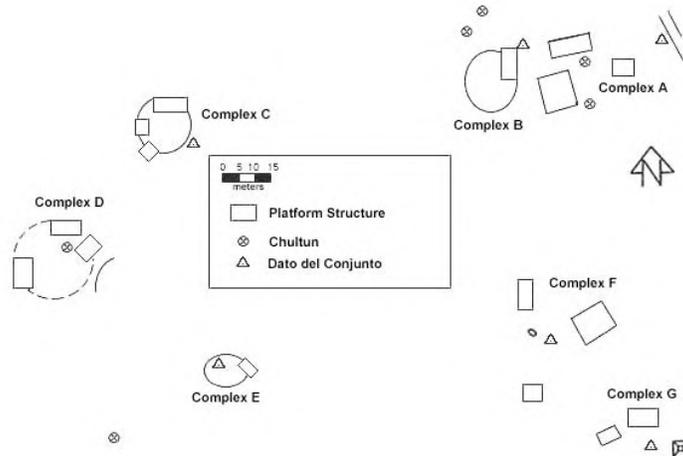


**FAMSI © 2001: T. Patrick Culbert**

## **Ancient Maya Wetland Agriculture**



**Research Year:** 1995

**Culture:** Maya

**Chronology:** Late Classic

**Location:** Northern Guatemala

**Site:** Bajo la Justa

### **Table of Contents**

[Abstract](#)

[The Research Problem](#)

[The 1995 Season](#)

[Ecological Studies](#)

[Bajo Communities](#)

[Summary](#)

[Sources Cited](#)

### **Abstract**

Funds from the Foundation for the Advancement of Mesoamerican Studies, Inc. (FAMSI) and the University of Arizona were used for a brief field season in Guatemala in May/June 1995. The objective of the research was the archaeological investigation of possible agricultural use of the seasonal swamp (the Bajo la Justa) between the sites

of Yaxhá and Nakum in northern Guatemala. The research is a collaborative project of the Instituto de Antropología e Historia de Guatemala (IDAEH) and the University of Arizona.

## **Resumen**

Con fondos de la Fundación para el Avance de los Estudios Mesoamericanos, Inc. (FAMSI) y de la Universidad de Arizona, fue posible completar una breve temporada de campo en Guatemala, en mayo/junio de 1995. El objetivo de esta investigación consistía en llevar a cabo un estudio arqueológico del posible uso agrícola del pantano estacional (el Bajo la Justa) entre los sitios de Yaxhá y Nakum, en el norte de Guatemala. La investigación es un proyecto en colaboración entre el Instituto de Antropología e Historia de Guatemala (IDAEH) y la Universidad de Arizona.

Submitted 11/01/1995 by:  
T. Patrick Culbert  
[tpc@U.Arizona.EDU](mailto:tpc@U.Arizona.EDU)

## **The Research Problem**

A primary problem in understanding the rise and collapse of Classic Maya civilization is the balance between population and subsistence. Current estimates (Culbert and Rice, 1990) indicate that population in the Late Classic reached the extremely high level of 200 persons/km<sup>2</sup> across the southern section of the lowlands. To feed this enormous population, the Maya had to abandon the conservative, ecologically-sound slash-and-burn agriculture that was the base of their early centuries of development (Harrison and Turner, 1978). To increase support capacity, the Maya must have embarked on venturesome new techniques of agricultural intensification that are still poorly understood.

A key factor in increasing agricultural support capacity would have been the use of the extensive wetlands of the Maya lowlands. In the traditional models of ancient Maya agriculture, it was presumed that such lands were unused for agricultural purposes. More recently, however, evidence of wetland utilization has been discovered in such diverse areas as the Candelaria River basin and the coast of Vera Cruz in México, and in Belize (Siemens and Puleston, 1972; Siemens, 1983; Turner and Harrison, 1983; Lambert and Arnason, 1983; Pohl, 1990). It is now clear that several different systems of wetland agriculture were being used by the Maya.

