Revelatory Locales: The Ritual Reuse of a Late Archaic Shell Ring in South Carolina

Matthew C. Sanger[1], Katherine Seeber[2], Samuel Bourcy[2], Jaclyn Galdun[3], Michele Troutman[2], Ginessa Mahar[4], Jeffrey T. Pietras[5], Caleb Kelly[6]

[1]: National Museum of the American Indian, 4th Street SW, Washington D.C., 20560; sangerm@si.edu, (corresponding author).
[2]: Department of Anthropology, Binghamton University, 4400 Vestal Parkway East, Binghamton, NY, 13902.
[3]: Landmark Archaeology Inc., 6242 Hawes Rd, Altamont, NY 12009.
[4]: University of Florida, Gainesville, FL, 32611.
[5]: Department of Geological Sciences and Environmental Studies, Binghamton University, 4400 Vestal Parkway East, Binghamton, NY, 13902.
[6]: Honors College, College of Charleston, 66 George Street, Charleston, SC 29424.

Abstract: Native Americans created numerous shell rings – large circular or arcing middens surrounding open plazas – across the coastal Southeast U.S. during the Late Archaic (ca. 4800-3200 cal B.P.). While archaeologists have long studied how Late Archaic peoples formed and used shell rings, their later histories are less well known despite these constructions being long-lasting and visible for millennia after their formation. We describe how later southeastern coastal occupants engaged with one such ring, the Sea Pines Shell Ring, by cremating human and non-human bodies more than a thousand years after its initial construction. This ritual reuse echoes similar practices engaged more than a thousand years earlier at another nearby ring and suggests that these sites were viewed as powerful places both during their initial construction and for hundreds of years afterwards. Relying on Native American philosophers, we suggest that shell rings, like other powerful places, are best understood as revelatory locales where time could be collapsed and communication with powerful entities, including ancestral peoples, established.

Keywords: Native American philosophy; Late Archaic Shell Rings; coastal Southeast U.S.; mortuary practices; site reuse; memory; landscape

1. Introduction

Particularly powerful locales, both natural and human-made, can draw people to them over vast amounts of time. Archaeologists often describe such locales as “persistent places” (Schlanger 1992); areas that have a social, aesthetic, or cosmological gravity that attracts and holds human attention over many generations. Such persistent places are often points at which past events and people are remembered, becoming “memory anchors” (Van Dyke 2017), places where individuals, families, and communities emplace their histories into the landscape and from which they often self-identify (Boric´ 2009; Hamilakis 2013; Jones 2007; Lucas 2005; Oliver 2004; Olsen 2010). While important worldwide, Native American authors describe how memorious places often take on particular importance within their communities as they are points where past, present, and future collapse and through which knowledge and wisdom are revealed (Cordova 2007; Norton-Smith 2010; Verney 2004). The creation, recognition, maintenance, and interpretation of these revelatory locales results in the formation of a “sacred landscape” through which Native American communities discover their place within a wider social and moral world that includes non-human actors (Deloria 1973, 1999, 2012).

In this paper, we investigate how the Indigenous peoples of the coastal Southeast U.S. formed a sacred landscape and engaged with the past by looking at their use and re-use of several prominent sites, known as shell rings. Shell rings are large to moderate-sized middens made of oyster and clam shells that partially or completely encircle shell-free interior plazas (Russo 2004). Archaeologists have documented more than fifty shell rings across the Atlantic and Gulf coasts from South Carolina to Mississippi, almost all of which date to the middle to end of the Late Archaic period (ca. 4800-3200 cal B.P.) (Figure 1). Native American communities used shell rings in different fashions; some were residential villages, others were gathering points for seasonal feasts, while others still were places of both residence and ceremony (Cannarozzi and Kowalewski 2019; Colaninno and Compton 2018; Russo 2014; Saunders 2014; Thompson 2018; Thompson and Andrus 2011).

While archaeologists have focused on understanding how Native Americans created shell rings during the Late Archaic, comparatively less effort has been invested in studying how later peoples engaged with these lasting constructions (Marrinan 1975; Thompson 2006). Our findings are important as they demonstrate the continuing importance of at least one shell ring, the Sea Pines Shell Ring, a millennia after its initial construction. This re-use included the cremation of animal bones, likely including human bodies – a practice recently reported from Late Archaic contexts at another nearby shell ring (Sanger et al. 2018, 2019). The continued practice of cremation spanning the initial occupation and later reuse of shell rings suggests that these sites retained a level of cultural and perhaps cosmological importance for long periods of time; conceivably this is because those rings were made by some of the first coastal residents and the ancestors of later peoples who occupied the region after sea levels had dropped and what was once the coast had become a more upland ecosystem.

