

Tropical rainforest and mountain species may be threatened by global warming

October 9 2008

Contrary to conventional wisdom, tropical plant and animal species living in some of the warmest places on Earth may be threatened by global warming, according to an article by University of Connecticut Ecologist Robert K. Colwell and colleagues in this week's (Oct. 10) issue of *Science* magazine.

As Earth's climate has warmed in recent decades, the geographical ranges of well-studied bird, butterfly, and plant species in the US and Europe have moved northward, following the gradual northward shift of their familiar climates. Other studies have shown that species in the US and Europe have shifted to higher elevations, as temperature zones on mountains have moved upward.

In contrast, surprisingly little attention has been given to the effects of warming climate on tropical plants and animals. Colwell's article in *Science* magazine this week may change that.

The report points out that tropical climates have warmed too (more than 3/4 degrees Centigrade [1.4 degrees Fahrenheit] since 1975), and climate models predict an additional increase of more than 3 degrees Centigrade (nearly 6 degrees Fahrenheit) over the next century in the tropical forests of Central and South America. This much warming would shift temperature zones uphill about 600 m (nearly 2000 feet) in elevation above sea level. Tropical species, like those at higher latitudes, will likely be driven to higher elevations by these changes, following the climate zones they are suited for.

Working their way up the forested slopes of a Costa Rican volcano rising nearly 3000 m (10,000 ft) above the coastal plain, Colwell and colleagues have collected data on the altitudinal ranges of nearly 2000 species of plants and insects.

They report that about half these species have such narrow altitudinal ranges that a 600 m (2000 ft) uphill shift would move these species into territory completely new to them, beyond the upper limits of their current ranges on the mountainside. But many may be unable to shift—most mountainside forests in the tropics have been severely fragmented by human land use.

Meanwhile, tropical lowland rainforests, the warmest forests on Earth, face a challenge that has no parallel at higher latitudes. If the current occupants of the lowlands shift uphill, tracking their accustomed climate, there are few replacements waiting in the wings, currently living in even warmer places.

According to Colwell and colleagues, the threat of lowland attrition from warming climates faces about half the species they studied in Costa Rica—unless lowland species retain tolerances to higher temperatures developed millions of years ago when the world was much warmer.

Only further research can estimate the risk, but Colwell's report indicates that the impact of global climate change on some tropical rainforest and mountain species could be significant.

Source: University of Connecticut

Citation: Tropical rainforest and mountain species may be threatened by global warming (2008, October 9) retrieved 9 April 2024 from <https://phys.org/news/2008-10-tropical-rainforest->

mountain-species-threatened.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.