

Interactive comment on “Impact of MODIS sensor calibration updates on Greenland ice sheet surface reflectance and albedo trends” by Kimberly A. Casey et al.

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The study presents a large multi data set intercomparison, is clearly written and is a valuable contribution to the study of snow (and ice) albedo. The WMO in 2011 has defined snow as an Essential Climate Variables for monitoring.

+ World Meteorological Organization (WMO) 2011 Systematic observation requirements for satellite-based data products for climate. GCOS-154, 138 pp.

The "beyond the scope of this study" argument to not validate using e.g. ground observations is not that convincing. A better justification may be something like: 'While we do not compare Collection 5 and 6 with ground data, our validation is through

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intercomparison of different satellite Terra and Aqua MOD09 and MOD10 products. Further, in an accepted article, Box et al. (2017) find Terra MOD10A1 albedo improving in relative accuracy substantially from Collection 5 to Collection 6, agreeing with GC-Net and PROMICE station data within 0.04 especially in mid-summer and for the majority of the island south of 80 N latitude (Box et al. 2017, Fig 4b).

+ Box, J.E., D. van As, K. Steffen, Greenland, Canadian and Icelandic land ice albedo grids (2000-2016), Geological Survey of Denmark and Greenland Bulletin, Vol. 38, 2017 <https://www.dropbox.com/s/4k36mfvackl8m1n/Box%20et%20al.%202017%20-%20revised%20-%20post-review.pdf?dl=0>

The definition of wet and dry surfaces is adequate. Yet, reminding the reader throughout the paper that much of the trends in the wet area are for ice not snow, seems important. For example, in the abstract "Wet snow albedo decline ..." I think this surface has a large bare ice fraction. So, something like "Wet snow and ice albedo decline" is more accurate.

In abstract, to be less qualitative, pg 1 line 21 include a quantitative metric beside 'slightly detected' also beside 'lower magnitude' in the next line.

p 7 line 4 'negligible trends' averaging over the sunlit year but what about July when metamorphism and impurity concentration on surface may be strongest?

p 8 line 31 remove 'significant' as the term should be reserved for statistical tests. Here, the use is ambiguous.

To orient readers, all geographic locations referred to in text, e.g. Humboldt should appear on at least one of the maps.

I suggest use of 'area' instead of inconsistent use of 'zone' 'area' and 'region'.

Interactive comment on The Cryosphere Discuss., doi:10.5194/tc-2017-38, 2017.

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