

2. **ABSTRACT:** A summary written in both Spanish and English, each no more than 500 words. The abstract describes the project and explains its significance in a manner that is readily understandable to a non-archaeologist.

Inequality is present in all human societies. For the Classic Maya (250-900 CE), inequality among elites is visible through elaborately carved monuments recording historic events, monumental architecture, massive anthropogenic landscape modifications, and distributions of luxury goods. In some regions of the Maya Lowlands, the emergence of inequality is well documented by the Middle Preclassic (800-400 BCE), while in other regions, such as southern Belize, the first political centers did not emerge until the end of the Late Preclassic (400 BCE – 250 CE). Previous research in southern Belize reconstructed a political history for the major centers of the region, Pusilha, Uxbenká, Lubaantun, and Nim Li Punit. However, knowing how these larger centers developed in articulation with the smaller, minor centers will elucidate how inequality emerged across the landscape of southern Belize. How did the political centers of this area arise in relation to the growing settlement population and each other, as well as other political centers within the greater Maya region? That is, how did new communities form based on when major and minor centers developed and declined? To answer this question, I propose developing multiproxy chronologies, which combine radiocarbon dates, ceramic typologies, and hieroglyphic dates, through test unit excavations in four minor centers: Ix Kuku'il, Uxbentun, Xnaheb, and Tzimin Che. Previous research also indicates that radiocarbon dating provides chronologic information beyond the known ceramic chronologies for the region. Thus, I will enhance the existing ceramic and epigraphic chronologies of Lubaantun and Nim Li Punit by dating previously excavated charcoal samples. This new multiproxy chronologic data will inform how inequality developed in this peripheral region of the Maya Lowlands and how minor political centers arose in relation to the larger political centers and regional population. This proposed project on minor political centers is part of a larger project funded through my start-up package through the University of Texas at Austin, which focuses on differential access to resources through settlement patterns and landscape archaeology. The significance of this project is that it informs how communities develop and decline and how inequality emerges. Understanding these processes within archaeological contexts may serve to guide responses to similar processes today. Pending ongoing COVID-19 restrictions, the fieldwork portions of this proposed project are scheduled for late May through early August 2021 but can occur in 2022 based on US and Belizean COVID-19 regulations.

La desigualdad está presente en todas las sociedades humanas. Para los Mayas Clásicos (250-900 d.C.), la desigualdad entre las élites es visible a través de monumentos elaboradamente tallados que registran eventos históricos, arquitectura monumental, modificaciones antropogénicas masivas del paisaje, y distribuciones de artículos de lujo. En algunas regiones de las Tierras Bajas Mayas, el surgimiento de la desigualdad está bien documentado por el Preclásico Medio (800-400 a. C.), mientras que en otras regiones, como el sur de Belice, los primeros centros políticos no surgieron hasta el final del Preclásico Tardío. (400 a. C. - 250 d. C.). Investigaciones anteriores en el sur de Belice reconstruyeron la historia política de los principales centros de la región, Pusilha, Uxbenká, Lubaantun y Nim Li Punit. Sin embargo, saber cómo se desarrollaron estos centros más grandes en articulación con los centros menores más pequeños aclarará cómo surgió la desigualdad en el paisaje del sur de Belice. ¿Cómo surgieron los centros políticos de esta área en relación con la creciente población de asentamientos y entre sí, así como con otros centros políticos dentro de la gran región maya? Es decir, ¿cómo se formaron las nuevas comunidades en función de cuándo se desarrollaron y declinaron los centros mayores y menores? Para responder a esta pregunta, propongo desarrollar cronologías multiproxi, que combinan fechas de radiocarbono, tipologías cerámicas, y fechas jeroglíficas, a través de excavaciones de unidades de prueba en cuatro centros menores: Ix Kuku'il, Uxbentun, Xnaheb, y Tzimin Che. Investigaciones anteriores también indican que la datación por radiocarbono proporciona información cronológica más allá de las cronologías cerámicas conocidas para

la región. Por lo tanto, mejoraré las cronologías cerámicas y epigráficas existentes de Lubaantun y Nim Li Punit al fechar muestras de carbón previamente excavadas. Estos nuevos datos cronológicos multiproxi informarán cómo se desarrolló la desigualdad en esta región periférica de las tierras bajas mayas y cómo surgieron los centros políticos menores en relación con los centros políticos más grandes y la población regional. Este proyecto propuesto sobre centros políticos menores es parte de un proyecto más grande financiado a través de mi paquete inicial a través de la Universidad de Texas en Austin, que se enfoca en el acceso diferencial a los recursos a través de patrones de asentamiento y arqueología del paisaje. La importancia de este proyecto es que informa cómo las comunidades se desarrollan y declinan y cómo surge la desigualdad. Comprender estos procesos dentro de los contextos arqueológicos puede servir para orientar las respuestas a procesos similares en la actualidad. A la espera de las restricciones vigentes de COVID-19, las partes de trabajo de campo de este proyecto propuesto están programadas para fines de mayo hasta principios de agosto de 2021, pero pueden ocurrir en 2022 según las regulaciones de COVID-19 de EE. UU. y Belice.

3. **PROJECT DESCRIPTION:** A description of the proposed project, not to exceed 2,000 words (exclusive of cover sheet, maps, photographs, bibliography, and appendix with curriculum vitae). If the proposed project is part of a larger research program, please briefly describe how this project relates to the larger project's objectives. The project description should begin with an introduction to the project and the subject of the research. It should explain the intellectual justification for the research project, the research objectives, the methods, and the work plan to meet the goals and objectives. The project description should also describe the qualifications of the investigators and collaborators, the schedule for completing the project, and any plans for publication and dissemination of the results.

