Thanks a lot for your Short Comment. Please find below our response to the points and issues that you raise.

1. Novelty

"They present no evidence for the existence of a continuous "river" and that analysis was undertaken in a paper published six years ago [Bamber et al., 2013]. The title of that paper answers the question about the existence of a continuous channel beneath the GrIS and we show hydraulic potentials that indicate likely drainage along the channel. Furthermore, we make it clear that the limited IPR coverage prevents direct observational evidence of a continuous channel but, given its origin, we conclude that it is most probably continuous. A large part of the introduction to this paper is, therefore, repeating previous inferences but in a way that suggest that they are new. I find that problematic."

The novelty of the paper, that re-examines the canyon found by Bamber et al., 2013, is on:

- Demonstrating water flow along the entire length of the valley under current ice conditions based on an advanced ice-sheet model that also accounts for water production at the base of the ice sheet instead of mapping potential subglacial water pathways based on Shreve, 1972's hydraulic potential theory.
- Demonstrating that our current picture of the Greenland ice-sheet subglacial hydrology underestimates the impacts from interpolation error artifacts and that by correcting these errors, large changes to the basal water distribution can occur.

The evidence from our simulations show an uninterrupted subglacial water pathway interpreted as a subglacial river system from the Interior of the Greenland Ice Sheet to Petermann glacier once the valley is opened. This was not done by Bamber et al. (2013) who presented subglacial hydraulic potential flow paths based on ice-sheet bed data that include the numerous rises in the valley caused by kriging interpolation.

Furthermore, we present other pieces of evidence and supportive of a currently active subglacial river system associated with the relation to ice thickness, basal hydrological basins, and the flatness of the valley base. We will reword the relevant paragraph in the introduction and better cite Bamber et al., 2013 with respect to their discussion of the possible continuity of the valley and the effects of limited IPR coverage.

2. Title

"Second, what do the authors mean by "river". To use this noun is incredibly misleading especially given the fact that, according to Fig 3b the modelled water depth appears to be ~0.5 mm! Water flow may be within an R channel (but not with those depths) or it may be via a thin film and it may or may not be continuous along the length of the channel. That is not a "river" in its conventional meaning.

A better title for this study would be "On the impact on subglacial water routing of a continuous subglacial channel from central to northern Greenland" because that is what this paper is actually about. Not conjectures on the existence of a "river" or not."

We would prefer to keep the original title after considering the following points:

- The article is about the "possibility of a long subglacial river" and as such presents evidence for such a system while recognizing that the huge void in data precludes a conclusive result.

- The word “river” is appropriate when defined as “subglacial river” which has different properties to a river over open land. In addition, many “rivers” on Earth do not flow at all times, or flow at certain times only along certain sections.

In terms of the very shallow simulated water depth in the valley, as mentioned in the manuscript, our basal hydrological model cannot simulate rivers so it is impossible to attain any appreciable depth unless the flood-fill algorithm is activated.

3. Water sheet depth in Figure 3

“There appears to be either a problem with scale/labelling on Fig 3 or with the calculations themselves because the water depth in Fig 3b appears to have a maximum (plotted) depth of 1 cm. However the difference in water depth in the two cases (Fig 3d) is up to 10 cm, which is clearly impossible. Either there is a problem with the numeric or the plotting. In addition, I read the description of Fig 3 and I had difficulty in making sense of it. I could not discern, for example, the 3 quasi linear sections the authors refer to.”

With regards to the scale labeling on Figure 3, there is no error in the plot. For most of the values in the difference plot the depth change is less than 0.008 metres. However, the top of the colour bar indicates black regions of over 0.1 metres difference (increase). The black regions (of which there are only 4) represent positions where the flood fill algorithm has filled an area leading to a depth increase of over 10 cm. While our typical water depths are the order of millimetres, the fill algorithm can produce depths up to a threshold of 10 metres. We will make this clearer in the next version of the manuscript.

Bamber, J. L., Siegert, M. J., Griggs, J. A., Marshall, S. J., and Spada, G. (2013), Paleofluvial Mega-Canyon Beneath the Central Greenland Ice Sheet, Science, 341(6149), 997-999