

Climate Trends from Homogenized Snow and Precipitation Data in the Tatra Mountains

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The dynamics of snow cover characteristics varies from region to region, as well as for different altitudes. Available long-term daily snow cover depths (S), precipitation types (PT) and totals (P) from selected stations (above 700 m a.s.l.) in the Tatra Mountains are used to scrutinise the mountain climate at elevations, where the station network is sparse. Prior to this inspection, an attempt to homogenize P and S time series (the longest since 1921/22 winter season) is presented. Results from several homogeneity tests (using AnClim software) are discussed and confronted with metadata. The influence of inhomogeneities, which may lead to climatological misinterpretation, is evaluated.

Similar to some recent studies in the Alps, a critical altitude, where the negative trend for snow characteristics reverts to positive is analyzed and located. Generally increasing trends of both P and air temperature in analyzed area are the key factors that change the ratio of solid, mixed and liquid precipitation, changing thus the climate of snow. The negative trends of solid P become more pronounced at altitudes near the forest upper boundary (1000 - 1500 m a.s.l.), where the mixed and liquid P become prevalent. The reduction of snow in lower elevations of Slovakian mountains is slightly compensated with small increase of precipitation amounts.