For the past 5,000 years, humans have lived in complex, networked, and nested cities, that wax and wane through time. How cities of varying size emerge is important to understanding the development of social inequality (Kintigh et al. 2014). Social inequality is differences in wealth within a population, deriving from differential access to resources transmitted intergenerationally through inherited inequality (Boone 1992; Smith et al. 2010). Within complex societies, inequality is recognized archaeologically through differences in house size (Feinman et al. 2018), ancestral veneration in mausolea (McAnany 2013), and displays of prestigious and luxury goods. These archaeological correlates of inequality are present across Mesoamerica by the Middle Preclassic (800-400 BCE) based on demographic expansion and the construction of monumental architecture associated with ritual events (Clark and Hansen 2018; Estrada-Belli 2006; Horn III 2015; Inomata et al. 2018, 2020). However, these processes did not occur among the ancient Maya in southern Belize until centuries later (Leventhal 1990, 1992).

While several large Maya urban centers in southern Belize have undergone extensive excavations, less research has been conducted on minor centers and extended settlements to understand the regional development and emergence of inequality. Major centers contain a civic ceremonial core with monuments (e.g., stelae), ballcourts, temples, large accessible plazas, high architectural volume, and elite residences (Walden et al. 2019); minor centers contain only some of these features reproduced at smaller scales and surrounded by smaller populations. My research uses data from households and administrative areas to evaluate the development of inequality based on differential access to resources over time. I have start-up funds to initiate a regional project on the development of inequality using human-environment interactions and demographic shifts assessed through survey and excavation of Classic Maya (250-900 CE) households. However, how these households developed in relation to political centers requires chronological information on the foundation and growth of the urban centers. Here, as a discrete, additional project laying the foundation for my larger research agenda, I will address processes of urban development and regional demographic growth linked to the emergence of social inequality through test unit excavations and chronology building at four minor centers in southern Belize. Understanding the processes underpinning how ancient cities develop, persist, and eventually decline elucidates lessons with cross-cultural and modern relevance (Feinman and Neitzel 2020).

The Classic Maya of southern Belize were networked with other elites across the Maya region, as evidenced by the epigraphic record (Martin 2020; Wanyerka 2009), long-distance trade goods (Braswell 2019; Golitko et al. 2012; Jordan and Prufer 2020), and high degrees of inequality among previously surveyed households (Thompson 2019; Thompson and Prufer 2019). However, how minor centers and households developed in articulation with major centers and each other remains unclear. Two well-studied centers, Uxbenká and Ix Kuku'il, exhibit different settlement patterns (Thompson et al. 2018) and chronologic developments (Thompson 2019). Multiproxy chronology building offers the best method to develop a holistic picture of the occupational history and emergence of inequality for the region (Thompson and Prufer 2019). Thus, using multiproxy chronologies including AMS ¹⁴C dating, I ask, "**How did new communities form based on when major and minor centers developed and declined?**" This project will establish a baseline for understanding demographic growth and the emergence of inequality in southern Belize. Knowing the foundation of minor centers will help answer questions such as if new communities form due to small populations fissioning to form new centers (neolocality)? Or are small, corporate groups present on the landscape that eventually develop into monumental epicenters through internal growth and

increased inequality? The **significance** of this discrete project on minor centers is that it is part of a larger research agenda evaluating regional inequality, settlement patterns, and household decision making but represents a separate sub-project focused on the development of monumental epicenters of minor centers as a microcosm of the larger regional trends.

Southern Belize is home to more than 20 Classic Maya centers, both major and minor, and is composed of three distinct geographic zones: the Maya Mountains, the southern foothills, and the coastal plains (Figure 1). Fertile soils, widespread availability of water through numerous rivers, and access to sandstone for construction made the foothills a preferred settlement location (Dunham 1990) and, therefore, the focus of this study. Archaeological research has primarily focused on the major centers (see Table 1), but recently some minor centers have undergone limited archaeological research while others, such as Tzimin Che and Uxbentun, have received little attention.

Much of the regional chronology is derived from ceramic and epigraphic data, creating potential limitations for our understanding of the regional development and emergence of inequality. At centers with both ceramic chronologies and AMS ^{14}C dates, the ceramics suggest shorter occupations than the radiometric dates. For example, ceramics at Ix Kuku'il indicate an occupation from 400-800 CE, but AMS ^{14}C dates from charcoal and human remains indicate an occupation of more than 1,000 years (Figure 2; Table 1; Thompson 2019). The same trend has been observed at Uxbenká where ceramics indicate an occupation from 250-1000 CE, but radiocarbon dates suggest a longer occupational history (Prufer and Kennett 2020; Thompson 2019). However, no AMS ^{14}C samples were processed for several of these centers (Table 1). Creating a multiproxy chronology by adding radiocarbon data from other foothill centers to the extant ceramic and epigraphic record will illuminate and clarify when inequality emerged at different political centers.

Table 1. Multiproxy chronologies for major (M) and minor (m) ancient Maya centers in southern Belize. Centers highlighted in dark grey will be excavated and centers in light grey will have previously collected charcoal processed. The extent of occupation is based on widespread occupation using ceramic, epigraphic, and AMS ^{14}C dates. See Figure 2.

