

## ***Interactive comment on* “Utility of late summer transient snowline migration rate on Taku Glacier, Alaska” by M. Pelto**

### **Anonymous Referee #1**

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Reviewer comments for the manuscript, “Utility of late summer transient snowline migration rate” submitted to the journal The Cryosphere.

This manuscript describes analysis of the migrating transient snow line on remote sensing imagery as an indicator of mass balance for the Taku Glacier on the Juneau Icefield, Alaska. The author describes the use of field measurements of mass balance gradient to compare with balance gradients determined from satellite imagery as a means of calculating glacier mass balance in remote locations without field measurements. Overall, the manuscript presents a solid study and I feel that this paper should be accepted for publication. However, there are still several grammatical errors and a few minor questions which the author should address.

General Comments:

My only major question/concern is found in the first paragraph on page 1371, which has to do with the use of the USGS DEM in determining the transient snow line. Does the author know the dates for which the elevations represent on the DEM? To my knowledge, most of the USGS DEM elevations were derived originally from aerial photographic stereo pairs, which for this portion of Alaska goes back to 1948. So, I wonder if this will have any bearing on the balance gradient results calculated from the use of the USGS DEMs? I would assume that there have been changes in elevation on Taku Glacier since 1948. At the least there should be a short description of the USGS DEM data.

#### Specific comments:

There were several grammatical errors that I noticed in the manuscript, including misspelled words, awkward sentences, and redundancy. Several of these are noted below:

Page 1366, line 26: there should probably be a comma between “facies” and “an”; either that or put “an ice and a snow facies” in parentheses.

Page 1367, line 8: there should be an “s” on the end of “glacier”

Page 1368, line 1: state what the “AAR” acronym means (accumulation area ratio).

Page 1368, line 14: You state the purpose of the study, but you do not include the point of the usefulness of the TSL on satellite imagery to determine the balance gradient. It seems to me that this should be mentioned here.

Page 1369, line 8: remove “in”

Page 1370, line 5: remove the sentence beginning with “The two snowpits, TKTP5 and DGTP1. . .”; you mention this above already.

Figure 2: The order of the legend needs to be adjusted (e.g. 1998, 2004, 2005, 2010).

Figure 3: remove “Should be”

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Figure 5: It is very difficult to see this figure. Is there any way you can zoom in on the Taku Glacier to show the TSLs?

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Interactive comment on The Cryosphere Discuss., 5, 1365, 2011.

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5, C585–C587, 2011

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