Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2018-433-RC1, 2018

Hydrology and Earth System Sciences
Discussions

Interactive comment on "New profiling and mooring records help to assess variability of Lake Issyk-Kul and reveal unknown features of its thermohaline structure" *by* Peter O. Zavialov et al.

Anonymous Referee #1

Received and published: 10 October 2018

General comments

The manuscript presents the results of the field campaigns in the lake Issyk-Kul for 2015-2017 that include observations from ship and mooring stations. The results cover wide range of physical and chemical properties of lake Issyk-Kul and represent a significant advancement in estimating the current state and variability of the lake regime, especially in the context of lack of recent comprehensive observations. Scientific results and analysis are sound and well discussed in the context of existing publications. The manuscript is well structured and is easy to read. I recommend the manuscript for publishing with only some minor revisions.

Specific comments L30-37. In what respect the differences in estimating the exact maximum depth of lake Issyk-Kul could be explained by interannual changes of the lake level (about 3.5 m during the 20th century)? I guess some of discrepancies could be explained by this.

L138. are the historical salinity measurements made using the same approach with similar account of ionic composition? This may affect your conclusion about the positive trend of salinity in deep waters.

Section 3.3 and in general - have you considered making some general scheme of 3D structure of various processes of water exchange in the lake? It will be very helpful to generalise many findings that are actually scattered in the text.

L296 - the fact that the days are exactly the same does not take into account the fact that temperature regime, wind field and river discharge (and thus plankton growth and distribution) may vary significantly from one year to another. By the way, do you have discharge data to compare different years?

Have you considered using some data on wind field (if available) and satellite imagery to better assess the situation during each field cruise?

Technical corrections L27: "abovementioned" - change to "above-mentioned"

L37 "high quality" - change to "high-quality"

L40 suggest start new sentence from "however".

L64 "buried 20-70 m in relation to the.." - suggest to change to "buried 20-70 m below the.."

L67 change to Peeters et al; (2003)

L73 suggest change "in continental Eurasia for millions of years" to "in continental Eurasia spanning millions of years"

L103 "A total of 75 stations were occupied" - modify the verb.

L122-125: I'm not sure that this precision is so important and suggest to round it up to half a meter.

L144 4.43oC - change to 4.43°C

L156 "it has never been reported at the times" - suggest rephrase "at the times"

L171 are these spike-like positive anomalies real or it could be instrument noise?

L197 - "instead" used two times

L202 - put Pokrovski bay, Dzhooku and Kichene-Kyzylsu rivers on map in Figure 1.

Section 3.3 and Figure 9 - at what depth(s) are the values provided in Kadyrov (1986)? Are they at about 200 m depth as shown on Figure 9? Also probably it would be helpful to give on Fig 9 different circles for values in the river estuaries and values in the open part of the lake.

L228 "nearly same" - change to "nearly the same"

L423 and elsewhere - put in situ in italics

L425 - be careful while comparing the 20 year trend for 1983-2003 and the results of 2015-2017. There could be significant interannual variability that is not resolved by these observations.

Figure 2 - I suggest to highlight the position of the two station used on Figure 1, as with just the coordinates it is difficult to assess their location.

Figure 4b - I suggest to inverse the color scheme with less saline water shown in blue and more saline in yellow

Figures 3 and 5-7: I suggest to put station position on figures so that potential interpolation errors could be estimated

Figure 14 I suggest to put transect position on Fig 1.

Figure 15 may be highlight the 2.75°C isoline? probably it will reveal some interesting features?

Table 1 - I suggest to provide "Total duration of cooling" not only in minutes but also in fraction of days (makes it easier to understand)

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