**Session:** [B009: Advances in Understanding and Predicting Forest Demography and Carbon in a Changing World](https://agu.confex.com/agu/agu24/prelim.cgi/Session/229276)

Or

B112: Tropical forests under a changing environment

**Title:** Sensitivity of tree growth to precipitation in seasonally dry tropical forests using long-term dendrometer band measurements

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# Abstract (2000 char, excluding spaces): (currently 1899)

Tropical tree woody growth has long-lasting effects on the terrestrial carbon pool due to long-residence times, but its sensitivity to ongoing global change remains less explored. Temperature and precipitation outside normal ranges that can lead to growth reductions that varies across species and individuals. Trees in seasonally dry forests have diverse allocation strategies and traits which can result in differential sensitivities to precipitation. At the extreme along a continuum of strategies, dry-season deciduousness influences species distributions and growth sensitivities to precipitation. Within species, exposure, size *per se* as well as the habitat-driven water availability can influence the precipitation sensitivity of tree growth.

Interannual growth sensitivity to climate in tropical trees is difficult to estimate reliably using standard methods like tree rings or plot inventories; only few species in the tropics make annual tree rings, and methods used in plot inventories have low precision to detect signals. We use 14 years of annual, high precision measurements of metal band dendrometers installed on over 2300 trees of over 150 species in a seasonally dry forest in Thailand to investigate a) the variation in precipitation sensitivity among species b) the contribution of dry season deciduousness to the precipitation sensitivity of a species and c) drivers of variation in precipitation sensitivity within species.

We identified two years of growth anomalies in the time series, consistent with precipitation anomalies and strong ENSO events. In these two events, median growth across all trees reduced by 50-75% from their long-term growth average calculated across the entire timeseries. Within these two years of growth anomalies, preliminary results show consistent variability among species, potentially associated with light and water use strategies. Within species, resistance showed slight differences with exposure, but directions of influence varied by species. The combined influences of these differences among and within species in precipitation sensitivity are expected to affect the carbon sequestration potential of tropical forests under a changing climate.