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Investigating 14th century immigration and settlement response on the Georgia Coast, USA

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ABSTRACT

Following the 14th century depopulation of the Savannah River Valley of modern Georgia and South Carolina, the neighboring coastal region of Georgia exhibited significant changes in settlement. In the absence of other demographic proxies, Georgia state site file data show that there was a greater accumulation of archaeological components during the 14th century than in any other preceding period. Exploratory Bayesian modeling of settlement practices using a compiled set of legacy radiocarbon dates demonstrates that much of this expansion of settlement happened concomitant with the depopulation of the Savannah River Valley.

1. Introduction

Climatic instability is one of the greatest natural challenges facing human groups. Drought, in particular, has been a major stressor of subsistence and sociopolitical systems. Droughts vary in geographic and temporal scale, sometimes intermittent and local, and occasionally decadal and regional. Human responses to drought vary in kind. For example, in the American Southwest, a significant disruption in normal rainfall patterns between 1250 CE and 1450 led to the abandonment of the Kayenta and Greater Mesa Verde regions (Cameron, 1995; Dean and Funkhouser, 1995; Hill et al., 2004; Lekson and Cameron, 1995; Mills et al., 2015). Decades of study have shown that these two cases of abandonment and migration led to very different social outcomes for both migrants and locals based on the cultural and environmental contexts of their respective homelands and destinations (Clark and Lyons, 2012; Mills, 2011; Ortman, 2012; Ortman et al., 2014; Stone, 2015).

These cases from the American Southwest are notable due to the high resolution in chronology, climate, and settlement that has been accessible to researchers. However, other cases of abandonment and movement have also been reported in North America. For example, researchers in the Eastern Woodlands of the United States have documented several cases of abandonment and population movement (Cobb and Butler, 2002; Krus and Cobb, 2018; Meeks and Anderson, 2013; Snow, 1995, 1996; Willey, 1953). One well-documented example is the abandonment of the Middle and Lower Savannah River Valley (SRV) at some point during the latter half of the 14th century. The 14th century was a period of environmental stress in the Savannah River Valley, with dendrochronological analysis revealing below-average rainfall resulting in estimated harvest shortfalls during 12 of the 19 years from 1359 CE to 1377 (Anderson et al., 1995). Perhaps as a result, the complex societies of the SRV abandoned their settlements and mound centers by 1400 CE (Anderson, 1994; Stephenson et al., 2015). This abandonment marked the collapse of several Mississippian chiefdoms that had occupied the valley for the previous 150 years.

At the mouth of the Savannah River on the Georgia Coast, the beginning of the Irene phase (1300–1580 CE) coincided with abandonment of the SRV. At that time, the northern Georgia Coast saw an expansion of settlement (Pearson, 1978; Sipe, 2013; Thomas, 2008c), incorporation of Mississippian stylistic motifs and ritual goods (Moore, 1897), and increased use of maize in the diet as observed in coastal bioarchaeological assemblages (Larsen et al., 2002; Thomas, 2008c). These changes have not been adequately explained. The current, implicit understanding is that these transformations occurred through an ill-defined, and incomplete, process of “Mississippianization” that arrived late on the Mississippian periphery (see Thomas, 2008a:309–312). I do not find the concept of Mississippianization to be clarifying here; what is important, however, is that adoption of the Mississippian iconographic lexicon and maize agriculture has been linked to processes of human movement (Beck, 2003; Blitz and Lorenz, 2002; Cobb and King, 2005; Pauketat, 2003; Willey, 1953; Williams, 1994).

The Georgia Coast seems a likely destination for former residents of the SRV, being easily reached via the Savannah River. Neighboring regions also appear to have received immigrants from the abandoned river valley. These regions surrounding the SRV, namely the Oconee,

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Pee Dee and Wateree river valleys, all experienced some degree of disruption coincident with abandonment of the SRV. Beck (2013) argued that the appearance of Late Mississippian Lamar ceramics from Georgia in the Carolina Piedmont, along with changes in the settlement system in that region, suggest that at least some former residents of the SRV made their way to the east. Similarly, Williams (1994) documented a population decline at the Shoulderbone site concomitant with the SRV abandonment and a complete depopulation of the site by 1450 CE. Some have suggested that Shoulderbone functioned as a protective buffer between the Oconee and Savannah River Valleys during a period of increasing political tensions (Anderson, 1994; Beck, 2013; Williams, 1994). However, after the SRV was abandoned, a defensive gateway settlement would have no longer been necessary. In addition, the Georgia Coast, like other coastal regions, was linked to the interior through the exchange of marine shell beads (Pearson and Cook, 2012; Trubitt, 2003). These exchange networks were likely mediated through matrimonial relationships, which have also been argued to structure migratory decision making (Brown and Kerber, 1990; Burmeister, 2000). Nevertheless, these lines of evidence, although compelling, are circumstantial.