A matter that has been a subject of heated debate, however, is whether the huge tracts of interior wetlands (called bajos) that constitute about 40% of the land surface in the central and northeast Department of the Petén in Guatemala (Rice and Culbert, 1990: Table 1.1) were put to agricultural use. Field patterns in the large Bajo de Morocoy just north of the Guatemalan border in Quintana Roo (Harrison, 1978) are clearly visible from the air, and canals in a small bajo were discovered at Río Azul in far northeast Guatemala (Culbert, Levi, and Cruz, 1990). Nevertheless, some researchers reject such evidence and insist that the large Petén bajos were unused (Pope and Dahlin, 1989; 1993). The disagreement will continue unabated until someone undertakes fieldwork in a major bajo system.

In July 1993, I was invited by Lcda. Vilma Fialko C., director of the intersite survey program of the Proyecto Triángulo of IDAEH to participate in her program by studying a major bajo in the survey area. Lcda. Fialko's program consists of intersite surveys between the sites of Tikal, Nakum, Yaxhá and Naranjo. Several large bajos lie within the survey area. In a planning visit in May 1994 (funded by the International Division of NSF), the Bajo la Justa, a bajo of 150 km<sup>2</sup> between Yaxhá and Nakum, was selected as the initial study area. I was appointed Investigador Invitado, a new status recently created to stimulate international collaboration with the research programs of IDAEH.

### **The 1995 Season**

The field research lasted from May 22 to June 3, 1995. The research team worked 12 hour days without a weekend break, considerably expanding what could be accomplished in such a short interval. Participants included Dr. T. Patrick Culbert and Lcda. Vilma Fialko C. (the Guatemalan collaborator), Dr. Laura J. Levi, and graduate students, Brian R. McKee and Julie Kunen.

The objectives of our research were to improve our knowledge of the microecological differences within the bajo and to search for indications of ancient human modifications. In addition, we did test excavations at the Aguada Maya, a large reservoir near the center of the bajo, and mapped a new site, Cara Fea, that was discovered in the process of cutting a trail through the bajo.

### **Ecological Studies**

We were assisted in vegetational classification by Don Felipe Lanza, a native Petenero and employee of the Forestry Division of the Tikal National Park. Under Sr. Lanza's guidance, we learned a great deal more detail about vegetational associations within bajos. In addition to the two well-known (Lundell, 1937) major types of bajo (which we now call "palm bajo" and "scrub bajo"), there are a large number of subtypes recognizable from the predominant tree species. We were visited in the field by Dr. Thomas Sever of NASA who is collaborating with the project. Our map of vegetational

types will be matched with satellite imagery to identify signatures that will make it possible to quantify similar wetland vegetation through the lowlands.

Two facts that contradict the traditional ideas about bajos became clear during our work. The first is that palm bajo is excellent for agriculture and is one of the microenvironments of choice among Petén farmers. The second is that this major type of bajo is much more extensive than previously thought. Palm bajo constituted 36% of a six km section of the Bajo la Justa, where we mapped vegetation types along the Yaxhá-Nakum survey transect of Vilma Fialko.

Several features were discovered during the vegetation survey that may be indicative of agricultural use. Long linear features in a section of scrub bajo near Yaxhá may be the remains of ancient field platforms. In addition, a type of undulating land surface that is common in the Bajo la Justa is similar to surface indications that proved to be canal and field systems at Río Azul.

## **Bajo Communities**

A very important fact about the location of Maya sites in relation to bajos has become clear from the surveys of the Proyecto Triángulo. Although house platforms are not found within any of the vegetational zones that mark bajo, our work suggests that there was occupation on almost every area of slightly higher land where patches of high forest occur as "islands" within bajo. We call these areas of occupation "bajo communities" and they will be one of the foci of our research in 1996.

