# Editorial

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# Editorial: Women in tropical forests research 2022

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Editorial on the Research Topic
Women in tropical forests research 2022

*"Women and girls represent half of the world's population and, therefore, half of its potential. Gender equality is essential to achieve peaceful societies, with full human potential and sustainable development."—United Nations.*

Anthropogenic activities are driving significant transformations, with tropical forests playing an important role in mitigating the effects of climate change and safeguarding global biodiversity (e.g., Gibson et al., 2011; Pan et al., 2011; Griscom et al., 2020). Therefore, increasing our knowledge of ecosystem function, dynamics, and floristics of tropical forests is essential for understanding the global consequences of human impacts on these vital ecosystems. However, we know that representation of researchers in the ecological sciences is not equal across gender or geographic regions (Livingston et al., 2016; Maas et al., 2021), which has been shown to negatively impact the quality of science produced (Campbell et al., 2013). This is observable in the rates of publications (Salerno et al., 2019; Frances et al., 2020), visibility in textbooks (Damschen et al., 2005), and invitations for keynotes at international conferences (Farr et al., 2017). Despite this, women scientists have made significant contributions to the ecological sciences and continue to increase in prominence (Fox et al., 2018). Nevertheless, women in tropical forest research still need to overcome many personal and societal barriers (e.g., Langenheim, 1996), such as the practicalities of being a woman in the field (e.g., menstruation), persistent sexism, issues of harassment, and navigating the politics of research as a woman (Teller and Porcelli, 2016; Thornton et al., 2019).

In this Research Topic, we wanted to celebrate the outstanding contribution of women in tropical forest research to promote gender equality, increase the visibility of early career researchers, and champion female researchers from diverse geographies. We began inviting female researchers across our networks and tropical science-focused societies (e.g., Association for Tropical Biology and Conservation) in 2021. We may have had a limited reach due to COVID-related disruption to research activities at this time; however, we were impressed by the caliber and geographic representation of the submissions we received. The studies presented in this Research Topic (and summarized below) are all led and edited by women researchers, span the three main tropical continents, and use a variety of methods to study tropical forests in a changing world.

Tropical forests are often highlighted for their ability to store carbon (e.g., Pan et al., 2011; Griscom et al., 2020), which is reduced when converting old-growth forests to secondary forests. However, not incorporating below-ground components such as soil carbon and soil carbon efflux underestimates carbon losses following conversion. Raczka et al. monitored monthly soil C efflux, moisture, and temperature for 1 year for

2-ha old-growth and 70-year-old secondary-growth ForestGEO forest dynamic plots in Singapore. They found significant differences between the two plots for all three measured variables. The old-growth forest exhibited lower soil C efflux, higher soil moisture, and lower soil temperature, which were attributed to greater fine root production and canopy openness in the secondary forest plot. These findings suggest that impacts on the below-ground carbon balance of tropical forest systems from logging, and disturbance can persist even after decades of regrowth.

Many tropical forests are predicted to become more exposed to variability in water availability (Uribe et al., 2023). The response of forests to water availability impacts the functioning and dynamics of tropical forests and also influences the distribution of plant functional traits, further affecting forest resilience. The majority of previous studies have focused on the effects of precipitation, neglecting the contribution of groundwater resources accessible to roots. Using 25 1-ha plots in the Central Amazon region covering a gradient in temporal water table depth fluctuations, Costa et al. assessed whether changes in water table depth (WTD) were associated with changes in wood density and leaf traits. They found that trees exhibiting higher wood densities had more acquisitive leaf traits in areas experiencing higher WTD fluctuations, contrary to expectations. They theorized a non-linear relationship of WTD with functional traits, going from conservative leaf traits in areas with low WTD and excess water to acquisitive traits in intermediate WTD and back to more conservative traits in areas with a deep WTD and high climatic water deficit.

With changing climate conditions, the regeneration potential of montane tropical forests is a concern (Chapman et al., 2016). West African montane forests are known for their particularly harsh climatic conditions, with a relatively short rainy season of 6 months and a dry season exacerbated by 2–3 months of Saharan dust arriving during the Harmattan winds (Jenik and Hall, 1966). Working in a 20-ha forest dynamics plot in south-eastern Nigeria, Abiem et al. assessed the influence of abiotic and biotic factors on seedling survival. Over their 2-year study, they found that the key influences on seedling survival were slope and aspect, high conspecific adult densities, and shade tolerance. They did note an increasing success rate of liana species' seedling survival, suggesting an emerging dynamic that could drive changes in forest community composition.

Montane forests are also sites of high disturbance due to landslides. Freund and Silman produced a review of the ecological impacts of landslides on the Andes, a tropical biodiversity hotspot, proposing a new framework for a more systematic study of landslide dynamics using remote sensing. They argue that important successional dynamics are being missed that may be unique to this hotspot, due to inaccessibly steep landslide sites. They propose that landslides could be a valuable mechanism for tree migration upslope, clearing large areas of land with bare soil available for trees to colonize at a faster rate than demographic transitions. These dynamics could be observed by using unmanned aerial vehicles (UAVs) to assess the biodiversity of communities following landslide events, employing aerial or space-based spectroscopy to map plant functional diversity, and developing predictive models through deep learning to produce a "living landslide inventory" for the tropical Andes. This could be pivotal for observing and understanding the impacts of changing climate on this biodiversity hotspot.

This Research Topic emphasizes the ongoing and outstanding contributions of women to tropical research science, which we hope readers will enjoy and value.

## Author contributions

GH: Conceptualization, Writing – original draft, Writing – review & editing. AM: Conceptualization, Writing – original draft, Writing – review & editing.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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## Publisher's note

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