

Interactive comment on “Phytoplankton blooms on the western shelf of Tasmania: evidence of a highly productive ecosystem” by J. Kämpf

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Received and published: 7 October 2014

Thanks for your comments from which I concluded four points: 1) Explain spring bloom development on west Tasmanian shelf (river plumes?); 2) Use the same vertical scale in both panels of Figure 10 to facilitate visual comparison; 3) Improve the clarity of text on event-based analysis; and 4) Discuss validity of the comparison of "production" between the regions in the absence of in-situ data. Here is my reply to these points:

1) The question as to why there is a spring bloom on the west Tasmanian shelf but not off the Bonney Coast is puzzling. I cannot answer this question, given that there are many instances of enhanced river discharge on the west Tasmanian shelf without any bloom response. Only 16% of stronger river flow events (>50 m³/s) are associated with blooms of (reconstructed) chlorophyll-a levels >1.5 mg/m³. On the other hand, there is

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often a coincidence of spring bloom development in the adjacent Tasman Sea, which points to the influence of the onset of thermal stratification. Nevertheless, how this effect interplays with river plumes on the continental shelf remains unclear to me. It seems that only future field studies can solve this puzzle, which is outside the scope of this work.

2) Figure 10 will be updated in the revised manuscript, noting that the vertical ranges shown are already close.

3) I will try to improve the clarify of the text on the event-based analysis. Perhaps it would be better to show the number of valid and missing (cloud bias) events in Tables 1 and 2 instead of total number of events per category and percentage of missing events.

4) Yes, in-situ data (which don't exist yet) would make the case stronger, but this first satellite-derived comparison of "production" between adjacent upwelling centres is justifiable in the author's view given that a) the source properties of upwelled water is likely to be the same (i.e. Subantarctic Mode Water), b) surface temperatures are similar during upwelling events (indicating a similar upwelling intensity), c) the magnitude of fluorescence line height values are similar (indicating a similar phytoplankton growth rate on the timescale of upwelling events) and d) the regions are not located too far apart from each other. To this end, my intention was to roughly estimate the order of magnitude of "production" as a motivation for further studies. Yes, the west Tasmanian shelf is understudied and I hope that this paper fuels future research.

Pending on further comments by others, I will upload an updated manuscript at the end of this discussion phase.

Interactive comment on Ocean Sci. Discuss., 11, 2173, 2014.