Submitted Abstract

ID IMC22-FSAbstr- 392

First Author First Name Last Name	 Momchil (1) Panayotov
Submitting Author First Name Last Name	 Momchil Panayotov
Correspondence	panayotov.m@ltu.bg
Co-Authors **>> E-Mails will be not listed**	Tsvetanov, Nickolay (1); Bebi, Peter (2)
Organisations	1: University of Forestry, Bulgaria 2: WSL Institute for Snow and Avalanche Research SLF
Country	Bulgaria
Region	Eastern Europe
Title	Avalanche Interactions With Endemic Pine Forests In The Pirin Mountains In Bulgaria.
Keywords	Avalanches, Tree-Rings, Dendrochronology, Bulgaria
Type	List Of Focus Session
Focus Session ID	25

Abstract

Pirin Mountains in Bulgaria are the refuge of some of the best-protected endemic Pinus peuce and Pinus heldreichii forests in the world. These species are famous for their longevity with many trees reaching more than 500 years. Due to the steep and long mountain slopes the forests are affected by avalanches and some of the trees keep record of past avalanche activity in their tree rings.

In our study we use combination of tree-ring analysis, satellite images and historical aerophotos to evaluate the effects of avalanches on forests in the Bunderitsa valley. We have collected tree-ring cores from affected trees on the borders between the forest and some of the large avalanche couloirs on the northwestern slope of Todorka peak and the eastern slope of Palashitsa and Vihren peaks thus collecting data on past avalanches with bigger sizes.

Our findings show that avalanches are the main shaping factor for the structure of forests in the valley followed by fires. Past avalanche activity has opened long-lasting avalanche tracks in the forests. About 56% of the potential forests (i.e. territories below treeline, outside of avalanche couloirs, streams, rock formations and screes) are strongly affected by avalanches. Of them 39% are in avalanche runout zones, 12% are in avalanche tracks in the forests and 48% are forests, which are periodically strongly affected by bigger avalanches. Comparisons with older aerophotos (1970s) showed that back then there were larger openings in the forests due to high frequency of avalanches in the very snowy 1950s and 1960s. Although recent avalanche activity has decreased, there are still years with larger events, which affect strongly forests. In addition, tourist development in vicinity has increased risk for human health and life due to avalanche accidents, including in forests.

By use of tree-ring analysis we reconstructed past avalanches that affected certain areas of the study region. The big couloirs are affected by smaller avalanches almost annually, while bigger avalanches have hit the neighboring forests almost every decade. By use of simulations with the RAMMS software and comparisons with recent records we evaluate the potential size and parameters of old avalanches. Our findings demonstrate that avalanches in the valley are of high importance and require more attention by authorities both as risk factor for human health and life and as natural disturbance shaping the forest structure and dynamics.