Drought legacy effects on vegetation growth in Yunnan Province, China

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Climate change is leading to significant changes in the intensity and frequency of drought events, and the key processes of terrestrial ecosystems are directly affected by the uncertainty of extreme climate events. In 2009-2010, Southwest China suffered a once-in-a-hundred-years extreme drought, but the response of vegetation to this drought event on a long-term scale is still unclear. Using multi-year moderate resolution imaging spectrometer (MODIS) normalized difference vegetation index (NDVI) data and meteorological data, the duration of legacy effect of 2009-2010 extreme drought in Yunnan Province were studied and the response difference of diverse vegetation types were analyzed. The results showed that 1) The inhibition of vegetation growth occurred about 2 years in Yunnan Province after the extreme drought event, especially in areas where precipitation experienced a severe reduction. 2) The most sensitive area of vegetation response to drought events is around 2000 m above sea level, and the vegetation growth above 4000m is almost unaffected. 3) Compared with grassland and farmland, the inhibition of forest vegetation is stronger. This research revealed the negative impact of extreme drought on the growth of vegetation in Yunnan Province and provided a theoretical basis for coping with extreme drought and restoring vegetation effectively in the future.