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EXPLORING THE GUALE VILLAGE AND SPANISH MISSION OCCUPATIONS AT THE SAPELO SHELL RING COMPLEX THROUGH BAYESIAN ANALYSIS

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ABSTRACT. Bayesian analysis of radiocarbon (^{14}C) dates in North American archaeology is increasing, especially among archaeologists working in deeper time. However, historical archaeologists have been slow to embrace these new techniques, and there have been only a few examples of the incorporation of calendar dates as informative priors in Bayesian models in such work in the United States. To illustrate the value of Bayesian approaches to sites with both substantial earlier Native American occupations as well as a historic era European presence, we present the results of our Bayesian analysis of ^{14}C dates from the earlier Guale village and the Mission period contexts from the Sapelo Shell Ring Complex (9MC23) in southern Georgia. Jefferies and Moore have explored the Spanish Mission period deposits at this site to better understand the Native American interactions with the Spanish during the 16th and 17th centuries along the Georgia Coast. Given the results of our Bayesian modeling, we can say with some degree of confidence that the deposits thus far excavated and sampled contain important information dating to the 17th-century mission on Sapelo Island. In addition, our modeling of new dates suggests the range of the pre-Mission era Guale village. Based on these new dates, we can now say with some degree of certainty which of the deposits sampled likely contain information that dates to one of the critical periods of Mission period research, the AD 1660–1684 period that ushered in the close of mission efforts on the Georgia Coast.

KEYWORDS: AMS dating, Bayesian, Georgia Coast, historic period, Spanish.

INTRODUCTION

It is becoming increasingly clear that large-scale movements of villages and regional populations were part of historical events and possibly adaptive processes that permeated sections of the Eastern Woodlands (Birch 2012; Pluckhahn et al. 2020). Closer to our study area along the Georgia Coast is the postulated abandonment of the Savannah River Valley (Anderson 1994) and possible subsequent movement of people to the coast (Ritchison 2018b). Indeed, there are even hints that population movements also were part of the regular coastal pattern or were perhaps reactions to early colonial encounters on the Georgia Coast (Figure 1). For example, there appears to be no Altamaha period sites on Ossabaw Island (Pearson 2014), suggesting the possibility that it was abandoned prior to or just at the time when Spanish settlers entered the region.

The issue with evaluating such evidence for population movement for the Georgia Coast is, however, three-fold. First, the ceramic chronologies as they are currently constructed do not provide the temporal resolution necessary to evaluate settlements and abandonments for this era. Second, with regards to radiocarbon (^{14}C) dates, this area of the calibration curve tends to fall on a plateau which has a tendency to produce multiple intercepts (see Thompson and Krus 2018). Finally, mollusks have historically been the material of choice for archaeologists attempting to date such events. Mollusks, however, due to their need for marine reservoir corrections, have been found to produce less precise dates (Hadden and Cherkinsky 2017; Thompson and Krus 2018; Krus and Thompson 2019) and be susceptible to the possible uptake of older carbon (Cherkinsky et al. 2014).

In order to circumvent some of the pitfalls identified above we apply a Bayesian analysis of ^{14}C dates from the late pre-Mission (AD 1300–1580) and Mission period (AD 1580–1700)

