
28 ***DRONES, MAPPING, AND EXCAVATIONS IN THE MIDDLE BELIZE VALLEY: RESEARCH INVESTIGATIONS OF THE BELIZE RIVER EAST ARCHAEOLOGY (BREA) PROJECT***

Eleanor Harrison-Buck, Marieka Brouwer Burg, Mark Willis, Chet Walker, Satoru Murata, Brett Houk, Alex Gantos, and Astrid Runggaldier

The Belize River East Archaeology (BREA) project has continued to focus on survey, mapping, and excavations of sites in the middle Belize Valley, particularly the ancient Maya site of Saturday Creek. Previously, we have suggested that Saturday Creek and its associated Hats Kaab “E-Group” marked an important crossroads in the middle Belize Valley. Here, we present an overview of our work this past season, which included re-mapping the site core of Saturday Creek using a Total Station and performing several test excavations. We also flew several unmanned aerial vehicles (otherwise known as “drones”) in the areas of cleared agricultural fields that surround the Saturday Creek site core. The drone mapping revealed an extraordinary density of mounds, particularly just north of the site core in the vicinity of the “E-Group,” indicating that this locale was a major focus of population aggregation in ancient times. The results of our mapping complement our previous GIS spatial analyses and studies of ceramic distribution patterns for this area in the eastern Belize Watershed. Combined, our studies leave little doubt that Saturday Creek and its vicinity marked a central node in the landscape, arguably because it served as a nexus between east-west and north-south trade and communication networks from Classic to Colonial times.

Introduction

The eastern Belize River valley appears to have a long history that extends from the Formative period through Colonial times. Here, we report on investigations carried out this year during our fourth season of the Belize River East Archaeology (BREA) project. The BREA study area encompasses the eastern Belize watershed between Belmopan and Belize City (Figure 1). We find that most of the ancient Maya settlement hugs the bank of the Belize River, likely because it served as the ancient “highway” between the coast and inland centers. While the main trunk of the Belize River serves as the anchor for our archaeological investigations, the Belize Watershed comprises numerous creeks and a large expanse of wetlands to the north. These bodies of water form a network of waterways that facilitated the movement of people and goods from Preclassic through colonial times (Harrison-Buck et al. 2012, 2013).

Ethnohistoric accounts suggest that while waterways were critically important, there were also several north-south overland routes that connected these rivers and creeks (Figure 2). Previously, we have presented the results of a least-cost path analysis conducted along one proposed route, which we refer to as North-South Route #1 (Brouwer-Burg et al. 2014). Elsewhere, we have suggested that Route #1

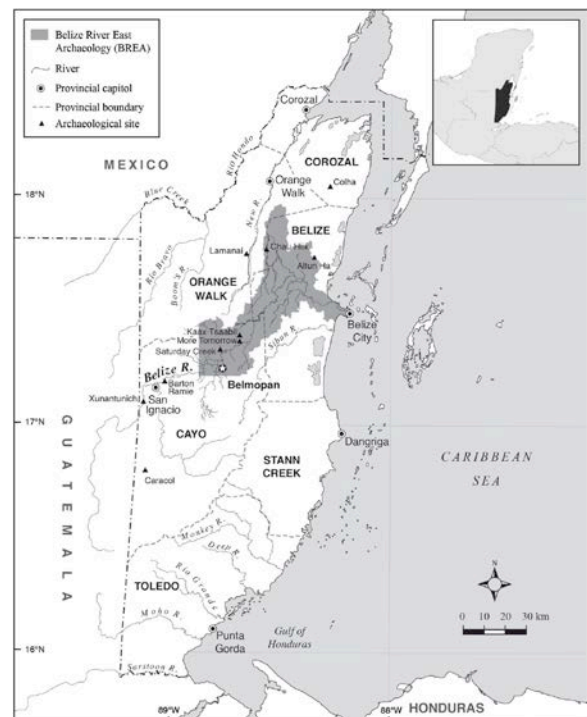


Figure 1. Map of the BREA study area (map prepared by M. Brouwer-Burg).

may represent a north-south overland route used by the Spanish during the sixteenth and seventeenth centuries (Buck et al. 2013; Harrison-Buck 2010; Harrison-Buck, Kaeding, and Murata 2013). Ethnohistoric accounts suggest this route extended from the Chetumal Bay south to the head waters of the New River,

