

## ***Interactive comment on “Indian Ocean Dipole and El Niño/Southern Oscillation impacts on regional chlorophyll anomalies in the Indian Ocean” by J. C. Currie et al.***

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We would like to thank both anonymous reviewers for their thorough treatment of our paper and their insightful comments, which have helped identify significant improvements that will be made to our manuscript. We provide a detailed answer to each reviewer separately, which will be uploaded as PDF supplements, but summarize the most significant proposed changes to the manuscript below. In our detailed responses to each comment, we have differentiated our text from that of the reviewer's by using italics for our responses.

1. Both reviewers pointed out that the methodological section was not accommodating

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enough to readers unfamiliar with the tools used. To make it more digestible, we propose to (a) add a supplementary figure displaying the time series of IOD, ENSO, IOD with ENSO signal removed, surface chlorophyll in the EEIO box and surface chlorophyll in the EEIO box with ENSO signal removed, in order to illustrate the temporal evolution of ENSO and IOD indices, as well as the effect of the partial regression technique; (b) add a non-technical sentence at the beginning of each paragraph dealing with the statistical methods; and (c) revise the notation of and expand on the equations used to explain the partial regression method. We will also refer to the relevant equation numbers in the graphics or tables where their results are presented.

2. Reviewer #1 suggests that the paper lacks discussion on the biogeochemical and ecosystem processes that may govern chlorophyll variability (beyond the nutrient availability via thermocline displacement that is discussed). The objective of this paper was to specifically address chlorophyll changes caused by IOD and ENSO-induced variability in the physical environment. We will adjust sentences in the introduction to clarify this better. To address the omission pointed out by the reviewer, we plan to add a paragraph in the discussion section that talks about other biogeochemical and ecosystem factors that may influence chlorophyll variability (such as grazing or nutrient recycling). Furthermore, in the regions where climate modes only explain a marginal part of the interannual chlorophyll variability, we will allude to these potential biogeochemical and ecosystem factors.

3. Reviewer #1 argues that the description of physical processes behind SST and thermocline variations during ENSO/IOSD events may be too extensive and confusing. We agree that this treatment may be too detailed (in light of the subject having been covered by previous literature) and propose to shorten and simplify these parts in the Introduction (Sect. 1) and Physical response (Sect. 4.2) sections.

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