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The Cryosphere Discussions
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Interactive comment on "Brief communication: Unabated wastage of the Juneau and Stikine icefields (southeast Alaska) in the early 21st century" *by* Etienne Berthier et al.

M. Pelto (Referee)

mauri.pelto@nichols.edu

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Berthier et al (2017) provide a detailed update of the mass balance record of two large icefields in southeast Alaska and an updated method of determination. The geodetic mass balance based on ASTER images is a significant improvement over previous combined analysis use ASTER and SRTM. Particularly on the Juneau Icefield the record is validated against both field mass balance observations and laser altimetry. The results is a robust record. The paper also provides a detailed review of how the SRTM data proved unreliable due to variable C-band penetration of snow and firn. This is an important and concise update in approach that should be used to reassess other

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geodetic mass balance records that used best practices at the time, but may have this same correctable bias.

Specific Comments: The two different line numbers result from two different line numbering versions of the paper. Not sure which the authors will utilize.

40 or 45: Indicate that Lemon Creek Glacier is a WGMS reference glacier. Also separately note that the record to reflect that the Lemon Creek Glacier record from 2000-2016 is -0.56 m w.e. a-1 (WGMS, 2017).

65: Field observations of the ELA and mass balance do not support a slow down.

108 or 118: Taku Glacier (southern outlet of JIF)"

110 or 120: Should be reported that the most extensive thinning of the lower reach of JI glaciers is associated with lacustrine calving retreats on Field, Gilkey, Llewellyn, Meade, Mendenhall, and Tulsequah glacier (Pelto, 2017), which also notes that every outlet glacier retreated significantly except Taku Glacier. This supports the line 48 statement as well. On Stikine Icefield lacustrine and tidewater calving retreat during the study period occurred on Baird, Dawes, Great, Sawyer, South Sawyer, Speel and Wright Glacier.

146 or 156: Any thoughts on why the difference? This is in the terminus region for many glaciers including lake formation zone.

181 or 195: Separately note that the mass balance of Taku Glacier from 2000-2016 is -0.08 m w.e. a-1 (WGMS, 2017). Consider the value of citing Pelto et al (2008) pointed out the mass balance transition."Surface mass balance was positive from 1946-1988 +0.42 ma-1. This led to glacier thickening. From 1988-2006 an important change has occurred and annual balance has been -0.14 ma-1, and the glacier thickness has ceased increasing along Profile IV."

Table 1: Should add column for the field observed mass balance for Taku Glacier and Lemon Creek Glacier.

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242 or 264: The linear correction used by Larsen et al (2007) would depend on the season of comparsion.

249 or 271: remove "is linked to the"

254 or 276: Winter balance observations on Taku Glacier support this seasonal amplitude.

262 or 286: which is in agreement with the altimetry and field based assessments on a smaller sample of these glaciers.

275 or 301: Is it worth elaborating for one sentence on the Tandem X issues? Also are the issues much reduced in summer for Tandem X?

Pelto, M. S., Miller, M. M., Adema, G. W., Beedle, M. J., McGee, S. R., Sprenke, K. F., and Lang, M.: The equilibrium flow and mass balance of the Taku Glacier, Alaska 1950-2006, The Cryosphere, 2, 147-157, https://doi.org/10.5194/tc-2-147-2008, 2008.

Pelto, M.: Recent Climate Change Impacts on Mountain Glaciers (John Wiley Sons, Inc.), chap. 3., 2017.

WGMS: Fluctuations of Glaciers Database. World Glacier Monitoring Service, Zurich, Switzerland. DOI:10.5904/wgms-fog-2017-10. Online access: http://dx.doi.org/10.5904/wgms-fog-2017-10, 2017.

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