

Interactive comment on “Neoglacial trends in diatom dynamics from a small alpine lake in the Qinling Mountains of central China” by Bo Cheng et al.

Anonymous Referee #2

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This is a neat little palaeolimnological study from Lake Yuhuang Chi from the Qinling Mountains, a biodiversity hotspot. It uses diatom community turnover and guild changes alongside climatic drivers to interpret how climate has altered lake primary production. I felt that the location of the study site and the paucity of other palaeolimnological studies from this region are what make this paper worthy of publication. Its methodology is not ground-breaking but is a standard palaeolimnological approach. I found the interpretation vague but I think this can easily be addressed. Perhaps a result from the lack of other studies in this region? A multi-proxy approach would have helped to pick apart some of the environmental changes further. I thought the figures were really clear and easy to interpret. Specifically: Line 70: Describe what is beta-diversity

Line 77: What do you mean by elevation-dependent warming? Line 97: Don't really like the term global warmth...is there another way to say this? Line 99: "less monotonic" - is that the right term? Thought monotonic was used to describe sequences...? Line 110: Define LIA Line 115: Define ASM Line 124: What do you mean by ecological guilds? Line 132: On what account is it a biodiversity hotspot? Describe. Line 141: Describe what you mean by Larix forest - what species? what climate/soil conditions do they require? etc. Line 142: More detail on the lake itself would be good. Has the lake ever been studied before? Any more bathymetry of the lake? What is its riparian/shoreline vegetation? Is it in a small, steep catchment? Does it have macrophytes in its shallow waters? Is it dimictic/polymictic etc? Or is knowledge extremely limited here? Line 155: Which country is Beta Analytic? Line 224: Don't quite follow the sentence. Do you mean 120 of the species were rare? Line 316: State specifically how and why the change in catchment vegetation would have altered delivery of allocthonous material? Increased or decreased? Line 321: Not a clear sentence. Did limiting resources become more limited? Or more resources became more limited? Line 323: "deterministic processes become more important" - more important than what? What do you mean by deterministic processes? Line 330: What "resources"? Be specific. Line 334: Again, what "resources"? Be specific. Line 342: Again, be more specific about what "resources" you mean and why and how this increased the prevalence of high profile diatoms. Line 351: Potassium (K⁺)? Line 383: Again this sentence is vague. What do you mean by the "number of resources that are limited" and why has it increased beta-diversity? Line 386: In line 140 you used masl not m.a.s.l. - be consistent. Line 386: How far away is the Loess Plateau to the Qinling Mountains? Is it climatically similar? Line 387: Is this a worthy comparison if the soils and altitudinal differences are dissimilar? If so, why? This could be a good opportunity to highlight the importance of lake and catchment characteristics is shaping the response of lake ecology to large-scale spatial and temporal drivers of change. Line 395-6: Don't understand what you mean by "several interacting, time-transgressive forcings", please be clear and describe what you mean. Line 411: What is K⁺ a proxy for? Please describe for readers who may

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not know. Line 414: What do you mean by phenological records? Line 421: What are these conditions? Be specific. Line 422: How does cold conditions and extended ice cover decrease these planktonic diatoms? Be specific. Changes to turnover events? Nutrient supply? Line 428: What do you mean by "resources" here? Nutrients? Be specific. Line 434: Again what do you mean by "resources" becoming more available? Be specific. Line 436: Why is this important? Describe. Line 448: "time of the"..? Line 453: What is "their"? Be clear.

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