

***Interactive comment on “Long-term contributions of Baffin and Bylot Island Glaciers to sea level rise: an integrated approach using airborne and satellite laser altimetry, stereoscopic imagery and satellite gravimetry” by A. S. Gardner et al.***

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The authors have documented a detailed and well-designed study of the glaciers of Baffin Island and Bylot Island. The methods are described in excellent detail. The comments below are mainly focused on the need to reference a recently published paper now examining the Barnes Ice Cap that provides additional corroboration (Dupont et al, 2012).

1566-12: Citing a single 20 year old reference on an issue that has not been resolved

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is not sufficient to say that the Barnes Ice Cap played a central role 116 k years ago in ice sheet development. Restate as .."it may have played a central role" or ... "it played a role"

1579-12: There is no commentary here on the fact that BIC has superimposed ice. Superimposed ice has a higher density than snow or firn and may have a role here. In March 2011 a field campaign on BIC found only superimposed ice accumulation at the summit of the ice sheet (Dupont et al, 2012). I understand the data from this study does not answer the question, it just must be mentioned.

1584-16: Compare to the results from (Dupont et al, 2012), who note that "for the BIC elevation change data from the ICESat altimeter confirmed the thinning of the BIC at a mean rate of -0.75 m/yr for the 2003-2009."

1586-13: Changes in melt season length has been identified as a key as well (Dupont et al, 2012). "the melt season lengthened by 33% from  $65.6 \pm 6$  days at the beginning of the period (1979-1987) to  $87.1 \pm 7.8$  days towards the end (2002-2010). The interannual variations of the number of melt days were in agreement with those derived from active microwave backscatter data from the QuikSCAT scatterometer for the overlapping 2000-2009 period."

References:

Dupont, F., Royer, A., Langlois, A., Gressent, A., Picard, G., Fily, M., Cliché, P. and Chum, M.: Monitoring the melt season length of the Barnes ice cap over the 1979-2010 period using active and passive microwave remote sensing data. Hydrologic Processes: DOI: 10.1002/hyp.9382, 2012

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