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The potential impact of climate change on linkages between above and below ground communities in low diversity ecosystems in extreme environments

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ABSTRACT

There is growing evidence that ecosystem function depend on biodiversity. For example, experimental studies with different number of plant species show that microbial biomass, fungal abundance and N mineralisation rates increase with increasing plant diversity. Global warming is expected to have major impacts on ecosystems in future, influencing biodiversity in a wide range of ecosystems. Specifically, low diversity ecosystems in extreme environments are thought to be more vulnerable to global change than ecosystem with higher diversity, at the same time they have received less attention than ecosystems with higher diversity. At present, there are only a few long-climate change studies that have incorporated diversity and richness based on species level data for both above and below ground communities across several trophic levels. The impact on low diversity ecosystem in extreme environments is exemplified from preliminary results from two decades of experimental warming on the linkages between above and below ground communities across contrasting vegetation communities in the arctic. The study includes species level data on vascular plants, lichens, bryophytes, collembola, mites, fungi and bacteria.

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