Center Name	Extent of Occupation	Hieroglyphic Texts or Stylized Monuments	Ceramic Typologies	AMS ^{14}C Dating	Subregion within Southern Belize	Source
Uxbenká (M)	200-1000 CE	X	X	X	Foothills	Leventhal 1990; Prufer et al. 2011, 2017; Wanyerka 2009
Ix Kuku'il (m)	400-100 CE		X	X	Foothills	Thompson 2019
Kaq'ru' Ha' (m)	400-800 CE		X	X	Eastern Pasion	Novotny 2015
Ek Xux (M)	400-900 CE		X	X	Maya Mountains	Kindon 2002
Nim Li Punit (M)	400-900 CE	X	X		Foothills	Dunham et al. 1989; Fauvelle 2012; Prager et al. 2014; Prager and Braswell 2016
Muklebal Tzul (M)	575-800 CE		X	X	Maya Mountains	Kindon 2002
Pusilha (M)	571-1100 CE	X	X		Eastern Pasion	Irish and Braswell 2015; Prager et al. 2014
Lubaantun (M)	700-900 CE	X	X		Foothills	Hammond 1975; Leventhal 1992; Prager et al. 2014
Xnaheb (m)	700-1000 CE	X	X		Foothills	Dunham 1990; Dunham et al. 1989; Jamison 1993; Prufer 2002
Uxbentun (m)	750-900 CE		X		Foothills	Hammond 1975

Tzimin Che (m)	909 CE	X			Foothills	Wanyerka 2009
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I am requesting funds to excavate in the monumental epicenters of four minor centers to better understand the regional urban development and emergence of inequality within the foothills (Figures 1 and 3). I will process three to five AMS ¹⁴C dates from each center and three AMS ¹⁴C dates from both Nim Li Punit and Lubaantun to complement their existing chronologies (see Prager et al. 2014). These data will result in a deeper understanding of the processes of urban development and how major and minor centers arose with the intergenerational transmission of wealth in a peripheral region of the Maya Lowlands. The results may indicate that **all** monumental epicenters were constructed by emergent rulers by 400 CE, likely through internal growth and inherited inequality (Hypothesis 1 [H1] Table 2). Archaeological correlates would include evidence of massive landscape modifications associated with despotic power before 400 CE. Alternatively, monumental epicenters may have been constructed at different times as inequality emerged at different rates as political power shifted between the centers of southern Belize (H2). Archaeological correlates include large anthropogenic landscape modifications occurring over centuries at different centers at different times as groups of people splintered off founding new, monumental epicenters. Finally, migration may have resulted in the foundation of new minor centers (H3). Differences in ceramics and architectural styles inconsistent with the regional trends of southern Belize (see Braswell and Prufer 2009) will be present.

Table 2. Research Question, Hypotheses, and Archaeological Correlates for Test Expectations.

How did new communities form based on when major and minor centers developed and declined?		
Hypothesis		Archaeological Correlates for Test Expectations
Hypothesis 1	All monumental epicenters were constructed by 400 CE as widespread demographic expansion and the emergence of inequality occurred simultaneously across the region where centers grew due to internal growth and inherited inequality.	Plaza excavations will indicate massive landscape modifications and architectural improvements by 400 CE based on AMS ¹⁴ C dates and ceramic typologies. This trend will be present at all monumental epicenters.
Hypothesis 2	Monumental epicenters were constructed at different times as inequality emerged and political power shifted between the centers of southern Belize as new centers formed through neolocality, fissioning from older centers.	AMS ¹⁴ C dates from on top of bedrock in plaza excavations will vary, indicating the period of initial bedrock modification and construction of the monumental epicenter. Large scale modifications and architectural improvements will occur over centuries and vary between the centers of southern Belize.
Hypothesis 3	Monumental epicenters are constructed at different times by migrating populations moving into southern Belize from other parts of the Maya region.	AMS ¹⁴ C dates will indicate the gradual development of minor centers as new populations move in from elsewhere. Ceramics linked to massive landscape alternations and inequality will not conform to regionally established typologies (see Fauvelle 2012; Hammond 1975; Jordan 2014). Architecture construction techniques may vary, especially for the earliest constructions.

My team will excavate two 2m-x-6m units on the edges of epicenter plazas of minor centers (Figure 3). In the Toledo Uplands, depth from the surface to bedrock is shallow in the center of the hills and deeper on the edges of hills, where the Classic Maya built up the hillside to expand the plazas (Prufer and Thompson 2016). Excavating units extending from the edge of the hill towards the center/summit will reveal hilltop modifications, construction techniques, and provide chronologic data (i.e., ceramics and charcoal). In southern Belize, a rotational labor program that distributes economic opportunities among numerous families has proven a positive way to work with the local Indigenous communities. Therefore, I will hire a new group of archaeological assistants each week, enabling up to eight people from each community to partake in archaeological research. I will excavate at Ix Kuku'il, Tzimin Che, Uxbentun, and Xnaheb in June and July 2021 (see 6. *Schedule* below).

I will conduct all artifact analyses at the Big Falls Field Station in Big Falls, Belize (see Figure 1) on the weekends. Preparation for AMS ¹⁴C will occur in the Spatial and Environmental Archaeology (SEA) Lab at University of Texas at Austin in Fall 2021, and samples will be sent to Pennsylvania State University. I will date 3-5 charcoal samples from each center, sampling for the earliest assumed dates based on excavation contexts, stratigraphy, and associated ceramics.

