Reconstructing snow avalanches in the Southeastern Pyrenees

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A regional study of snow avalanche dynamics should involve the reconstruction of past avalanche events. By combining different approaches, information can be gathered, and thus the understanding of the process can be improved. In this study, dendrogeomorphology, nivometeorology, avalanche mapping, population inquiries and information from historical documents were used to reconstruct the recent past history of snow avalanches in the Southeastern Pyrenees. A previous overview of the events which took place during the winter avalanche crisis of 1995-1996 was done, and 6 avalanche paths were chosen throughout the territory. Dendrogeomorphological campaigns were carried out at every site, which consisted of a systematic sampling of trees along transects. The majority of the trees were mountain pines (*Pinus uncinata*), the most common species growing in the subalpine forest of this region. This species proved to be an appropriate archive for avalanche dating. The dendrogeomorphological work yielded the dates of several avalanche seasons during the twentieth century at every study site. Some of these avalanches were already known, but others had not been documented before. Evidence of past avalanches went back to 1850s', although uncertainty increased due to the lack of old living trees. The approximate extent of events was traced. In some cases, the former avalanche path map was rectified with the dendrochronological information from larger past events. With the delivered dates, meteorological and nivometeorological records from the specific winter seasons were investigated. Regarding snowpack conditions and meteorological synoptical situations, the most probable avalanche release episodes were found out. The geographical distribution of the studied avalanche paths helped to distinguish the extensive avalanche seasons: 1971-1972, 1995-1996, 2002-2003 from the more local.