



Alpine temperature changes: features and feedbacks

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Due to the environmental and socio-economic importance of mountainous regions, it is crucial to understand causes and consequences of climate change in those sensitive areas. This study aims for a better understanding of characteristics of temperature changes and related feedback mechanisms in mountainous regions. Therefore, a multi-variable dataset in daily resolution including information on minimum, mean and maximum air temperatures, snow depth, cloud cover, air humidity, global radiation, sunshine duration and evaporation from meteorological stations located in Switzerland and Germany covering an elevation range of over 3000 m is investigated. All data used originates from the data portal IDAweb of the national weather and climate service of Switzerland (MeteoSwiss). Moving average trends on a daily basis provide high resolution, yet stable signals, giving insight into the dynamics of climatic changes and possible feedback mechanisms. Investigations go along with the development of an interactive web app for easy access and understanding of conducted analyses. Among other features, the app enables station-based comparison of by the user selected climate variables, flexible adjustment of time frame, window width of moving averages and method used for the determination of trend magnitude and the examination of measurement sites with an interactive map. Preliminary results indicate that solar brightening, snow/ice albedo feedback as well as changes in cloud cover and water-vapor feedback mechanisms shape yearly cycles of temperature trends. The intensity and effect of individual mechanisms vary depending on the time of the day and year, elevation and other site-specific characteristics.