

Newly revealed Maya farming hotspots hold key to ancient culture

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Ancient Maya pyramid at Tikal, Guatemala.

(Phys.org) —BYU researchers have dug up new evidence from an ancient Maya city that may help solve the mystery of just how many people lived in the civilization.

Using [soil chemistry](#), combined with advanced remote sensing and satellite imagery, the researchers have pinpointed for the first time where Maya farmers in Tikal, Guatemala, carried out some of their most significant crop production.

The location of the prime farmland indicates that the Maya population at Tikal may have been much different than previously thought.

"Our soil analysis is finding that Mayas did not grow maize heavily on the hillsides, but rather along the borders of the low-lying wetlands called bajos," said BYU soil scientist Richard Terry. "Knowing where they grew corn gives us a clearer picture about their civilization unknown until now."

The finding in Guatemala comes at the same time separate researchers have discovered a lost Maya civilization in the Mexican jungle.

Terry and his team analyzed the [carbon isotope](#) signatures of 185 soil cores taken in and around Tikal. Combined with data from radar and [satellite imagery](#), the carbon signatures allowed researchers to create a model that maps the areas where the Maya planted – and didn't plant – corn.



Ancient Maya pyramids tower above the forest at Tikal, Guatemala, during a rain storm.

One of the most unexpected findings was the lack of maize residue in the fertile [upland soils](#), said coauthor David Webster, a professor of anthropology at Penn State. Archeologists have long believed the Maya used the hillsides primarily for corn (maize) agriculture, much like modern inhabitants of the region.

Relying primarily on the deep soil zones near the wetlands (called bajos) for maize production, as the research indicates, has significant bearing on the amount of people that could be supported. Experts currently estimate Tikal's population was between 30,000 and 62,000 inhabitants.

Next spring Terry and his team will pursue additional research in Tikal

to determine if the bajos themselves were used for maize agriculture.

"We've discovered an important piece of data that was missing in the equation to determine the size and scope of the Maya population," said BYU grad student Chris Balzotti, lead author of the study published in the *International Journal of Remote Sensing*. "Archeologists will be able to take our model and apply it to what they know to determine better population estimates."

Terry has led environmental science students to ancient Maya ruins annually for the past 15 years. Six years ago, research led by Terry used soil chemical residues to detect a large marketplace in a Maya city on the Yucatan Peninsula of Mexico. The findings were the first strong evidence that the ancient Maya had a market economy similar to societies today.

The latest round of research also suggests new information about how the ancient Maya managed their rainforests.

While some experts believe the forests were cleared for farming, and others believe they were left and crops were grown beneath the canopy, the model shows it was a combination of both: Portions of the forest were cleared while larger portions of the forest were left standing.

"Dirt analysis may not be as sexy as digging up a jade mask from a former Maya king, but now we can answer more questions about the regular people that made up this ancient civilization," Balzotti said.

Provided by Brigham Young University

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