Since 2008, I have conducted research in southern Belize, and from 2013 to 2018 I led all aspects of archaeological research at Ix Kuku'il including collaborative planning with the local indigenous community; survey; excavations; artifact, laboratory, and spatial analyses; report writing; and disseminating results. I am trained in GIS and remote sensing, archaeological excavation, and chronometric dating including ceramic analysis and the preparation of organic materials for AMS ¹⁴C dating. The **Broader Impacts** of the proposed project include engagement with indigenous Maya communities and collaborations with international agencies. As an early career female scholar, my leadership may encourage young women to pursue their educational dreams, something that remains uncommon in traditional Maya communities (Taylor 2018). Results will be disseminated to academic and public communities alike through peer-reviewed academic journal articles; scholarly presentations at conferences; lectures at public venues, including museums and to Maya communities in Belize; and through social media including Twitter and Instagram.

4. BUDGET: A budget of research expenses in US dollars with justification of each item must be included. For airfares, please indicate who will be supported by this line item. Salaries of principal investigators will not be paid. Salaries and fees for in-country personnel mandated by the host country's permit regulations are allowed. Contact the H. and T. King Grant Administrator at SAA with any questions: htkgrant.saa@gmail.com. Fees for curation and permits are allowed, but no institutional overheads will be paid. No equipment purchase over \$1,000 will be supported. Proposals may include the cost of membership in the Society for American Archaeology if the applicant lives in Latin America. Proposals must list all other sources of support and amounts, both obtained and pending, for the proposed research.

Category	Item	Description	Amount (USD) requested from SAA King Grant	Amount (USD) to be used from start-up funds
Travel	International Airfare	Round-trip (RT) airfare from Austin, Texas to Belize City, Belize is approximately \$600 on Google Flights. I will fly RT from Austin and the second archaeological supervisor will be from the United States. Prices for airfare from several cities across the US is approximately \$600.00.		\$1,200.00
Travel	Local Airfare	Round-trip local airfare from the Belize International Airport to Punta Gorda (PG) is needed for myself and one additional trained archaeologist from the United States. Due to the schedule of flights, it is not possible to land in Belize City and catch the bus to PG on the same day. Round trip airfare is available through Tropic Air for \$323 per person https://www.tropicair.com/		\$646.00
Travel	Car Rental	I have access to a truck to drive to and from the project base in Big Falls to the locations of fieldwork.	\$0.00	
Travel	Gas	The cost of gas in Toledo District, Belize is ~\$6.00/gal. The locations of Ix Kuku'il, Uxbentun, Xnaheb, and Tzmin Che from Big Falls, where the field station is located, vary from 2 miles to 20 miles. In addition to driving to the field sites, I will need to drive to the nearest large town of Punta Gorda to replenish food and supplies on the weekends. Finally, I will need to drive to Belmopan, Belize to check-in with government officials and the Institute of Archaeology. It is estimated that I will spend \$400 on gas.	\$400.00	
Housing and Subsistence	Lodging – Big Falls and Xnaheb	The non-local archaeologists (myself and one other trained archaeologist from the US) will stay in the Big Falls Field Station while excavating at Xnaheb and on the weekends.	\$0.00	

Housing and Subsistence	Lodging – Tzimin Che	We will camp while working at Tzimin Che.	\$0.00	
Housing and Subsistence	Lodging – Ix Kuku’il	We will stay at Ms. Andrea Coh’s guest house in San Jose while excavating at Ix Kuku’il for two weeks. The weekly cost for accommodations is \$50.	\$100.00	
Housing and Subsistence	Lodging – Uxbentun	During the two weeks when we are working at Uxbentun, we will need to stay at the Maya Mountain Research Farm (https://numundo.org/center/belize/maya-mountain-research-farm) where Uxbentun is located. Weekly accommodations including food are \$200 / week / person.	\$800.00	
Housing and Subsistence	Food per diem	The US Department of State M&IE rate is \$80 / day. However, only \$900.00 to cover food expenses for 10 weeks for two individuals is requested.	\$900.00	
Field Work	Local archaeological assistant (labor)	I will hire four people for eight weeks. Two teams of two local archaeological assistants and one trained archaeological supervisor will work on each 2m-x-6m excavation unit. Two units will be excavated in each epicenter, spending two weeks at each center. Local archaeological assistants will be from local communities adjacent to the minor center (e.g., San Jose community members will be hired to work at Ix Kuku’il). Each laborer will be paid \$125 / week. Belizean social security is at a rate of 12%. $(\$125 \times 4 \text{ laborers} \times 8 \text{ weeks}) = \$4,000 \times 1.12 = \$4,480$	\$4,480.00	
Field Work	Supplies	I have access to archaeological excavation supplies at the Big Falls Field Station. Supplies include screens, shovels, trowels, measuring tapes, and artifact bags. However, some supplies will need to be purchased / printed (notebooks, field forms) or replaced or replenished (buckets, new screens, artifact tags and field forms).	\$400.00	
Community Outreach	Food	I will hire local women’s groups (e.g., the Indian Creek Mayan Arts Women’s Group @MayanArtsWomansGroup) from each village to make tamales for the Community Archaeology Day events. This will simultaneously give back to the community, provide economic income for women, and engage with local, traditional celebratory foods. I will purchase beverages (tang / juice mixes) or, if possible, request cacao drink (a		\$500.00

