

## **NGEE-Tropics Overview Abstract**

Tropical forests cycle more CO<sub>2</sub> and water than any other biome, and are critical to Earth's energy balance. Yet processes controlling tropical forest carbon cycling are not well established, and large uncertainties in observational estimates and Earth system model (ESM) projections of net carbon fluxes remain unresolved, contributing significant uncertainty to climate projections. Thus the overarching goal of NGEE-Tropics is to develop a predictive understanding of how tropical forest carbon balance and climate system feedbacks will respond to changing environmental drivers over the 21<sup>st</sup> Century. To accomplish this goal, NGEE-Tropics will develop a transformational, process-rich model framework where the evolution and feedbacks of tropical forests to a changing climate are modeled at the scale of a next generation ESM grid cell. Research in Phase 1 will develop improved understanding and model representation of key tropical forest processes including: responses to changing temperature, precipitation, and atmospheric CO<sub>2</sub>; disturbance and land-use change; and heterogeneity in belowground processes. Model development and measurement activities will be integrated at pilot study field sites. A data synthesis and management framework will be developed to build and provide data products via a community portal. Phase 1 will provide a foundation for research on pantropical forest interactions with climate for NGEE-Tropics Phases 2 and 3.