

## **The study of marginal snowpacks: interest and difficulty**

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A marginal snowpack is a recent concept that refers to relatively shallow and temporary snow cover but with still relevant environmental and socioeconomic roles. This type of snowpack occupies large regions of the World in the transition areas between persistent seasonal and ephemeral snowpacks and is very common in Mediterranean climate zones. Ongoing climate warming will likely result in large areas currently dominated by persistent snowpacks transitioning into marginal snowpacks, while current marginal snowpacks are threatened to shift to ephemeral snow covers. Therefore, marginal snowpacks and marginal-to-ephemeral transitional states are likely to become more frequent and widespread in the near future. However, most of the modelling and monitoring tools of snow have been developed in areas of well-developed snowpacks. There is still a lack of accurate observation systems and specific parametrizations to deal with the highly spatially dynamic and interannually variable marginal snowpacks. Their study and modelling is complicated by their frequent patchy nature and typical coexistence with shrubs and forests, an interaction that has rarely been studied.

Facing these challenges, this presentation shows different approaches to properly define, identify and map marginal snowpacks at different spatial scales. It also provides evidence of their complex spatial distribution and their interaction with forests and shrubs, and provide clues on how to improve the scientific capabilities to monitor and to model marginal snowpacks, and to assess their hydrological and environmental relevance.