

## ***Interactive comment on “Wet/dry status change in global closed basins between the mid-Holocene and the Last Glacial Maximum and its implication for future projection” by Xinzhong Zhang et al.***

**Cody Routson (Referee)**

cody.routson@nau.edu

Received and published: 20 March 2020

Zhang et al., present a nice new compilation of existing Holocene and glacial hydroclimate records, which is accompanied by an interesting analysis. They compare proxy hydroclimate records, proxy lake level records, and PMIP simulations between the last glacial maximum, mid-Holocene, and future warming. Generally the analyses are straight forward and I think worthwhile of publication. However, before I can adequately evaluate the study design and associated conclusions, much work needs to be done to clarify the writing. The manuscript would substantially improve by having a native english speaker edit the sentences and overall structure. Many of the sentences

C1

are incomplete, difficult to follow, or entirely nonsense. I would also highly recommend reading and implementing the writing principals outlined by Joshua Schimel in his book “Writing Science” published in 2012.

Below is my preliminary review, which was conducted rapidly and remains incomplete until the overall presentation and writing is improved.

The introduction is meandering and hard to follow. Make sure each sentence doing work, frame the knowledge gap, and keep the story moving forward in a logical sequence.

Line 62. This gets to the point of the study, but should also include the LGM. Something along the lines of “. . . pattern of changes during the LGM, mid-Holocene and modern warm period. . .”

Also there is only one modern warm period so it should be singular in this sentence.

Line 71: This sentence is difficult for me to follow. Please re-write. Or remove?

Line 72: Is there a sampling resolution criteria?

Line 76: I appreciate a description of the COHMAP dating scheme, however it is difficult to follow as written. Please clarify. Use multiple sentences if needed.

Line 79. It took me some time to figure out what what you are trying to communicate here. The finding of 52 sites and Table 1 are results, and should be moved down into the beginning of the results section. Then, on line 79, a new paragraph should be started with rewording the sentence to something along the lines of: “We then compared our new compilation of proxy records to 50. . .”

Line 82-84: Sentence structure, please clarify. Use multiple sentences as necessary.

Line 107: Replace “involved” with “used”

Line 127: This sentence doesn't make sense.

C2

Line 148: Please show the data (a graph or otherwise) to support the statement in this paragraph.

Line 145: I'm not following the argument in this paragraph. What two global warming processes? Was this described somewhere in the methods? E21 and L21? Please clarify.

Line 51 and Figure 2: Please justify the comparison between warming from the LGM to MH versus PI to future warming. This should be done in the methods and then discussed in the discussion. There are very important mechanistic differences between mid-Holocene and future warming. Mid-Holocene warming was driven by changes in primarily summertime insolation whereas future warming is driven by greenhouse forcing. Some impacts are comparable, but differences in forcing mechanisms need addressed. It appears that you try to do some of this in the discussion, but it needs to be developed/clarified.

Figure 2 and 3 captions. Please indicate why the maps have extreme missing data coverage. The significant regions are shown by the gridding. . . CRU has data over the regions which show no data. . .

Line 193: Please point the reader to the correlations (Table 4) before discussing them.

Line 241: Please point toward something to justify the statement that winter precipitation will play a dominant roll in future hydroclimate changes.

Line 256: Please remove the word "comprehensive".

Line 266: The conclusion that moisture changes in closed basins are resilient to warming needs justified. . . Large increases in temperature alone will dramatically increase evaporation and decrease effective moisture (e.g. lake level) under RCP 8.5 scenarios.

Data availability: Please make your compilation of 52 hydroclimate records available in addition to data that were already available.

C3

In general, make sure statements are accompanied by the data that support them (Figures, tables or otherwise).

I look forward to clarifications and revisions,

Sincerely,

Cody Routson

---

Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2020-21>, 2020.

C4