

Researchers find 16,000 tree species in the Amazon

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Feeley poses on a tree canopy walkway in the Madre de Dios region in southeastern Peru in 2012.

After decades of research, scientists from around the world have quantified the number of individual trees and species scattered throughout the Amazon Basin.

Kenneth Feeley, professor in the FIU Department of Biological Sciences and co-author of the study, is one of 100 international researchers from 88 institutions who contributed to "Hyperdominance in the Amazonian Tree Flora," an article published in *Science* in October.

The study examined more than 1000 1-hectare plots, or nearly 4 square miles, in the Amazon Basin. The basin, located throughout parts of Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru and Venezuela, is the part of South America drained by the Amazon River. At 2.1 million square miles, the Amazon is the world's largest rainforest. Using extrapolations from data compiled for more than 10 years, researchers estimate there are nearly 390 billion individual trees of about 16,000 species.

Feeley, who has spent more than 15 years studying the ecology, biogeography and conservation of tropical plant and animal communities, provided collections of fruit, plant and leaf specimens, known as herbaria, to the study and analyzed and compared data.

"One of the most remarkable and important outcomes of this study is the revelation of how little we actually know about the Amazon" Feeley said. "This study attempts to answer incredibly basic questions: How many trees are there in the Amazon? How many species of tree are there? What are the most [common species](#)? How many rare species are there? To even attempt to answer these questions, we worked for many years to gather immense amounts of data from across the huge expanses of remote and uncharted territories."

A key finding of the study is that most of the individual trees in the Amazon come from just 227 super common, or "hyper-dominant" species, including Brazil nut, chocolate, rubber and acai berry. While the study suggests that hyper-dominants account for 50 percent of all carbon and ecosystem services in the Amazon, it also notes almost none of the

227 hyper-dominants are consistently common across the Amazon. Instead, most dominate a region or forest type, such as swamps or upland forests. According to Feeley, scientists can now focus their research efforts on the hyper-dominant species in order to have a better understanding of how the Amazon will respond to climate change and deforestation as a whole.

"While we now know that the Amazon is dominated by a handful of hyper-dominant species, we also now know there are thousands of extremely rare species hiding out there. It is these rare species, the 'dark biodiversity,' that account for most of the biodiversity the Amazon is famous for," Feeley said. "These species present an intractable problem for ecologists and conservation biologists. We have a lot more work to do if we ever hope to understand and protect [rare species](#), and hence the full diversity of the tropical rainforest."

Provided by Florida International University

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