Interactive comment on “Three main stages in the uplift of the Tibetan Plateau during the Cenozoic period and its possible effects on Asian aridification: A review” by Zhixiang Wang et al.

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1. Scientific significance: The authors do not provide new data, analysis, or concepts. The links between silicate weathering and CO2 drawdown have been with us for multiple decades. The discussion of links between tectonic events on the Tibetan Plateau and climate events cherry-picks events and muddles their timing. In this study, we only summarized that the evidence of the age of the Tibetan Plateau, and the climatic variations of inland Asia. On this basis, we found that there are three distinct uplifts in the Tibetan Plateau. At the same time, the climate in Asia had a significant drying trend. Therefore, we proposed that the three main uplifts of the Tibetan Plateau significantly affect the Asian inland aridification. Therefore, this manuscript was not provided new data and analysis. 2. Major comments: The authors need to clearly delineate time periods of interest. For example, currently all middle–late Miocene climate changes are lumped together, even though the original authors discriminate different mechanisms for climate changes within this period. Similarly, the Cretaceous paleoelevation history of the plateau is largely ignored. See comment on line 400 for an example. Documented uplift events and paleoelevation are not clearly correlative to climate shifts. For example see comment on lines 537–542. Data and conclusions are apparently reported largely without context or comment. This may be fine for an annotated bibliography, but for a review paper, some context and analysis of claims is needed. Otherwise, readers might as well go read all of the citations for themselves. The lack of critical analysis of the data obviates the need for this review. See comments on lines 68 or 397 for an example. Alternative explanations for the observed climate change are dismissed out of hand, without presentation of counter-evidence. We agree with the Reviewer suggestions. We have lumped together middle-late Miocene climate changes because numerous geological evidences show that the Tibetan Plateau has significant outward growth and uplifts of marginal mountains. In the original manuscript, we have emphasized the Cretaceous paleoelevation history (line 189-199). In the revised manuscript, we do not judge whether the results of the published papers are the right or wrong. We only summarized and concluded the evidence in the uplifts of the Tibetan Plateau and associated with climatic changes. Therefore, we do not comment, analyze and declare data and conclusions from the referenced articles. 3. Delete “the” before “Tibet” Line 16, 28, 517: Delete “the” before “uplift” Line 19, 26, 77, 277, 343: Replace “during” with “from” Line 20: Delete “n” in “Himalayan” Line 23: Delete “the” before “Eocene” Line 23–24: Delete “the” before “northern” Line 25: Delete “the” before “central” Line 39: The Cenozoic is an era. Done 4. Line 57: Why “was interpreted”? Reconsider verb tense. Corrected. 5. Line 66: Add “the” before “Lhasa” Line 68: What about the detrital zircon geochronology suggests that Indo-Asian collision occurred at that time? The authors need to provide sufficient
The timing of these climatic shifts in the early Cenozoic is not clearly correlated to palaeoelevation of the Tibetan Plateau. The southern Tibetan Plateau was probably close to modern elevation in the Late Cretaceous. Why didn’t the climate shifts start then?

DeCelles et al. (2002) is not an appropriate reference here. Deleted.

Line 230: Change “offer a large amount for” to “would provide abundant”. Done

Line 236: Delete “the” before “thermal”. Done

Line 244, 349: Delete “s” on “uplifts” Line 247: Delete “sea”.

Simulation results show that initiation of the monsoon in the early Cenozoic was produced by insulating warm, moist air over continental India from the cold and dry extratropics via the high Himalayas and adjacent mountain ranges. We agree with the opinion that uplifts in the northern margin of the Tibetan Plateau have caused significant reductions in annual precipitation in a broad region of inland Asia (Boos and Kuang, 2010, Nature). But this is needed to further simulate in future.

Line 252–254: This sentence (particularly the second half of the sentence) is unclear. Rewrite. Done 25.

Line 258: Insert “the” before “modern”. Done 26.

Line 345: Insert “the” before “late”. Done 27.

Line 345: What does “which” refer to? “Which” refers to the retreat of the Paratethys Sea. Done

Line 360: This is an awkward sentence. Rewrite. Corrected

Line 397: This is a case in a general point that the authors need to provide more details for readers to be able to evaluate the claims. No mention is made of the depositional setting where this change in CO3 content was observed. Without these details, the reader is forced to find and read the relevant literature, obviating the need for this review. Corrected.

Line 400: What time period are the authors referring to? Hough et al. (2014) observe a regional increase in aridity at 14Ma, but basin-specific increase in aridity at 50Ma. We suggested the age of 14 – 8Ma interval. We have emphasized the manuscript. 32. Line 537 – 542 : The timing of these climatic shifts in the early Cenozoic is not clearly correlated to palaeoelevation. Scale South Asian summer monsoon circulation is affected (Boos and Kuang, 2010, Nature).

Please also note the supplement to this comment: https://www.clim-past-discuss.net/cp-2018-64/cp-2018-64-AC1-supplement.pdf