

## Introduction

As part of the Stann Creek Regional Archaeology Project (SCRAP), worked obsidian pieces were systematically surface collected from the settlement zones of the Maya archaeological site of Alabama in the east-central region of Belize (Figure 1). These artifacts were subjected to Energy Dispersive X-Ray Fluorescence spectrometry (EDXRF) at the McMaster Archaeological XRF Lab (MAXLab) in an effort to determine their source location. The Alabama site has been dated to the Late/Terminal Classic periods (ca. 700-1100 C.E.).<sup>i</sup>

### Primary Goals

- Effectively determine the geographical origin of the obsidian found at Alabama, which is known to be an exotic material type.
- To evaluate the results of EDXRF analysis and integrate them into what is already known about Late/Terminal Classic trade in the Maya world.
- Develop further working hypotheses regarding Alabama obsidian and trade route access over time, to be further tested in upcoming excavations.

## Methodology

49 obsidian artifacts, systematically collected during settlement survey, were subjected to EDXRF analysis, along with 14 known source samples (Figure 2). **EDXRF** exposes pieces of obsidian to high energy x-rays causing some of the electrons in the atoms inner orbital shells to dislodge. These vacancies are filled by electrons from higher energy orbital shells that drop to the lower energy orbits by releasing a fluorescent x-ray. These fluorescent x-rays are unique to each element in their wavelength and energy and by measuring them we can determine the chemical composition of the sample. This data is then compared to known chemical compositions of specific obsidian outcrops (sources) and assigned to each accordingly.



Figure 1: A topographical map of east-central Belize and the archaeological site of Alabama.<sup>ii</sup>

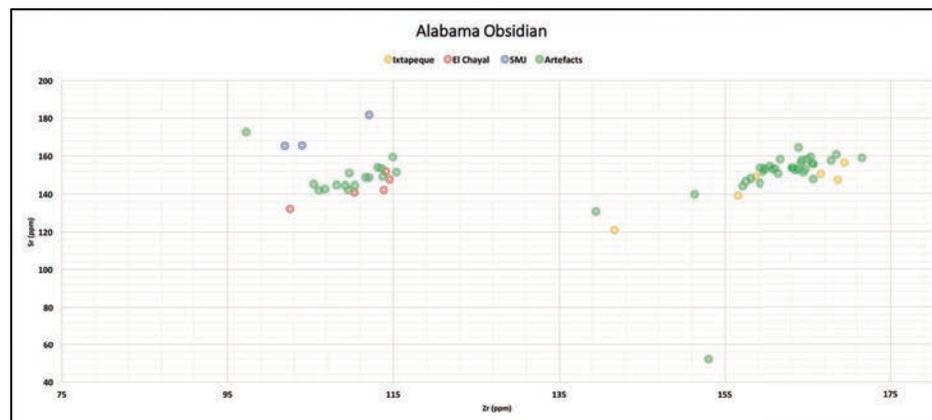


Figure 2: The results of XRF analysis on the Alabama obsidian.

## Results

The EDXRF analysis of the Alabama obsidian revealed that all but one artifact originated from three major outcrops in the highlands of Guatemala. Thirty-two pieces came from Ixtepeque, fifteen pieces from El Chayal, and one piece from San Martin Jilotepeque. This data on the geographical location of the obsidian found at Alabama correlates with what we know of other sites located in east-central and southern Belize, most obtaining obsidian from Guatemalan sources as opposed to Mexican outcrops. However, the quantities in which each difference source is present is intriguing; it has previously been proposed that Ixtepeque obsidian was traded predominantly via coastal routes and El Chayal obsidian via an inland route.<sup>iii</sup> The fact that both sources are represented here in relatively high quantities may suggest that Alabama was receiving obsidian, and perhaps other commodities, from inland as well as coastal trade paths. Its proximity to the coast of Belize (20km) and the fact that it lies on a riverine path inland, the Waha Leaf Creek, could have facilitated the movement of goods from the coast and its closeness to the Hummingbird Gap, a path through the Maya Mountains, could have easily brought goods to Alabama via an inland route.

## Future Research

XRF analysis conducted on obsidian from various contexts recovered during the 2016 field season will provide a more accurate reflection of where the people of Alabama were obtaining their obsidian during the Late and Terminal Classic. These results, coupled with the analysis of ceramics and other artifacts found within the same contexts, could shed light on the role of Alabama within east-central Belize. From this we can begin to form a more holistic picture on how Alabama interacted with other communities in East-Central Belize and throughout the Maya world.

## References

- MacKinnon, J. Jefferson (1987). *Preliminary Report: Point Placencia Archaeological Project, December 1986-January 1987*. Unpublished report submitted to the Belize Department of Archaeology, Belmopan, Belize.
- Peuramaki-Brown, Meaghan (2015). *The Stann Creek Regional Archaeology Project: Report of the second (2015) field season*. Report submitted to the Institute of Archaeology, National Institute of Culture and History, Belize.
- Hammond, Norman (1972). Obsidian Trade Routes in the Maya Area. *Science, New Series* 178(4065):1092-1093.

