

## **'Pristine' Amazonian region hosted large, urban civilization, study finds**

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They aren't the lost cities early explorers sought fruitlessly to discover. But ancient settlements in the Amazon, now almost entirely obscured by tropical forest, were once large and complex enough to be considered "urban" as the term is commonly applied to both medieval European and ancient Greek communities.

So says a paper set to appear Friday in *Science* co-authored by anthropologists from the University of Florida and Brazil, and a member of the Kuikuro, an indigenous Amazonian people who are the descendants of the settlements' original inhabitants.

"If we look at your average medieval town or your average Greek polis, most are about the scale of those we find in this part of the Amazon," said Mike Heckenberger, a UF professor of anthropology and the lead author of the paper. "Only the ones we find are much more complicated in terms of their planning."

The paper also argues that the size and scale of the settlements in the southern Amazon in North Central Brazil means that what many scientists have considered virgin tropical forests are in fact heavily influenced by historic human activity. Not only that, but the settlements – consisting of networks of walled towns and smaller villages, each organized around a central plaza – suggest future solutions for supporting the indigenous population in Brazil's state of Mato Grosso and other regions of the Amazon, the paper says.

"Some of the practices that these folks hammered may provide alternative forms of understanding how to do low level sustainable development today," Heckenberger said.

Heckenberger and his colleagues first announced the discovery of the settlements in a 2003 Science paper. The largest date from around 1250 to 1650, when European colonists and the diseases they brought likely killed most of their inhabitants.

The communities are now almost entirely overgrown. But Heckenberger said that members of the Kuikuro, a Xinguano tribe that calls the region home, are adept at identifying telltale landscape features that reveal ancient activity. These include, for example, "dark earth" that indicate past human waste dumps or farming, concentrations of pottery shards and earthworks. Also assisted by satellite imagery and GPS technology, the researchers spent more than a decade uncovering and mapping the obscured communities.

The new paper reports that the settlements consisted of clusters of 150-acre towns and smaller villages organized in spread out "galactic" patterns.

None of the large towns was as large as the largest medieval or Greek towns. But as with those towns, the Amazonian ones were surrounded by large walls – in their case, composed of earthworks still extant today. Among other repeated features, each Amazonian settlement had an identical formal road, always oriented northeast to southwest in keeping with the mid-year summer solstice, connected to a central plaza.

The careful placement of the like-oriented settlements is indicative of the regional planning and political organization that are hallmarks of urban society, Heckenberger said.

"These are not cities, but this is urbanism, built around towns," he said.

The findings are important because they contradict long-held stereotypes about early Western versus early New World settlements that rest on the idea that "if you find it in Europe, it's a city. If you find it somewhere else, it has to be something else," Heckenberger said.

"They have quite remarkable planning and self-organization, more so than many classical examples of what people would call urbanism," he said.

But the research is also important because it means at least one area of "pristine" Amazon has a history of human activity. That could change not only how scientists assess the flora and fauna, but also how conservationists approach preserving the remains of forest so heavily cleared it is the world's largest soybean producing area. "This throws a wrench in all the models suggesting we are looking at primordial biodiversity," Heckenberger said.

Around the communities the scientists found dams and artificial ponds that indicate inhabitants farmed fish near their homes. They also found the remnants of open areas and large compost heaps suggesting widespread near-town cultivation.

Source: University of Florida

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