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The impact of simulated climate change on soil microbial community structure

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Long term experiments are essential to study the effects of climate change on biogeochemical processes and ecological properties. Predicting the impact of climate change on high carbon soils is particularly important as these can release the most carbon into the atmosphere and represent a potential positive feedback. The Clocaenog experiment in North Wales has studied the impact of artificial drought and warming upon an upland heathland for nearly twenty years. Over this time there have been only some changes in plant structure but there have been changes in soil hydrology and respiration. Specifically, over the course of the experiment there has been a state shift in soil moisture, triggered by an external drought event.
The observed changes in soil moisture and respiration have only weak links to changes in aboveground plant communities yet may link to changes to belowground communities. This work focuses on community characterisation of the soil bacteria and fungi using DNA sequencing of the 16S and ITS gene regions. We have the opportunity to compare community composition from two time points within the experiment, four and eighteen years after establishment. This allows us to examine the soil before and after the state shift in soil moisture to find out if the change in water dynamics is associated with a change in soil microbial community structure. We shall present preliminary results exploring differences in composition across the drought, warming and control treatments within the two different time periods.