

# Lasers reveal Maya war ruins

Archaeologists discover ancient fortifications that evoke a “palpable sense of fear.”



Far from being the peaceful farmers and priests they were once believed to be, the Maya fought bitter wars that culminated in bloody sacrifices.

BY TOM CLYNES

ARCHAEOLOGISTS GUIDED BY laser images of a remote region of northern Guatemala have discovered 20-foot-high walls, watchtowers, and other evidence that ancient Maya societies waged large-scale warfare over many years. The finds have upended long-established

impressions of a civilization that tamed the jungle and built thriving cities, then declined and disappeared beneath the dense tropical forest.

Among the most startling discoveries was a large fortress complex now called La Cuernavilla. Built on a steep ridge between the Maya cities of El Zotz and Tikal, the heavily fortified site included high walls, moats, watchtowers, and caches of round stones that likely served as ammunition for warriors' slings. It is the largest defensive system ever discovered in the region, "and possibly in all of the ancient Americas," says [Stephen Houston](#), a Brown University archaeologist and Maya scholar.

The presence of the Cuernavilla citadel and other newly identified structures built expressly for warfare suggests that conflict was large-scale and systematic, and a part of life throughout much of the ancient civilization's duration.

"This was surprising," says Houston, "because we had a tendency to romanticize Maya warfare as something that was largely ritualized and concentrated toward the end of the civilization. But the fortifications we're seeing now suggest an elevated level of conflict over centuries. Rulers were so deeply worried about defense that they felt the need to invest in all these hilltop fortifications. There is an almost palpable sense of fear in this landscape."

In February 2018, National Geographic broke the [story](#) of the [PACUNAM LiDAR Initiative](#), a sweeping aerial survey of some 800 square miles (2,100 square kilometers) of the [Maya Biosphere Reserve](#) in northern Guatemala. Using revolutionary laser technology, the survey revealed the long-hidden ruins of a sprawling pre-Columbian civilization that was far more complex and interconnected than most Maya specialists had supposed.

Guided by the new high-tech treasure maps, the LiDAR team deployed through the jungle over the past year to conduct hands-on investigations of more than a dozen of the most promising sites—most of which would have been imperceptible without LiDAR.

“You could walk over the top of a major ruin and miss it,” says [Thomas Garrison](#), an Ithaca College archaeologist who’s part of the PACUNAM project. “But LiDAR picks up the patterns and makes the features pop out with astounding clarity.”

Three-dimensional maps generated by the survey yielded surprises even at [Tikal](#), the largest and most extensively explored archaeological site in Guatemala. The ancient city was at least four times bigger than previously thought, and partly surrounded by a massive ditch and rampart stretching for miles.

Also revealed at Tikal were two large pyramids that had been presumed to be natural features until correctly identified by the new data. The larger of the pyramids is likely to be an important ceremonial structure, say researchers, and may contain the tomb of an influential king.

The new maps also identified two previously unknown settlements along an ancient elevated highway that leads north from the Maya site of [La Corona](#) toward the capital of the [Snake King dynasty](#), Calakmul (located in what is now Mexico). The discovery suggests that La Corona played a key role in establishing and spreading the influence of the Snake Kings into the lowland Maya region, which ultimately led to their conquering powerful Tikal in A.D. 562.

## MAPPING THE MAYA

### WORLD

Researchers using aerial Lidar sensing equipment targeted 10 parcels within Guatemala’s Maya Biosphere Reserve.

Their discoveries are revealing previously unknown areas of Maya cities.