To better understand site reuse, we draw on modern Native American writers, particularly those writing in the field of philosophy, who describe living in an enlivened landscape marked by revelatory locales – places where knowledge of the world can be acquired. Often, these locales are also points where time is collapsed, and past events and peoples are "re-presenced." Influenced by these writers, we discuss the place of shell rings within the broader Late Archaic landscape and detail our findings, including evidence of mortuary activities occurring at the Sea Pines Shell Ring roughly a millennia after it was initially constructed. We compare these activities to what we know about mortuary practices at other rings and suggest that their continuity reflects a continued respect for these sites as places where communication could be established between living and ancestral peoples. We close the paper by considering the challenges of working with possible ancestral human remains in an ethical and respectful manner. To this goal, we briefly describe our engagement with local Native American communities, the practices we adopted while excavating, and our decision to rebury all cremains back in their original location. To frame our discussion, we first provide a brief review of how archaeologists have considered how past peoples engaged in their own pasts, particularly the intersections of place and memory.

2. Place, memory, and the engagement of the past in the past

The intersection of place and memory is a perennial anthropological and archaeological topic that has been resurgent in the last two decades (Basso 1996; Bender 2002; Boric´ 2009; Connerton 1989; Van Dyke 2009; Yoffee 2007). This resurgence is based on an increased interest in how past peoples interacted with their own pasts, both remembered and invented (Alcock 2002; Bradley 2002; Kuijt 2008; Mills and Walker 2008; Rowlands 1993).

Archaeologists describe how past peoples enacted, deployed, invented, manipulated, centralized, rejected, and otherwise employed their pasts as tools for social change and cultural continuity (Jones 2007; Stanton and Magnoni 2008; Yoffee 2007). Archaeologists typically focus on social or group memory (as opposed to personal or an individual's memories) as shared histories play critical roles in the creation of communal identities, legitimization of novel power structures, and transformation of cultural practices (Golden 2010; Meskell 2003; Stockett 2010). Shared histories and social memories are made more potent and efficacious when they are displayed publicly, often by emplacing them into particular points on the landscape, such as in the formation of monuments or by infusing natural features with memorious value (Bradley 2002; Duncan 1990; Holtorf 1997; Joyce 2004; Rowlands 1993).

Archaeologists have created a variety of terms to describe memorious places. Certain locales, deemed "persistent places," are points of recurrent use over long periods of time, but not necessarily places where people intentionally engaged with remnants of the past (Littleton and Allen 2007; Schlanger 1992; Schneider 2015). A variety of factors can result in the establishment of a persistent place; some hold critical resources, such as fresh water or knappable stone, while others offer aesthetic value, such as mountaintops or waterfalls. As people visit or occupy locales over long periods of time, the material aspects of a place often become intertwined with individual, familial, and communal memories resulting in complex and diverse understandings of a shared cultural landscape (Moore and Thompson 2012; Wallis 2008; Zedeno and Bowser 2009).

In contrast to persistent places, there are places where people more explicitly engage and display their shared memories and histories. Ruth Van Dyke (2017) describes such places as "memory anchors"; points where shared histories are directly and explicitly emplaced in the landscape. Relying on examples drawn from Native Americans, memory anchors are often highly visible natural features, such as mountains, canyons, or waterways, although they can also be human-made constructions. Memory anchors acquire at least some of their memorious power by their ability to transcend the temporality of human life; they are long-lasting and durable features that remain relatively unchanged over vast amounts of time. In this fashion, memory anchors are akin to monumental architecture and constructions in that they are viewed as continuing into the future and often extending into the past (Bradley 2002; Hamilakis 2013; Holtorf 1997). The power of particular places (and things) to persist over long periods of time means that they often acquire (and lose) meaning, valence, and salience over their existence (Boric´ 2009; Hamilakis 2013; Jones 2007; Lucas 2005; Oliver 2004; Olsen 2010).

3. The power of place for past and contemporaneous Native American peoples

> In shifting from temporal concepts to spatial terms, we find that a revelation is not so much the period of time in which it occurs as the place it may occur. Revelation becomes a particular experience at a particular place, no universal truth emerging but an awareness arising that certain places have a qualitative holiness over and above other places. The universality of truth then becomes the relevance of the experience for a community of people, not its continual adjustment to evolving scientific and philosophical conceptions of the universe.
> V. Deloria Jr. (1973: 80)

Archaeologists studying the formation and use of social memory typically draw on European philosophers including Halbwachs, Bourdieu, Bergson, Deleuze, Husserl, Heidegger, and Merleau-Ponty (see reviews in Boric´ 2009; Olivier 2011; Van Dyke 2019). Largely absent are Indigenous voices, although this is slowly changing (e.g., Zedeño and Bowser 2009). A wealth of writings by Native American philosophers (Burkhart 2019; Cordova 2007; Deloria 1973, 2012; Norton-Smith 2010; Warrior 2015; Waters 2004a; Welch 2019) speak to an understanding of place, time, memory, and identity that is, in our opinion, far more applicable than Euro-American writers when discussing the deep history of peoples in North America.

