Lidar: Uncovering Lost Cities

Archaeological evidence suggests that the Amazon Rainforest may once have been home to numerous ancient civilizations. With the aid of lidar (light detection and ranging) equipment and technology, what’s left of these ancient civilizations is now re-emerging.

Recent aerial lidar surveys have shown that the Khmer region, which850 km2
ruled much of southeast Asia between the 6th and 12th centuries AD, was once home to some of the most densely populated and expansive cities, temples, and canals than previously thought.

The Mosquitia of today looks inhospitable, but lidar data show that pre-Columbian city “La Ciudad Blanca” in the jungles of Mosquitia, beneath a canopy of over 300 meters, is the largest urban settlement ever mapped. The remaining structures and terrain can be finely mapped in just a few hours.

The remains of the ancient Khmer city of Caracol, in the midst of dense forest, were visible above only the treetops. A Lidar survey revealed that Caracol was the largest pre-Columbian city in Mesoamerica from ~250 to 1000s C.E. Caracol was built on a solid stone foundation and covered an area of 9500 km2. The 2015 CARICA lidar study covered 1901 sq km2.

Lidar revealed a complex at the Citadel of El Pilar that differs from classic Maya centers—it spreads across 10,000 acres of dense jungle.

The Khmer Empire

Recent aerial lidar surveys have shown that the Khmer region, which stretches from southern Vietnam through Laos, Thailand, Cambodia, and as far as Java and Bali in Indonesia, once encompassed an area of 5,500,000 km2.

The Amazon basin

The Amazon rainforest, covering ~5.5 million km2, is a treasure trove of ancient sites and archeological sites. Since lidar survey was used to clear the forest canopy, revealing hidden, underlying infrastructure.

Early Khmer urban and agricultural settlements were composed of densely packed mud and thatch that disappeared into jungle over the centuries. As a result, almost nothing was left behind except invisible buried canals and roads.

Lidar data from Mosquitia have identified 100 new archaeological sites with religious and monumental architecture and rebuilding of the forest canopy.

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The Amazon today

The Amazon today has more than 60,000 km2 of terrain over 300 meters above sea level. It has 750,000 km2 of rivers and streams, 100,000 km2 of mangroves, and 300,000 km2 of swamps and backwaters. The Amazon is estimated to be 4,000 km2.

The Amazon survey

Recent lidar evidence suggests geophysical and cultural sites that were home to up to 10,000 inhabitants.

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Sources: Int’l J. Remote Sensing (1); http://angkorlidar.org; www.joseiriartearchaeology.net; http://anthropology.colostate.edu; (8-10); Opt. Photon. News 25

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