



Vulnerability of global terrestrial ecosystem to climate change

Delong Li

Peking University, College of Urban and Environmental Sciences, Beijing, China (dlli@pku.edu.cn)

Climate change is believed to have far-reaching impacts on ecosystems. Current approaches to quantify such impacts focus on measuring exposure to climatic change and largely ignore the ecosystem resistance and resilience that may also affect vulnerability outcomes. Here we assess the relative vulnerability of global terrestrial ecosystems to short climate variability by simultaneously integrating exposure, sensitivity and resilience at high spatial resolution (0.05°). Results show that vulnerable areas are mainly distributed in plain regions, and that deserts and xeric shrublands are most vulnerable within different biomes. Although the global vulnerability pattern is mainly determined by exposure, ecosystem sensitivity and resilience enlarge or alleviate the external climate pressure at local regions. Intact ecosystems exhibit low sensitivity and high resilience, which may provide best defence against climate change. Integrating all three aspects of vulnerability may offer more comprehensive and spatially explicit adaptation strategies for reducing climate change impacts on terrestrial ecosystems.