

Interactive comment on “Overview of areal changes of the ice shelves on the Antarctic Peninsula over the past 50 years” by A. J. Cook and D. G. Vaughan

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1) Although presenting the relationship between the area of an ice shelf and its grounded catchment would be an interesting product, it would not be a simple addition to make to the current paper. First we would have to define the catchment area for each ice shelf, which would require considerable effort.

2) The suggestion regarding the prevalence of pinning points in the ice shelves and their impacts on course of ice-shelf change is interesting but also beyond the scope of what we have tried to achieve here. We would not necessarily agree with this assessment of the impact of the pinning points on the ice shelves mentioned in the comment,

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but ice rises certainly do appear to have played a role (promoting and slowing) ice-shelf retreat. We thus believe that the role of pinning points is complex, and probably cannot be simply characterised by the distance between them. This is undoubtedly an area of study that needs more focus, but is, we believe, justifiably outside the current paper.

3) We feel we have given a sufficient summary of the conclusions of Fox and Vaughan (2005) and we do not wish to repeat the detail that can be found in the original paper. However, we have added extra text to clarify that the pinning point was located on the western side.

4) The paper referred to in this paragraph (Vaughan, D. G. (1993), Implications of the break-up of Wordie Ice Shelf, Antarctica for sea level, *Ant. Sci.*, 5(4), 403-408. – unfortunately missing from the reference list but now included) describes an argument that was subsequently shown to be substantially flawed. This was that a change in backstress from the ice shelf would be felt differently by different tributary glaciers, and this would thus cause the medial flowlines to be displaced in time. The absence of any measureable shift in these flowlines led to the conclusion of that paper, that the ice shelf was not exerting any backstress influence on the glaciers. This has been criticised in the literature, and comprehensively shown to be incorrect. For this reason, one of us at least (DGV) would prefer not to discuss the reasoning in that paper further, it is hope that it is sufficient to point out its shortcomings and focus rather on the observations that demonstrated that the glaciers were indeed altered by the ice-shelf loss.

5) Unfortunately, we cannot offer an answer to the question of why George VI Ice Shelf is thicker in the south than in the north.

6) The suggestion is a good one, the contrasting point has been added.

7) Again this is a good point and one that could be followed up in future investigations. Since this is a paper about change it is probably inappropriate to begin this investigation here.

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Interactive comment on The Cryosphere Discuss., 3, 579, 2009.

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