		traditional Maya celebration beverage) to be made [pending the community cacao supply].		
Community Outreach	Supplies	For the Community Archaeology Day events, I will have coloring stations available for the children. I will purchase coloring supplies (e.g., crayons, colored pencils, and colored markers) in the United States (where they are significantly cheaper) and donate them to the schools after the community events. Coloring sheets will be downloaded and printed in the United States.		\$30.00
Government Fees	Belizean Institute of Archaeology Permit Fee	The permit fee to conduct archaeological research in Belize is \$100.00.	\$100.00	
Government Fees	Belizean Institute of Archaeology Government Fees	The government of Belize requires (20%) of all field expenses for archaeologists for administration and consolidation fees. Field expenses include in-country (Belize) travel, labor, lodging, and food. (\$400 [gas] + \$4,480 [labor] + \$900 [lodging] + 900 [food] + \$400 [supplies]+\$100 [permit]) x .2 = \$1,436.	\$1,436.00	
Laboratory Analysis Costs	Radiocarbon Dates	A total of 22 charcoal samples will be selected from excavations (3-5 from each of the six centers: Ix Kuku'il, Uxbentun, Xnaheb, Tzimin Che, Nim Li Punit, and Lubaantun). I will pre-process charcoal samples at the Spatial and Environmental Archaeology (SEA) Lab at the University of Texas at Austin. Radiocarbon dating will be used to reconstruct the earliest and latest phases of occupation and landscape modifications from plaza unit excavations. Samples will be prepared in the SEA Lab and measured at the PSU AMS facility (https://eesl.iee.psu.edu/node/54). The total cost will be \$290 per sample.	\$6,380.00	
Total			\$14,996.00	\$2,376.00

*Belize has a stable conversation rate of \$1 USD = \$2 BZE.

5. PERMITS: Proposals must include a statement on obtaining permission from the host country to conduct the project. If permits have been granted, the proposal should state this. We realize that until a grant is awarded, the application for a permit is usually not possible, unless the awardee's research is part of an ongoing project. In either case, the proposal should state which permits are required and the steps that will be taken to secure necessary permissions, if this has not yet been completed. SAA cannot advance funds until grantees submit proof that work is able to commence (e.g., travel to field work country is allowed; permits have been obtained, etc.).

If funded, my proposal will require two permits from the Belizean Institution of Archaeology: an excavation permit and an export permit. I will request a permit from Dr. John Morris of the Institute of Archaeology in January 2021 to conduct field work in southern Belize for summer 2021. I will also request to export all charcoal samples to the United States for AMS ^{14}C dating in the SEA Lab at the University of Texas at Austin.

Dr. Geoffrey Braswell has granted permissions to run six charcoal samples for AMS ^{14}C dating (3 from Nim Li Punit and 3 from Lubaantun). Charcoal samples are currently housed in Big Falls, Belize and I will export these samples with the excavated charcoal samples from my proposed project. The email correspondence granting permission is available upon request.

6. **REVISED SCHEDULE:** A schedule for the proposed research should be included along with a justified assurance that the research can be completed within the time frame. **In the event of a disruption like COVID-19, SAA will allow for extensions** but a new schedule must be approved in writing.

Schedule of Events	May 2022	June 2022	July 2022	Aug 2022	Sept 2022	Oct 2022	Nov 2022	Dec 2022	Jan 2023	Feb 2023	March 2023	April 2023	May 2023
Preparations for Field Work*	X												
Excavations at Ix Kuku'il*		X											
Excavations at Tzimin Che		X											
Excavations at Uxbentun			X										
Excavations at Xnaheb			X										
Lab Analysis in Belize*		X	X										
Community Archaeology Days				X									
Lab Analysis at UT (AMS ¹⁴ C dating, GIS, report writing)				X	X	X	X	X					
Disseminate Results at Conferences			BAS							AAG		SAA	
Write peer-reviewed Article 1					X	X	X	X					
Write peer-reviewed Article 2							X	X	X	X			
Write peer-reviewed Article 3										X	X	X	X

* Pending COVID restrictions both in the United States and in Belize, three weeks of field work could occur in late December 2021 / early January 2022 during the academic years winter break. Regardless, field work will need to extend into summer 2022. The schedule below adheres to a summer field work schedule and the asterisk (*) means the activity could occur during the 2021-2022 winter break, pending COVID restrictions.

Potential short season of field work in Belize: 27 December 2021 – 15 January 2022

Summer field season in Belize: 22 May 2022 – 5 August 2022

Lab work at the University of Texas at Austin: 15 August 2022 – 30 November 2022

Continued writing (no funding needed): through May 2023

Preparations for Field Work will occur the last week of May 2022*. This will include meetings and consultations with local communities and landowners in San Jose (Ix Kuku'il), Medina Bank (Tzimin Che), San Pedro Columbia and the Maya Mountain Research Farm (Uxbentun), and Indian Creek (Xnaheb) regarding archaeological excavations (see Figure 1). During this time, I will also arrange an Archaeology Day with each community to share my findings and results in early August 2022.

Excavations at Ix Kuku'il will begin the first week of June 2022*. We will excavate two 2m-x-6m units on the edge of the Group A plaza (see Figure 3). We will stay in San Jose at Ms. Andrea Coh's guest house. Ms. Coh charges \$50/week to rent the guest house.

Excavations at Tzimin Che will occur the third and fourth week of June 2022. We will excavate two 2m-x-6m units on the edges of the main plazas in the epicenter (see Figure 3). The local topography is unknown so exact locations will be selected upon arrival to Tzimin Che. Tzimin Che is 7 km to the closest modern community so we will camp near the archaeological center.

Belize Archaeology Symposium (BAS) is scheduled for the last week of June. I will present my initial research findings from Ix Kuku'il and Tzimin Che at the 2022 BAS.

