

Interactive comment on “Proglacial icings as records of winter hydrological processes” by Anna Chesnokova et al.

Olga Makarieva (Referee)

omakarieva@gmail.com

Received and published: 11 July 2020

Aufeis studies have been recently getting second breath in the Arctic countries and this tendency should be fully supported. Aufeis are visible manifestation of complicated hydrological, geocryological and hydrogeological processes in the cold regions and their changes in warming climate. The new approaches of their investigation that may provide additional information on the sources of winter flow and their transformation are highly relevant for understanding of changing hydrological regime. Chesnokova et al. proposed the combination of direct (time lapse cameras) and indirect (chemical) methods to study the sources of aufeis fields in the glacierized catchments in the Yukon River basin. The analysis of visible images of aufeis formation during winter season supported by the analysis of water and ice samples on stable water isotopes, ionic

C1

composition, DOC allowed for qualitative distinguishing between the potential sources of aufeis feeding. Some simple adjustments like using the ice rails in the view fields of the time lapse cameras, assessment of aufeis fields areas and volumes at the end of spring by direct measurements and remote sensing data analysis, precipitation measurements would add qualitative value to the study. In general, the paper is well written, the explanations are clear and descriptive. It is important that the authors are aware and discuss the limitations of the proposed approach and obtained results. General recommendation to the authors would be not to limit the literature review to North American authors and pay attention to the Russian studies of recent hydrological changes and aufeis phenomena, all the more so that the first author clearly is able to read in Russian. Specific comments Line 17-19: I would suggest eliminating the following sentence from the abstract “If confirmed in other cold regions, those results will suggest orienting winter flow trend studies toward a multi-causal hypothesis in glacierized catchments”, as it sounds a bit boastfully. Line 445: change naturel to natural

Last comment and scientific regards to the authors from the field studies of giant aufeis in the North-East of Russia (the Magadan region) where we are at the moment using the same methods as proposed in the paper – TLC, water and ice samples, though complimented by hydrological measurements of aufeis input into river streamflow. The photo is attached.

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2020-63>, 2020.

C2



Fig. 1.

C3