Influences of alpine ecosystem responses to climate change on dew yields on Qinghai-Tibet Plateau, China

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Under climate change, the mechanisms of Alpine ecosystems and hydrological processes have undergone big changes. However, the dew yields dynamic caused by climate, as a part of hydrological processes, have not been taken into consideration in cold frost areas. Climate warming on the Qinghai-Tibet Plateau, caused by the impacts of greenhouse gases and Human activities, has resulted in changes of dew yields in the Alpine meadow ecosystems. This paper explores the potential implications of climate change on the dew yields on Qinghai-Tibet Plateau. Passive dew collection experiments were initiated during 2008-2010 in the sampled plots, which were measured by using micro-lysimeters. Meteorological information was also collected by utilizing the weather station. Through the analysis, it is found that the dew yields are very sensitivity in response to global warming. Based on regression analysis, the relationship between the temperature, air humidity and dew yields are analysed. It is found that: the dew yields increase with the raise of temperature, and decrease with the decline of temperature; in certain extent, dew yields have negative correlation with air humidity. Dew yields increase with the decrease of air humidity, and decrease with the increase of air humidity. Under same climatic condition, the dew yields will decrease with the degradation of Alpine meadow. The dew yields model was been established by using two variables of temperature and air humidity. It is predicted that the dew yields in this area will almost increase by simulation of three climate models (GFDL/CM2.0, CNRM/CM3 and INM/CM3.0).