Biologist offers insight into future of the Amazon

July 3 2012

(Phys.org) -- The Amazon is at a crossroads and decisions made today could have significant impacts on the region's long-term viability, according to FIU biologist Kenneth Feeley.

The results of his latest research, "The relative importance of deforestation, precipitation change, and temperature sensitivity in determining the future distributions and diversity of Amazonian plant species," appear in the July issue of *Global Change Biology*.

The study examines how two major impacts — deforestation and global climate change — are affecting the Amazon's vastly diverse plant populations. Feeley and his colleagues examined what they believe to be

several different realistic scenarios for the future — doing nothing, mitigating warming and deforestation, and a variety of situations in between.

“It’s very hard to work in the tropics. There are so many species and most of them are rare,” said Feeley, who examined 3,000 plant species for this research. “There’s this huge lack of knowledge, so we wanted to look at the entire Amazon basin and what its future might be.”

The research incorporates the potential for plant species to respond to climate change. Possible adaptability includes requiring less water when concentrations of atmospheric carbon dioxide are high, tolerating or acclimating to elevate temperatures and shifting their distributions.

“Our results tell us there’s a huge range of possibilities for the Amazon. That’s good news, because the best-case scenario isn’t that bad,” Feeley said. “But the worst-case scenario is terrible. Most likely we will fall somewhere in the middle.”

Feeley’s best-case scenario presumes 2 degrees Celsius warming, South American governments, especially Brazil, taking measures to stem deforestation, and plant species being able to positively respond to climate change. In this scenario, he projects low rates of species extinction with some species potentially benefitting through an expansion in their range areas. His worst-case scenario — greater warming, business-as-usual rates of deforestation, and plant species generally being intolerant of changes in climate — would result in high rates of extinction and significant loss of species diversity.

“It’s a matter of which one we lean closer to. As a policy maker, these projections provide a guide to judge where we want to fall in this spectrum,” Feeley said. “Some things, like deforestation, are within society’s control. Some things are out of our control, such as how species

can respond to changes."

The research is designed to give benchmarks for policy makers, identify priorities for researchers and points of focus for conservationists.

"Dr. Feeley's work provides the sound science that policy makers will need to make informed decisions to help us conserve the Amazon Basin," said Mike Heithaus, director of FIU's School of Environment, Arts and Society. "As a society we face considerable challenges, and to overcome them we need this type of work that integrates multiple threats and provides realistic predictions of where we might end up based on our decisions."

A self-proclaimed realist, Feeley said he hopes his research will help others to realize climate change and deforestation must be part of the same conversation.

"It's not realistic to think you can totally stop either," Feeley said. "Climate change alone is going to lead massive changes to the Amazon. Deforestation alone is going to lead to massive changes. Put them together and we have a very bad scenario. When you cut up the landscape, you're reducing species' abilities to tolerate warming. I think we need to focus on slowing both."

While a realist, Feeley isn't without hope. His optimism is focused on convincing others to rethink how they live.

"We can't solve these problems without changing our lifestyles in very significant ways," he said. "We, as humans, have the strange ability to disconnect our actions from their long-term consequences, but we have been able to solve big problems in the past. We have to hope that we can come up with some great big solution to the challenges that face us now. I don't know what it will be, but it will have to be something new. We

need to think big, and we need to think fast."

More information: onlinelibrary.wiley.com/doi/10 … 012.02719.x/abstract

Provided by Florida International University

Citation: Biologist offers insight into future of the Amazon (2012, July 3) retrieved 27 April 2024 from https://phys.org/news/2012-07-biologist-insight-future-amazon.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.