Evidence of migration tends to be found at the scale of individual sites. In particular, ceramics and domestic architecture have been used as material correlates to identify population movements (e.g., De Roche, 1983; Haviland, 1972; Milner, 1986; Rouse, 1986; Stone, 2015; Warrick, 2008). Unfortunately, the archaeological record of the Georgia Coast does not include these necessary criteria. The Lamar-series ceramics noted by Beck (2013) in the Carolina Piedmont long precede the abandonment of the SRV on the Georgia Coast. In fact, a high degree of similarity in both temper and style in Mississippian ceramics across most of the state of Georgia suggests that the types of interpersonal connections that structure individual decisions that fundamentally comprise migration events had existed between several of the regions in question for some time. However, the presence of similar ceramic throughout much of Georgia during this time precludes identification of a classic "site-unit intrusion" (sensu Smith, 1984). Further, in the case of the Georgia Coast, our understanding of Late Prehistoric domestic architecture is limited by the small sample of excavated structures (see Keene and Garrison, 2013). Therefore, recognizing a large-scale population movement from the SRV to the Georgia Coast via these traditional methods is currently not possible.

Analysis of regional settlement data, along with a growing regional radiocarbon database, provides another method to evaluate population dynamics. I used both settlement analysis and Bayesian modeling of radiocarbon data to evaluate the character and timing of shifts in settlement practices on the Georgia Coast relative to the timing of abandonment of the Savannah River Valley. Determining the timing and nature of settlement changes will improve our understanding of these regional socio-political transformations and the role of immigration in those changes.

A number of approaches can be used to derive population estimates from settlement data. Warrick (2008) organized these approaches based on how closely the estimates approximate actual population numbers. At the grossest scale, population sizes can be estimated based on the carrying capacity of the environment, provided that information about environmental conditions and subsistence practices and technologies is available. This can be made more precise through inclusion of historical census data and material remains such as artifacts, food remains, and burial assemblages.

Settlement-based methods rely on ethnographic and ethnohistorical analogies, where archaeological measures of house and room counts, number of hearths, or total roofed area are related to specific numbers of people (Warrick, 2008:55–64). Such data are more difficult to obtain, requiring either extensive horizontal excavation or high-resolution, expansive shallow geophysical surveys where extant surface remains do not exist, such as in the American Southeast. Because contract archaeological survey projects contribute most of the settlement data available through state archaeological site files, these data are rarely available for conducting population reconstructions, especially at regional scales.

Another approach is to use total settlement area, rather than household-level areal estimates, to calculate population size (Warrick, 2008:69–70). This approach would likely produce less accurate estimates than methods based on intra-settlement data, but state site files are more likely to include information about total settlement area. For example, more than half of all entries in the Georgia Archaeological Site File (GASF) have a real data. However, at least for the GASF, there is another major issue in using site file data for population estimates. In Georgia, when areal data are available, site area is not differentiated based on occupational component. Population estimates are synchronic in nature and, if there is no ability to control for time in the areal data, this method would ultimately be insufficient to investigate changing populations through time. Even with these issues, state site file databases are still the best source of regional data, providing a way to examine population dynamics at the scale required to observe regional abandonments and resulting population movements.

2. Methods

Site file data can be used to analyze population movements because population movements of a sufficient scale should be identifiable based on rates of change in the number of archaeological components that either exceed or fall below expected rates of growth. To calculate the rate of change, we can restructure mathematical equations of population growth. Although population growth is limited by a number of factors that mean that increases in the human population will never be strictly exponential, archaeological components only increase in number (natural and cultural site destruction notwithstanding). With the growth in archaeological components being a strictly compounding process, I can reorganize a mathematical formula for growth, such as the curve proposed by Malthus (1798) for unconstrained, exponential population growth,

$$P = P_o e^{(rt)}$$

where a population, P, equals the initial population, P_O, multiplied by the mathematical constant e to the power of time, t, multiplied by the rate of change, r, per unit of t, such that, if the values of the other variables are known, calculating the rate of change in a population over a given period of time is possible using the formula:

$$r = \frac{\ln\left(\frac{P}{P_0}\right)}{t}$$

This restructured equation remains reliant on population estimates for the beginning and end of a defined period of time. However, for an estimate of the rate of change in a population, a proxy for initial population and final population measures will suffice.

Human populations tend to steadily increase over the long term, but fluctuate over the short-term. Archaeological components are similar; sites may be occupied or abandoned in the short-term, but the total number of components increases over the long-term. As such, rates of archaeological component accumulation in a region can serve as a proxy for the rate of population growth, given a few assumptions. One assumption is that socio-ecological systems (i.e., settlement, subsistence, and social organization) remain static during defined spans of time. Conveniently, delineations between major archaeological periods tend to mark significant and observable transformations in these systems. Also, we must assume that a certain number of components is needed to support a certain, albeit unknown, population in a given settlement system.

With these assumptions, we can substitute P and P_O with C and C_O, respectively, where C = the total number of archaeological components within span t, C_O = the initial number of occupied components at the