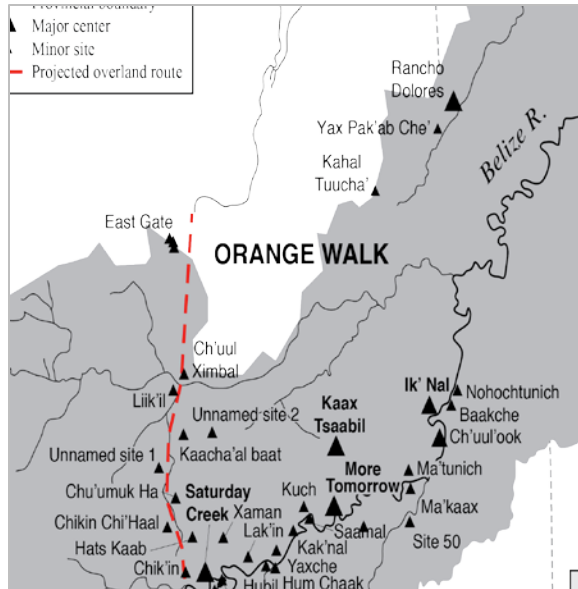


Figure 2. Projected Overland Route #1 (map prepared by M. Brouwer-Burg).

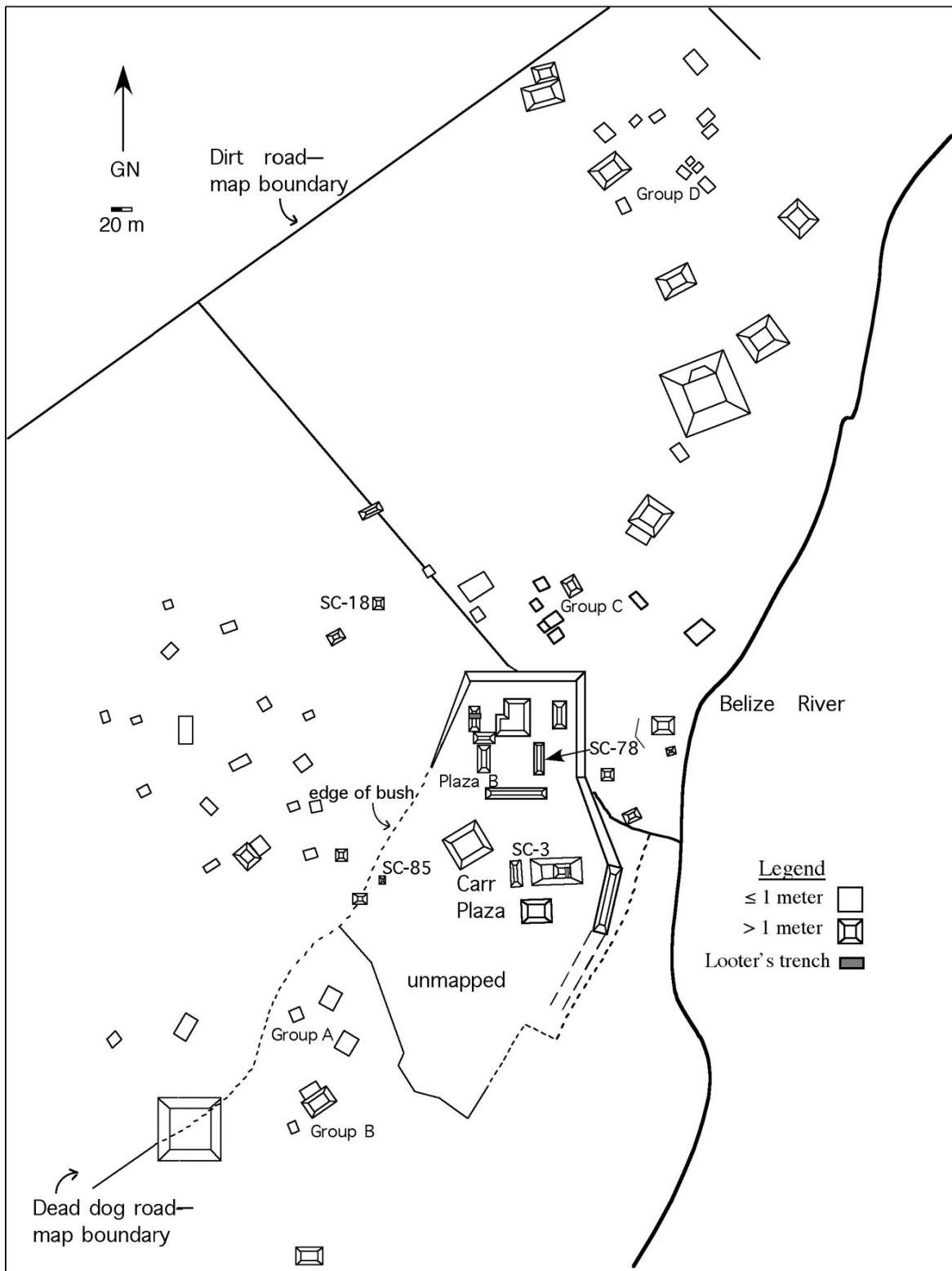
known as Ram Goat Creek, and that it went due south through swamp and pine savannah until it reached a partially submerged “natural bridge” of stone that the Spanish used to cross Labouring Creek (Jones 1989:138, 312 [Note 35]; see also Scholes and Thompson 1977:45). The route then headed overland south to a point in the middle Belize River that we believe is in the vicinity of Saturday Creek (Harrison-Buck, Kaeding, and Murata 2013).

