



Case Study: Tropical Forest Project

A project in Barro Colorado Nature Monument, Panama is using Skye's equipment to measure the effects of leaf litter on forest seedlings. Leaf litter undoubtedly plays an important role in the dynamics of tropical forest ecosystems.

Not only does the decomposition of leaf litter provide substantial amounts of nutrients for plant growth, the litter layer also acts as a protective cover for the forest floor by buffering changes in temperature and moisture, maintaining the soil structure and hindering erosion.

Despite the recognised importance of leaf litter in forest dynamics, large-scale litter manipulation studies, which are needed to quantify the role of the litter layer, are rare. The Gigante Litter Manipulation Project (GLIMP) was set-up on the Gigante peninsula, part of the Barro Colorado Nature Monument, in order to investigate the role of leaf litter in nutrient cycling in tropical forests. Fifteen 45-m x 45-m plots were set up in old-growth forest in 2000. There are three treatments with five replications: litter removed once a month (L-), litter added once a month (L+), and controls (CT).



Several experiments and long-term studies are being carried out in these plots, looking at the effect of the added litter on parameters such as soil respiration, root production and decomposition rates. A current experiment, using Skye DataHogs with integral light sensors, is investigating whether seedling growth is affected by litter manipulation; because light is the major resource limiting seedling growth in the understorey they need to measure light above the seedlings.

Three light measuring units are deployed per plot and rotated daily to determine the light received by each seedling in the understorey. One DataHog is kept in full sunlight to control for variations in irradiance due to cloud cover and time of day, so that all values can be comparable between days by expressing them as %full sunlight. The DataHogs have been collecting and storing data reliably since December 2006. There has not been any significant differences found in understorey light between litter treatments, suggesting that any differences in seedling growth can be attributed to differences in nutrient levels caused by differences in litter.

Equipment used

This study is using a DataHog2 datalogger with integral light sensors. All of our standard light sensors can be incorporated in the SDL5030 datalogger in this way. Please ask for more details.

Acknowledgements and Contacts

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