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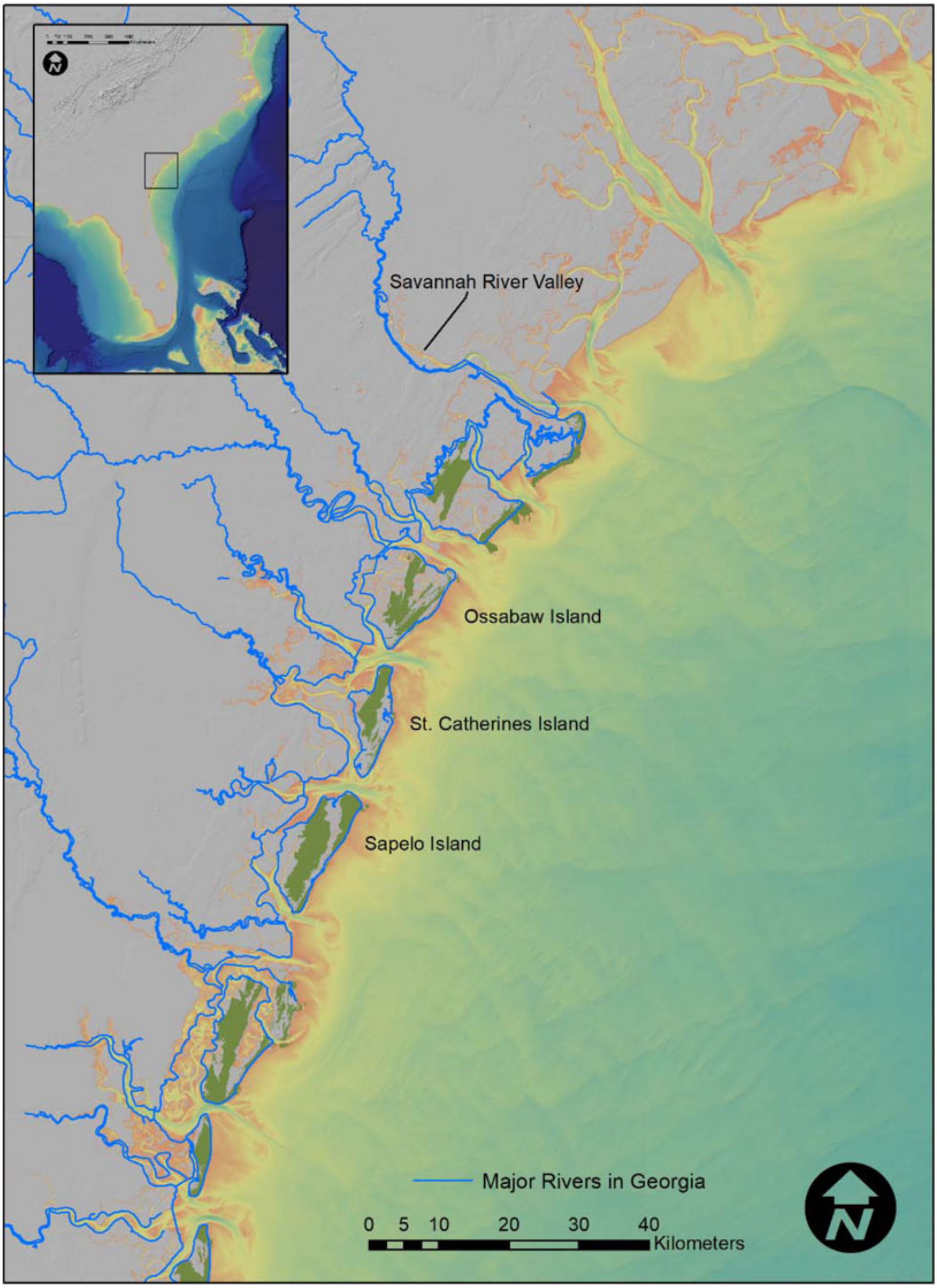

Figure 1 Location of Sapelo Island along the Georgia Coast.

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occupations of the Sapelo Shell Ring Complex (9MC23). Our purpose here is to provide a finer grain temporal resolution regarding both the Mission period occupation and exactly when Native Americans lived in the same locale prior to the establishment of the Spanish Mission system. Understanding these events has implications for the 15th and 17th centuries and is the first step in a broader understanding of the nature of colonial entanglements in the region.

NATIVE AMERICANS AND SPANISH MISSIONARIES AND EXPLORERS ON SAPELO ISLAND AND THE GEORGIA COAST

Late period Native American archaeological sites occupied in the few centuries just before European contact on the northern Georgia coast are identified primarily by the presence of Irene and Savannah ceramic types. The literature on these ceramic series place the Savannah period between AD 1150–1275 (800–675 BP) and the Irene period AD 1275–1580 (650–370 BP) (DePratter 1991; Thomas 2008b). More recently Ritchison (2018a) produced a Bayesian analysis of the entire coastal sequence using the ^{14}C database developed by Turck and Thompson (2014) for coastal Georgia. In his modeling of dates associated with the Savannah and Irene periods he found that his models suggested an earlier start date for the Savannah period and a much later end date for their production (Ritchison 2018a: 7). His model for Irene ceramics generally agrees with the previous start dates for this series; however, the model indicates that people ceased producing these ceramics earlier than the standard chronologies suggest (Ritchison 2018a). As Ritchison (2018a) points out, his research shows not so much that his new dates for these ceramic chronologies need to be accepted, but rather there are questions regarding the chronologies of these ceramics that need to be addressed by better sample contexts and types (e.g., shorter-lived botanical species). Understanding such chronologies has the potential to inform us about the processes of missionization and the social landscape at the time of European contact, as discussed in more detail below.

