

## Nutrient limitation and the responses of the carbon dynamics in forest ecosystems to global change

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It is well known that net primary productivity and/or decomposition rate can be limited by nutrients when climate is mild. Particularly because phosphorus and nitrogen are directly involved in the carboxylation biochemical processes, the rate of carbon fixation in forest ecosystems can become lowered when the supply of these nutrients is low. The magnitude of the responses of forest ecosystems to global warming can be, thus, dependent on the strength of nutrient limitation. It is expected that the temperature dependency of the net primary productivity of a forest is low if the forest is strongly limited by nutrients. However, how/if such interactions of nutrients and temperature occur in natural forest ecosystems has not been elucidated well. In order to investigate such a research question, I and co-workers are comparing two altitudinal gradients (one phosphorus-impooverished and the other relatively phosphorus richer) on a humid tropical mountain. Our long-term observation indicates that trees adjust phosphorus-use efficiency when the demand for phosphorus co-varies with temperature and maintain net primary productivity despites the strong phosphorus limitation. Our results indicate that the temperature dependency of the net primary productivity under a strong nutrient limitation can be greater than expected earlier.

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