

Interactive comment on "Temperature and rainfall estimates for past 18 000 years in Owens Valley, California with a coupled catchment–lake model" by Z. Yu et al.

Anonymous Referee #2

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General Comments: The authors combined numerical modeling and proxy data to quantify the paleoclimate information including precipitation and temperature in the Owens Valley. I think this paper provides valuable information for exploring the climate change in the western U.S. and it has potential implications for water resource assessment in California over a long period. I recommend the publication of this article after addressing the following specific comments.

Specific Comments: 1. It seems that authors may not be aware of some recently publications studying similar questions and reporting similar results. Please refer to the following papers for introducing or discussing their findings: Munroe and Laabs,

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2011; Munroe and Laabs, 2013; Broecker and Putnam, 2012; Goebel et al., 2011 (the complete reference is listed in the following). There may be more, so I encourage the authors to make a more thorough literature review.

2. Equation (2) on page 6510, and Equation (4) on page 6511. Check these two equations, where the water balance may not be satisfied. The net change in volume of the lake is missing in these two equations.

3. For the inverse modeling, there should be more than one combination (precipitation and temperature in this paper) that can give a good fit. What constrain conditions did the author apply to select the best combination?

4. One purpose of looking back is to better predict the future. The authors should provide an assessment of the broader implication of their findings for the study region, for example, by briefly discussing how to connect the paleoclimate information with future climate change.

5. Line 19, page 6514: "A number of input parameters are required....." Please be more specific on the number of parameters. Also please expand the introduction of parameters; for example, which parameters are more sensitive to the model result?

6. Figure 3, page 6534: The simulated runoff in the Mono Lake drainage basin should be long-term average of the monthly runoff. In which period was the long-term average calculated? The authors need to clearly state the calibration period.

7. Figure 5, page 6536: The three figures are not readable. Please use different line patterns, colors, and larger labels for better illustration.

8. Figure 8, page 6539: It seems that the simulation did not match the estimated temperature based on pollen. What can be inferred from this figure? The authors need to discuss more about the comparison.

Typing Errors: 1. Page 6512 Line 24: "Monon" should be "Mono". 2. Missing units for the Y Axis in Figure 2.

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