

## Response to Reviewers

cp-2021-45 “Climate & Ecology in the Rocky Mountain Interior After the Early Eocene Climatic Optimum” Stein, Sheldon, Allen, Smith, Dzombak, Jicha

### General Comments

The authors did an excellent job of addressing reviews. I apologize for the delay in completing the follow-up review. The project motivation is much clearer following revisions, and the contextualization of their data has increased straightforwardness and readability for a broader paleoclimate audience. The study is interesting, providing an important snapshot of paleoenvironmental conditions during an interval of dynamic climate from a key locality. Overall, the paper is well-organized, well-written, and well-suited for publication in *Climate of the Past* in its current state. I have included some very minor comments, most of which will likely be addressed during the editorial process. These minor comments can be treated as suggestions; I am recommending publication as is.

**We thank the reviewer for their positive feedback.**

### *Minor Comments*

Lines 385-388: Sentence is unclear.

**We have edited the sentence to be clearer: “One limitation on this reconstruction is that it does not account for species-specific isotope discrimination behaviour that varies taxonomically (Beerling & Royer 2002; Stein et al., 2019; Sheldon et al., 2020). Values on the fringes of these values (44%) may be so extreme after having experienced diagenesis of certain compounds while others were left behind, skewing the isotopic values to be representative of the compounds and not the bulk tissue (Beerling & Royer 2002; Tu et al., 2004).”**

Lines 428-429: Sentence is unclear.

**We have edited the sentence to be clearer: “More compound-specific analyses of organic compounds would be needed to determine if and how plant influence is contributing to weathering in high % C sections (Fig. S4;  $R^2 = 0.20$ ;  $p$ -value = 0.01; Ong et al., 1970; Berner 1992).”**

Lines 457-460: Thanks for adding a bit more discussion on potential for seasonal biases. The last sentence of this paragraph would improve if a reference or two was included to support the phrase “B-horizon bulk geochemical data is in equilibrium with the environment and takes so long to form, therefore is not resolved enough to be affected by seasonality.”

**We have added a reference (Sheldon et al., 2002). Thanks!**

Line 460-461. Sentence is unclear or incomplete.

**We have modified the sentence to be clearer. “These collected fossils (sampled at 26 m on the stratigraphic section, housed at ESS laboratory at the University of Michigan) are taxonomically comparable to fossils found by Allen (2017b; Bridger Formation) and MacGinitie (1969; Green River Formation). The flora sampled are characteristic of a mesic, forested environment (e.g., wet forest; Hamzeh & Dayanandan 2004; Hamzeh et al., 2006).”**