EGU21-14504
https://doi.org/10.5194/egusphere-egu21-14504
EGU General Assembly 2021

Tree-ring reconstruction of snow avalanches in Şureanu Mountains (Southern Carpathians, Romania)

Corina Todea and Olimpiu Pop
Laboratory of Dendrochronology, Faculty of Geography, Babeş-Bolyai University, Cluj-Napoca, Romania

Snow avalanches (SAs) are a widespread natural hazard in the Carpathians, damaging forests and threatening properties, tourism infrastructures and people. In Şureanu Mountains (Southern Carpathians), SA activity is not documented in the historical archives and consequently information regarding the SA frequency and their spatial extent is lacking. Along the forested avalanche paths, disturbed trees record selectively in their annual rings evidence of past events. Tree rings represent therefore a natural archive which can provide valuable information about the past SA activity. The aim of the present study is to reconstruct the occurrence and spatial extent of past SA activity with tree rings in Şureanu Mts. For this purpose, two avalanche paths adjacent to a ski area located in the central part of Şureanu Mts., have been investigated. Samples (cores and discs) collected from 121 and 141 Norway spruce (Picea abies (L.) Karst.) trees damaged by SAs along both paths have been analyzed. Tree-growth anomalies (e.g. scars, callus tissues, onset sequences of tangential rows of traumatic resin ducts, compression wood and growth suppression sequences) associated with the mechanical impact produced by SAs on trees were identified and used to reconstruct the SA history. Within the investigated paths, the reconstructed SA chronology spans the period of the last century. The minimum SA frequency and maximum extent reconstructed served to define the return periods within the two paths investigated. Tree-ring derived records provided the most consistent SA chronology in the study area, and can further be integrated in the avalanche hazard zoning assessment.