by cambium, radial cell expansion, and secondary wall thickening. Throughout the season, these processes occurred at different times but overlapped each other. In the conditions of Middle Siberia (Russia), the production of cells by cambium was observed in June and July. Radial diameter growth of earlywood tracheids occurred mainly in June, latewood tracheids in July. The development of secondary wall thickening of earlywood cells occurred in June-July, latewood ones in August and the first half of September. Hydrothermal conditions of these months considerably affected morphological parameters of these tracheids. Each of these processes reacted on environmental factors independently and had their own optimum temperatures, which is the cause of differences in cell wall biomass deposited in separate periods of the season. The data should be taken into consideration in the solution of the problem of productivity and quality of wood produced in different climate conditions.

**Fire impact on the structure and dynamic of *Prosopis caldenia* woodlands in the Argentinean pampas**. Bogino, S. (*State University of San Luis, Argentina; stellabogino@gmail.com*), Vivalda, F., Dussart de la Iglesia, E (*State University of La Pampa, Argentina; florvivalda@hotmail.com; estebangdussart@yahoo.fr*).

*Prosopis caldenia* (Burkart) woodlands dominate the driest part of the Argentinean Pampas covering more than 30 000 km$^2$. Fire is considered as the main natural disturbance factor affecting this area. The objective of this work was to detect the fire impact on the age structure and the radial growth of *P. caldenia* woodlands. Standard dendrochronological analysis of 70 cross sections was applied on samples from mature and renewal stands. Mature forest establishment occurred in the 1890s as a result of regrowth of post-fire stumps, but presently they are dominated by post-fire trees regenerated in the 1920s. Since the 1990s, regeneration has been dominated by *Schinus fasciculatus*. Renewals forests originated in the mid 1960s, with a massive recruitment of caldén trees in the 1980s as a result of fire. Since 1990, fire events have doubled. The analysis of variance determined significant differences between radial growth of the eldest and the youngest individuals of both stands. The eldest individuals of both stands showed similar growth rates. This work suggests that these woodlands dynamic is historically linked with fire events and their growth rates depend on woodland initial density.

**Site selection for dendroclimatological studies with *Bertholletia excelsa***. Mattos, P., Santos, A., Garrastazu, M., Muñoz-Braz, E., Tonini, H. (*EMBRAPA, Brazil; patricia.mattos@embrapa.br; andreiataborda@yahoo.com.br; marilice.garrastazu@embrapa.br; evaldo.braz@embrapa.br; helio.tonini@embrapa.br*).

In this study, the dendroclimatological potential of four sites selected for characterizing the genetic variability of *Bertholletia excelsa* in the state of Mato Grosso, with available samples (SISBIO-32932), was evaluated. *Bertholletia excelsa* is a long-lived species with wide distribution in the Amazon region and present visible annual growth rings. The geographic coordinates of the trees in the state of Mato Grosso, Brazil were obtained, and they were complemented with the coordinates available at CRIA site (Reference Center on Environmental Information), from different herbariums. The layers were obtained from the weather database Worldclim. The algorithm Environmental Distance was applied in the openModeller software. It was observed that in all four sites with samples available, the species occurrence potential was above 90%, suggesting that those sites will present growth rings with low sensitivity to climatic variables. However, at the sites at Alta Floresta and Itaúba counties, it was observed in adjacent areas where the *Bertholletia excelsa* occurrence potential was between 50 and 70%. As the pixel size to generate the information was about one kilometer, it is suggested that the samples from Alta Floresta and Itaúba may present potential for application in dendroclimatological studies in the Amazon region from Mato Grosso State.

**Responses of the radial growth of trees to climate change at the timberline in southeast Tibetan Plateau**. Shang, H. (*Chinese Academy of Forestry, China; shanghechina@126.com*).

Southeast Tibet is characterized by a cold and humid climate and a high diversity of forest types with the highest timberlines in the world. In order to examine the difference in climate response between the shade-tolerant and intolerant tree species, tree-ring width chronologies of Georgei fir (*Abies georgei var. smithii*) growing on the shady slope and *Sabina saltuaria* (Rehd. et Wils.) Cheng et W. T. Wang on the sunny slope at the timberline in the Sygera Mountains in southeast Tibet of China were developed. Both standard chronologies show significantly positive correlations with mean summer (June-August) temperature. The tree-ring width growth of *Sabina saltuaria* responded sensitively to recent warming observed in the instrumental record since 1961, with the last decade being the warmest period in the past 242 years, while tree-ring width of Georgei fir did not track the warming trend in southeast Tibet. In brief, at the timberline of Sygera Mountains, the growth of *Sabina saltuaria* responds more sensitively to climate change than that of Georgei fir. Respective biological characteristics and habitat adaptation of both the tree species might result in the differences, implying the significance of tree species selection in paleoclimatic reconstruction.

## C-10 Vegetation zone shifts in response to climate change

*Organizers:* Constance Millar (U.S. Forest Service) & Pavel Cudlin (Global Change Research Centre, Academy of Sciences of the Czech Republic)

**Can the shift of vegetation zones be thought of an efficient adaptation mechanism or just a wishful thinking?** Cudlin, P. (*Academy of Sciences of the Czech Republic, Czech Republic; pavelcu@usbe.cas.cz*), Hlásny, T. (*National Forest Centre, Slovakia; hlasny@nlcsk.org*), Matějka, K. (*IDS, Czech Republic; matejka@infodatasys.cz*), Treml, V. (*Charles University in Prague, Czech Republic; treml@natur.cuni.cz*), Macků, J. (*Forest Management Institute, Czech Republic; macku.jaromir@uhul.cz*), Marek, M. (*Global Change Research Centre, Czech Republic; marek.mv@czechglobe.cz*).

A growing body of evidence suggests that processes such as treeline upward expansion, drought induced retraction of species lower-range limit, and shift of vegetation zones may occur in response to global climate change. Vegetation shift needs to be considered as an inherent adaptation mechanism allowing species to track climatically suitable sites. Such shift can, however, be limited by a variety of nonclimatic factors such as nutrient availability, soil conditions, landscape fragmentation, or species-specific traits such as dispersal capacity, competition with ground vegetation, or presence of mycorrhizal fungal symbionts. Many