In the 16th century when Spanish explorers and missionaries first arrived along the shores of the Atlantic, the Guale of the northern Georgia Coast were organized into ranked political units with inherited leadership and status (Thomas 2008c). As Thomas (2008b) argues, inherited leadership may have emerged by around AD 800, which is early for the region in general. By the 16th century, however, this system, at least as practiced among the Guale, may have been less individualizing and more corporate and collective in nature. This is possibly indicated by the changing focus and form of public architecture at the Irene site during this time (Anderson 1994; Saunders 2000; Thompson 2009; Ritchison 2018b). Despite this shift to a more collective form of leadership, the Guale continued to have formal inherited status roles well into the era of European colonization (Worth 2007; Thompson and Worth 2011).

David Hurst Thomas (2008a) has identified one of the central issues concerning the Guale at the time of European colonization. Dubbed the “Guale Problem,” he lays out some of the contradictions concerning the nature of mobility among Native peoples of the region. Specifically, there are inconsistencies in the historic documents relating to the Mission period and the nature of mobility that was practiced among Guale groups (see also Jones 1978). This also relates to Guale subsistence and their reliance on maize agriculture. In short, early descriptions by 16th century Jesuit missionaries in the region describe the Guale as being highly mobile, moving from place to place in search of resources. Subsequent descriptions by 17th century Franciscan missionaries describe the opposite.

These accounts suggest the presence of large aggregate villages that engaged in maize agriculture.

There is now a growing corpus of archaeological studies that address the Guale problem. These studies include zooarchaeological, bioarcheological, and isotopic research (Keene 2004; Andrus and Crowe 2008; Thompson and Andrus 2013), all of which point to year-round occupation of Savannah and Irene period sites on a variety of site sizes and potentially different types. In fact, studies of the earlier Late Archaic sites suggest that Native inhabitants of the Georgia coast were living in year-round villages over 4000 years ago (Colaninno 2010; Thompson and Worth 2011; Thompson and Moore 2015; Sanger et al. 2019). One possible explanation for the disconnect among the historic sources is that the Guale were experiencing severe drought conditions in the late 1500s, as documented and discussed by Blanton and Thomas (2008), thus engendering a higher than normal degree of mobility.

One other possible hypothesis that would explain the observed degree of mobility of the Guale in the late 1500s is that they were in the middle of larger-scale settlement migrations at this time. As noted earlier, Ossabaw Island, located just two islands north of Sapelo Island, appears to be abandoned prior to or during the Mission period, as there are no Altamaha sites currently recorded on the island (Pearson 2014). In addition, Spanish accounts for Sapelo Island indicate that it too was largely devoid of Native American settlement by 1595 (Worth 2007; Jefferies and Moore 2013). We do know that there was substantial population movement and aggregation during the Mission period where mission towns moved wholesale around the coast, shifting their location to different islands and annexing mainland populations at times (Worth 2007; Thomas 2008a; Jefferies and Moore 2013). These movements were due, in part, to largely external factors, such as attack from pirates, as well as other Native groups intent on capturing slaves (Worth 2007; Jefferies and Moore 2013). However, it is possible that these larger-scale movements were part of a much older institution of population migration among islands as a way of dealing with scalar and resource stressors. At this point this is merely a hypothesis and the first step to see if it is possible to identify settlement and island-wide abandonments that might indicate this historical pattern.

The Sapelo Shell Ring Complex

As a way to explore some of the larger issues regarding the nature of abandonment of islands, settlement continuity of Mission period sites, and when these were occupied by Spanish missionaries, we have begun a large-scale ^{14}C dating project of the Sapelo Shell Ring Complex on Sapelo Island. While mainly known for its Late Archaic shell rings, the complex also has overlapping Savannah, Irene, and Spanish Mission period settlements. For the past several years, Jefferies and Moore (2013, 2018) have excavated a host of Mission period and earlier contexts at the site. The Mission period for the Georgia coast begins in AD 1568 and continues until around AD 1684 (Worth 2007).

