



## Evaluation of ecosystem resilience to drought based on drought intensity and recovery time

**Ying Yao**

Beijing Normal University, China (3374945681@qq.com)

Drought is one of the most complex hydrological and climate disasters, causing damage to ecosystem structure and function. Ecosystem resilience is considered a key concept for understanding and describing the response of ecosystems to drought. Recovery time, as an important measure of resilience, has been widely used to assess ecosystem resilience to drought, but there is a deficiency in distinguishing the difference in recovery time under various drought intensities. On the basis of the existing assessment of drought resilience based on recovery time, we defined a new resilience indicator using an exponentially fitted curve to characterize the relationship between drought intensity and the corresponding recovery time, and the resilience was quantified by the curve area. Resistance represents the capacity of ecosystems to remain stable during droughts, and we quantified the resistance indicator by the ratio of the frequency of no vegetation loss during drought to drought frequencies. Our results showed that the ecosystem resilience to drought increased from arid to sub-humid regions in China's dryland, and resistance was the lowest in the semiarid region. There was a trade-off between resilience and resistance: grassland had higher resilience and lower resistance than forestland. Drought memory contributed to the high resilience in the case of high drought frequency. These findings enriched the identification of the resilience of ecosystems to drought and the relationship between resilience and resistance and drought frequency in drylands.