An additional fact of great importance is that the communities located within bajo are of considerable diversity, ranging from medium-size centers with significant monumental architecture to groups of small structures. Two sites within the Bajo la Justa illustrate this diversity. One of these sites, Poza Maya, is located near the center of the bajo, 5 km north of Yaxhá and 8 km south of Nakum. The Poza Maya site occupies a high ridge covered by tall forest that rises from the bajo. About 40 large structures arranged around nine courtyards form the center of the site. Test pits dug by Guatemalan archaeologists in the plazas encountered multiple earlier floors and as much as 7 m of fill over an extensive area. The size of the structures (up to 20 m high), the presence of vaulted masonry architecture, and the enormous investment of labor in raising plazas suggest that Poza Maya was an organizational center for whatever activities took place in the Bajo la Justa. Partial exploration of a lower section of the ridge in May 1995 discovered 10 small structures, but it has not been determined how extensive this "lower class" occupation was. If the Bajo la Justa was an unutilized wasteland, it is hard to imagine why a site of this size and complexity was in its center.

About 1 km from Poza Maya at the interface between the Poza Maya ridge and the bajo is the Aguada Maya, a large, almost square reservoir 250 m on a side. Excavations in May 1995 demonstrated that the embankments of the aguada were constructed, and

revealed a possible system of canals that enters the reservoir at one corner. The size of the reservoir in an area where there cannot have been a large population suggests some special use for the feature.

Cara Fea ([Figure 1](#)), the second example of a bajo community, was discovered during our 1995 season. The site occupies another ridge of upland forest within the Bajo la Justa about 2 km from the Poza Maya site. In stark contrast to the very large monumental architecture at Poza Maya, the Cara Fea site consists of about 20 smaller structures in eight patio groups. An unusually large number of chultuns at the site may be an indication of some special storage activity.

Recognition of the prevalence and diversity of bajo communities opens important research questions. The striking difference in architectural scale between Poza Maya and Cara Fea indicates an organizational structure within bajo that must be investigated in terms of chronology, settlement patterns and artifactual assemblages. Are the communities a result of a sudden, brief surge of population or do they represent a long-standing pattern? If of long duration, do they change significantly over time? Do the sites represent the same or different kinds of productive activities?