Large-scale surveys of the site by Jefferies and Moore have documented a number of large shell midden piles that contain Savannah, Irene, and Altamaha series ceramics, suggesting that these midden piles date to the few centuries leading up to the Mission period, as well as some being contemporaneous with the mission on Sapelo. Exactly when, however, prior to the mission these earlier piles date is uncertain (e.g., 14th–16th centuries).

Jefferies and Moore suggest that the Sapelo Shell Ring Complex's Mission period occupation is that of the 17th century mission of *San Joseph de Sapala*. To further refine the exact temporal components of the excavated deposits, artifacts, and features of this site, we conducted a Bayesian analysis of 10 ^{14}C dates associated with Spanish period features. While the mission itself was established in the early 1600s, the results of this research indicate that deposits sampled represent the very tail end of the Mission period along the Georgia coast, AD 1660–1684 (Thompson et al. 2019). At this point, we have a good understanding of the temporal position of these deposits; however, there is still the possibility of an earlier Spanish mission on the island, as well as a later Yamasee occupation. Part of the issue with identifying these earlier and later occupations, as well as the dates of the earlier shell midden piles at the site, is that both the European and Native ceramics found in these deposits have production periods of 100 years or more (Thompson et al. 2019); therefore, we once again turn to ^{14}C and Bayesian analysis to refine our temporal understanding. In what follows, we present the results of nine new dates modeled with the previous 10 to both further refine the Mission period occupation and begin to understand the nature of the Native American occupation just prior to the arrival of the Spanish.

MATERIALS AND METHODS

As we outlined in our earlier study (Thompson et al. 2019), our model building for the 10 earlier and 9 new dates started with a selection of samples that we thought would return the most reliable dating of the events we were interested in evaluating (Table 1). To select the samples, we relied on three main criteria which consisted of (1) if the sample was from a short-lived botanical remain, (2) if the sample was a European botanical or animal introduction, and (3) the frequency of ceramic types and other artifacts associated with the samples.

Two of the main sample types that we knew must date the early historic era or later were species that were brought over and quickly adopted when Spanish missionaries arrived on the Georgia Coast. For Sapelo these include peach trees (*Prunus persica*) and pigs (*Sus scrofa*), and fragments of both are represented in our samples. Next, we chose maize samples (*Zea mays*) from feature contexts that we knew had European made artifacts in them, which included objects like wrought nails. We grouped together all of these samples in the model, as will be described below.

We had two other groupings of dates that we incorporated into our sampling procedures. These included maize samples and grape seeds (*Vitus* spp.) that were found in direct association with Altamaha ceramics, which are the Mission period Native American ceramics of the Georgia Coast. These ceramics have a production end date in the region of around AD 1715 (Thomas 2009). The final grouping of dates in our sample are hickory nuts, maize, and one unidentified carbonized wood sample associated with Savannah and Irene series ceramics. These dates are thought to represent the pre-mission period.

Based on our knowledge of the types of samples, their contexts, and historic dates for the end production of Altamaha ceramics, and Mission period and post-mission period events, we constructed a series of models in OxCal 4.3; however, space here only permits presentation of our final model. Variations of the model, however, did not produce dramatically different results. In fact, our inclusion of new dates did not significantly alter the dates from our previous modeling of the Mission period dates from the site (see Thompson et al. 2019).

Table 1 Radiocarbon samples and dates.

