

Dear Sebastiano Piccolroaz,

Thank you for the comments and suggestions for improving the text of our manuscript. We further implemented into the revised manuscript as many suggestions as possible. We have checked the revised version for typos; English has also been corrected in those sentences that need to be clarified.

We following the comments step-by-step:

- Line 20: "while estimating" --> "to estimate"

Answer: We corrected the text.

- Line 70: "data from the Earth surface properties (surface temperature and specific humidity as well as roughness lengths for momentum and moisture/heat)" Do in this case Earth surface properties refer to the lake properties? If so please revise the sentence and I think that the list in parentheses should be updated (e.g., specific humidity).

Answer: Thanks for this comment, we agreed that the sentences needed to be corrected. We further corrected the text as following: "In the bulk-aerodynamic approach, the evaporation is calculated on the basis of data from the land surface properties (whether a land surface type is an ice or a lake or rock or a forest, surface temperature and surface roughness) and atmospheric variables (wind speed, specific humidity and air temperature) in the lowermost part of the atmospheric boundary layer."

- Line 85: "approache" --> "approaches"

Answer: We corrected.

- Line 91: "Antarctica however, the uncertainties inherent in the estimations are not yet known" please, adjust the use of the comma to make the reading clearer.

Answer: we corrected the text: "... we selected the empirical equations that were previously applied while estimating the evaporation over the lakes located in Antarctica (Borghini et al., 2013; Shevnina and Kourzeneva, 2017). However, the uncertainties inherent in these estimations are not yet known due to lack of direct measurements of the evaporation."

- Lines 93-96: is this sentence needed?

Answer: We deleted the sentence in the revised version of the manuscript. We also excluded Edinger et al. (1968) from the list of the reference.

- Lines 99: "The eddy covariance (EC)..." new paragraph.

Answer: The text was corrected.

- Lines 156-162: these sentences should be improved and English revised (e.g., "is the glacial type", "as it is not the landlocked type as given in Phartiyal et al. (2011)". It is unclear if the lake is a glacial (line 157), a landlocked lake (line 162), or a glacial lake with water temperatures of a landlocked lake.

Answer. Thank you for this comment. We removed the following text: "For landlocked lakes, the major source of water is melting seasonal snow cover (Simonov, 1971; Hodgson, 2012; Shevnina

and Kourzeneva, 2017). It allows us to suppose that Lake Zub/Priyadarshini is the glacial type, as it is not the landlocked type as given in Phartiyal et al. (2011).”

- Figure 3: the resolution of plots b and c should be improved

Answer. We replaced the sub-plots 3 b and 3 c with better resolution images.

- Line 247: a reference showing that this assumption is reasonable would be useful here.

Answer. Thank you for the comment. We further corrected the text: “In this study, we assumed that Lake Zub/Priyadarshini had no thermal stratification during the austral summer season as the many other ice-free lakes located in the Antarctic oases (Sokratova, 2011).”

- Line 265: "spiks" --> "spikes"

Answer: Corrected.

- Lines 348 and 396-397: please revise: $(a + b w_2) (e_s - e_2)$ is equal to $a(1 + b/a w_2) (e_s - e_2)$ not to $[1/a](1 + [b/a]w_2) (e_s - e_2)$. Still, I wonder why the authors used $(a + b w_2) (e_s - e_2)$. Please, simply refer to $A(1 + B w_2) (e_s - e_2)$. You do not have to redo calculations ($A=a$ and $B=b/a$ in your case), simply use the same formula structure as those used in the literature to allow for a direct comparison of coefficients and avoid confusion. So at line 408, the equation should read $0.33(1 + 1.82 w_2) (e_s - e_2)$ making the comparison with the other formulas straightforward.

Answer: Thank you for this comment. We further corrected the text by including the only one (classical) formula: “The relationship between evaporation and 2-meter wind speed and saturation deficit was approximated by the formula reading as $E = A (1 + B w_2) (e_s - e_2)$ in Table 3. In this formula, two empirical coefficients (A and B) were evaluated from the series of the evaporation (after the EC method) and the wind speed and air temperature observations done at Maitri site, which is nearest to Lake Zub/Priyadarshini.” We also corrected the text in line 408.

