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Spatiotemporal characteristics of drought and its impact to vegetation activities in China

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Abstract: Drought is considered as a phenomenon with an imbalance of moisture content payments. As the result of climate change with more prolonged precipitation deficit and abnormal high evaporation, drought is expected to increase in frequency and severity. However, the result from self-calibrating Palmer Drought Severity Index (scPDSI) calculated by different ways showed various performance. Here we show that drought in China experienced a slight increase during the 1948-2012 as the results of monthly 1° scPDSI data sets from J. Sheffield (-0.0295 m-1), the monthly 2.5° scPDSI data sets from Dai (-0.0008 m-1) and the monthly 2.5° scPDSI data sets , from NCAR(-0.0006 m-1), and trends from those different scPDSIs show similar spatial patterns in China. The Central China, Northeast, North China, East China and South China have significant drier trend, while the Southwest and Northwest dry more slightly, because almost half area of this two regions such as Qinghai-Tibet Plateau became wetter in last decades. Meanwhile, the vegetation activities express differently because of vegetation types and dry-wet pattern. Vegetation activities in Northeast experienced a significant decrease (-0.0295 yr-1) between 1992-2005, where the land cover is dominated by wet forests and meadow grasslands. the result investigated by land use and land cover change show that the forest decreased drastically in this region, that maybe caused by the serious trend of drought.

Key words: scPDSI, drought, trend, vegetation activity, LUCC