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Multi-use solar landscapes:

Synergies and tradeoffs

Date: 10 July 2025
Time: 11:00
Location: Room T
Speaker: Prof. Sujith Ravi, Temple University, USA (http://sites.temple.edu/ravi/)

Abstract

Colocating solar photovoltaics with crops or native vegetation (agrivoltaics or ecovoltaics) could offer a sustainable solution to meeting growing food and energy demands. We studied the environmental and socio-economic co-benefits of co-deploying solar energy with crops, biofuels, grazing, and pollinator-friendly native vegetation at multiple sites around the world. Our results suggest that the combined effect of photovoltaic arrays and vegetation may homogenize soil moisture distribution and provide greater buffering of soil temperatures against extremes. Agrivoltaics allows farmers to develop and manage microclimates, which can help retain, improve, or expand agricultural production in some areas, particularly under changing climate conditions and irrigation water limitations. Furthermore, integrating native vegetation and managed grazing with solar infrastructure on agricultural lands with carbon debt can support climate mitigation, soil restoration, pollinator habitats, and additional income streams. However, these benefits are highly site-dependent. Variability in crop yields and the extent of vegetation-induced cooling effects on photovoltaic performance often depend on local climatic conditions and microclimatic shifts induced by solar arrays. Our findings provide foundational data to support site preservation, target site-specific co-benefits, and guide the development of climate-resilient and resource-conserving multi-use solar landscapes.

About the Speaker

Sujith Ravi is an environmental scientist interested in understanding the impacts of land use change and disturbances (natural and anthropogenic) on ecohydrological processes in terrestrial ecosystems. Dr. Ravi's research addresses the challenge of managing scarce soil and water resources in the context of multiple demands and multiple constraints associated with land use change and disturbances, the core challenge facing the future of world's food security and environmental quality. Dr. Ravi received his PhD in Environmental Sciences (Hydrology) from the University of Virginia. Prior to joining Temple University, he was a postdoctoral fellow at The Center on Food Security and the Environment at Stanford University. Dr. Ravi's work has been recognized with a faculty early career award (NSF-CAREER) from the US National Science Foundation, the American Geophysical Union (AGU) Editors Citation for Excellence in Refereeing, Distinguished Faculty Award for mentoring from Temple University, and Award for Excellence in Scholarship in the Sciences & Engineering from the University of Virginia. Dr. Ravi is currently serving as an Associate Editor of the Journal of Geophysical Research – Earth Surface (AGU) and Ecosphere (Ecological Society of America).

All are welcome!
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