Excavations at Uxbentun will occur the first full week and second week of July 2022. We will excavate one 2m-x-6m unit on the northeastern edge of the plaza near the main northern pyramid and we will excavate a second 2m-x-6m unit on the mid-western edge on the highest part of the plaza (Figure 3). Uxbentun is located on the Maya Mountain Research Farm (MMRF; <https://numundo.org/center/belize/maya-mountain-research-farm>) and, therefore, we will stay at MMRF while we excavate at Uxbentun.

Excavations at Xnaheb will occur the third and fourth week of July 2022. We will excavate one 2m-x-6m unit in the North Group and another in the Southern Group as they appear to be on raised platforms (see Figure 3). We will stay at the Field Station in Big Falls and drive to Xnaheb daily. The drive is less than 10 minutes each way.

Lab Analysis in Belize* will occur on the weekends in June and July and consist of washing, counting, weighing, and cataloging all artifacts. It will also include gathering temporal data from ceramics.

There will be four separate **Community Archaeology Day** events that will occur after excavations and lab analysis in Belize has been completed. These will occur the first week of August 2022. Events will include displaying artifacts of interest, a digital slide show, snacks, and coloring activities for the children. At the event community members can ask the archaeologists and local archaeological assistants questions about the research project, excavations, and general findings. This creates transparency between the Indigenous community and foreign archaeologists.

Lab Analysis at the University of Texas at Austin will occur in my newly initiated Spatial and Environmental Archaeology Lab. This will include scanning and digitizing all field forms and drawings, and digitizing any GIS data. The lab analysis also included preparation of organic materials for AMS ¹⁴C dating including the mechanical separation / cleaning of samples, acid-base-acid washes, and vacuum sealing and combusting samples in quartz tubes with copper oxide and silver.

I will **disseminate results at three conferences**: the BAS (June/July 2022, see above), the American Association of Geographers meeting (AAG, Spring 2023, exact dates TBD), and the Society for American Archaeology meeting (SAA, March 29 – April 2, 2023). Presenting at three conferences will disseminate results to diverse communities including Belizean public and tour guides as well as academic scholars from both geography and archaeology.

This project will result in at least **three peer-reviewed journal articles** (see *9. Publications and Outputs* below) and this data will provide a foundation for future research and collaborations in southern Belize. Publications will be written after the field season.

Excavations at Uxbentun will occur the first full week and second week of July 2021. We will excavate one 2m-x-6m unit on the northeastern edge of the plaza near the main northern pyramid and we will excavate a second 2m-x-6m unit on the mid-western edge on the highest part of the plaza (Figure 3). Uxbentun is located on the Maya Mountain Research Farm (MMRF; <https://numundo.org/center/belize/maya-mountain-research-farm>) and, therefore, we will stay at MMRF while we excavate at Uxbentun.

Excavations at Xnaheb will occur the third and fourth week of July 2021. We will excavate one 2m-x-6m unit in the North Group and another in the Southern Group as they appear to be on raised platforms (see Figure 3). We will stay at the Field Station in Big Falls and drive to Xnaheb daily. The drive is less than 10 minutes each way.

Lab Analysis in Belize will occur on the weekends in June and July and consist of washing, counting, weighing, and cataloging all artifacts. It will also include gathering temporal data from ceramics.

There will be four separate **Community Archaeology Day** events that will occur after excavations and lab analysis in Belize has been completed. These will occur the first week of August 2021. Events will include displaying artifacts of interest, a digital slide show, snacks, and coloring activities for the children. At the event community members can ask the archaeologists and local archaeological assistants questions about the research project, excavations, and general findings. This creates transparency between the Indigenous community and foreign archaeologists.

Lab Analysis at the University of Texas at Austin will occur in my newly initiated Spatial and Environmental Archaeology Lab. This will include scanning and digitizing all field forms and drawings, and digitizing any GIS data. The lab analysis also included preparation of organic materials for AMS ¹⁴C dating including the mechanical separation / cleaning of samples, acid-base-acid washes, and vacuum sealing and combusting samples in quartz tubes with copper oxide and silver.

I will **disseminate results at three conferences**: the BAS (June/July 2021, see above), the American Association of Geographers meeting (AAG, 25 February – 1 March 2022), and the Society for American Archaeology meeting (SAA, 30 March – 3 April 2022). Presenting at three conferences will disseminate results to diverse communities including Belizean public and tour guides as well as academic scholars from both geography and archaeology.

This project will result in at least **three peer-reviewed journal articles** (see 9. *Publications and Outputs* below) and this data will provide a foundation for future research and collaborations in southern Belize. Publications will be written after the field season.

7. LOCATION: Include a location map of the region and site(s) to be investigated and a site map, if available, as well as no more than two other relevant figures.



Figure 1. Location of southern Belize (black outline) within the Maya region (inset map). Classic Maya centers (black circles) mentioned in the text are labeled on the map and the four centers where excavations will occur are emphasized. The three geographic zones and paved roads are visible. Modern villages (red squares) are indicated with villages mentioned in the text emphasized.