We have spent the last couple field seasons ground-truthing this route and this season filled in more of the gaps along this projected path, which Brouwer Burg (this volume) discusses in greater detail. Here, we simply point out the clear string of settlement that we have identified thus far and note that it does indeed run roughly north-south in a linear path between Labouring Creek and the Saturday Creek site (Figure 2). Our survey of this area has not only refined the location of the north-south overland route based on the dispersal of the mounds, but also sheds light on the length of time this route may have been used. We conducted surface collection at each of these four sites and all of them revealed dense Terminal Classic ceramic material. Saturday Creek, Hats Kaab and Chum’umuk Ha are so far the only sites where we firmly identified Preclassic material.

According to the sixteenth century accounts, the overland route was said to enter the Belize River at the Maya town of Lucu in the mid-section of the Belize River (Jones 1989:287-288). According to the Spanish reports, Lucu was located right next to “the hamlet formerly known as Chantome” (Jones 1989:287-288), which we believe may have been the ancient site of Saturday Creek that was largely abandoned when the Spanish arrived (Harrison-Buck 2010). Jones (1989) notes a cluster of Contact period sites in this area of the middle Belize River. The density of settlement in this spot at the time of Contact is further support that the area around Saturday Creek marked an important crossroads linking the north-south overland route and the Belize River (Brouwer-Burg et al. 2014; Harrison-Buck 2010). This year, in addition to further reconnaissance along our projected north-south overland route we aimed to further investigate the site of Saturday Creek and its hinterland settlement with two primary goals in mind: 1) to map the site core of Saturday Creek and its surrounding hinterland settlement and 2) to investigate the possibility of Spanish Contact in this area.

Drones and the Mapping of Saturday Creek

Using an optical transit and stadia rod, the site core of Saturday Creek was mapped around fifteen years ago by Dr. Lisa Lucero and her team (Lucero 1999:10). Of the 100 mounds they recorded at Saturday Creek along on the northern side of the river, Lucero notes that her survey team was only able to map 75 of them (Figure 3). The BREA project spent three weeks in January 2014 and another four weeks this summer surveying and re-mapping the site core of Saturday Creek using a Total Station and GPS. This has allowed us to record detailed topographic information for the site core and more accurately tie in the site to our existing GIS map of the BREA study area. Figure 4 shows our topographic map of the site core that includes the southern section of the site core that was previously unmapped. Satoru Murata also created an interpolated digital elevation model of the site center (Figure 5). You can see that Saturday Creek has a sizeable site core with a main elite residence to the north, three large



Saturday Creek

Figure 3. Original rectified map of Saturday Creek site (after Lucero et al 2004: Fig. 6.2).

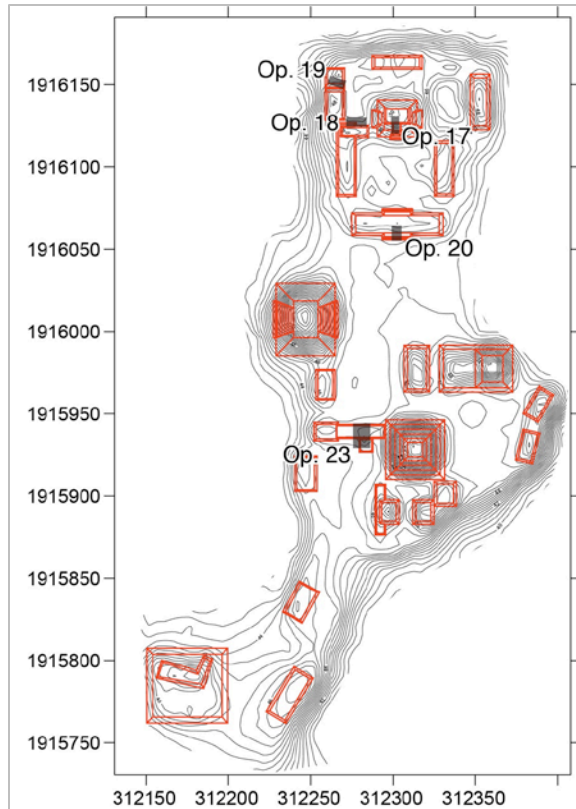


Figure 4. Topographic map of the Saturday Creek site core (map prepared by S. Murata).

