

# ***Interactive comment on “Influence of late Quaternary climate on the biogeography of Neotropical aquatic species as reflected by non-marine ostracodes” by Sergio Cohuo et al.***

## **Anonymous Referee #2**

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The article brings sound results, methods and discussion. There are a few details and suggestions I provide below. They are all related to SDM.

1- Line 180: There are two versions of WorldClim database available: 1.4 and 2.0. Please, refer here to 1.4 version, since it is the one including past and future models. 2- Concerning the variables included: Are they correlated? Usually, it is reported the correlation among variables because it can lead to flawed SDM analyses. 3- Lines 347-391 Congruence between paleo-records and modeled paleo-distributions of freshwater ostracodes in the northern Neotropical region. Especially line 384-386: “In general, the comparison between species distribution models and paleorecords

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shows a quite high degree of similarity”. This question may be addressed more accurately by pre-modeling niche comparison – i.e. a comparison made without inferring a model that expresses a probability distribution. It would provide interesting statistics about how different are the niches of extant and paleo- distributions. Principal Components Analysis (PCA) calibrated on the environmental background (PCA-env) may be employed to measure and display graphically the niche overlap, and Schoener’s D metrics niche comparisons and Warren et al. (2008)’s niche equivalency tests may be run taking D metrics as reference. It takes the presence points of species under consideration and randomly reassigns them to each species, then it checks if the species niches are drawn from the same underlying environmental parameter distribution. If the observed value of D falls within the density of 95% of the simulated values, the null hypothesis of niche equivalency cannot be rejected. To perform all these tests, I recommend the R Package Ecospat (You can find details here: <https://onlinelibrary.wiley.com/doi/full/10.1111/ecog.02671>).

4- Lines 392-477 4.2 Endemic and non-endemic species responses during long-term climatic fluctuations: Glacial/Interglacial cycles and Marine Isotope Stages Again, consider if your discussion may take some benefit from niche comparisons as suggested in the comment above. Indeed because one of the questions addressed in the study is related to how different are the responses of endemic and non-endemic species to climate change. 5- Table 1: Please, replace the codes for environmental variables (e.g. BIO 1 ) by their names (“mean annual temperature”), hence it will be much easier to the reader relate them to the discussion.

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