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# Global-scale Changes in Vegetation Resilience Mapped with Satellite Data

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It is theorized that the resilience of natural ecosystems – their ability to resist and recover from external perturbations – can be estimated from their natural variability. We test this hypothesis using a global set of recovery rates from large disturbances derived from satellite vegetation data, and find that the expected theoretical relationships between these empirical recovery rates and the lag-1 autocorrelation and variance indeed hold approximately. The spatial pattern of global vegetation resilience reveals a strong link to both precipitation availability and variability, implying that water plays a first-order role in controlling the resilience of global vegetation.

The resilience of vegetation is not, however, static – global changes in temperature, precipitation, and anthropogenic influence will all impact the ability of ecosystems to adapt to and recover from disturbances. We investigate the global spatial and temporal patterns of changes in resilience using the empirically confirmed metrics – lag-1 autocorrelation and variance – and find spatially heterogeneous long-term (1980s-) trends; recent trends (2000s-) in vegetation resilience are strongly negative across land-cover types and climate zones.