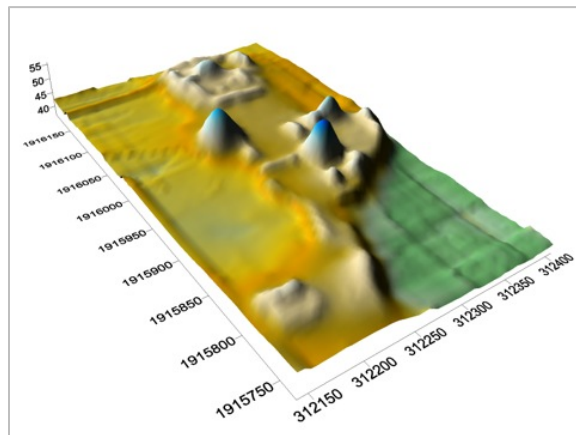


Figure 5. 3-D Image of the site core of Saturday Creek, looking northeast (map created by S. Murata).

pyramids, and a smaller pyramid attached to a ballcourt. In surveying the southern section of the site that was previously unmapped we identified another plaza group and several large structures, two of which may represent a second ballcourt at the site.

While much of the site core of Saturday Creek is in bush, most of the area outside the site

core has been cleared for agriculture. Unfortunately, the mounds in this area have been victims of extensive bulldozing and repeated plowing over the years and are at high risk of destruction. So our aim has been to get the settlement documented before further destruction occurred. Although destructive, the clearing makes for good visibility and we took advantage of this by mapping the area during the January season using several unmanned aerial vehicles (UAVs), otherwise known as “drones.” In less than two days, our drone specialists Chet Walker and Mark Willis flew an area around Saturday Creek that was a little over 7 square km. (Figure 6). They flew two different kinds of drones, a MikroKopter Hexakopter and an ardupilot fixed wing drone. These ready-to-deploy, light-weight UAVs have on-board systems comprising a digital camera, a GPS, and a radio receiver, which is controlled by a ground-based computer (a semi-rugged laptop). For high-resolution mapping, the goal is to generate a very dense digital terrain model (DTM), which requires a series of overlapping images to recreate the topography of the region. In just two days, a point for every 5cm on the ground was collected with the two UAVs, for a total of over 50 million points in the seven square km area. Using commercial photo-merging software, the individual photographs are merged by common points relative to the location of the camera. They establish control points marked with aerial photo targets that are placed across the area prior to flight. Under optimal conditions, they are able to establish the precise location of the imagery to within +/- 10 centimeters. The software then uses the estimated camera positions of all the tiled images to derive a 3D polygonal mesh of the ground surface and produces a digital elevation model (or DEM) that can be used in any GIS (Global Information System) or 3D mapping software such as Surfer.

At Saturday Creek the low house mounds are difficult to discern on the ground because of the repeated plowing over the years and removal of stone on the mounds. On the ground, we could tell it was a densely settled area around Saturday Creek but had no idea how dense until we saw the results of drone imagery. Figure 6 shows the subtle variations in surface

