



MADAGASCAR DISSERTATION/THESIS PROJECT

MA48 - Tree biodiversity and ecosystem function

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Trees in tropical forests are fundamental to key ecosystem processes such as primary production and evapotranspiration which can be measured by satellites. In Mariarano there is considerable spatial variability in these functions, as well as temporal variability from year to year. Some variation may be explained by abiotic factors such as soils, relief or landscape configuration. However, what is the relationship between tree biodiversity and ecosystem function? In this project, you would work with expert botanists to contribute to long-term monitoring of trees in 20m botanical plots. You might want to test hypotheses relating to species diversity, or you could also use our plant trait datasets to also calculate trait diversity metrics for forest plots. You may also wish to use hyperspectral remote sensing data to investigate the relationship between biodiversity and spectral diversity.

Suggested reading

*Randrianarison, Andry, et al. (2016), 'Linking historical land use to present vegetation and soil characteristics under slash-and-burn cultivation in Madagascar', *Appl. Veg. Sci.*, 19 (1), 40-52.

*Zaehring, Julie G, et al. (2016), 'Beyond deforestation monitoring in conservation hotspots: Analysing landscape mosaic dynamics in north-eastern Madagascar', *Appl. Geogr.*, 68 9-19.

Armstrong, Amanda, et al. (2018), 'Simulating Forest Dynamics of Lowland Rainforests in Eastern Madagascar', *Forests*, 9 (4),

Basham, Edmund W, et al. (2019), 'Distance-decay differs among vertical strata in a tropical rainforest', *J. Anim. Ecol.*, 88 (1), 114-24.

Dunham, Amy E, et al. (2018), 'Fruiting phenology is linked to rainfall variability in a tropical rain forest', *Biotropica*, 50 (3), 396-404.

Federman, Sarah, et al. (2018), 'Reconciling species diversity in a tropical plant Glade (Canarium, Burseraceae)', PLoS One, 13 (6),

Ghulam, Abduwasit (2014), 'Monitoring Tropical Forest Degradation in Betampona Nature Reserve, Madagascar Using Multisource Remote Sensing Data Fusion', IEEE J. Sel. Top. Appl. Earth Observ. Remote Sens., 7 (12), 4960-71.

Randriamalala, Josoa R, et al. (2019), 'Slow recovery of endangered xerophytic thickets vegetation after slash-and-burn cultivation in Madagascar', Biol. Conserv., 233 260-67.

Razafindratsima, Onja H, et al. (2018), 'Edge effects on components of diversity and above-ground biomass in a tropical rainforest', J. Appl. Ecol., 55 (2), 977-85.

Vieilledent, Ghislain, et al. (2018), 'Combining global tree cover loss data with historical national forest cover maps to look at six decades of deforestation and forest fragmentation in Madagascar', Biol. Conserv., 222 189-97.