

## ***Interactive comment on “The effect of seasonally and spatially varying chlorophyll on Bay of Bengal surface ocean properties and the South Asian Monsoon” by Jack Giddings et al.***

**Jack Giddings**

j.giddings@uea.ac.uk

Received and published: 6 July 2020

Short response to Reviewer 1

Thank you for your constructive comments and suggested improvements of our manuscript. We believe your comments will help to improve our manuscript. We feel we are able to address all the specific and line-by-line comments. In this short response, we will provide a brief reply to the five specific comments made by Reviewer 1, which may help other reviewers with similar concerns. A full response will be submitted after receiving all reviewers comments.

C1

The first specific comment by Reviewer 1 was the need for clarity of the aims of the study. The aim of the present study is to understand how biological radiative heating affects the monsoon in the BoB. The model bias is used to further understand how the chlorophyll-induced signal affects monsoon rainfall over the BoB. In the revised manuscript, we will make sure that the aim, purpose and contribution of the study are stated more clearly throughout.

The second specific comment was the need for further explanation of the physical mechanisms of the mean seasonality of the South Asian monsoon and to show these mechanisms schematically on Fig.1. In the revised manuscript, we will make sure to add a short section explaining the physical mechanisms of the South Asian monsoon in the Introduction section. We will further include relevant oceanic currents and atmospheric winds schematically on Fig. 1 to better convey the key physical mechanisms of the South Asian monsoon.

The third specific comment referred to Fig. 4 and Fig. 8 in the Results section. We acknowledge that these figures are particularly small. We agree that the latitudinal and longitudinal domain size should be reduced, and the political boundaries should be removed to significantly improve the extraction of relevant information from Fig. 4 and Fig. 8. As we wait for other reviewers comments, we will think carefully about how to display the relevant information more clearly in the manuscript.

The third specific comment was the need to include summarising sentences at the end of the Results' subsections. We will make sure summarising sentences are added to conclude the main findings of each Results subsection. Fig. 1 submitted with this short response (see page C4) shows a schematic that we hope summarises the main findings of the study and will be added to the revised manuscript.

The final specific comment by Reviewer 1 was the need to expand and discuss the take home message of the paper. Reviewer 1 is correct about the take home message and we will aim to convey this message more clearly in the Discussion/Conclusions

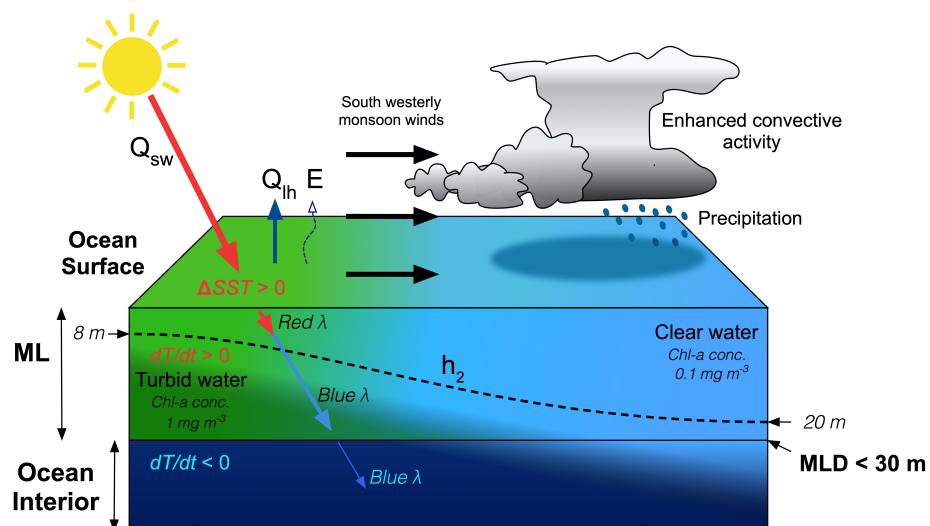
C2

sections of the revised manuscript.

We again appreciate the specific and line-by-line comments made by Reviewer 1 and look forward to receiving other reviews in the near future.

Interactive comment on Weather Clim. Dynam. Discuss., <https://doi.org/10.5194/wcd-2020-15>, 2020.

C3



**Fig. 1.** Schematic of the penetration of shortwave radiative heat flux ( $Q_{sw}$ ), scale depth of blue light ( $h_2$ ), mixed layer radiant heating rates ( $dT/dt$ ), change in SST ( $\Delta SST$ ) and convective rainfall.

C4