## MAYA BIOSHPERE RESERVE



☐ Mayan cities

■ Targeted lidar zones

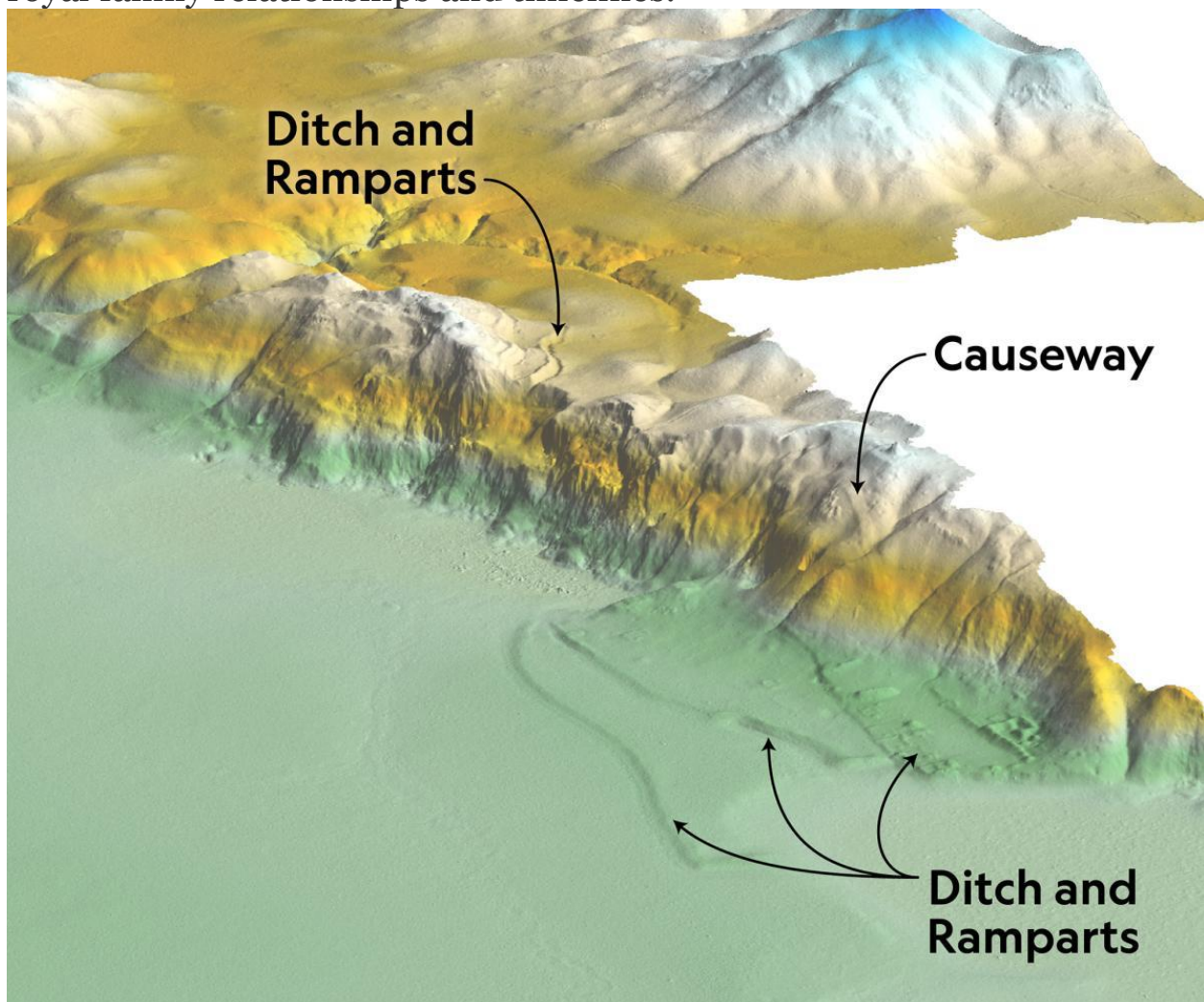
🌿 Current forest cover



Nearly 1,500 years old, a rare ritual altar discovered at La Corona depicts a ruler believed to have played a key role in the rise of a powerful Maya dynasty known as the Snake Kings.

“Deciphered hieroglyphs have helped us to understand much about the players in this Game of Thrones drama,” says Garrison. “Now LiDAR is now revealing the stage on which that drama unfolded.”

Archaeologists stress that LiDAR, for all its utility, will never see below the ground or yield direct dates of occupation. “We’ll still need to dig and hack our way through the jungle, but now we have a very accurate map to guide us,” says [Francisco Estrada-Belli](#), a Tulane University archaeologist and [National Geographic Explorer](#). Estrada-Belli’s excavations of royal tombs have enabled researchers to reconstruct royal family relationships and timelines.



The first phase of the LiDAR Initiative generated the largest data set ever obtained for archaeological research—but the project’s

collaborators and other researchers are already clamoring for more. ([Test your knowledge and take our ancient Maya quiz.](#))

A second phase of data collection should begin by the summer, according to [PACUNAM](#) director Marianne Hernandez. Researchers hope to eventually map the entire Maya Biosphere Reserve, part of a pre-Columbian settlement system that extended north to the Gulf Coast of Mexico.

“As we fill in more of the gaps, I think we’ll continue to realize that Maya civilization was as robust as some of those that are now considered to be the most important civilizations of antiquity,” says Hernandez. “Now we’re working on bringing in more collaborators and making what we’re doing scalable, so that we can multiply the benefits. This is a beginning, a doorway that opens to decades of further research.”