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Interactive comment on “Northern Hemisphere spring snow cover variability and change over 1922–2010 including an assessment of uncertainty” by R. D. Brown and D. A. Robinson

Anonymous Referee #2

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Overall, the manuscript is well written and provides a clear and logical flow of arguments. I think that it is an important extension of previous work and well suited for publication in TC. I have a few suggestions on content to strengthen the interpretations, but do not see these as major issues.

Content suggestions: 1) On page 2487 the authors mention that it is not possible to correct for "technological bias" in the data sets. Given that the authors go to great lengths to calculate other errors, I think it is appropriate to add a sentence here explaining that this bias is expected to be significantly lower than other forms and why this should be the case (as is assumed for further calculations to produce significant

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findings but not stated in the text directly).

2) On page 2491 the authors discuss Figure 1 and provide various reasons for the high standard deviations amongst data sets. It might be useful to similarly calculate the geographic distribution of differences in elevations in the individual data sets. The maximum standard deviations appear in the higher topography regions and in locations of narrow coastal mountains, which suggest that the scaling differences between data sources could be a major reason for this disparity (as discussed in the text). I think such a calculation would help quantify the discussion of this point.

3) I suggest adding corresponding temperature trends to Table 3.

4) I think that Figure 9's relationships and that of Table 4 could be enhanced by correlating March temperature (or averaged March to April temperature given the SCE is not a discrete 1 March to 1 April value) with March to April snow cover change. Given that snow cover is a result of integrated snowfall (and snowmelt, although likely relatively smaller than spatial accumulation until March) during the winter, the given correlations are likely reduced by existing snowcover responding to temperature anomalies in previous months. This calculation should improve correlations.

Technical Correction: On pg 2492 there is a space missing between "around1980" in the second to last line.

Interactive comment on The Cryosphere Discuss., 4, 2483, 2010.

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