

Interactive comment on “Regional impacts of ocean color on tropical Pacific variability” by W. Anderson et al.

W. Anderson et al.

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We thank Dr. van Oldenborgh for his gracious and helpful comments. We enumerate our response to these below.

Major comment

We have investigated the importance of lateral advection as suggested. Using a lagged correlation analysis following Wittenberg et al. (2006) we find that the bulk of the response lags the NINO3 SSTs by 3–6 months, suggesting that it is not a primary feedback, but rather acts to move the system from one state to another. This has started us thinking about the changes we see in the frequency spectra, which are in fact quite consistent with the differences in this mechanism. It isn't clear that we have space in this paper to do a full analysis of these frequency effects, which are in any case

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dwarfed by the large changes in amplitude, but we are planning to explore this in more detail in a future paper.

There are some correlations at zero lag, but they are in general fairly weak (0.4-0.6) do not explain the differences between the models. The Blue model (with weak ENSO) has a strong heat advection in the central Pacific (stronger feedback), while the Blue-Margin run has a weaker feedback. These differences are related to differences in the u' anomalies which in turn appear to be related to details of the position of the wind stress response to NINO3 SSTs. We plan to address this issue in the final version of the manuscript by adding two figures, one which looks at the structure of the stress and zonal velocity response in the zonal and meridional average, the second presenting the lagged correlation analysis. We will also alter Figures 8 and 13 to reflect this mechanism and add the suggested references to the bibliography.

Minor comments

1. We will include a table with more details of the layer depth in the upper ocean.
2. We actually tried this first, and didn't find it worked. We will play with contours and colors to see if we can clarify the figure.
3. This was done to make the contour interval legible... we will change it.
4. We will regenerate this figure with continents shaded.
5. We will include this reference
6. Good point, we will truncate the precision!
7. We don't believe this changes the conclusions substantially, but we will investigate this before submitting a final revised version.

We will fix the typos noted.

Interactive comment on Ocean Sci. Discuss., 6, 243, 2009.

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