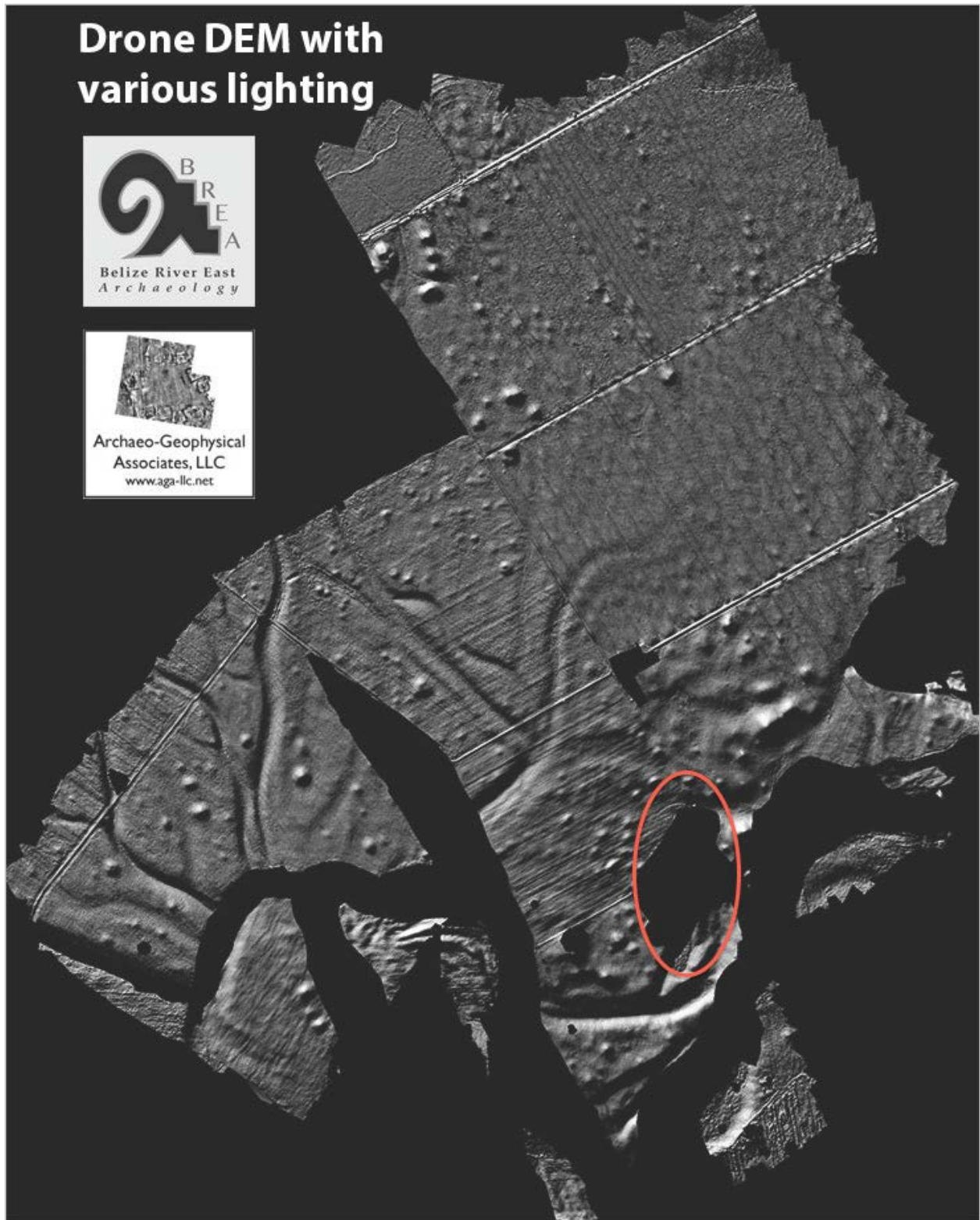


Figure 6. Drone DEM image of Saturday Creek hinterlands with red oval highlighting location of site core in bush (map prepared by Mark Willis).

