

# 25<sup>th</sup> FEFCO

Forest Ecosystem Function Colloquium (FEFCO) は、地域や地球全体のレベルで森林生態系の機能とその持続的活用法を統合的に理解することを目的とし、研究者間の学術交流を推進します。

第25回森林生態系機能コロキウムは、ミシガン州立大学のScott C Stark博士にご講演いただきます。どなたでも参加できますので、多くの皆様のご参加をお待ちしております。京都大学農学研究科熱帯環境学研究室がホストを務めます。

25<sup>th</sup> FEFCO

2015/11/5 16:00 - 17:30

Faculty of Agriculture Main Building, S174  
Scott C Stark (Michigan State University)

Linking forest ecosystems and the climate:  
Scaling from local controls on structure and function to global  
ecoclimate teleconnections

Forest structure and dynamics are changing rapidly around the world as a consequence of climate-change-related pests, droughts and wildfires, and changing anthropogenic forest usage. It is critical to understand these changes at the process level (e.g. demographic performance of trees) to accurately predict subsequent forest responses, including impacts on carbon and water cycles, surface-atmosphere energy balance, and ecological trajectories. These impacts must also be linked with atmospheric circulation to understand local-through-global scale consequences for coupled vegetation-atmosphere dynamics and to predict future states of earth systems. I present on two interrelated research approaches to address these challenges:

First, I develop a remote sensing approach that uses three-dimensional canopy information to investigate forest dynamics over the full spectrum of forest demographic groups, including those that fall primarily in the shade of larger trees. I show that forest structure (e.g., size distributions) and dynamics can be retrieved from LiDAR remote sensing by accounting for tree architecture over light environments. Second, I ask whether 'Ecoclimate Teleconnections' can link tree die-off in North America—via impacts on local climates and subsequently atmospheric circulation—with vegetation change in the Amazon and other regions around the world.

This work highlights the need to link detailed observations of ecological dynamics from a high-throughput remote sensing approach to earth systems models to understand the causes and consequences of forest disturbance in the Anthropocene.