Note: The reviewer comments are presented as previously posted in normal black font. Our responses appear below each reviewer comment italicized. All line numbers listed in responses to comments refer to the version with tracked changes.

Reviewer #2

Suggestions for revision or reasons for rejection

The second version of this manuscript is much improved from the previous version I reviewed in terms of data presentation and narrative. I thank the authors for the edits to the figures—they have addressed a lot of questions that I had. The new version of the conclusion is very well done and adequately demonstrates the impact of this work on the scientific community.

I have two remaining minor concerns that may or may not involve recalculations. The first is regarding the catchment area that is being used for the GZWs (m and n) in the JOIDES inner reaches. At my previous recommendation, the authors have considered the ice flow reconfiguration during the later stages of grounded ice retreat in the southwestern Ross Sea, which is indicated by glacial landforms on the seafloor (Greenwood et al., 2018). The authors have adjusted the catchments for their JOIDES wedges to reflect the initial northward flow from the Byrd catchment, which fed the middle JOIDES GZW, followed by reorganization of JOIDES ice flow that caused the inner reaches to be sourced from the nearby outlet glaciers of the Transantarctic Mountains. For the inner reaches, it appears the authors have used only the David Glacier catchment area for the calculations, rather than the entire pink polygon representing all flow from the Transantarctics. This is good, because the small catchments north of David Glacier are irrelevant at these late stages of retreat. However, I don't think the authors incorporated the southernmost catchment represented by the pink polygon, which is important because it represents outlet glaciers that fed the readvance in southern JOIDES following the reorganization of flow. These southernmost glaciers, and in particular Mawson and Mackay Glacier, were arguably the greatest contributors to the readvance of ice and suppliers of GZW sediment in the inner reaches. In contrast, seafloor geomorphology indicates that David Glacier probably contributed but did not dominate at this time (Greenwood et al., 2018). Although it probably will not change the calculated values drastically, I do suggest the authors adjust their catchment area for the JOIDES inner reach wedges (m and n).

> *The reorganized drainage area in the previous version uses the catchments from Mawson and Mackay Glacier in addition to David Glacier. The southernmost polygon in the pink region of Figure 2 contains the drainage areas of both Mawson and Mackay Glaciers based on the drainage area definitions from IMBIE 2016. We have clarified the confusing text in the manuscript (Lines 116 – 118).*

My second concern also involves the JOIDES inner reach GZWs (m and n). I only ask that the authors verify whether either of these GZWs have been shown in other recent publications. I suspect that GZW “m” is the same as the inner JOIDES GZW complex described in both Greenwood et al., 2018 and Simkins et al., 2017, but it is hard to tell in these figures. If it is the same GZW, then it is the one that was fed by the reorganized flow from the Transantarctic Mountains, as mentioned above and described in this manuscript. In my last review, I assumed that both “m” and “n” had the same catchment due to their proximity to each other, and this manuscript seems to make the same assumption in its revision. However, this may have been an oversight. I question the origin of “n.” It may be possible that “n” was formed during original southward retreat into the Byrd catchment just prior to the reorganization, and "m" followed after the reorganization and readvance, as described in the aforementioned publications, thus making "n" the older of the two GZWs. The authors should look more closely at these GZWs and compare them to existing publications to verify or refute the claim that both catchments are to the west. Additionally, they should indicate which, if any, GZWs from previous publications are equivalent to the “m" and “n” wedges and are discussed in greater detail, so that their catchment choices will be further supported and readers may more easily synthesize this new work with prior work.

> *GZW m is the same as the one identified in the Greenwood et al., 2018 and Simkins et al., 2017. We previously listed that as one of the GZWs that was described in earlier studies. A more detailed description of the previously identified GZWs is available in Appendix 1 and Supplemental Table 3 of the Supplemental.*
>
> *After review, GZW n was most likely formed during original southward retreat into the Byrd catchment after retreat from the Pennell Middle Shelf GZW position. This deposition occurred prior to the reorganization that is responsible for GZW m. We have corrected the calculation to use the Byrd drainage area for this GZW (Table 1; Line 195). We have also added text in the discussion to clarify that GZW n was deposited first and GZW m was deposited after the reorganization. (Lines 271 – 274). GZW n was not identified in a previous study and is outside of the multibeam coverage used in Greenwood et al., 2018 and Simkins et al., 2017.*

Two minor technical corrections:

~~Line 703: Insert “constrain” between “better” and “contributions”~~

We have made the change (Line 382)

~~Line 706: Insert “changes” after “sea level”~~

We have made the change (Line 385)