Seasonal dynamics of plant functional diversity in a temperate evergreen forest and tropical savanna woodland transitional zone

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Not much is known about how plant traits or functional diversity (FD) fluctuate within a growing season, as trait measurements typically occur during peak biomass and are assumed to be constant over time. This assumption introduces error to upscaled models of canopy characteristics and can result in misleading predictions of important functions such as carbon uptake. Examining FD over time will help us understand if and how plant communities strategically change not only average trait expression, but also variance of expression, seasonally and in response to environmental disturbance. It can also determine the dynamics of any existing relationships between traits and their variances over time. Vegetation samples were collected in the field every two weeks during the growing season in a temperate evergreen forest in the Netherlands from 2017-2018, and a tropical savanna woodland transitional zone in Ghana during 2018. Leaves were analyzed for multiple traits including water content, carbon, nitrogen, and chlorophyll. From these, functional diversity metrics were derived for each sample period. Spectra were also obtained from which vegetative traits were derived and compared to the sample-based results. We compare these dynamics among the two contrasting ecosystems; and for the field site in the Netherlands, we compare a non-drought year (2017) to a drought year (2018) to determine disturbance effects. Based on the spectral data, we discuss how these temporal findings can improve earth observation models.