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Measuring forest resilience and exploring tipping point behavior

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Forests provide an important ecological service by partially balancing the global carbon budget, sequestering about one quarter of anthropogenic emissions (2.4 GT C per year). However, several forest biomes are subject to increasing stress and tree mortality due to invasive pests, drought and fire and these appear to be exacerbated by climate change. A question arising for forest managers and policy makers is how to anticipate and deal with the acceleration of forest stress and mortality with on-going warming climate. To provide a baseline to which anticipated changes may be compared. We will attempt to answer the following questions: (1) how can we quantify and measure forest resilience to climate related stresses? (2) what trends or patterns in climate are indicative of sufficient stress as to push forests past a key control to forest tipping point leading to a change in the type of ecosystem? and (3) can we define such tipping point behaviors of forests? We have explored these questions by using tree-ring data, remote sensing images, eddy flux tower data and nonlinear stability theory. Here we report some initial results along with the pilot-studies.

Biography

Chuixiang Yi has served as an Associate Professor at Beijing Normal University, China. He has accumulated 10 years of Post-doctoral research experiences in the USA across many campuses, including UC, Berkeley, University of Minnesota, Pennsylvania State University, and University of Colorado. He is presently an Associate Professor at Queens College, City University of New York. He is a Micrometeorologist and Theoretical Modeler studying how climate change affects the carbon cycle and ultimately how these changes to the carbon cycle may alter our environment and further alter our climate in the future.

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