**Climate
of the Past
Discussions**

Interactive comment on "High-latitude environmental change during MIS 8–12: biogeochemical evidence from Lake El'gygytgyn, Far East Russia" *by* R. M. D'Anjou et al.

Anonymous Referee #2

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Review of "High-latitude environmental change during MIS 8-12: biogeochemical evidence from Lake El'gygytgyn, Far East Russia" by D'Anjou, Wei, Castañeda, Brigham-Grette, Petsch, Finkelstein submitted to Climate of the Past

main topics This paper intends to present extensive organic geochemical investigations of the MIS 9 and 11 in extensively studied lake, Far East Russia. general overview This paper is well-organized and presents new data of high interest. Data are honestly presented and interpretations are done in respect to organic indices limitations, well stated. Title does not exactly reflect the article papers. Very few is provided for MIS 12, 10 and even less for MIS 8. This paper focus on MIS 9 and 11. By looking at

the different organic indexes shown here, it seems that MIS11 lasts from 420 to 400 kyrs rather than 430-390 kyrs as highlighted on the figure. Does this study bring some new information on MIS11 duration? or is it the result of chronological approximation? details p. 4748, lines 5-6: detail acronyms MBT, CBT and GDCT. Provide BIT equation in Table 1 and refer to this table in the text. p. 4749, line 10: in the present state, Fig. 1 does not indicate the ICDP drill. Red star indicate the Lake but there is no symbol for the drill on the small map. Please add it. p.4749 line 11: I definitively a continuous sampling rather than discrete sampling: to study climatic and environmental changes, smoothing the signal is definitively less serious than an random sampling of the original climatic signal. You definitively miss real extrema, even rapid changes and can artificially create new extrema. That's not your choice but you might consider this point for the future study. Try both approach on a highly resolved climatic signal (any out of ice core), extract one point at "varying depth intervals" and compare the resulting signal with what you would have had by integrating the original signal on a few centimeters. Which one better fit with the original one? p. 4749, line 16: can you shortly provide information on the chronology precision, especially for the MIS of interest. p.4750, line 14: keep n-alkane with a lower case N, even at the beginning of the sentence. p. 4750, lines 15-16: please refer to Table 1 for CPI and TAR equations p. 4752, line 25: between 420 and 400 kyr, you only have 5 points, including extrema, this means one point for 50 kyr. In contrary, end of MIS9 is much higher resolved. Be more exact. p. 4758, line 8: remove "insert references" p.4759, lines 16-20 it seems also by focusing on CPI and TAR amongst others that MIS 11 duration is much lower than shown by gray rectangle: 420-400 kyr BP rather than 430-190kyr. Can you propose an explanation?

Table 1 is unreadable for me. No lower cases at all. It might be a problem of computer? Don't know! Climate of the Past editing service should solve it. Here is the copy of what I got. Figure 2: is the one point Crenarchaeol peak at 422 kyr real? or can it be an experimental artefact? same question for the oldest point. Figure 3: it is perhaps still more visual to present all reconstructed temperatures with the same scale.

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Table 1. Equations and indices used in this study.

Equations and indices	Summary	Reference
Carbon Preference Index (CPI)	$CPI = C + 2.C + C + C + CC + 2.C + C + C + C + C$	Bray and Evans (1961)
Terrigenous to Aquatic Ratio (TAR)	$TAR = \sum C + C + C \; \sum C + C + C$	Bourbonniere and Meyers (1996)
Average Chain Length (ACL)	$ACL =$ $17 \; 17 + 19 \; 19...31 \; 31 + 33 \; 33 \; 17 + 19...31 + 33$	Modified from Poynter and Eglinton (1990)
Methylation of Branched Tetraethers (MBT)	$MBT = I + Ib + Icl + Ib + Ic + II + IIb + IIc + (III + IIIb + IIIc)$	Weijers et al. (2007)
Cyclisation of Branched Tetraethers (CBT)	$CBT = -\log (Ib + IIbI + II)$	Weijers et al. (2007)
Diol Index (DI)	$DI = 100 \times 1,15C30diol1,15C30 \; diol + 1,15C32diol$	Versteegh (1997, 2000)

Fig. 1. strange table 1

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