



NGEE Tropics

Next-Generation Ecosystem Experiments Tropics



What Is NGEE Tropics?

NGEE Tropics is a decadal, multi-institutional project to fill critical gaps in knowledge of tropical forest–climate system interactions. NGEE Tropics aims to transform Earth system models' depiction of tropical forests' response to changing environmental drivers on time-scales of hours to centuries, from tree leaves to entire canopies, and individual trees to entire regions.

Why Study Tropical Forests?

Tropical forests cover less than 7% of Earth's surface but exchange vast amounts of carbon dioxide, water, and energy with the atmosphere. They are one of the world's most important land-based carbon sinks, helping to regulate the Earth's climate. However, scientists are uncertain how tropical forests will respond to a warming climate and changing atmosphere.

Research Questions



How do forest composition and nutrients govern forest responses to elevated CO₂?



How will hot droughts and increased storm-driven wind disturbance lead to climate change feedbacks?



How will logging and burning of tropical forests affect their response to climate change?



Research Design

NGEE Tropics will deliver a state-of-the-art, process-rich tropical forest ecosystem model. Phases 1 and 2 of NGEE Tropics developed the Functionally Assembled Terrestrial Ecosystem Simulator (FATES), coupled it to DOE's Energy Exascale Earth System Model (E3SM), and collected data on tropical forest dynamics. Phase 3 continues to test the model across the tropics to understand tropical forest feedbacks to the climate system.



3 INTEGRATION
THEMES

YEARS
ACTIVE:

2015
TO
PRESENT



11
STUDY
LOCATIONS

Research Locations

Researchers and collaborators conduct intensive research activities for Phase 3 at various pantropical sites and three primary locations: Panama, the Amazon Basin, and Malaysia.



More Information

NGEE Tropics

ngee-tropics.lbl.gov



ESS Program

ess.science.energy.gov



Contacts

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