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Living with extreme weather events – perspectives from climatology, geomorphological analysis, chronicles and opinion polls

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The ongoing climate change debate focuses more and more on changing extreme events. Information on past events can be derived from a number of sources, such as instrumental data, residual impacts in the landscape, but also chronicles and people's memories. A project called "A Tale of Two Valleys" within the framework of the research program "proVision" allowed to study past extreme events in two inner-alpine valleys from the sources mentioned before. Instrumental climate time series provided information for the past 200 years, however great attention had to be given to the homogeneity of the series. To derive homogenized time series of selected climate change indices methods like HOCLIS and Vincent have been applied. Trend analyses of climate change indices inform about increase or decrease of extreme events.

Traces of major geomorphodynamic processes of the past (e.g. rockfalls, landslides, debris flows) which were triggered or affected by extreme weather events are still apparent in the landscape and could be evaluated by geomorphological analysis using remote sensing and field data.

Regional chronicles provided additional knowledge and covered longer periods back in time, however compared to meteorological time series they enclose a high degree of subjectivity and intermittent recordings cannot be obviated. Finally, questionnaires and oral history complemented our picture of past extreme weather events. People were differently affected and have different memories of it. The joint analyses of these four data sources showed agreement to some extent, however also showed some reasonable differences: meteorological data are point measurements only with a sometimes too coarse temporal resolution. Due to land-use changes and improved constructional measures the impact of an extreme meteorological event may be different today compared to earlier times.