

Interactive  
Comment

***Interactive comment on “A new glacier inventory for 2009 reveals spatial and temporal variability in glacier response to atmospheric warming in the Northern Antarctic Peninsula, 1988–2009” by B. J. Davies et al.***

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The authors present a comprehensive summary of the characteristics of the glaciers of the northern Antarctic Peninsula. This represents a significant body of work which will be of great value to the community. They also summarise recent changes (from 1988) and make some preliminary conclusions about the relation between these changes and climatological forcings.

I think this paper is in good shape. Even as a non-expert on many aspects I found the

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text clear and interesting. I only have only a number of more minor comments.

P3543L6: "last 50 years" is really from the last data in Turner et al, so that leaves the last decade unreported

L8: this "thermal limit" is, I believe, just suggested not bound up in some theoretical basis?

L13: add "part of" to "Larsen Ice Shelf" or specify A, B

L27: "focused"

P3544L8: thoughtout the paper I think a number of proper nouns are introduced which I do not think are actually widely recognised places. ie, Western Antarctic Peninsula is surely western Antarctic Peninsula, as is Eastern, Northern, etc. This applies to the title also. Graham Land is the "northern Antarctic Peninsula" I think (I imagine the SCAR gazetteer agrees).

P3546L6: the study of Gille appears to only consider ocean north of 60S, so it's a stretch to push that to the study region. needs some rewording

P3548L6: which version of the SPIRIT DEM was used (v1 or v2). Was the SPIRIT correlation mask used? If so, how were gaps filled? If not, then how were spikes removed?

P3550L20: Could you not obtain these from ASTER?

L24: "proxy for ice thickness" needs a reference

P3553L14-18: why is this comparison done - that is, why are the correlations expected? I think the critical information may be in the supplementary text and belongs here. the same question applies to the comparisons on ELA values in Section 4.3. Please introduce the tests with some context and the purpose.

P3555L16: new sentence before 2nd ELA\_mean (ie, missing full stop)

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P3555L25: I found the obvious missing - that the flow is generally perpendicular to, and away from, the central Trinity Peninsula spine. I think this was mentioned earlier, but here it should be repeated.

P3557L9: it is noted in table 9 caption that there is little data for 1997. this is stated implicitly at L14, but should be discussed more clearly here with cross reference that values in Table 9 for 1997 are likely unreliable.

P3558L15: how do the authors partition "atmospheric" from "climatic" in this setting of land terminating glaciers?

L18: "regionally" - explicitly here this is especially by elevation?

P3559L2: "reaction to climate warming" - this looks like a loose remark. the connection has not been established, and indeed the issue of accumulation variation is raised within the paper. Need full stop after "1km<sup>2</sup>"

L6: "margins \*of\*"

L22: table 8 should be table 9 I think

L24: "probabilistic" begs the question of how this was done. It should be described

L27: should be net surface lowering, or not area-averaged surface lowering

P3560L15: "both from ..." does not make sense

P3561L9: there is no figure 9

P3563L3: "was therefore caused by" - I do not think this has been established

L21: this conclusion here seems likely, but it has not come into the earlier discussion. I think it should be introduced earlier that 1988-2001 values may well be dominated by 1995-2001 period. However, Table 9 suggests the opposite in terms of area loss. I'd appreciate if the authors made this very clear

P3567L6: again, southward extrapolation of the results of Gille. I think Meredith and

King would be sufficient.

L12: thinning terminus also steepens the glacier. want to discuss?

P3568L13: "\*s\*tudy"

P3572L21: journal is J of Climate

Table 9 caption: "\*The\* error margin"; "As \*the\* analysis"; "divides, \*the\* error"

Most figures: font size is in general too small, often crazily so. detail is there on zoom of pdf, but many fonts could be reasonably increased.e.g., lat, lon on Fig 1 and other maps

Fig1: add other Antarctic bases - O'Higgins, etc. Fig 2 caption: one of the "accumulation area" should be ablation I guess Fig 3D: looks like 2 or more populations to me. Fig 4: specify year of snapshot in caption Fig 6: strange x axis units of "months to Feb" does this mean "months before Feb 2009". why not just year??

Supplementary material: in general I found this under-crossreferenced in the text. In fact, I think most of the supp text could go in the main body. there is overlap and much of what is written seems arbitrarily separated from the main text.

Table S2: specify ArcGIS version

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Interactive comment on The Cryosphere Discuss., 5, 3541, 2011.

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