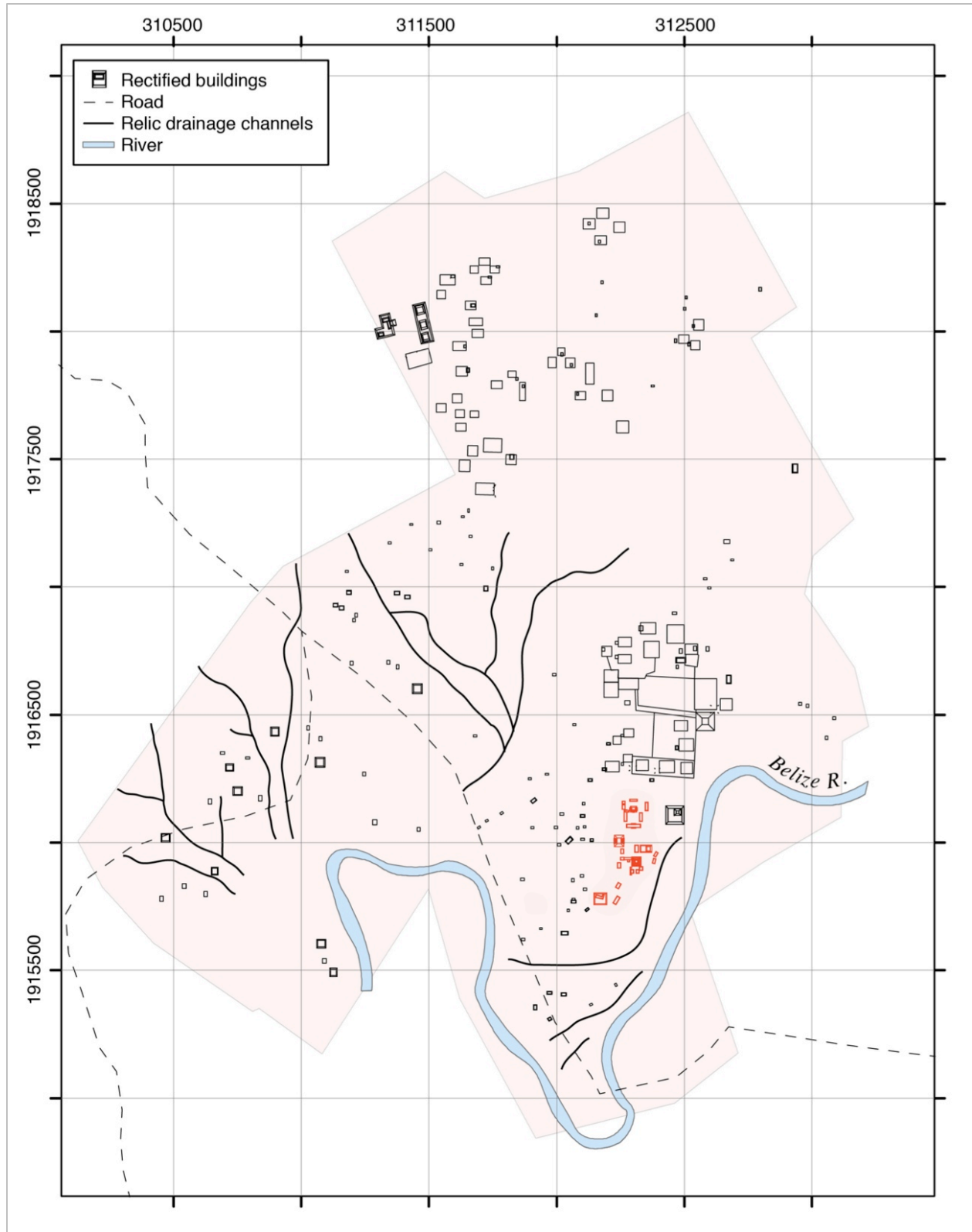


Figure 7. Rectified map of Saturday Creek and hinterland settlement (map prepared by S. Murata and M. Brouwer Burg).

topography that highlights the archaeological features when the varying light sources are changed and you can detect what appear to be hundreds of mounds packed into this small area. The densest settlement appears to be to the north of the site core just east-southeast of Hats Kaab, an E-Group or variant of an inline triadic shrine complex we have discussed in detail elsewhere (see Brouwer Burg et al. n.d.; Brouwer Burg et al. 2014; Runngaldier et al. 2013). We produced a rectified map of the drone survey based on a combination of the aerial imagery, elevation data from the DEM, and ground-truthing (see Figure 7). Figure 7 is a preliminary map that requires more systematic ground-truthing, which we plan to conduct in future seasons. However, a cursory inspection of the mounds and their associated ceramics shows that many of these structures were continuously occupied from Preclassic to Postclassic times, based on ceramic material found on the surface.

The take home message from our drone work is two-fold. First, unlike Lidar, drone imagery cannot see through the forest, but it is a far less expensive and clearly a very efficient tool for providing detailed maps of sites in large expanses of open fields. Second, we can firmly say that Saturday Creek was no small rural village, but rather, a large city center with a densely settled supporting population. We believe it served as a central node on the landscape and continued to be densely populated through time because of its location at the crossroads between the north-south overland route and the Belize River.

Archaeological Investigations at Saturday Creek

In addition to mapping the site core and conducting drone work in the Saturday Creek hinterlands, a second goal this season was to further refine our understanding of the Saturday Creek chronology and to investigate the possibility of Spanish Contact in this area. If we are correct that the Spanish account of “the site formerly known as Chantome” was Saturday Creek it would suggest that Saturday Creek was no longer occupied in the sixteenth century, but was still recognized as an important point in the landscape. If so, we would expect to find evidence of pilgrimage to the site core during the



Figure 8. Photo of Structure 11 at Saturday Creek (photo by E. Harrison-Buck).

Contact period. Yet, as others have noted, evidence of Spanish Contact is elusive at best and rarely visible on the surface prior to excavation (Pendergast et al. 1993). Therefore, this season we set up several test excavations in two different plaza groups at Saturday Creek (Figure 4). Four units were placed in the north plaza (Operations 17, 18, 19, and 20) and another unit was placed in the South Plaza group (Operation 23). Excavations in the North Plaza revealed a primarily Late Classic (A.D. 600-800) occupation with a small amount of terminal debris dating to the Terminal Classic (ca. AD 800-900). Our investigations in the South Plaza revealed a later occupation beginning in the Terminal Classic. Operation 23, measuring 6 m (east-west) x 8 m (north-south), exposed the southern edge of Structure 10 and the western half of Structure 11, a low square platform that appears to have stairs on all four sides of the structure (Figure 8). Excavations revealed near the surface several special deposits of whole or partially intact marine conch shell. The associated ceramic material found on the surface of the structure and over top of the plaza surface on the western side of Structure 11 consisted mostly of broken censer material dating to the Postclassic period. Some clues that these deposits date to the Late Postclassic comes from the presence of Palmul Incised vessels, Chenmul Modeled censers, and other unusual anthropomorphic censer fragments (see Figure 9). The architectural configuration and associated censer material suggests that the structure served as a Late Postclassic shrine building.



