

Interactive comment on “Rapid millennial-scale vegetation changes in the tropical Andes” by D. H. Urrego et al.

Anonymous Referee #2

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OVERVIEW

The present manuscript reports a reanalysis of some of the most important records for the tropical Andes, in West of South America, and focus on the vegetation changes detected at sub-millennial scale to study environmental variability. Given the uncertainty of the research question debated and the novel approach, the authors have nicely explained the objectives of the present work and the advantages compared to previous attempts, as have discussed the potential problems of the techniques used. Regarding the objectives proposed however, the paper ends a bit shallow in its present form, lacking further discussion about the meaning of the results found, i.e., the potential drivers that have caused synchronicities/asynchronies between the records.

MAJOR COMMENTS

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Abstract. The inference of precipitation changes (line 7) based on aquatic and shore-line vegetation is a bit risky as shifts in these taxa provide very local scale information and may be related to different drivers including precipitation, but also temperature through an increase in evaporation. I suggest the use of different terms such as moisture availability, P/E balance or similar throughout the text. Environmental setting.

Section 2.1 is entitled “Geography, vegetation and climate” but I haven’t found any information about vegetation so far. Although the study area will imply large variation of the taxa occurrence and distribution, some basic information is required that will help the readers not familiarised with the tropics.

Methods.

1) Although the use of AP% as proxy for temperature shifts has been explained, some clarification would be appreciated. This proxy is especially useful in high steep locations (mountain range) that includes a close ecotone between a forested and a non-forested plant community. This would be the case to some extent for the seven Andean records, but please clarify why using AP% in Lake Consuelo should work taken into account that puna is located almost 2000 m upwards and changes in communities promoted by temperature shifts might be unnoticed by AP%.

2) Given the data showed in Table 1, there are some records without a very high resolution. This might be problematic for comparing the level of details that for instance La Cocha record is going to provide. Please provide further details in how you are avoiding these potential issues.

Table 1. Please add the number of radiocarbon dates obtained in each record for building the age-depth model.

Figure 1. Please check the right location of Lake Pacucha and re-draw SASM (maybe as a shade or with bars?) to clarify the real extent of the atmospheric pattern and include the season for the ITCZ etc.. Some coordinates would be much appreciated.

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Figure 2. Where are the lowland taxa? Were not important at all, including in Lake Consuelo?

SPECIFIC COMMENTS

Page 1704, lines 25-26: I would rephrase this including some potential mechanisms responsible for the lack of consistent signature found to date in time and/or space (differences in analysis resolution, proxy sensitivity, climate system operating. . .).

Page 1705, line 22: Please change “unmarked set by Dunia” for a proper reference.

Page 1712, lines 7-10: Please include the reference for the elevation of subAndean forests in the interglacials (or how they obtained the information).

Page 1713, lines 3-4: This sentence is saying just the opposite of the previous one (page 1712, lines 26-27). Please, clarify.

Page 1713, line 11: There is a typo in Surucucho.

Page 1714, line 3: Please define “relatively high resolution” taken into account the record data (almost 300 years of sampling resolution).

Page 1718, line 20: Please see comment on Methods above.

Page 1721, line 11: Please avoid the term “precipitation changes” based on aquatic taxa, it will promote misunderstandings (despite you might be right in some cases, but this proxy cannot provide this type of evidence).

Interactive comment on Clim. Past Discuss., 11, 1701, 2015.

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