than the cold phase. These results suggest that recent declines in may be attributable to transitions in the PDO from cold to warm.

Overall, I find this to be a nice straightforward story and an interesting set of experi-

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ments. I think the interpretation of the results is appropriate and well presented. The forcing is highly idealized, but I think the interpretation does not over-reach. I recommend publication pending some very minor revisions.

Minor comments:

In 14-15: "constrained" is a poor word choice. Perhaps "controlled?"

In 33: I agree that ocean models capture aspects of this mean picture reasonably well: the overall contrast between high latitude and tropical shadow zones is generally well simulated (in the good models), but the models tend to have OMZs that are much too extensive. In this sense, the model are terrible. This statement needs a bit more nuance.

In 120-121: I am having trouble parsing this sentence: "The corresponding time steps of the individual annual forcings of the year 1948 – 2007 have been averaged, leading to the reconstruction of a 1 year, 6h temporal resolution, climatological forcing." Please rephrase. I think you are simply saying that you construct an annual climatology of the bandpass-filtered forcing at 6h resolution.

In 130 and below: the units  $\text{ms}^{-1}$  should be  $\text{m s}^{-1}$

In 141-142: what's going on here: looks like random text.

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