Site #	Unit	Level	Provenience	Material	UGAMS lab #	$\delta^{13}C$ (‰)	^{14}C age (yr BP)	±	pMC	±
9Mc23	20	Level 4	Postmold 3	*Zea mays* (maize)	25044	–9.6	210	25	97.44	0.31
9Mc23	21	Level 3	Feature 3	*Zea mays* (maize)	25045	–11	180	25	97.76	0.31
9Mc23	22	Level 3	Feature 5	*Zea mays* (maize)	25046	–10.8	180	25	97.81	0.31
9Mc23	22	Level 3	Feature 3	*Prunus persica* (peach pit)	25047	–23.3	180	25	97.72	0.30
9Mc23	48	Levels 4/5	Feature 66	*Sus scrofa* (pig)	25048	–14.6	220	25	97.33	0.30
9Mc23	38	Level 2	Feature 46 W1/2	cf. *Zea mays* (maize)	25049	–11	160	25	98.06	0.30
9Mc23	39	Level 3	Column sample	*Prunus persica* (peach pit)	25050	–24.5	260	25	96.79	0.30
9Mc23	39	Level 2	Column sample	*Prunus persica* (peach pit)	25051	–24	290	25	96.48	0.30
9Mc23	42	Level 3	Feature 50	*Zea mays* (maize)	25052	–8.8	160	25	97.98	0.31
9Mc23	49	Zone B	Feature 69	*Prunus persica* (peach pit)	25053	–24.1	220	25	97.27	0.30
9Mc23	20	2B (west 1/2, top)	Shell-filled pit	*Zea mays* (maize)	38997	–10.04	220	20	97.24	0.26
9Mc23	23	Level 4	Shell-filled pit	*Vitus* sp. (grape)	38998	–24.57	410	20	94.99	0.25
9Mc23	23	Level 2	Shell midden pile	*Zea mays* (maize)	38999	–10.31	420	20	94.91	0.26
9Mc23	51	Level 3	Shell midden pile	*Quercus* spp. (acorn)	39000	–26.08	350	20	95.76	0.25
9Mc23	57	Level 4	Shell midden pile	*Carya* spp. (hickory nut)	39001	–25.65	630	20	92.45	0.24
9Mc23	57	Level 3	Shell midden pile	*Carya* spp. (hickory nut)	39002	–27.22	670	20	92.01	0.24
9Mc23	60	Level 3	Shell midden pile	*Zea mays* (maize)	39003	–11.3	210	20	97.38	0.25
9Mc23	60	Level 2	Shell midden pile	*Carya* spp. (hickory nut)	39004	–26.62	220	20	97.32	0.25
9Mc23	47	Level 2	Shell midden pile	UID wood	39005	–26.71	710	20	91.58	0.24

These dates were grouped in a phase as samples with known associated Native American Mission period ceramics.

The structure of the model can be seen in Figure 2 and Table 2. We used a three-phase model for these dates with the Group 1 Savannah-Irene being in a sequence with the other two, Group 2 Altamaha Samples and Group 3 Spanish Samples, which are independent phases within a larger phase. In a few cases in both Group 1 and Group 3, we are able to use the sequence command to order dates by their stratigraphic order, which further constrained them to tighter ranges. All dates were calibrated and modeled using the IntCal13 curve in OxCal 4.3 (Reimer et al. 2013) and were rounded to the nearest 5-year interval. For the lone sample of unidentified carbonized wood, we used the Charcoal Outlier Model which includes an offset for "wood charcoal samples" (Bronk Ramsey 2009; Hamilton and Krus 2018). As with our previous work, we did not include a TPQ for the model, as establishing exactly when the site was initially settled is still a matter of ongoing research. We did, however, include a TAQ, which is critical to the modeling of the dates. In our previous study, we used a conservative date of 1750 for the end production of Altamaha ceramics, as this was the upper end of the range of the ^{14}C dates associated with these dates. Again, archaeologists usually assign a production end date to Altamaha ceramics of 1715 as we state above. For Sapelo Island, we know from historic records that by 1733 it was used only for hunting by Native American groups, providing another possible TAQ to be used (Sullivan 2001). We modeled all of the dates using each of these as TAQs. None of these produced significantly different results with most modeled dates being the same, except for a larger range for two dates with the TAQ of 1750. Therefore, we adopt in the current study the TAQ of 1733 with an error range of 15 years, as it is likely the most reflective of the actual use of the island.

RESULTS

The results of our modeling of the dates indicate good agreement. Both the Amodel (98) and Aoverall (93.4) for the model indicate statistical significance, exceeding the 60-threshold established for Bayesian analysis (Bronk Ramsey 2009; Hamilton and Krus 2018). Due to the long tails in the distribution of these dates we focus on the 68% probability range, but 95% ranges are provided as well (Table 2). All dates indicate good convergence (i.e., >95).

The modeling provides a start date for the pre-mission village at *cal. AD 1265–1370* (68% probability) and *cal. AD 1200–1385* (95% probability). In looking at the dates for the Group 1: Savannah- Irene, the modeled ranges all end around AD 1500. The only exception is one date whose range extends into the 16th century (UGAMS 39000), which has a range of *cal. AD 1465–1515* (68% probability) and *cal. AD 1450–1585* (95% probability). The boundary end estimation for these dates is *cal. AD 1475–1555* (68% probability) and cal. *AD 1465–1615* (95% probability).