Figure 9. Late Postclassic ceramics from Op. 23 (photos by M. Brouwer Burg).

To the north of the Postclassic shrine, there is an east-west platform (Structure 10) that bounds the northern side of the South Plaza. Operation 23 exposed a small portion of the southeast corner of this platform. In the final phase of Structure 10, we identified a cache deposit (Special Deposit 1) that was placed in the fill of the southeast corner of the platform (Figure 10). The cache consists of a dense concentration of burned and fragmentary animal bone, which appears to be mostly marine shell, resting on an incised Postclassic vessel fragment that resembles the incised orange-redware chalices found in Late Postclassic contexts at Lamanai (Pendergast 1981:Fig. 15). The cache was capped by fragments of an unslipped jar and within the bone deposit we found three jade beads, a bone pendant that may be part of a rosary, and a quartz crystal artifact that appears to be the top of a bottle stopper (Figure 10). It resembles those still used today in the Catholic church as stoppers for spouted sacred vessels containing holy water or for chrisal bottles



Figure 10. Historic quartz (?) bottle top found in Special Deposit 1 in Operation 23 (photo by M. Brouwer Burg).

used for holy anointing oil. Both are essential for baptisms and other blessings for healing and purifying persons, places, and objects and were used by the Spanish Catholic priests during the early Colonial period. This represents our first clear evidence of Spanish Contact at this site, which we suggest may be the Contact period site of Chantome.

Discussion

At Lucu, which we believe is in the vicinity of Saturday Creek, the Spanish described the Maya people there as greeting them “lovingly and calmly” (their words not mine). While it is certainly nice to know that we are likely excavating the remains of some very pleasant people according to the Spanish, it is clear from the ethnohistoric accounts that the Maya people engaged with them differently wherever they went and their response to the Spanish was quite variable. For instance, just a few kilometers up river at the Contact period Maya town of Zaczuz the Spanish built a church, but according to the Spanish accounts the Maya tore down the bell and threw it into the

underbrush as an act of resistance (Jones 1989:217). Following a series of Maya rebellions in 1668, “Franciscans, reportedly accompanied by soldiers...baptised 600 individuals of all ages” at Tipu, one of the main Contact period Maya towns located farther upstream in the upper Belize Valley (Jones 1989:115). Jones (1989:248) surmises that the Belize Valley inhabitants at Tipu and elsewhere acquiesced to some of these missionary efforts to “stave off military rule and permanent Spanish religious presence.” In lieu of a permanent Spanish priest, religious assistants who were considered *principales* or native elites were trained by the Spanish clergy “as teachers of catechism to the young, as scribes, and even as substitutes for the priest at times of baptism and burial” (Jones 1989:108). These individuals held elite status, derived from their role as scribes and religious specialists. While they held powerful responsibilities for the Church, they also are consistently described by the Spanish as leaders of Maya rebellions involved in “idolatrous” behavior, such as native rituals and recording native histories in codical-style manuscripts (Chuchiak 2010; Hanks 2010; Harrison-Buck 2014:684-685; Jones 1989:107-108; Knowlton 2008). As a native religious leader with access to doctrinal knowledge and sacred vestments of the Spanish Church, it may well have been a *maestro* (perhaps one living nearby at Zacuz or Lucu) who was responsible for the Maya ritual deposit at Saturday Creek. This would explain the selective incorporation of the crystal stopper from a Spanish holy water or chrismal bottle that, conceivably, could have been in the possession of the village’s maestro.

Elizabeth Graham (1998:29) observes: “The bias in archaeology has been to emphasize the political role of Christianity as a religion of the state, and thereby to interpret pre-Columbian elements in religious material culture as resistance phenomena.” She suggests that by dichotomizing the Maya experience at the time of Contact as either rejection or acceptance is too overly simplistic. This perspective underplays the native conceptualization of their own universe and their proactive response and creative reconfiguration of indigenous values in the midst of a changing world (Graham 1998:29-30). The ethnohistoric accounts when coupled

with the archaeological remains demonstrate that the Maya were not simply reactive, but proactive (Graham 1998:29). The incorporation of a glass stopper that may have contained holy water or wine was likely one reason for its selective use in the special Maya deposit at Saturday Creek, but its association with other precious materials, such as jade and its ability to sparkle brightly in the sun (which it still does) reflects indigenous values. Arguably, its sacred value as an object expresses native beliefs rather than Christian ones.

