

Patterns of ancient croplands give insight into early Hawaiian society, research shows

May 16 2011, by Earle Holland

A pattern of earthen berms, spread across a northern peninsula of the big island of Hawaii, is providing archeologists with clues to exactly how residents farmed in paradise long before Europeans arrived at the islands.

The findings suggest that simple, practical decisions made by individual households were eventually adopted by the ruling class as a means to improve [agricultural productivity](#).

The research was reported in the latest issue of the journal [Proceedings of the National Academy of Sciences](#).

"Archeologically, this kind of research is really hard to do in most places since there is rarely a 'signature' for the agricultural activity, or a strong connection between the remains of a house and a plot of farmland," explained, Julie Field, an assistant professor of anthropology at Ohio State University.

Field, along with colleagues from California and New Zealand, has spent three field seasons unearthing the remnants of an agricultural gridwork that dates back nearly 600 years. The pattern was formed by a series of earthen walls, or berms, which served as windbreaks, protecting the crops.

"In this part of Hawaii, the trade winds blow all the time, so the berms are there to protect the crops from the winds," she said. "The main crop

was sweet potato which likes dry [loose soil](#). The berms protect the soil from being blown away."

The researchers are familiar with the challenges the winds posed. Field said that while they were excavating sites, the wind would "blow so hard, the skin would come off our ears if they weren't covered. It just sandblasts your ears and you have to wear goggles to see."

"It is an intense place to work," she said.

Previous work by other researchers has [radiocarbon](#) dated [organic material](#) found in the berms, establishing a timeline for when the [agricultural system](#) was first built. Over time, more walls were built, subdividing the original agricultural plots into smaller and smaller parcels.

At the same time, other researchers were able to date materials from household sites of the early Hawaiians, and link those dates to the building of specific agricultural plots.

This showed that individual households that farmed the land expanded over time and then separated into new households as the population grew.

"Within a 300-year period, 1,400 AD to 1,700 AD, the data suggests that the population at least quadrupled, as did the number of houses," Field said.

The researchers believe the data also provides insight into the structure of Hawaiian society at the time. "We know that there was a single chief for each district and a series of lesser chiefs below that," she said.

Similar to the feudal system of Europe, a portion of the crop surplus was always designated for the chiefs.

"This suggests to us that the field system was originally put in place probably by individual households that produced crops for their own consumption.

"It was then appropriated by the chiefs and turned into more of a surplus production system, where they demanded that the land be put into production and more people would produce more surplus food," she said.

"Our study is unique in that we can trace the activities of very, very small groups of people and, from that, try to glean the larger processes of society," Field said.

"We want to look at parts of Hawaii and treat them as a model for the evolution of Hawaiian society."

The researchers said that the next question is whether the field system was used seasonally, whether they modified it over the year and used different parts of it depending on the season.

"That's what it looks like happened, but we need more dating of different features at the sites to be able to figure that out," Field said.

Provided by The Ohio State University

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