



## Member Spotlight

### AAAS Fellows Diane and Arlen Chase search for clues about Mayan mystery

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AAAS Fellows Diane and Arlen Chase in their archaeological laboratory at Caracol, Belize during the 2014 field season. (Photo: Courtesy of Diane and Arlen Chase)

A large and thriving Maya community all but vanished into the jungles of west central Belize more than 1,000 years ago. Anthropological archaeologists at the University of Central Florida, Arlen and Diane Chase, have spent their careers documenting this lost hub of civilization hoping to uncover insight into the lives of the people who lived there.

Among the tangled roots of this lush rainforest, Arlen and Diane have spent 30 years trying to uncover clues about the residents' daily life, leaders, complex social structures—and mysterious downfall. [[Read their blog.](#)]

For this husband and wife team, Caracol has become more than a career: It is a second home for the whole family from January through March. “We have three kids, they all went down with us from the time they were two months old,” said Arlen. “It’s a pretty neat thing to be going to sleep in the middle of the ruins,” added Diane.

At its peak, in about A.D. 650, the Mayan site of Caracol was home to more than 100,000 people. They constructed scores of large structures, from masonry tombs, to terraces, reservoirs, causeways, altars, and elaborate pyramids where their rulers were buried.

Theirs was among the most advanced civilizations in history. Their hieroglyphic writing had more than 800 signs, or glyphs, and their star-based calendar was one of the most accurate ever discovered. Their communities made enormous achievements in engineering, the arts, astronomy and mathematics.

“Caracol required incredible organization to maintain,” said Diane. “It was a huge city with road systems and fields and all of the bits and pieces that go into urban planning and city development,” she said.

Extended families integrated their crops with their houses, and farmers’ markets were embedded every few kilometers.

“Today, we talk about green cities, and garden cities, and ‘new’ urban development,” said Diane. “And we’re really going back to what the Maya were in fact practicing,” adds Arlen.

Caracol is near the Guatemala border, 56 miles from the nearest town. While access has improved over the years, the trek to reach the site during the early years of study was a rugged adventure requiring bulldozers and Land Rovers to reach the site.

For many years they were truly in the dark when it came to events beyond the cedar and mahogany forests of their rainforest camp. “We missed the whole first Gulf War. We didn't even know it happened,” said Arlen.

Today they have a satellite dish and Internet, although it’s sometimes as slow as dial-up.

Their first challenge was trying to map the site. Because of dense vegetation in the rainforest, it was slow going with traditional ground survey instruments—and even with some Landsat satellite imagery.

In 2009, they got a boost from a new technological tool, the aircraft-based, remote sensing technology known as LIDAR, (Light Detection And Ranging). The technique uses lasers to “see” through trees, providing a clear and dramatic picture of the enormity and complexity of the site.

It turned out that the 23 or so kilometers they had mapped by hand matched almost perfectly with these new laser images. With the addition of the Lidar data, they now calculate that the sprawling civilization once covered about 200 square kilometers. Diane said viewing a LIDAR-based projection of Caracol across an entire wall was an ‘aha’ moment.

“You could see all of the terraces, you could see all the residential groups, all the road systems, we could see looters’ trenches and looted tombs,” said Arlen.

In addition to mapping, they also have been conducting stable isotope analysis of bones at the site. The results show two distinct diets: the “palace” diet, high in protein and maize for the elite; and a much poorer diet for the working class. Arlen Chase says a similar 21<sup>st</sup> century pattern can be seen in the “food deserts” in large urban areas like Chicago or Detroit.

They believe wars between rival Maya communities ultimately led to the collapse of Caracol. The epicentral buildings were burnt around A.D. 895, and the site was probably abandoned within 25 years.

Wanting to share their discoveries with the descendants of the people who built Caracol, the Chases have created educational and economic opportunity for their host nation. There are usually about 30 workers, half students, half local Belizians. Many of the locals come year after year, and there are even some second-generation workers.

They also work with tour group leaders to provide the latest, most accurate information about history and preservation of the site. Thanks to the country's investment in a new road, the site now gets up to 100 tourists a day.

They hope their future years of field study will add to knowledge about Mayan social levels, and the complex economic, political, and ritual relationships among neighborhoods.

“We expect to be working at Caracol for a long time to come. Our work will probably never come to an end,” said Arlen.