Dates associated with Mission period deposits were modeled as a single overarching phase with two independent subphases, Group 2: Altamaha Samples and Group 3: Spanish Samples. For these dates, the model-estimated start for the Mission period occupation falls between *cal. AD 1605–1655* (68% probability) and *cal. AD 1550–1660* (95% probability). The end date for the Mission period falls between *cal. AD 1660–1685* (68% probability) and *cal. AD 1650–1705* (95% probability).

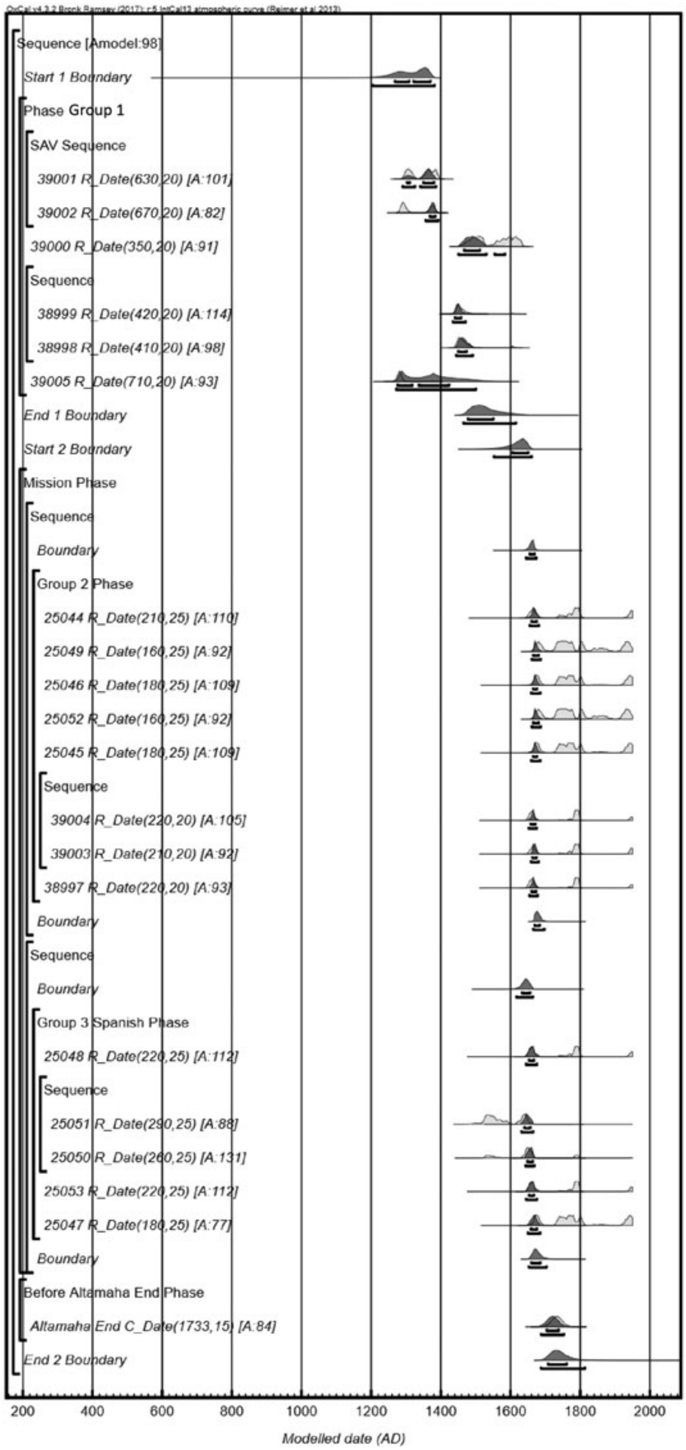

Figure 2 Probability distributions for the pre-mission village and mission period context samples from the Sapelo Island Shell Ring Complex. The light gray and dark gray together represent calibrated distributions and the dark gray alone represents the posterior density estimates based on the model that incorporates at a TAQ of 1733 ± 15 based on historic documents and archaeological information.

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Table 2 Modeled pre-mission and mission dates from Sapelo Shell Ring Complex.

