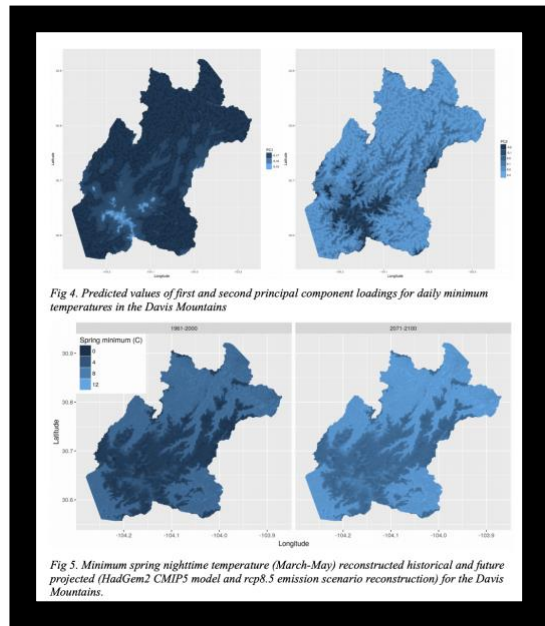


Predicting Sky Island Forest Vulnerability to Climate Change

2018



The Sky Island forests, located in the southwestern United States, makes up one of the most diverse temperate forest ecosystems in the world. Climate is a major factor in vegetation patterns across the Southwest and it is likely that this region will face a hotter climate in the future with significant drying in some seasons. Basic models of plant response to warming climates predict vegetation moving to cooler and wetter locations where conditions are more favorable for growth.

However, the process of species' responses to changes in temperature and water is much more complex than simply moving upslope. The daily temperature highs and lows vary both in relation to elevation and topography, and water availability

does not necessarily increase with elevation. Detailed measurements were taken across three mountain ranges in West Texas to identify key microclimate and topographical drivers that may influence vegetation movement. The data was then paired with measurements of physiological traits linked to drought tolerance to predict and pinpoint where suitable habitats for certain southwestern tree species may occur under future climate scenarios. Findings suggest a linkage between topography and the effects it has on air temperature and soil moisture such that the cooler, wetter locations may not always be at the highest elevations. Results suggest a topographically controlled microclimate might mitigate some habitat loss even under a warming climate. There were also findings that pointed towards how fire may interact with drought and species adaptation. For example, the post-fire Oaks resprouts produced more drought-susceptible tissue than did pre-fire adults; so there may be some levels of adaptation occurring with particular species in response to drought and fires.

For more information click [here](#).