- Line 359: $SSC=0.8$ means $NSE=0.2$, which in my experience is a very low score. Normally, $NSE<0.5$ is an unsatisfactory performance (see Moriasi et al., 2007; DOI: 10.13031/2013.23153), corresponding to a maximum SSC of 0.5. I would refer to Moriasi et al. (2007) instead of Popov (1979).

Answer: Thank you for this comment. Indeed, Moriasi et al. (2007) have been given a good overview of the methods used to estimate the efficiency of a new model (or relations) in hydrological applications in the United States. Among others, the Nash-Sutcliffe efficiency (NSE)

index is given as:
$$NSE = 1 - \frac{\sum_{i=1}^n (Y_i^{obs} - Y_i^{mod})^2}{\sum_{i=1}^n (Y_i^{obs} - \bar{Y})^2}$$
; the NSE is not simply equal to $1-SSC$. We have

calculated the NSE index together with the SSC criterion, and both of them indicate unacceptable values not allowed to recommend the methods in estimations of the daily evaporation. We have included these results into the manuscript in the previous revision, however it raised criticism (due to similarity of the indexes used), then we excluded one of the indexes (it was NSI by chance). In our manuscript, we added the formula for the SSC criterion, which is not given by Moriasi et al. (2007), and this criterion is commonly applied in the hydrological applications over the Former Soviet Union’ countries. We added Moriasi et al. (2007) to the list of the references.

Moriasi, D. N., Arnold, J. G., Van Liew, M. W., Bingner, R. L., Harmel, R. D., Veith T. L.: Model evaluation guidelines for systematic quantification of accuracy in watershed simulations,

Transactions of the American society of agricultural and biological engineers, vol. 50, 885-900, <https://doi.org/10.13031/2013.23153>, 2007.

- Lines 390-392: please revise (double negative construction; suggested for what?).

Answer: thank you for the comment. We corrected the text as follows: "Unfortunately, none of the considered empirical equations can be recommended to calculate the daily evaporation due to big uncertainties inherent in these methods."

- Lines 393-395: please revise (English)

Answer: we further remove one sentence from the text (... The bulk-aerodynamic method also cannot be suggested to match the daily evaluation of evaporation using the meteorological observations at the Maitri site...).

- Line 427: turbulence in the lake or in the atmosphere above the lake? Please be clear that you refer to turbulence in the ABL above the lake (here and at lines 428-435). This part should be moved to the Discussion.

Answer: Thank you for the comment. We modified text: "We interpreted the situation so that these strange aspects, contradicting the literature on bulk-transfer coefficients, may arise from three potential factors: (a) evaporation from spray droplets, which is sometimes very large, when dry Antarctic air masses are advected over open water (Guest, 2021), but not accounted for by the bulk formulae; (b) non-local factors affecting turbulence over the lake; or (c) some unidentified error source in the data."

- Lines 435-438: please revise: smooth the sentence or remove it. This limitation can be recalled in the Discussion (for both the bulk and combination equations).

Answer: We agreed that the entire text from lines 421-435 can be moved to the Discussion (to become the second paragraph of the Discussion). We further deleted the following text: "We therefore do not consider ...".

- It is better to refer to lake surface water temperature (LSWT) and not to lake surface temperature (LST).

Answer: Thanks for the comment, we implemented the new notation for the lake surface water temperature in the revised version of the manuscript.

- The quality and resolution of figures should be improved (Fig. 3, Fig.4, Fig. 5). The font type and size should be the same and the layout too (e.g., in Fig. 5 the authors used a different font. In Fig.3 the plots have gray backgrounds).

Answer: Thank you for the comment. We further replaced the sub-plots 3 b and 3 c with the images of better resolution, and we also improved the resolution of Fig. 4 and Fig. 7. The font of the labels in Fig. 5 is the same as on the others.

with the best regards

Elena Shevnina,
on behalf of the authors