

## Vortragsankündigung - Talk Announcement

3. Juli, 14:00 Uhr, Forst-Fakultät, Büsgenweg 4, Raum 4.3

# **Desertification pathways induced by rapid vegetation transformations: from shrub encroachment to exotic grass invasions in North American deserts**

Prof. Sujith Ravi



*Department of Earth and Environmental Science,  
Temple University, Philadelphia, PA, USA*

Vegetation patterns and transitions in drylands, such as shrub encroachment and grass invasions, are often sustained by positive feedbacks between ecosystem states and environmental conditions (e.g., sediment–vegetation interactions) or disturbances (e.g., fire, grazing), operating across scales from patches to landscapes. Drawing on a decade of research at shrub–grass ecotones in North American deserts, we identify internal feedback mechanisms—such as those involving soil moisture, microclimate, and nutrient dynamics—that reinforce shrub-dominated states, and demonstrate how these are altered by prescribed fire and grazing management. We hypothesize that similar feedbacks underlie transitions from native shrublands to invasive grasslands in other desert systems, such as the Sonoran Desert, although the ecological consequences may differ. Our findings suggest that both spatial heterogeneity, associated with shrub encroachment, and spatial homogenization, associated with grass invasions, can drive land degradation, depending on plant functional traits and feedback dynamics. These processes underscore the critical role of vegetation–sediment interactions in shaping pattern formation, state transitions, desertification, and the long-term stability of arid landscapes.