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Disturbed forest affects the hydrological processes in a small mountain catchment

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Hydrological response covered by disturbed forest catchments are in a focus of hydrologist last decades, mainly because the connection with widespread droughts. In this study, we compare two mountain catchments in Šumava Mts. (Czech Republic), both with small glacial lakes. Plešné lake catchment is characterised by disturbed forest by a bark beetle calamity. Contrary, Čertovo lake catchment features with undisturbed forest. Both catchments have comparable geological, climate setting and origin forest types. Stable isotopes of water were used for determining the hydrological pathways and water residence time. The results show that the state of the forest significantly affects the water balance of the catchments, but the mean residence time seems to be independent on this. On the other hand, even small changes in water residence time are important for the solutes and nutrients transport in the catchments. The lakes are fed by surface and subsurface water originating from liquid precipitation in and mostly snow in winter. The isotopic analysis helps to understand how much the snow cover affects the water balance during the hydrological year in two catchments with different forest stands.