In conclusion, we believe the ethnohistoric and archaeological data together support the identity of Saturday Creek as Chantome and its settlement in the vicinity as Lucu, which the Spanish described as the location where the overland route entered the Belize River and where there was a cluster of Maya settlement at the time of Contact (Jones 1989. Scholes and Thompson 1977). We will continue to investigate Saturday Creek and its vicinity in the future as we believe this area has the potential for shedding light on our understanding of the impact of early Spanish Contact and Christianization and how this area in the middle Belize Valley was connected with other Contact period settlement like Tipu and Lamanai, facilitated by a network of rivers and our north-south overland route.

References Cited

- Buck, David, Eleanor Harrison-Buck, and Timothy Divoll
2013 The Search for the “Overland Route” and the New Richmond Site: Survey and Reconnaissance Between Saturday and Labouring Creek. In *Archaeology in the Middle Belize Valley: A Report of the 2012 Belize River East Archaeology Project*, edited by E. Harrison-Buck, pp. 41-55. Occasional Paper No. 6. University of New Hampshire, Durham.
- Brouwer Burg, M., Eleanor Harrison-Buck, and Astrid Runggaldier
2014 At the Crossroads: Examining the Hats Kaab E-Group as a Node of Trade and Communication in the Eastern Belize Watershed. *Research Reports in Belizean Archaeology* 11:259-270.
- Brouwer Burg, M., Astrid Runggaldier, and Eleanor Harrison-Buck
n.d. The Afterlife of Earthen-Core Buildings: A Taphonomic Study of Threatened and Effaced

- Architecture in Central Belize. *Journal of Field Archaeology*, Accepted.
- Chuchiak, John F. IV
2010 Writing as Resistance: Maya Graphic Pluralism and Indigenous Elite Strategies for Survival in Colonial Yucatán, 1550-1750. *Ethnohistory* 57(1): 87-116.
- Graham, Elizabeth
1998 Mission Archaeology. *Annual Review of Anthropology* 27:25-62.
- Hanks, William E.
2010 *Converting Words: Maya in the Age of the Cross*. University of California Press, Berkeley.
- Harrison-Buck, Eleanor
2010 At the Crossroads in the Middle Belize Valley: Modeling Networks of Ritual Interaction in Belize from Classic to Colonial times. *Research Reports in Belizean Archaeology* 7:85-94.
2014 Reevaluating Chronology and Historical Content in the Maya Books of Chilam Balam. *Ethnohistory* 61(4):681-713.
- Harrison-Buck, Eleanor, Adam Keading, and Satoru Murata
2013 A Network of Waterways in the Eastern Belize Watershed: Recent Survey and Excavation of the 2012 BREA Field Season. *Research Reports in Belizean Archaeology* 10:77-90.
- Harrison-Buck, Eleanor, Satoru Murata, and Adam Keading
2012 From Preclassic to Colonial Times in the Middle Belize Valley: Recent Archaeological Investigations of the BREA Project. *Research Reports in Belizean Archaeology* 9:131-140.
- Jones, Grant D.
1989 *Maya Resistance to Spanish Rule: Time and History on a Colonial Frontier*. University of New Mexico Press, Albuquerque.
- Knowlton, Timothy
2008 Dynamics of Indigenous Language Ideologies in the Colonial Redaction of a Yucatec Maya Cosmological Text. *Anthropological Linguistics* 50(1): 90-112.
- Lucero, Lisa
1999 *Testing and Mapping Saturday Creek: The 1999 Field Season of the Valley of Peace Archaeological (VOPA) Project*. Report submitted to the Department of Archaeology, Ministry of Tourism Government of Belize.
- Lucero, Lisa J., Scott L. Fedick, Andrew Kinkella, and Sean M. Graebner
2004 Ancient Maya Settlement in the Valley of Peace Area. In *The Ancient Maya of the Belize Valley: Half a Century of Archaeological Research*, edited by James F. Garber, pp. 86-102. University Press of Florida, Gainesville, FL.
- Pendergast, David M.
1981 Lamanai, Belize: Summary of Excavation Results, 1974-1980. *Journal of Field Archaeology* 8(1):29-53.
- Pendergast, David M., Grant D. Jones, and Elizabeth Graham
1993 Locating Maya Lowlands Spanish Colonial Towns: A Case Study from Belize. *Latin American Antiquity* 4 (1):59-73.
- Runggaldier, Astrid, Mariëka Brouwer Burg, and Eleanor Harrison-Buck
2013 Hats Kaab: A Newly Discovered E-Group at the Closing of the 13th Baktun. *Research Reports in Belizean Archaeology* 10: 65-75.
- Scholes, France V. and Sir Eric Thompson
1977 The Francisco Pérez Probanza of 1654-1656 and the Matrícula of Tipu (Belize). In *Anthropology and History in Yucatán*, edited by Grant D. Jones, pp. 43-68. University of Texas Press, Austin.