Clim. Past Discuss., 9, C3035–C3039, 2014
www.clim-past-discuss.net/9/C3035/2014/

Climate of the Past Discussions
Open Access

Interactive comment on "Treeline dynamics with climate change at Central Nepal Himalaya" *by* N. P. Gaire et al.

N. P. Gaire et al.

npgaire2007@gmail.com

Received and published: 5 January 2014

Anonymous Referee-1

Thank you very much for your encouraging comments to improve quality of the paper.

General comment: ..... A direct relationship is suggested between climate and tree growth, and between climate and species regeneration. That relationship however was not possible to be measured in one of the species, and was neither constant nor clear in the second species.

Authors Reply: Although, a direct relationship is suggested between climate and tree growth, and between climate and species regeneration, this, however, was not possible in our study. There might be interaction between the temperatures and other climatic

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

factors like precipitation, both affecting the radial growth and the regeneration of the trees growing in the present study sites leading to different relationship. Some indirect relationship with precipitation might have resulted from moisture stress resulted from increasing summer temperature, decreasing amount of precipitation as well as fluctuation in the precipitation with changing geographical area. Lack of climatic data close to the sampling site is the major constraint for this kind of the study in the Himalaya particularly in Nepal. Regarding the response of the second species (Betula utilis) with climate, so far we have not been able to develop good chronology ourselves to calculate response with climate and incorporate in the result.We were expecting to add Betula chronology at least in our revised manuscript but still we could not receive chronology from the experts of another lab working in the species to whom our sample is sent for further analysis. The lack of young seedlings and saplings and short climatic data limited the assessment of the response of regeneration to climate. Therefore, we have taken the reference of Dawadi et al (2013) to know how the growth of Betula utilis is responding to climate and incorporated it in our discussion as their site is also a treeline close to our study area with similar climate. We tried our best to compile the relevant information and use them whenever appropriate.

Specific Comments:

Comment 1: Manuscript describes structure and dynamics of each of the two species considered. There is no, however, a deeper analysis of the differences on the autoecology and ecophysiology of the species, their shade tolerance and disturbance regime characteristics for example, that could explain the results obtained.

Authors Reply: There is a lack of references on the detailed autoecological and ecophysiological studies on the species selected for present study. We have incorporated information on the shade tolerance and disturbance regime where possible and relevant. Some information given by Shrestha et al (2007), Roder (2002) and Hughes et al (2009) in those aspects is added in discussion.

CPD
9, C3035–C3039, 2014

Comment 2: The tree ring chronology shown in Figure 5 more than “oscillating through time” (page 5953, line 4) seems to have several periods (1820-1860, 1860-1970, 1970-2000, 2000), where the chronology oscillates around different mean values. I suggest checking this characteristic using the Rodionov’s shifting technique

Authors Reply: Now we have checked the temporal growth situation of the A. spectabilis in the tree ring chronology by using Rodionov’s shifting technique(Rodionov 2004, 2006)(Pls see Fig. 5) and have incorporated the result in the revised manuscript.

Technical Corrections:

Comment 1: Last phrase of the abstract referred to further paleo studies is not necessary.

Authors Reply: Omitted as suggested.

Comment 2: Climatic trends from Chame meteorological station are not significant for precipitation or for temperature. I suggest to move section “Local climate scenario” to section 2.1 “Site conditions”.

Authors Reply: Thank you. Local climate scenario is now moved to section site condition as suggested.

Comment 3: Tree ring standard chronology of Abiesspectabilis (Figure 5) has enough sample replication only since 1820, with more than five radii. I suggest to start the graph at 1820 and to include the EPS line.

Authors Reply:The tree ring standard chronology of Abies spectabilis is now started at 1827 when it has enough sample replication with more than five radii. The EPS line as well as regime shift is also incorporated on Fig. 5.

Comment 4: No verification tests were provided for climate reconstruction analyses. I suggest to include some verification statistics and to discuss the quality of the reconstruction.

CPD
9, C3035–C3039, 2014

Authors Reply: Thank you for good suggestion. But, the available climatic data from local station covered only 30 years. So, we could not split it into calibration and verification half, and used all data for calibration period only. While testing verification statistics, calibration test pass statistical test of significance but verification could not performed due to insufficient data. Due to this limitation we have not much emphasized on this section and put all these reconstruction graph and statistics on supplementary section. Our message to the readers is that our chronology can be used for climate reconstruction provided that the availability of the climatic data of sufficient length to test both calibration and verification. Our reconstruction has some strength as calibration test pass statistical test.

Reference added:

Hughes, N. M., Johnson, D. M., Akhalkatsi, M., and Abdaladze, O. (2009): Characterizing Betulalitwinowii seedling microsites at the alpine-treelineecotone, central Greater Caucasus Mountains, Georgia„ Arctic, Antarctic, and Alpine Research, 41, 112–118, doi: 10.1657/1938-4246(08-021)[HUGHES]2.0.CO;2, 2009.

Roder, W., Gratzer, G., and Wangdi, K. (2002): Cattle grazing in the conifer forests of Bhutan, Mountain Research and Development 22, 368-374, doi:10.1659/0276-4741(2002)022[0368:CGITCF]2.0.CO;2, 2002.

Rodionov, S. N., 2004: A sequential algorithm for testing climate regime shifts. Geophys. Res. Lett., 31, L09204, doi: 10.1029/2004GL019448.

Rodionov 2006: The use of prewhitening in climate regime shift detection. Geophys. Res. Lett., 33, L12707, doi: 10.1029/2006GL025904.

Interactive comment on Clim. Past Discuss., 9, 5941, 2013.

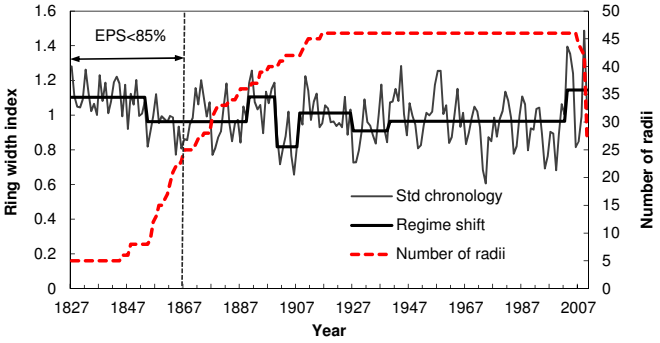

Fig. 1.

CPD
9, C3035–C3039, 2014