



## **Spatial and morphometrical approach to solifluction lobes in Sierra Nevada**

**M. Oliva** (1), L. Schulte (1) & A. Gómez Ortiz (1)

University of Barcelona

The Sierra Nevada massif (Mulhacén, 3.478 m.) is a semiarid Mediterranean massif located in the southern Iberian Peninsula with many solifluction lobes concentrated in the headwaters of the highest cirques, especially widespread are in San Juan and Rio Seco, north and south exposed valleys, at heights of 2.500-3.000 meters.

A detailed morphometrical analysis of more than two hundred lobes has been carried out in these valleys considering parameters such as altitude, slope, orientation, typology, vegetal cover, length, width and frontal height for each lobe. We have mapped and classified lobes according to their morphometrical and pedological characteristics (MATSUOKA, 2005; HUGENHOLTZ & LEWKOWICZ, 2002): stone-banked lobes (STL), low solifluction lobes (LSL), high solifluction lobes (HSL), solifluction terrassettes (ST), stone-mantled lobes (MSS), turf-mantled lobes (MST), block (STL block) and mudflow-affected solifluction lobes (MSL). Statistical analysis show that 72% are covered with peat and 28% are mostly not vegetated. Vegetation cover is mostly controlled by slope and altitude ( $r=-0.70$ ;  $r=-0.60$ ): the higher and the steeper solifluction lobes are, the sparser vegetation cover they will have. Length and width of lobes present good correlations with slope ( $r=0.63$ ;  $r=0.54$ ) and total surface is mainly controlled by altitude ( $r=-0.72$ ), slope ( $r=0.63$ ) and vegetation cover ( $r=0.46$ ).

Nowadays solifluction activity in Sierra Nevada is inactive to weakly active. Thermal and topographic monitoring of solifluction lobes suggests that current environmental conditions are not colder and/or wetter enough to promote solifluction in this massif; only some lobes near water channels and near late-lying snow patches show small displacements, in all cases less than 0,5 cm/year. Peat-topped lobes also tend to show

lower values than those with less vegetation.