

Interactive comment on “Glacier area and length changes in Norway from repeat inventories” by S. H. Winsvold et al.

Anonymous Referee #1

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This article reports on the assessment of glacier areal and length retreat in Norway over the last 60 years, and even further for the northernmost regions. The authors make extensive use of Landsat imagery to create an exhaustive inventory of the extent of glaciers at two epochs, namely, 1990 and 2000, while the 1950 epoch is supported by the national mapping program originating from aerial surveys. With their exhaustive inventory the authors are able to unveil substantial differences in behavior between glacierized regions exposed to contrasting climatic influences. In doing so, the authors provide a very useful and well documented account of glacier changes in Norway that I expect will serve as a reference for a long time.

In addition to this characterization, the authors discuss the impact of the North Atlantic Oscillation (NAO) on the observed retreat in area and length of glaciers by building on

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the assessed impact of NAO on Norwegian climate as documented in the literature. This latter aspect is however in my view the weakest part of an otherwise great, well written, exhaustive, sound, and exceptionally documented inventory. While I would support the publication of this work in The Cryosphere, I would however recommend that the consideration of the influence of NAO be better supported than merely in regards to previous and rather dated work and indirect interpretations. The richness of the inventory presented in this paper, as well as its exhaustiveness could very much justify that the expected influence of NAO, hereby discussed, be revisited on the basis of a sound methodology and analysis. In fact my recommendation in this regard would even be that the indirect but somewhat still speculative discussion about the influence of NAO on the glacier behavior in Norway be only prudently suggested in this paper and that more definitive results in this regards be the purpose of a subsequent analysis for which the motivation seems evident in view of the new data.

The present inventory, as well as some of its derivative results such as the discussion of the impact of indices to the definition of glacier outlines, or the robust derivation of glacier center line, are I believe worthy enough of a rigorous and well conducted work that warrant publication. Beside this general remark, I only have a few additional specific comments and corrections to point out:

P3071 L11: space is missing after e.g.

P3072 L21: isn't it 7% rather than 0.7 and why is such occupation of Norway in the geographical grid relevant?

P3078 L27: “An uncertainty” rather than “A uncertainty”

P3083 L22: I am not convinced the hyphen is appropriate.

P3086 L14: December instead of Desember

P3097 L1: spell Kääb

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