

Scientists dispel myths, provide new insight into human impact on pre-Columbian Amazon River Basin

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Scientists travel along rivers in the Peruvian Amazon to look at environmental change. Credit: Crystal McMichael

A paper published this week in *Science* provides the most nuanced view to date of the small, shifting human populations in much of the Amazon before the arrival of Europeans. The research, which includes the first landscape-scale sampling of central and western Amazonia, finds that early inhabitants were concentrated near rivers and lakes but actually had little long-term impact on the outlying forests, as if they merely tiptoed around the land far from natural sources of water. In doing so, the new study overturns the currently popular idea that the Amazon was a cultural parkland in pre-Columbian times.

The [Amazon Basin](#) is one of Earth's areas of highest biodiversity.

Therefore, understanding how Amazonia was modified by humans in the past is important for conservation and understanding the [ecological processes](#) of tropical rainforests.

Researchers, at Florida Institute of Technology, the Smithsonian Institution, Wake Forest University and the University of Florida looked at how widespread [human](#) impacts were in Amazonia before the Europeans arrived. If the Pre-Columbian Amazon was a highly altered landscape, then most of the Amazon's current biodiversity could have come from human effects.

The research team, led by Florida Tech's Crystal McMichael and Mark Bush, retrieved 247 soil cores from 55 locations throughout the central and western Amazon, sampling sites that were likely disturbed by humans, like river banks and areas known from [archeological evidence](#) to have been occupied by people. They also collected cores farther away from rivers, where human impacts were unknown and used markers in the cores to track the histories of fire, vegetation and human alterations of the soil. The eastern Amazon has already been studied in detail.

McMichael, Bush, and their colleagues conclude that people in the central and western Amazon generally lived in small groups, with larger populations on some rivers.

"There is strong evidence of large settlements in eastern Amazonia, but our data point to different cultural adaptations in the central and western Amazon, which left vast areas with very little human imprint," said Bush.

They did not live in large settlements throughout the basin as was previously thought. Even sites of supposedly large settlements did not show evidence of high population densities and large-scale agriculture. All the signs point to smaller, mobile populations before Europeans

arrived. The impacts of these small populations were largely limited to river banks.

"The amazing biodiversity of the [Amazon](#) is not a byproduct of past human disturbance," said McMichael. "We also can't assume that these forests will be resilient to disturbance, because many have never been disturbed, or have only been lightly disturbed in the past."

Certainly there is no parallel in western Amazonia for the scale of modern disturbance that accompanies industrial agriculture, road construction, and the synergies of those disturbances with climate change."

Provided by Florida Institute of Technology

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