

Whole-ecosystem experimental manipulations of tropical forests

Abstract

Tropical forests are highly diverse systems involving extraordinary numbers of interactions between species, with each species responding in a different way to the abiotic environment. Understanding how these systems function and predicting how they respond to anthropogenic global change is extremely challenging. We argue for the necessity of 'whole-ecosystem' experimental manipulations, in which the entire ecosystem is targeted, either to reveal the functioning of the system in its natural state or to understand responses to anthropogenic impacts. We survey the current range of whole-ecosystem manipulations, which include those targeting weather and climate, nutrients, biotic interactions, human impacts, and habitat restoration. Finally we describe the unique challenges and opportunities presented by such projects and suggest directions for future experiments.