

Dear editor,

We have implemented all suggested grammar and spelling changes and a reference as requested. In addition, regional names (West Siberia, Polar Urals) have been made consistent.

Figure 9 has been adjusted for color-blindness. In other cases the readability is given, mostly due to the provision of unit IDs in addition.

The color has been removed from Table 2 to comply with the journal rules. A copy of the color version has been added as figure to the appendix instead. The color tables of appendix C have been converted to figures. References to these Tables/Figures have been updated in the text accordingly.

Color and caption updates have been made to figure 19 and a further supporting figure added to the supplement (see detailed reviewer response below).

Response to reviewer comments:

There are two things you said you included in the supplements (Appendices) that I cannot find:

- In your response document, you say “We now also provide a comparison to CAWASAR (originally published as Widhalm et al. 2015) as a supplement.” I do not see this comparison in the Appendix.
- In your response document, you say “We have now prepared comparisons with regional maps from Alaska and the Lena Delta in the supplement”. I do not see this in the Appendix.

Response: There is an Appendix and a separate Supplement (was new after first revision). The information not found by the reviewer is part of the supplement which was uploaded as a separate file.

Minor editorial comments (except grammar and spelling, addition of reference)

Line 185 – similar to what?

Response: added ‘ as anticipated in this study’

Line 334-335 – I found this sentence confusing and suggest this possible rewrite. “AVA records, which include wetness descriptions, include the categories wet and aquatic in more than 50 % of the samples in units #3, 4 and 8 (Figure 6).

- Adapted to: AVA records, which provide wetness descriptions, included the categories wet and aquatic in more than 50 % of the samples in units ...

Lines 354-357 – At first (and second reading), I didn’t understand these sentences, what the point was that you were trying to make, or what the groups were in Figure 13. Since I found this so confusing, a sentence explaining this in the Fig. 13 caption or in the text would be helpful. While this may seem like overexplaining, something like the following would be helpful: “Wetness group 1 sum is the proportion of 1 x 1 km areas that had only one wetness category, group 2 had two wetness categories, and group 3 had all three.”

- Added to caption ‘Values for wetness group sum '1' are the proportion of 1 x 1 km areas that had only one wetness category, group sum '2' had two wetness categories, and group sum '3' had all three.’

Line 423 – change “fires are abundant and smoke is transported to the tundra area.” to “fires

are abundant in the boreal forest and smoke is transported to adjacent tundra areas.”

Lines 423-425 – Is there a northern water-cover layer that you would recommend users apply to fix this problem? Or would you recommend users apply regional water-cover screens to improve the map?

- Added: The snow/ice class can be, however, re-labeled as water in regions without glaciers (excluding high Arctic islands, Greenland and mountain ranges)

Figure 19 caption – on my computer screen, there is no gray or light green in the CAL-2020 maps. I see a brown and a tan color, so do not know which is the lichen/moss and which is the graminoid.

- Response: This is indeed a wrong version of the color scheme. Figures are now replaced.
- The caption has been extended in addition. The information on wetscape type according to Olefeld et al. 2021 has been included and the Wetscape comparison added to the supplement. One sentence was added in the main text.

Line 508 – I would add that the CALU covers 97% of the Arctic (or say only 3% missing).

- Added: CALU covers only 97% of the Arctic (excluding ice sheets).

Table A3 – In caption, change “characteristics” to “percent cover” or something similar. The column “Samples” has incorrect data – a copy of the “Mean”. Change “Tussock graminoids” to “Tussock graminoids”

- Thanks for spotting. The sample column is now removed as it is not applicable in this case (template for soil table was initially used).

Figure D1 – Please include CALU unit #s

- updated