



## **High and dry: are oceanic-alpine ecosystems resilient to summer drought?**

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Oceanic-alpine ecosystems in the Scottish Highlands are potentially among the most carbon rich habitats globally, with snowbeds being particularly large stores of old carbon. Spring snow cover extent in the northern hemisphere has declined over recent decades and is expected to decline by up to a further 25% by 2100. Potentially this will reduce melt water input to snowbeds during summer, while dry periods between rain events are also expected to increase, raising the risk of summer drought. Snow cover has greater sensitivity to warming at lower than higher elevations. Low-middle oceanic-alpine ecosystems, such as those in Scotland, already experiencing variable snow cover year to year, are therefore likely to be more vulnerable to climate warming than higher elevation mountain systems. We compared the resistance and resilience of snowbed and non-snowbed communities to summer drought, hypothesising snowbeds would be less resistant and resilient to drought than *Racomitrium* heath communities. Here we present ecosystem respiration fluxes from snowbed and *Racomitrium* heath mesocosms from a 37-day drought experiment, and subsequent recovery phase. Ecosystem respiration decreased under drought from both the snowbed and *Racomitrium* heath, and returned quickly to control levels upon rewetting. These alpine ecosystems are sensitive to summer drought, and although they were not resistant, these ecosystems were resilient to one drought event.