Again, we wish to extend thanks to the reviewer for their positive feedback of this draft manuscript. As with Reviewer 1, the comments given by Reviewer 2 were insightful and highlighted the need for further clarification and improvement to the final version of this article.

We have responded to the reviewer comments below (as bold italicised font) and again hope that it might stimulate deeper discussion within this forum.

The major challenge of the authors' work is to tease apart seasonal and inter-annual climate variations affecting the organic matter (OM) loading and hypoxia formation in a deep coastal inlet. Considerable amount of observational data is acquired and statistically processed to address three issues (in line 76 – 86): (1) effects of rainfall on OM loading and oxygen distribution; (2) effects of climate forcing on rainfall patterns and associated hypoxia formation; (3) implications on greenhouse gas emissions in this seasonally hypoxic system. Overall, I find issue #1 is well demonstrated, #2 is logically sound; and #3 is loosely based on current dataset. Nevertheless, the topic is interesting and, once the manuscript is improved, it will be suitable for publication in Biogeosciences. The following major issues are suggested for the authors to consider in the next round of revision.

(1) I am not sure whether the rainfall pattern shows seasonal variation? I am very confused with the 8 panels in figure 2, because the authors did not describe any panel (A through H) at all. Is it possible to have a simpler version of figure 2, and demonstrate the rainfall pattern?

> ***Post hoc testing substantiated the seasonal variation though we will improve and further clarify this in the figures, the figure caption, and in the text.***
>
> ***Specifically, we will improve our in-text references to specific figure panels and will make use of colour to better highlight post-hoc groupings and ensure the Panels are clearly labelled and described.***

(2) In figure 3, what is the meaning of x-axis? Does higher values represent more rainfall? My intuition is that, more rainfall results in higher river flow; but why would the Pearson corr. different towards the left of the two panels (at low rainfall and low river flow)?

> ***The x-axis refers to the number of days used to determine rainfall / flow volume when examining the relationship between this volume and the concentration of DOC/DON.***
>
> ***Higher x-axis values represent a longer period of consideration when calculating the accumulated volume of water either falling into the catchment or estimated to be flowing through the Gordon River.***
>
> ***The Pearson correlation will differ due to improved signal to noise ratios when considering rainfall volume / estimated flow over periods longer than a couple of days.***
>
> ***The strongest correlations between rainfall and DOC/DON concentration were found when considering rainfall over a 5 day-period just prior to sampling for DOC/DON.***

The strongest correlations between estimated flow and DOC/DON concentration were found when considering the total accumulated flow 2 to 3 days prior to sampling DOC/DON concentrations.

Our flow estimates are based on rainfall volume and we believe the improvement in the Pearson Correlation when considering accumulated volume over the few days prior to sampling is likely related to hydrological phenomena (e.g. the time it takes catchment runoff to reach the mouth of the Gordon River).

(3) In figure 4, the upper panel show no significant seasonal variations in organic carbon loading; in figure 10, why OM loading is low during positive SAM? Can the authors show correlation between SAM and OM loading to support this claim? In addition, the daily average farm carbon load is much lower than riverine input; I would suggest the upstream dams are a much more important factor to consider because dams may dampen seasonal variabilities of river flow and OM loading.

We will improve the panel figures to better align with the statistical relationships (including these significant seasonal effects) mentioned in the text.

In figure 10, OM loading is low during positive SAM index periods because rainfall volume is lower during these periods. The data shown in Figure 3 indicates that greater rainfall is associated with higher concentrations of OC and ON at the Gordon River mouth. Higher OC and ON concentrations + greater river flow yields higher river OC and ON loading.

Positive SAM index values are associated with less rainfall in Western Tasmania. Less rainfall in the catchment will result in lower riverine OM loading. We will consider adding an additional figure to the manuscript (possibly as a panel) to show the relationship between SAM index and OC and ON load.

We agree that upstream dams have the potential to seriously impact the river flow and subsequently the OM load entering the harbour but note that there is a large amount of catchment area (and resulting runoff volume) that remains unregulated by the dam. Figure 2A does show what appears to be this dampening effect (especially when compared to Figures 2C and 2D), and we believe this could be one of the reasons that the correlations presented in Figure 8 are not stronger.

(4) This manuscript does not present any greenhouse gas data; with these data the manuscript would have been more convincing by linking the greenhouse gas formation to SAM and further to climate variation. The aim #3 of this manuscript remains unresolved.

Our goal was to establish that the conditions for the formation of GHGs exist in the harbour (sub-oxia), establish how these conditions are spatially distributed, and when these conditions are likely to occur. We stated the 3rd aim of the paper as:

"Discuss implications for managing these systems regarding the regulation of freshwater input, OM loading, and the potential for GHG emissions".

Our intention is to draw the link between the formation of oxygen poor conditions and the resulting potential for these systems to generate greenhouse gasses such as CH_4 and N_2O. We never intended to show the distribution of GHG in this system in this paper, only that the potential exists and should be studied further.

We will leave the final decision of how to best address this concern to the editorial team, but we do take this concern seriously and would like to highlight that this concern was also shared by Reviewer 1.