

Clim. Past Discuss., referee comment RC1
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Comment on cp-2021-109

Anonymous Referee #1

Referee comment on "Holocene climate and oceanography of the coastal Western United States and California Current System" by Hannah M. Palmer et al., Clim. Past Discuss., <https://doi.org/10.5194/cp-2021-109-RC1>, 2021

The paper by Palmer et al. compiles 101 papers (although the abstract says 100 plus 50?) from the western US to summarize millennial-scale (EH, MH, and LH), spatial patterns of climatic, ecologic, pyrogenic, and oceanic changes. Overall, I found the paper interesting and applaud its titanic effort. Summarizing data is not easy. The authors do a good job covering the literature with very few exceptions (see below and attached PDF). The methods are sound, the criteria for inclusion reasonable, and the final spatial and temporal interpretations within the bounds of the available science. Note: as a summary paper, I trust that the interpretations by the authors follow those by the primary authors, so I did not double the cited literature.

I provide suggestions/edits/comments below in order of the text, not importance.

1) line 48: under-sampled because of a lack of temperature-sensitive terrestrial records...I think this qualifier should be mentioned. Most WNA records are more water sensitive.

2) line 57: summer insolation was at a Holocene maximum...winter insolation was at a Holocene minimum.

3) add Kaufmann et al., 2020, and Routson et al., 2019.

4) up-date with Swain et al., 2018; Goss et al., 2020 - specific to W US and CA.

5) line 85: need to mention Wise's dipole work since it is the dominant feature of

interannual hydroclimate in the W US...also, Dettinger and Cayan...also worth adding something about atmospheric rivers in this section since they are THE source of major hydrologic change - feast or famine W US climate.

6) line 125 - not sure if this Kirby paper actually deals with plant or animal communities? Maybe Kirby et al. (2018) show a strong coupling between hydroclimate and vegetation over 32,000 years at Lake Elsinore? Or, Dingemans et al. (2014)?

7) line 141: because of diverse age control issues between and within the 100 comparison sites, you might qualify this first question to reflect millennial-scale patterns since less than millennial is unlikely without significant age control assumptions across sites?

8) Figure 1: I would prefer a labeling scheme for each site so that the reader can go back and forth from the table to the figure to find the sites...e.g., 1, 2, 3, etc.

9) Figure 1: draw the boundaries as defined by your spatial criteria...PNW, SW, etc...

10) line 163: I think there should be an age control criterion...what is the minimum number of Holocene ages required to make millennial-scale statements??

11) line 163: are you updating the age models? In many of these types of summary papers, the age models are outdated and likely obsolete. Most review papers begin with fresh age models to make sure that papers published 20 years ago are correctly compared to papers published yesterday.

12) line 210: Add Leidelmeijer et al. (2021) - Barley Lake early Holocene.

13) line 230-234: in the SW (west of AZ), a wetter early Holocene was a product of more intense winter ppt associated with low winter insolation...the monsoon plays little if any significant role in the annual hydrologic budget west of AZ...see Kirby et al. (2005, 2007, 2012) and (Bird et al., 2010). It is reasonable that the monsoon boost may have "helped" maintain lakes where playas exist today, but without the increase in early Holocene winter ppt caused by lower winter insolation and its likely impact of storm tracks, the SW (west of AZ) would have been dry.

14) Figure 2: add numbers so that the reader can cross-reference sites to the table.

15) line 240: Leidelmeijer et al., 2021 agrees with a dry early Holocene from Nor Cal.

16) line 266: see earlier comments...the monsoon provided a hydrologic buffer, but it cannot explain the general increase in moisture...winter ppt must be the answer because the climate of the SW (west of AZ) is unimodal and dominated by winter ppt. All the monsoonal rain in the "world [hyperbole]" could not make the SW (west of AZ) wet without ample winter ppt...enhanced by lower winter insolation and its likely modulation of winter season storm tracks over the SW during the early Holocene.

17) line 306: add Barber, Donald C., A. Dyke, Claude Hillaire-Marcel, Anne E. Jennings, John T. Andrews, Maclean W. Kerwin, Guy Bilodeau et al. "Forcing of the cold event of 8,200 years ago by catastrophic drainage of Laurentide lakes." *Nature* 400, no. 6742 (1999): 344-348.

18) line 415 and elsewhere: I think you are overplaying the significance of the monsoon on the CA annual hydrologic budget. CA is characterized by a unimodal hydroclimate in terms of what matters for its annual hydrologic budget...and what matters is simply winter ppt amount and to a lesser extent, summer evaporation.

19) line 417: most of CA receives no significant monsoonal ppt ever...except Mojave and east (see Hereford, Richard, Robert H. Webb, and Claire I. Longpre. *Precipitation history of the Mojave Desert region, 1893-2001*. No. 117-03. 2004.).

20) Section 3.2.5 and other human sections: check out...Grenda, Donn R., and Alex V. Benitez. *Continuity and change: 8,500 years of lacustrine adaptation on the shores of Lake Elsinore*. Statistical Research, 1997.

21) line 628: the Late Holocene Dry Period is reserved for the published LHDP by Mensing et al. 2013...I think you misinterpreted Lund and Platzman's data and LHDP age range...at Zaca Lake, ALL 3 papers show an LHDP period between 2500 and 2000 cal yr BP. The MCA is also present as well as the LIA...but nothing comes close in duration or magnitude as the LHDP.

22) section 3.5: add Crawford, Jeffrey N., Scott A. Mensing, Frank K. Lake, and Susan RH Zimmerman. "Late Holocene fire and vegetation reconstruction from the western Klamath Mountains, California, USA: A multi-disciplinary approach for examining potential human land-use impacts." *The Holocene* 25, no. 8 (2015): 1341-1357.

23) line 838: really should consistently point out that the early Holocene was characterized by both higher summer insolation and lower winter insolation...BOTH played

a role in the millennial-scale Holocene changes you discuss in this paper.

24) line 862: AND, age control issues!!!, proxy sensitivity issues, and differences in the proxies used from site to site.

Please also note the supplement to this comment:

<https://cp.copernicus.org/preprints/cp-2021-109/cp-2021-109-RC1-supplement.pdf>