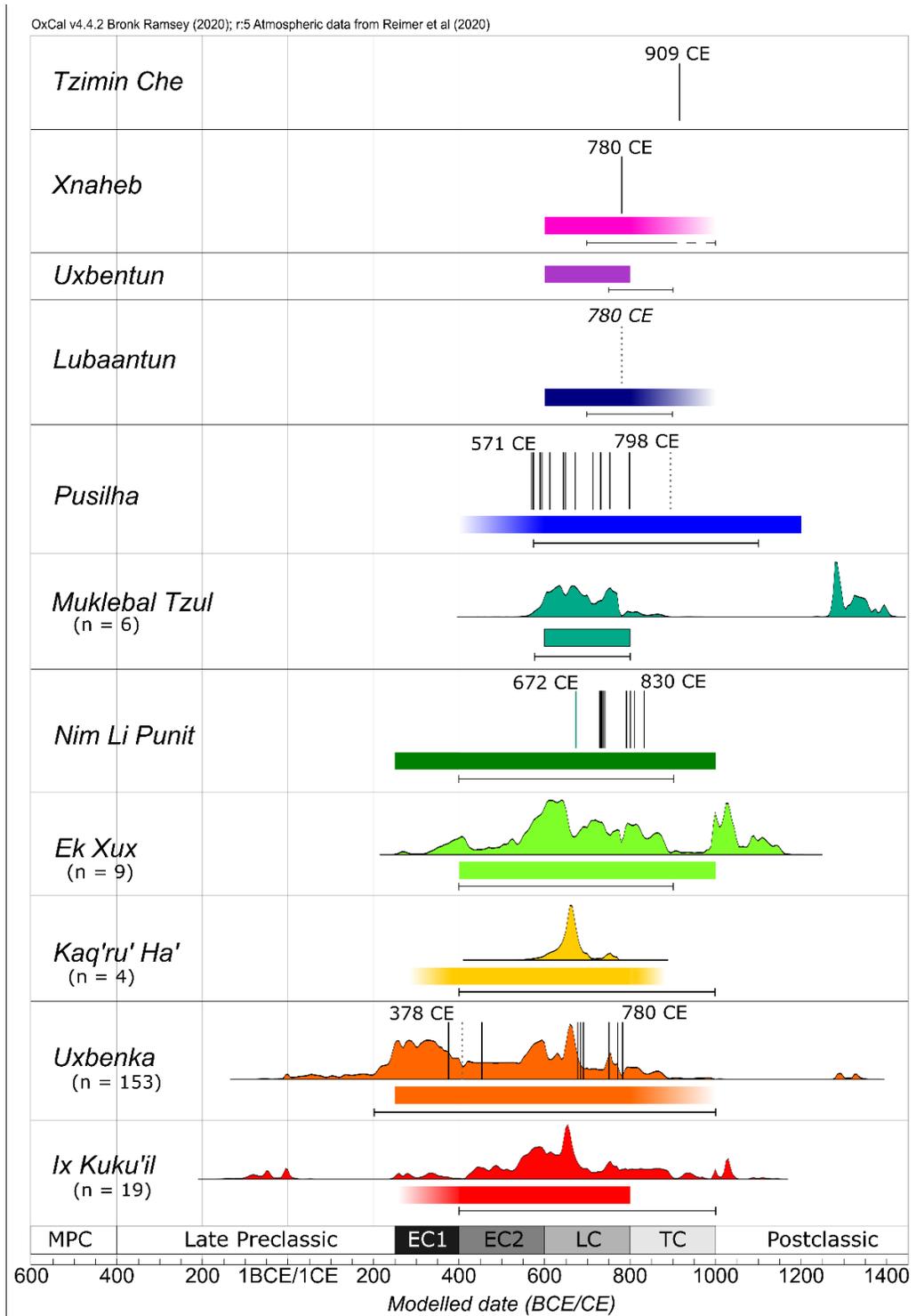


Figure 2. Southern Belize center chronologies (see Table 1) based on ceramics (horizontal color blocks), epigraphic (solid vertical lines) or stylistic dates (dotted vertical lines) from a monument (black) or artifact (teal), and summed probability distributions of AMS ^{14}C dates calibrated in OxCal 4.2.2 (Bronk Ramsey 2020) using the IntCal20 calibration curve (Reimer et al. 2020). Earliest and latest epigraphic dates for each center are labeled. The number of AMS ^{14}C dates used in each OxCal curve are listed below the center name. General span of occupation (see Table 1) is indicated by the horizontal black bar beneath the ceramic color block. Additional chronologic information on Tzimin Che is not available.

