

New study examines effects of drought in the Amazon

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Recent research surrounding the impact of drought in the Amazon has provided contradictory findings as to how tropical forests react to a drier and warmer climate. A new study published in the August 2 Early Edition of the *Proceedings of the National Academy of Sciences (PNAS)* examines the response of Amazon forests to variations in climate conditions, specifically considering how those changes may influence forest productivity. These findings provide possible context for why previous studies have offered varying conclusions.

Scientists from the Instituto de Pesquisa Ambiental da Amazonia, the University of Florida-Gainesville, and the Woods Hole Research Center co-authored the paper.

According to Paulo Brando, the paper's lead author, "Our study builds on field studies and remote sensing studies to demonstrate that relatively undisturbed Amazon forests are quite tolerant of seasonal [drought](#), unlike other types of vegetation and severely disturbed forests. Our study also points to several potential mechanisms controlling seasonal and inter-annual oscillations in vegetation productivity across the Amazon Basin. To date, discussions of these mechanisms have been largely lacking in the scientific debate about how Amazon forests may respond to [climate change](#)."

The study used a combination of remote sensing and field-based studies, including MODIS Enhanced Vegetation Index (EVI) data from the 2000-2008 dry seasons in the Amazon Basin. This was integrated with

[climate data](#) from 1996-2005 recorded at 280 meteorological stations. Statistical relationships between EVI and several variables were also analyzed for both the entire Amazon Basin and for an intensively studied site (Tapajos).

Scott Goetz, a co-author, explains, "This analysis is unique in that it captures, in great detail, how forest productivity varies with meteorological measurements, particularly during drought years. Our findings build upon earlier work but take those several steps further by actually making the link with climate and examining how forests respond by flushing new leaves."

In addition to contributing to the debate about vegetation vulnerability to drought, the authors report important patterns in climate across the [Amazon Basin](#) from 1996-2005. Precipitation decreased during the rainy season, while dry-season light availability increased. Given the importance of these changes to processes that permit forests to sequester carbon during drought conditions, the authors emphasize the need for better integration of field-based data and remote sensing studies.

This paper's release coincides with calls within the scientific community for a better understanding of how Amazonian forests and other tropical [forest](#) formations may respond to climate- and land-use related drought.

According to Daniel Nepstad, also a co-author, "Our study further demonstrates that the response of forests to drought is complex. It is premature to draw a big conclusion about the susceptibility of Amazon forests to drought from [remote sensing](#) data alone."

Provided by Woods Hole Research Center

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