GLOBAL CHANGE ECOLOGY

Forests on the move

Proc. Natl Acad. Sci. USA **116**, 587–592 (2018).

Credit: JOHN KELLERMAN / Alamy Stock Photo

How will climate change impact forests, and is it already affecting their structure and function? To answer such questions, we need information about which environmental factors determine the patterns and processes of forest functional diversity. Daniel J. Wiczyński from the University of California, Los Angeles, and colleagues have analysed a global forest dataset to ascertain how environmental factors such as precipitation, temperature, solar radiation, wind speed and vapour pressure affect the distribution of key functional traits of forests, like tree height, wood density, seed mass, and leaf area and nutrient composition.

They found that functional diversity in forests tends to decrease as environmental conditions become harsher, such as along altitudinal and latitudinal gradients. Their results also show that temperature variability and vapour air pressure, rather than mean annual temperature and precipitation, are the main factors involved in the geographical distribution of plant traits,

as they control functional diversity and asymmetry in forests. Their analysis further points out that climate change is already shaping the structure of forest ecosystems, causing functional patterns to shift in parallel with regional shifts in climate.

Altitudinal and latitudinal shifts in forest composition as a result of global warming will have substantial consequences for ecosystem productivity and services, with major societal implications. The challenge now is to increase the spatiotemporal resolution of the data included in this study, particularly to regions where climate change is especially critical, to refine our understanding of forest functional trait distributions and evaluate forthcoming socioeconomic consequences of forest ecosystem shifts.

Abel Barral

Published online: 8 February 2019
<https://doi.org/10.1038/s41477-019-0374-3>