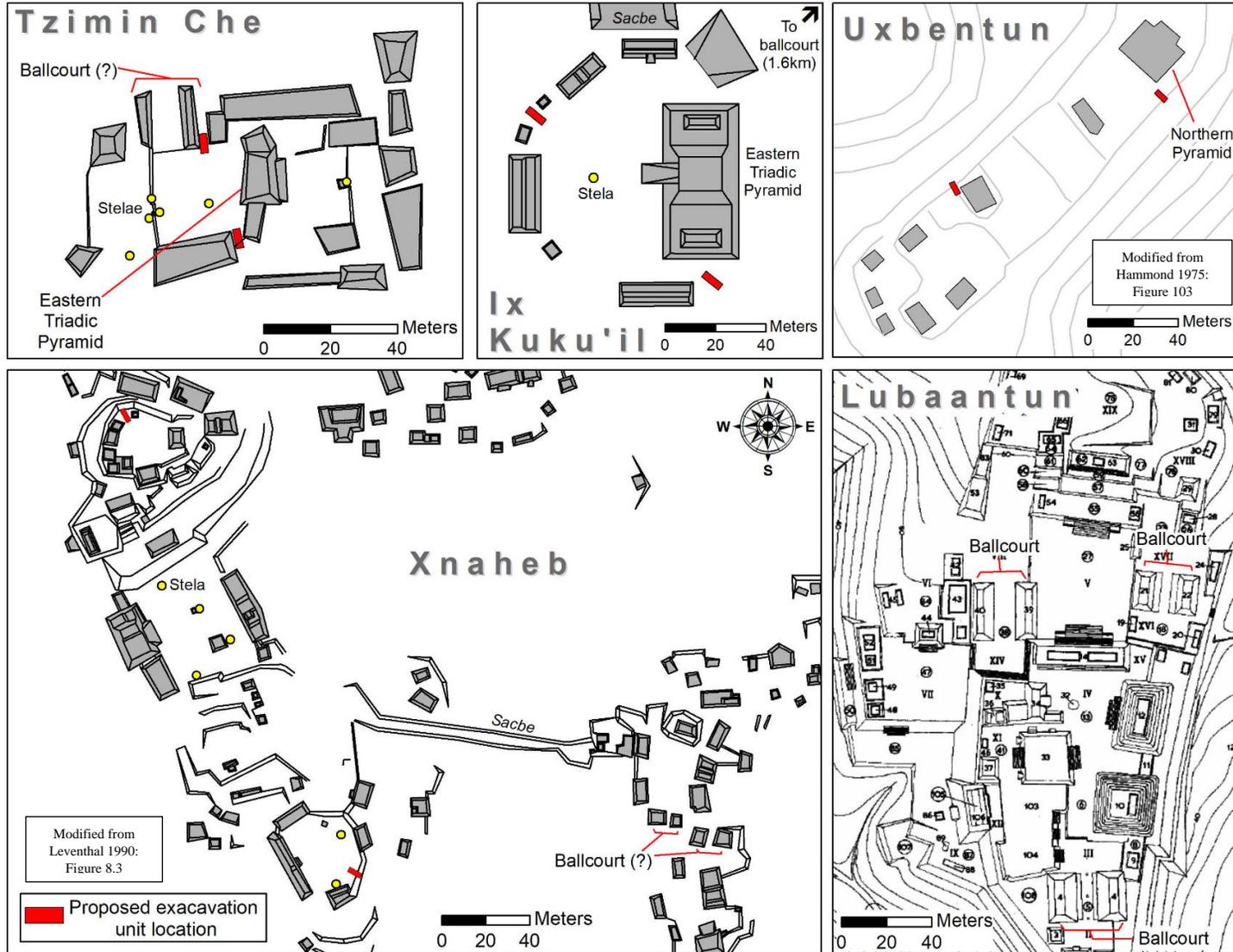


Figure 3. Epicenters of minor centers (see Table 1) and excavation locations (red rectangles). Lubaantun (Modified from Hammond 1972:Figure 20.4), a major center, is included for comparison of the size of major vs. minor centers in southern Belize.

8. BIBLIOGRAPHY: A bibliography of references cited should be included and should demonstrate awareness of the literature relevant to the proposed research.

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9. **PUBLICATIONS AND OUTPUTS:** Please describe all relevant research products you expect to produce (e.g., documentation, data, new tool, new method, website, media, publications, presentations, etc.).

Data

Data will include scans of all excavation forms and field drawings, digitized profiles and plan views, artifact analyses including ceramic typologies, and AMS ¹⁴C dates from secure excavation contexts. These data will be written up in reports and submitted to the Belizean Institute of Archaeology and the SAA as well as to local communities of San Jose (Ix Kuku'il), San Pedro Columbia (Uxbentun), Indian Creek (Xnaheb), and Medina Bank (Tzimin Che) and the Maya Leadership Alliance (MLA). Reports will be made publicly available through academia.edu, ResearchGate, and tDAR.

Social Media

I will use Twitter and Instagram (@ArchaeologyAmy) to share daily findings with local and global communities. WiFi is available in Big Falls and at the Maya Mountain Research Farm and cellular internet is often accessible on hilltops across southern Belize allowing for daily internet access. Social media will also be used to disseminate results once they are published.

Presentations

BAS (2021 and 2022)

- The annual Belizean Archaeology Symposium (BAS) encourages local tour guides and Belizean public to attend. I will report preliminary findings from the first half of field work in 2021 and final results of the developmental trajectory of foothills minor centers (BAS 2022).

SAA (2022)

- Society for American Archaeology (SAA). I will report on the regional development of southern Belize including the emergence of inequality at minor centers, building off previous work by other scholars in the region.

AAGs (2022)

- Association of American Geographers (AAG). I will present on the spatial aspects of the regional development of southern Belize.

Publications

Peer-Review Article 1: *Research Reports in Belizean Archaeology* – Preliminary findings will be presented in *Research Reports in Belizean Archaeology*, a regional peer-reviewed journal.

Peer-Review Article 2: *Latin American Antiquity* – This publication will emphasize the history of archaeology in southern Belize and shifts in methods and approaches over the past century including the importance of building relationships with indigenous communities for cultural heritage management.

Peer-Review Article 3: *Journal of Anthropological Archaeology* – This publication will focus on the development of the minor centers of southern Belize in relationship to the larger, well-studied centers in southern Belize and the greater Maya region, and the emergence of inequality. These will be based on AMS ¹⁴C dates and ceramics – especially smaller, minor centers that we know little about such as Ix Kuku'il [civic ceremonial core], Uxbentun, Xnaheb, and Tzimin Che. This will build off previous and recent work and incorporate new radiocarbon assays from Nim Li Punit and Lubaantun.