Name	Unmodeled (BC/AD)						Modeled (BC/AD)						Indices Amodel 98 Aoverall 93.4		
	from	to	%	from	to	%	from	to	%	from	to	%	Acomb	A	C
Sequence															
Start 1 Boundary							1265	1370	68	1200	1385	95.4			99.5
Phase															
Group 1 (SAV) Sequence															
39001 R_Date(630,20)	1295	1390	68	1290	1395	95	1300	1380	68	1290	1390	95.4		101	99.9
39002 R_Date(670,20)	1280	1385	68	1275	1390	95	1365	1385	68	1355	1395	95.4		82	100
39000 R_Date(350,20)	1485	1630	68	1460	1635	95	1465	1515	68	1450	1585	95.4		91	99.9
Sequence															
38999 R_Date(420,20)	1440	1470	68	1435	1490	95	1440	1460	68	1430	1470	95.4		114	100
38998 R_Date(410,20)	1440	1470	68	1435	1615	95	1445	1475	68	1440	1495	95.4		98	100
Charcoal Outlier_Model							–125	5	68	–220	5	95.4			98.9
Exp(1,–10,0)	–1.24	–0.05	68	–3.18	–0.05	95									98.2
U(0,3)	2.21E-17	3	68	2.21E-17	3	95	1.392	2.793	68	0.198	3	95.4		100	96
39005 R_Date(710,20)	1270	1290	68	1260	1300	95	1275	1425	68	1270	1500	95.4		93	98.7
End 1 Boundary							1475	1555	68	1465	1615	95.4			99.9
Interval							50	150	68	0	160	95.4			99.9
Start 2 Boundary							1605	1655	68	1550	1660	95.4			99.9
Mission Phase															
Sequence															
Boundary							1655	1670	68	1645	1675	95.4			99.9
Group 2 Phase															
25044 R_Date(210,25)	1650	—	68	1645	—	95	1660	1675	68	1655	1685	95.4		110	100
25049 R_Date(160,25)	1665	1945	68	1665	—	95	1665	1680	68	1660	1690	95.4		92	100
25046 R_Date(180,25)	1665	—	68	1655	—	96	1665	1680	68	1655	1685	95.4		109	100
25052 R_Date(160,25)	1665	1945	68	1665	—	95	1665	1680	68	1660	1690	95.4		92	100
25045 R_Date(180,25)	1665	—	68	1655	—	96	1665	1680	68	1655	1685	95.4		109	100
Sequence															
39004 R_Date(220,20)	1650	1800	68	1645	—	95	1655	1670	68	1650	1675	95.4		105	100
39003 R_Date(210,20)	1655	—	68	1645	—	95	1660	1675	68	1655	1680	95.4		92	100

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Table 2 (*Continued*)

Name	Unmodeled (BC/AD)						Modeled (BC/AD)						Indices Amodel 98 Aoverall 93.4		
	from	to	%	from	to	%	from	to	%	from	to	%	Acomb	A	C
38997 R_Date(220,20)	1650	1800	68	1645	—	95	1660	1675	68	1650	1680	95.4		93	100
Boundary							1665	1685	68	1665	1700	95.4			99.9
Sequence															
Boundary							1630	1660	68	1615	1665	95.4			99.9
Group 3 Spanish Phase															
25048 R_Date(220,25)	1645	—	68	1640	—	95	1650	1670	68	1645	1680	95.4		112	100
Sequence															
25051 R_Date(290,25)	1520	1650	68	1495	1660	95	1635	1660	68	1630	1665	95.4		88	99.9
25050 R_Date(260,25)	1530	1795	68	1520	1800	95	1645	1665	68	1640	1670	95.4		131	100
25053 R_Date(220,25)	1645	—	68	1640	—	95	1650	1670	68	1645	1680	95.4		112	100
25047 R_Date(180,25)	1665	—	68	1655	—	96	1655	1680	68	1650	1685	95.4		77	100
Boundary							1660	1685	68	1650	1705	95.4			99.9
Before Altamaha End Phase															
Altamaha End C_Date (1733,15)	1715	1750	68	1700	1765	95	1700	1740	68	1685	1755	95.4		84	99.9
End 2 Boundary							1705	1765	68	1685	1815	95.4			99.7

In looking at each of the modeled dates, all of them seem to fall around the later part of the 17th century (Figure 2). Visually there appears to be a gap between the Irene pre-mission village and the currently dated deposits for the Mission period on Sapelo. Using the interval command, the possible gap between the end of the pre-mission village and the start of mission period activities is around *50–150* (68% probability) or *0–160* years (95% probability).

