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Interactive comment on "Brief Communication: Sudden drainage of a subglacial lake beneath the Greenland Ice Sheet" *by* I. M. Howat et al.

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The Authors thanks the reviewer for her/his helpful comments. Point-by-point responses below:

Responses to Reviewer 2

Did the authors thought about giving a name to this lake for future reference in the literature?

We are uncertain what the protocol is for this. We opt not to name the feature at this time.

A location map is really missing. What about an inset in Figure 1?

Full Screen / Esc

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Interactive Discussion

Discussion Paper

Added as suggested.

Why did not the authors use the ASTER data (imagery and DEMs) also available over their study site? ASTER DEM are less accurate than the elevation data they used but, once vertically adjusted, may provide some additional insight into the timing of the preand post- drainage surface elevation changes. I checked the archive of ASTER images and found a dozen of cloud free images and some of them (acquired 2002-07-21, 2012-07-16 & 2012-08-17 among others) seem to lead to very useful DEMs. I know it means some additional work but I think it is worth exploring all the available data.

We did analyze all available ASTER imagery but the DEM's were not of high enough quality in this area to provide useful additional information for our analysis.

A depression of similar depth ($\sim$70 m) but over a much larger area (about 5 km2), has recently been detected at the surface of the East Antarctic Ice Sheet, initially by (Smith et al., 2009) and studied in depth with similar remote sensing data as in the present study later (Flament et al., 2014; McMillan et al., 2013). It is probably worth referring to thosestudies in the present article given the similarity of the maximum surface lowering.

Considering the vast difference in ice sheet environments, it's not clear why the similar lowering should be anything but coincidental. Also, we have also referenced earlier studies Antarctic lake drainage in the paper.

I am very curious to learn how this depression was first detected. On imagery? or on DEM? By chance? I guess others readers will be curious too. Can you provide this in a short sentence for example in the "author contribution" section if you do not think it is relevant for the main text.

Simply, the depression clearly stands out in the high resolution DEM.

Specific comments. P5363 L18. I think the section "observations" should start about here.

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It's subjective where to put the section break since we need to cite some observations to introduce the feature.

P5363 L27. What is the size (km2) of the depression?

Added.

P5363 L29. Size (km2) of the area covered by water. Given that water is found in the depression, your depression volume is a lower bound, right? To mention

Added. Also added "minimum" to the volume change estimate.

P5364 L8. space missing

Corrected

P5364 L12. can use WV1 here (acronym defined already)

Corrected

P5364 L23. "at the location" rather than "in the location" (???)

Corrected

P5364 L26. "of" missing between "margin" and "what" I think.

Corrected

P5365 L19. What about "the surface depression is located at the vertical of a reversed..."?

Reviewer's suggestion is unclear: "at the vertical"?

P5365 L24. Like in the previous comment, maybe good to clarify that the depression described here is at the surface (and not the bedrock one)

Changed to "surface depression"

P5366 L1. A reference (a review by R. Bell?) for this general statement about Antarctic

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subglacial lakes would be welcome.

Three references for Antarctic lakes provided earlier.

P5366 L23. I suggest adding "of this lake to the ice sheet margin"

Changed as suggested

P5368 L9. "it's" -> "its"

Corrected

P5368 L15. "Finally, the depression refills quickly after the collapse". Seems somewhat in contradiction with "Thus, failure of the lake to refill" (P5367, L21). Reconcile.

Changed to: "the depression infills with snow"

P5368 L25. The SPOT5 data are not described here.

Additional data description beyond that given in the main text (with citation) is not needed for the SPIRIT data, since this is distributed as a upper-level product.

Figure 1. What about adding annotations on the Landsat images to help the reader visualize what is described in the text (not so easy...)

Annotations and arrows have been added

Figure 3D. Could change the vertical axis so that the two curves do not interest. Could use two different colours for the curves (to better distinguished them) and the same colours for the two corresponding vertical axes. Legend: DEM's –> DEMs.

Changed as suggested.

Interactive comment on The Cryosphere Discuss., 8, 5361, 2014.