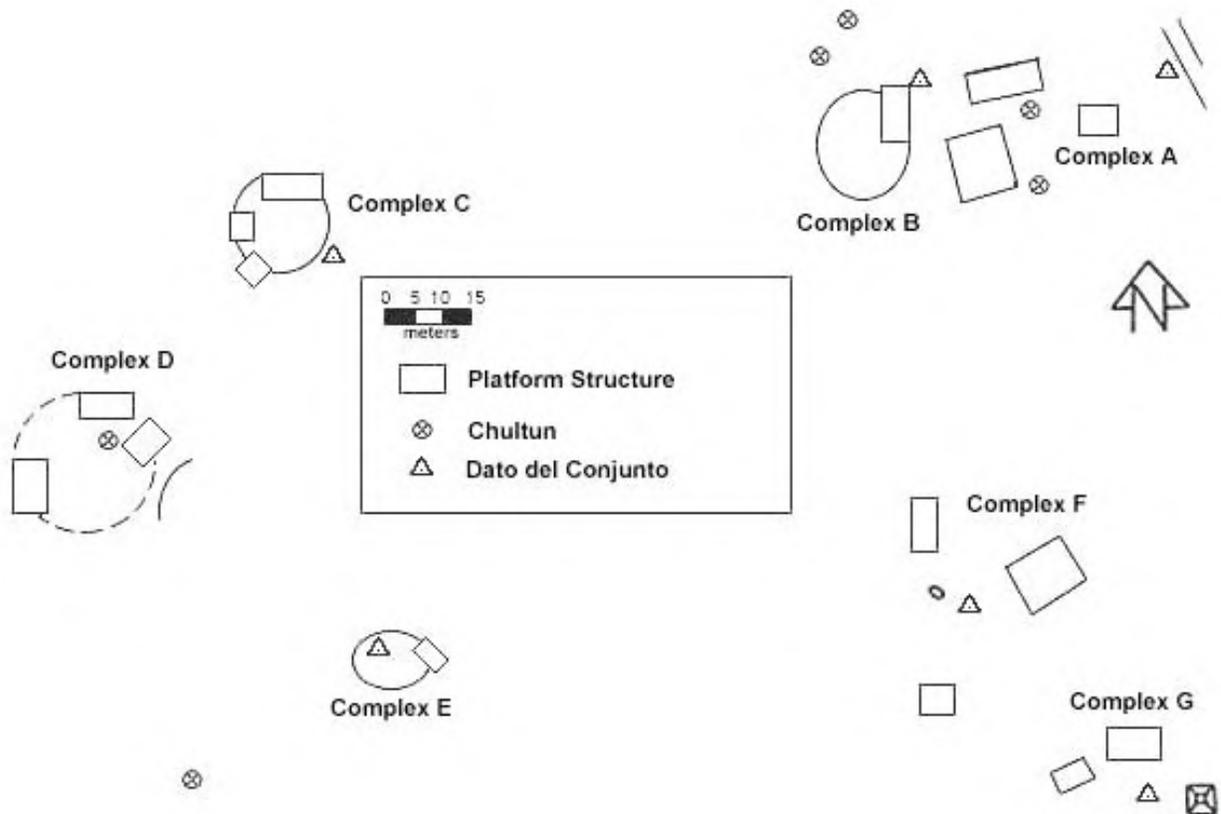


Figure 1. Cara Fea.

## Summary

Our field season was an important first step in developing a program of ecological and archaeological research in the wetlands of northern Guatemala. It has already resulted in a paper presented at the Guatemalan archaeology meetings that will be published in 1996 (Culbert *et al.*, n.d.) and proposals for further research to the Wenner-Gren Foundation and the National Science Foundation.

## Sources Cited

Culbert, T.P., L.J. Levi, and L. Cruz

1990 Lowland Maya Wetland Agriculture. In *Vision and Revision in Maya Studies*, edited by F. Clancy and P.D. Harrison, pp. 115-124. University of New Mexico Press, Albuquerque.

Culbert, T.P. and D.S. Rice, editors

1990 Precolumbian Population History in the Maya Lowlands. University of New Mexico Press, Albuquerque.

Harrison, P.D.

1978 Bajos Revisited: Visual Evidence for One System of Agriculture. In *Prehispanic Maya Agriculture*, edited by P.D. Harrison and B.L. Turner II, pp. 247-254. University of New Mexico Press, Albuquerque.

Harrison, P.D. and B.L. Turner II, editors

1978 *Prehispanic Maya Agriculture*. University of New Mexico Press, Albuquerque.

Lambert, J.D.H. and J.T. Arnason

1983 Ancient Maya Land-Use and Potential Agricultural Productivity at Lamanai Belize. In *Drained Field Agriculture in Central and South America*, edited by J.P. Darch, pp. 111-122. BAR International Series, no. 189, Oxford.

Lundell, C.

1937 *The Vegetation of the Petén*. Carnegie Institution of Washington, Publication 478, Washington, D.C.

Pohl, M., editor

1990 Ancient Maya Wetland Agriculture. Waveland Press, Boulder.

Pope, K.D. and B.H. Dahlin

1989 Ancient Maya Wetland Agriculture: New Insights from Ecological and Remote Sensing. *Journal of Field Archaeology* 16:87-106.

1993 Radar Detection and Ecology of Ancient Maya Canal Systems. *Journal of Field Archaeology* 20:379-383.

Rice, D.S. and T.P. Culbert

1990 Historical Contexts for Population Reconstruction in the Maya Lowlands. In *Precolumbian Population History in the Maya Lowlands*, edited by T.P. Culbert and D.S. Rice, pp. 1-36. University of New Mexico Press, Albuquerque.

Siemens, A.H.

1983 Oriented Raised Fields in Central Veracruz. *American Antiquity* 48:85-102.

Siemens, A.H. and D.E. Puleston

1972 Ridged Fields and Associated Features in Southern Campeche: New Perspectives on the Lowland Maya. *American Antiquity* 37:228-239.

Turner, B.L. II and P.D. Harrison, editors

1983 Pulltrouser Swamp: Ancient Maya Habitat, Agriculture, and Settlement in Northern Belize. University of Texas Press, Austin.