

>> **SYNTHESIZE** MOUNTAINS OF KNOWLEDGE <<

Submitted Abstract

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Abstract

Alpine skiing is a key sector for the economy of French mountain regions. Snowmaking has become the main strategy to adapt to the interannual variability of snow cover and is considered as an adaptation strategy to the declining trend in snowfall in order to address climate change issues (Steiger et al, 2017). This practice is regularly criticized because of the large volumes of water used. While most studies focused on the role of snow production on the snowpack reliability, few studies have focused on the evolution of water needs. However, many authors highlight the need to better understand the risks of water use conflicts in the mountains (Reynard et al 2001, 2014, 2020; Beniston et al., 2013). In this work, we highlight the determinants of water withdrawals in ski resorts. We used a mixed qualitative/quantitative approach. First, semi-directive interviews feed our theoretical reflexions. Then an empirical analysis using econometrics methods is conducted using an original panel dataset giving information on water withdrawals of about thirty ski resorts in the French Alps over 7 years coupled with financial, meteorological and ski area characteristics data. Different estimators are used to measure the sign, intensity and significance of several factors in determining water withdrawals, such as natural snow cover conditions, the construction of new reservoirs or the altitude of ski areas. The results allow us to better identify the factors that explain the water requirements for snow production in ski resorts, and to make more accurate projections. They feed into ongoing discussions to ensure that current socio-economic decisions do not lead to future water use conflicts in mountain socio-ecosystems. This will only be the case if the availability of water resources is sufficient to satisfy the various needs, and this work addresses one of them.