



Ground temperature regime and periglacial dynamics in three different sites from the summit area in Sierra Nevada (southern Spain) from 2006 to 2012

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Ground temperatures and its control on snow cover are crucial factors conditioning the activity of current periglacial processes in the highest lands of Sierra Nevada (Bétique Range, Iberian Peninsula).

We present summary results of the monitoring period from September 2006 to August 2012 in three sites with contrasting topography, aspect and snow cover. Temperatures loggers have recorded data at 2 hours time lapse at: a) Veleta glacial cirque, an environment with marginal permafrost and a small active rock glacier in it (3107 m asl), b) the flat summit plateau of Collado de los Machos (3297 m) characterized by the existence of inactive sorted circles with scarce snow cover, and c) the southern cirque of Rio Seco, an area with moderate snow cover and widespread solifluction lobes (3105 m).

We discuss the periglacial activity in the three study sites in relation with ground temperatures. Results show evidence of the decisive control played by snow cover (duration and thickness) in the thermal regime of the ground (rhythm, depth and intensity of freezing). Only the site in the Veleta cirque has revealed the existence of permafrost, which is inexistent at the summit plateaus and southern cirques. The freezing and thawing of the ground depends substantially on the geographical characteristics of the sites, although a common pattern is detected: the thawing occurs more rapidly than the freezing and the number of freeze-thaw cycles in air temperatures is substantially higher than in ground temperatures.