



Dendrogeomorphic analysis of Flash Floods in a small ungauged mountain catchment (Central Spain)

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Flash floods represent one of the most significant natural hazards with serious death tolls and economic damage at a worldwide level in general and in Mediterranean mountain catchments in particular. In these environments, systematic data is often lacking and analyses have to be based on alternative approaches such as dendrogeomorphology. In this study, we focus on the identification of flash floods based on growth disturbances (GD) observed in 98 heavily affected Mediterranean pine trees (*Pinus pinaster* Ait.) located in or next to the torrential channel of the Pelayo River in the Spanish Central System. Flash floods are quite common in this catchment and are triggered by heavy storms, with high discharge and debris transport rates favoured by high stream gradients. Comparison of the anomalies in tree morphology and the position of the trees in the channel showed that the intensity of the disturbance clearly depends on geomorphology. The dating of past flash-flood events was based on the number and intensity of GD observed in the tree-ring series, and on the spatial distribution of affected trees along the torrent, thus allowing seven flash-flood events during the last ~50 years to be dated, namely in 1963, 1966, 1973, 1976, 1996, 2000, and 2005.