



## **Long-term change in temperature and rainfall with altitude in Britain**

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This paper examines historic changes in temperature lapse rates and rainfall gradients between pairs of stations, lowland and upland, across Britain. Significant changes in temperature and rainfall gradients are observed but the pattern of change is spatially and seasonally variable. Links with changes in North Atlantic SSTs and the NAO are demonstrated. Temperature changes tended to be stronger in winter than in the summer and minima rose more than maxima in the uplands; in the lowlands changes were similar between minima and maxima. Most upland stations showed significant increases in rainfall totals in winter at rates greater than in the nearby lowlands. However, the variation in seasonal trends of lapse rates and rainfall gradients are large. The work showed that analysis of changes in annual temperature and rainfall gradients masked more important seasonal patterns in temperature and rainfall gradients with altitude. Hence there is concern about existing climate change projections and for downscaling of regional and global climate models. An extension of climate monitoring in the uplands would be useful in order to detail ongoing climate change in different upland areas.