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Interactive comment on "The effect of climate forcing on numerical simulations of the Cordilleran ice sheet at the Last Glacial Maximum" *by* J. Seguinot et al.

Anonymous Referee #2

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This well written paper reports on several realizations of the Cordilleran ice sheet produced by forcing the PISM with 5 different climate re-analysis products. These realizations can be compared to a geological record of the maximum extent of the ice sheet, and readers get a sense of the sensitivity of the model output to input climate. The delivery is concise, to the point, and easy to follow. This is not a significant new finding, nor does it represent advancement in state of the art in terms of surface mass balance schemes. A simple temperature offset is combined with lapse rates and positive degree day schemes to produce surface mass balance patterns. There are known to be problems with this approach, but I do not think that these problems are greater than the uncertainties associated with modeling the paleo-climate. I am in favor of publish-

ing the results because they may serve as a reference to others seeking a relatively simple method of producing reasonable representations of the Cordilleran ice sheet. Having a plausible realization of the Cordilleran, or if these results can be generalized, another paleo-ice sheet, would serve as an excellent starting point for more engaging experiments that relate the sea-level record to major reconfiguration of the paleo ice sheets.

Before publication, I do have one scientific concern about the way the experiments were carried out. The model setup (Section 2) includes only brief mention of isostatic effects. These are really significant in a run of this sort because the elevation of the ice surface could be as much as ∼1800 m too high without the effect. Given that lapse rates are used to re-scale the climate data to elevations that are altered by the presence of the ice sheet, and that the sliding relation is strongly controlled by bedrock elevation, I think a more detailed discussion of isostacy is warranted. Specifically, given that the goal is an LGM configuration, I'd like assurance that the bedrock elevation has come close to equilibrium at the 10ka point that is reported on. This assurance should be simple to provide with minor modifications to the model setup section.

The only writing problem I found was in figure 5, 'logarythmic' should be 'logarithmic'. Many thanks to the authors for getting the wording right the first time.

Interactive comment on The Cryosphere Discuss., 7, 6171, 2013.