DISCUSSION AND CONCLUSION

The result of our modeling study with new dates for the Mission and pre-mission periods for the Sapelo Shell Ring Complex provides additional insight into the nature of the human geography of the pre-mission landscape and the temporality of missionization on Sapelo Island. Our new dates and models for this site indicate that some of the observations made about the island specifically in the 16th century may be an accurate assessment of the nature of Guale occupation, and this work may possibly point to larger population movements and processes that were in operation prior to the establishment of Spanish missions on the coast.

At this point we can say that our modeling has confirmed our previous work at the Sapelo Shell Ring Complex. The newly incorporated dates from the site do not change substantively our observation that most of the Mission period deposits sampled thus far date to the later part of the Mission period on the island, ca. AD 1640–1684, which corresponds to the presence of majolica pottery as well. It is possible that one of the dates relates to an early mission component; however, it is difficult to evaluate this without additional samples from the same context. Again, our samples from the later end of the mission occupation bracket a critical time at the close of Spanish efforts on the Georgia Coast (Thompson et al. 2019). It was at the end of this timeframe that Mission San Joseph de Sapala was abandoned.

One of the interesting aspects of our new dates and modeling indicates that the Guale village, even with deposits that have Savannah period ceramics, appears to start only as early as the late 1200s or early 1300s, *cal. AD 1265–1370* (68% probability). The latest modeled date for this grouping of dates at the 68% confidence interval is *cal. AD 1475–1555* (68% probability). Most other modeled dates do not date later than the mid- to late 1400s. Comparing this grouping of dates to the Mission period modeled dates suggests the possibility of a gap in the occupation of the general locale sometime during the 1500s that may have lasted upwards of 50 years.

What is interesting regarding the possible gap in occupation for the Sapelo Shell Ring Complex is that an island-wide hiatus is suggested in the Spanish documents for this time frame. As we previously noted, Spanish missionaries suggest that Sapelo was abandoned sometime before 1595. A recent large ^{14}C dating project of Kenan Field by Ritchison (2019) returned only one sample that spanned this time period in question. Further, no ^{14}C dates in the coastal database assembled by Turck and Thompson (2014) span this period for Sapelo Island. It may be that nearby St. Catherines Island was the location where Sapelo, and potentially Ossabaw, groups moved and aggregated during this time, as this island currently has ^{14}C dates that span this timeframe (Thomas 2008c; Turck and Thompson 2014). Alternatively, populations may have aggregated at other locations like Creighton Island, which has yielded evidence for both large Irene and Mission period occupations and is suspected to be the lost town of Mission Santa Clara de Tupiqui (Porter et al. 2016).

In looking at the larger Guale landscape just prior to contact, it appears that a large number of sites containing Irene series ceramics were established during and after the 1300s (Thomas 2008c; Pearson 2014). During the Mission period we see a reduction in numbers of sites, in part due to the fact that Native peoples were aggregated into mission towns (Jefferies and Moore 2013), with this being especially the case for the latter part of the Mission period due to external slave raids and other threats.

While the aggregation of Native peoples into mission towns certainly occurred, it is possible that some of the reorganization with a greater focus on aggregation and coalescence of villages occurred just prior to the Mission period. The question is why this would be so. One possible explanation is that groups aggregated due to a constriction of resources caused by possible droughts during the 1500s. This may also account for the observed or interpreted higher mobility of the Guale by the Jesuits during this time as well. Dendrochronological studies indicate several high amplitude droughts during this time (Blanton and Thomas 2008). This process of aggregation may be a way to buffer against resource depression by allowing for more collective acquisition of aquatic resources, as has been argued for southwestern Florida (Thompson et al. 2018).

Currently, the large-scale population shifts hinted at in the ^{14}C record, historic documents, and distribution of sites across the landscape provide an interesting laboratory to develop research methodologies to test for abandonments and aggregation during a critical time period. Our work at Sapelo and our modeling of these pre-mission and Mission period dates point towards a process by which some of the ideas presented here can be tested. Currently, these hypothesized movements and abandonments need to be tested empirically. Large-scale dating of several sites on these islands and careful sample selection will be needed to see if these processes of abandonment and reoccupation are really at work during this time period. We now, however, have the tools to evaluate these important human scale events at the time Europeans entered the American Southeast.

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