

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

### **Anonymous Referee #1**

Received and published: 29 November 2013

#### General Comments.

This manuscript is a valuable contribution to the study of high-elevation forest ecosystems, tree line dynamics and interspecific relationships. The study area is also an interesting geographic region to analyze climate-tree growth relationships for the two tree species considered, *Abies spectabilis* and *Betula utilis*, living above 3,700 m of elevation. Main objectives were to (i) ascertain the present position of upper forest, treeline, and species limits, (ii) characterize the stand structure and dynamics at the forest line and tree line, and (iii) analyze the response of tree growth and regeneration with climate change using both dendroecological and dendroclimatological techniques. This work presents interesting information on the first two topics, although the evidence supporting the conclusions on the response of tree growth and regeneration with cli-

C2756

mate change is arguable. 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.

#### Specific Comments.

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.

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 to check this characteristics using the Rodionov’s shifting technique (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).

#### Technical corrections.

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

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”.

Tree ring standard chronology of *Abies spectabilis* (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.

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

C2757

C2758