BayCEER Kolloquium

Lectures in Ecology and Environmental Research

Summer 2020

UNIVERSITÄT BAYREUTH

Donnerstag/Thursday

09.07.2020

12pm live talk & discussion via ZOOM

online only!

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Physical constraints and biological controls of plant-environment interactions

Plants strongly shape the consequences of environmental change for water resources and climate. For example, without vegetation, intensified carbon dioxide (CO_2) emissions by fossil fuel burning would act on water resources only via the increased greenhouse effect and its consequences for precipitation and evaporative demand. However, plants respond directly to elevated atmospheric CO_2 concentrations (eCO_2), e.g. by reducing their stomatal conductance and/or increasing their CO_2 assimilation and growth rate. This has an additional effect of eCO_2 on our water resources by modified vegetation water use and on the climate by modified surface albedo, as well as modified latent and sensible heat fluxes. Such plant-environment interactions can further have profound impacts on carbon and nutrient cycling and carbon sequestration processes. Plant responses to environmental stimuli vary widely between species and growth environments and hence empirical approaches to predict these responses are fraught with major difficulties and uncertainty.

Here, I will present an optimality-based approach to predict plant and vegetation responses to environmental forcing, inspired by natural selection and the selective pressure to make the best out of the available resources. I will present some of the insights that can be gained from such an approach and then highlight the immense challenges of quantifying the cost-benefit trade-offs determining the optimal plant investment strategies into foliage, roots and water transport tissues.

Bayreuth Center of Ecology and Environmental Research

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The lectures are an inter-disciplinary platform for students, junior and senior scientists. Abstracts and further information: www.bayceer.uni-bayreuth.de/kolloquium/