

Interactive comment on “Aufeis of the Indigirka river basin (Russia): the database from historical data and recent Landsat images” by Olga Makarieva et al.

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The comments were sent in the form of doc document. So we have combined them here.

Comment: Suggestion to change the title to “Historical and recent aufeis, Indigirka River basin, Russia”

Response: Accepted. We changed the title.

Comment: In the abstract to specify present or historical aufeis are located in the elevation band of 1000-1300 m.

C1

Response: Specified. Line 25: Most present and historical aufeis are located in the elevation band of 1000 – 1200 m.

Comment: Suggestion to the reference. I think you need to list the last name of the author here (not the title) or alternatively, the publisher, and the publication year.

Response: We changed the reference as the following: (Aufeis of Siberia. . ., Nauka, 1981) – Line 46

Comment: The question to the reference (Alekseev, 2016) - Would be good to include which region this study represents.

Response: Line 74-77 Expanded the sentence as the following: However, the same author (Alekseev, 2016) states a general tendency to the decrease of aufeis volume for the last 50-60 years in some aufeis-affected areas of Russia such as Baikal region, South Yakutia, Kolyma region, Eastern Sayan Mountains, following the increase of global and local air temperature.

Comment: Unclear. Is it 896 or 808 aufeis in your database?

Response: Lines 156-157. Clarified. Our compilation contains data on 896 aufeis. The aufeis are presented as point objects in our database. The areas are specified only for 808 aufeis.

Comment: Confusing. Do you mean that there was no recording date provided in the 1958 map, but only in the Cadastre (the catalog)? Do you mean that the 1958 Cadastre/catalog was not solely based on aerial photos, but also through other sources that may not necessarily reflect aufeis coverage in ~1958?

Response: Lines 162-166. Clarified. The dates of ice recording for the remaining 34 % of the aufeis were not described, meaning that aufeis detection could be carried out based not on the visible ice presence at the aerial images but on geomorphological features of river valleys. Therefore, the Cadastre might as well contain data on old aufeis glades, where the aufeis themselves were absent.

C2

Comment: Clarify. Did you use these maps or did Grosse use these maps?

Response: Lines 167-172. Clarified. Spatial positioning of the Cadastral Map of aufeis was conducted using the location description by Russian topographic maps with the scale of 1:200 000. Grosse and Jones (2011) used the same set of maps for compiling the dataset of pingos (frost mounds) in northern Asia and described those maps in details therein. The maps of 1:200 000 scale were based on more detailed maps of 1:50 000 and 1:100 000 scale, which were derived from aerial photography acquired in the 1970–1980's.

Comment: Please provide some information on how many basins were included in correlation analysis.

Response: Lines 328-330. Clarified. Among 6 basins, the Spearman rank correlation coefficients between the basin average elevation and aufeis percentage are 0.71 and 0.77, the aufeis percentage assessed with the Cadastre and satellite data respectfully.

Comment: Can you make a stronger conclusion? For example that the total aufeis area have decreased over time, while simultaneously it appears that additional aufeis may have formed over time.

Response: We added the discussion section (lines 367-421) which shows the limitations of the datasets. Also we added the analysis of area reduction of large and giant aufeis. We do not think we have the complete evidence for strong conclusion. In Conclusion section we are rather cautious: Lines 436-439: The analysis of large and giant aufeis seems to indicate that there has been a significant decrease in aufeis area over the period of last 70 years. Additional analysis of historical aerial photography data could help to clarify the issue of aufeis area decline trend since the middle of the 20th century to the present.

Comment: Spelling of aufeis through the text and in the figures

Response: Corrected in the text and figures.

C3

Please also note the supplement to this comment:

<https://www.earth-syst-sci-data-discuss.net/essd-2018-99/essd-2018-99-AC2-supplement.pdf>

Interactive comment on Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2018-99>, 2018.

C4