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The Cryosphere Discussions

Interactive comment on "Mountain glaciers of NE Asia in the near future: a projection based on climate-glacier systems' interaction" *by* M. D. Ananicheva et al.

Anonymous Referee #2

Received and published: 14 April 2008

*** GENERAL COMMENTS ***

The paper presents a projection of changes in ELA and altitudinal range for entire glacier systems between a baseline period (USSR glacier inventory, 1940s to 1980s) and a climate scenario 2040s-2070s. The method used is a simple parameterisation based on climate data.

(1) Scientific significance: The paper presents data and projections of a little investigated area - NE Asia, and is as such interesting for TC. The method used is, however, little discussed so that the reader can believe the results or not, without having any indication about the performance of the method and quality of the results.

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Interactive Discussion
Discussion Paper

Manuscript evaluation:(3, fair).

Scientific quality: My major concerns are:

(2) The method used consist of many simplifications and ("tuning-") parameters, without discussing the model sensitivity and accuracy. No comparison to real data is presented, some of which should be available to the authors: actual mass balance profiles, modelled vs. measured ELA, etc. I suggest that the authors include a thorough section on model/result accuracy and sensitivity. Their results would gain much value if the reader would get an idea about their quality. Actually, I regard it as a must in a scientific study to discuss accuracy and model sensitivity issues. The authors could, for instance show how uncertainties in their assumptions and parameters propagate into the results. The uncertainties of the climate scenario used and the effects on the results is not discussed.

(3) the paper gives no hint to other studies about projecting glacier changes based on modelling mass balance profiles. There are a number of studies about this topic and the authors should in the introduction a section about other such works and how their methods relates to the others.

Manuscript evaluation: (3, fair)

(4) Presentation quality: The paper is written clear and concise in good English. Some figures require modifications to become readable. Manuscript evaluation: (2, good)

*** SPECIFIC COMMENTS ***

See above under (2) and (3). Discuss accuracy, sensitivity and uncertainties thoroughly. Compare to real data, as far as available. Relate to mass-balance sensitivity studies/methods by others.

(5) In many parts, the study reads as a summary rather than a full description. The authors should extend the introduction (e.g. other studies), data description and give more method details. The results & discussion, and the conclusion sections are give

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too few details (e.g. accuracy/sensitivity, more descriptions of the results for the individual glacier systems, relation to other glacier change studies in the region (or are there none?)).

(6) Most of the literature cited is in Russian. Are there no English publications available about the regions studied (e.g. from other authors) and the method (cf. comment 3).

(7) How does Fig 4 support the assumption of linear variation of elevation change with altitude?

*** TECHNICAL CORRECTIONS ***

page 3, line 7: "Observations ...". It would be good to see how these are in relation to the model

p4, l 20: ...THE Arctic...

p5, l 7-8: year-1 and yr-1 . Use EGU-recommended units

p5, l 14 and 19: sure about the comma?

p6, l 23: How can a glacier exist under "insufficient" precipitation?

p8, l 9 and 17: positive and negative lapse rates?

p12, l 9: What is a "beginning" and "end" of a glacier?

p13, l 10: Make a individual sentence out of the long expression in quotes.

p16, l 5: Braunschweig, not Brounshweig

Table 1: Give also ELAs not only ELA change; "diapason"? What do you mean with that? Ablation-accumulation? What is that?

Fig 1: Hard to read names of glacier systems on the grey mountain ranges.

Fig 2: Why grey hypsography bars on grey background? White background would improve readability.

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END OF REVIEW

Interactive comment on The Cryosphere Discuss., 2, 1, 2008.