

Title:

Downscaling approaches for climate model projections in complex terrain - from snow cover duration to meteorology

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Abstract:

Deriving high-resolved climate information in complex mountainous terrain is challenging because of limited observations and high spatial and temporal variability. Recent advances in the availability and quality of different observational (in-situ, remote sensing) and model (climate, reanalysis) data sets, however, offer opportunities to address this challenge by using statistical and (semi-)physical approaches. Here we present (a) past experiences of downscaling of snow cover duration and (b) future plans for comparing different downscaling methodologies. Regarding snow cover duration (a), we applied a statistical topography-based downscaling using long-term earth observation and regional climate model projections and compared this to a physical based approach. Critical issues revolve around scale mismatches and the propagation of uncertainties along the modeling chain. Regarding (b), a research plan will be presented, which aims to evaluate different downscaling approaches (deterministic, stochastic, (semi-)physical) in their applicability over complex mountain terrain in a region of the Southern Alps, while taking into account observational uncertainty.