Understandings of time and space are foundational to how humans comprehend the universe as they inform our conceptions of causality, define how we generate meaning, and otherwise influence how we live on earth. According to Vine Deloria (1973, 2012), a central figure in Indigenous studies, differences in the understandings of time and space are what distinguish Native American and Euro-American intellectual traditions (also see Burkhart 2019; Welch 2019). While most modern Euro-American philosophers assume a strict delineation between time and space[1], Native philosophers embrace a less binary or dualistic view of the world in which temporality and spatiality are defined as processes that blend into each other (Burkhart 2019; Cordova 2007; Norton-Smith 2010; Welch 2019). Brian Burkhart (2019) suggests that this less binary view is because Native American communities generate, validate, define, and value knowledge in ways unlike Euro-American peoples. According to Burkhart, and others (Cajete 2000, 2005; Welch 2019), direct experience is considered the most valued and legitimate form of knowledge within Native philosophies while Euro-American philosophies rely more on accumulated information acquired through indirect means. Put another way, while Euro-Americans reify information that is universal, testable, and abstractable, Native Americans more often value knowledge that is contextual, personal, and contingent (Cordova 2007; Norton-Smith 2010; Warrior 2015; Waters 2004b). These different ways of valuing knowledge can be seen in the two foundations of Euro-American world-building, the scientific process and Judeo-Christian religions, both of which rely on the presence of universal truths (although the definition of truth is quite different between the two). In contrast, Native science and cosmology (which are really one and the same) embraces an understanding of the world in which something can be true or real in one place or time, but not in another (Deloria 1973).

According to Deloria (1973, 2012), Burkhart (2019), and other Native philosophers (Cajete 2005; Welch 2019), differences in knowledge valuation, or epistemological differences, result in dramatically different worldviews, or ontologies, that are visible in how Native and Euro-Americans understand time and space. By validating accumulated information acquired through indirect means, Euro-American philosophies view time as the driving force in the universe; it is through the passing of time that humans acquire, test, and build on their understanding of the universe. Viewing time as causative creates an impetus to link past events in order from first to last (chronologically) to make sense of the present – in other words, to form linear histories. This notion of history, with its focus on chronology and causation, relies on a strict delineation between time and place (what happened when and where?) and the ability to define each in objective and measurable terms. This view of time and history also fuels the Euro-American drive to discover universal laws and rules that govern the world as there is the

[1] Modern physics, with its embrace of the Theory of Relativity, clearly challenges traditional Euro-American notions of time and space and there are a few Euro-American philosophers who have likewise blended these categories (e.g. Bruno Latour), yet these factors have not dramatically changed the broader Euro-American view of the world where time and space are distinct and measurable forces that operate equally and identically across the universe

possibility that predictive knowledge gained from the past can be used to influence the future (Deloria 2012).

In contrast to the Euro-American focus on temporality, Native philosophers foreground space/place as the bedrock principle upon which all else rests (Cordova 2004; Jojola 2004; Norton-Smith 2010; Welch 2019). Burkhart (2019) describes this focus as built on "epistemic locality" in which Native Americans value the knowledge-making capacity of direct individual experience. Such experiences always happen in specific places, not in some sort of abstract time or space, and therefore occur first and foremost in a locality. The importance of the locality in Native American philosophy, as well as direct individual experience, is because the world is filled with numerous non-human actors, each living in particular places, that together with humans, form localized social networks (Deloria 1973; Norton-Smith 2010). The health of these networks is critical as they sustain the world, both ecologically and cosmologically, and their maintenance is a moral duty (Cordova 2007). Knowledge of these local networks is therefore of the highest importance, which is why, in part, direct experience is of such value as it is only through these experiences that individuals and groups can find their proper place within the larger social landscape (Cajete 2000). This view of the world creates a clear contrast with Euro-American philosophers who view knowledge accumulating over time, as Native American philosophers view knowledge as accumulating in places. It is perhaps more accurate to describe knowledge as being revealed in places rather than accumulating as many writers suggest that particular places have intrinsic epistemic value – they hold wisdom and insights independent of humanity (Basso 1996; Deloria 1973, 2012).

The discovery, maintenance, protection, and experience of revelatory locales is considered critical to producing and testing knowledge, living a moral and just life, and creating meaningful and long-lasting communities (Burkhart 2004; Deloria 1973). Often, these locales are places where time collapses and events and people from the past are present. Deloria describes "the places where revelations were experienced were remembered and set aside as locations where, through rituals and ceremonials, the people could once again communicate with the spirits" (Deloria 1973: 65). Time and space blend as rituals are "acts of memory reconstituting and re-remembering spaces of shared pasts" (Shorter 2009). Understanding particular places as revelatory locales is important because it foregrounds these locations as points at which the past is not simply remembered (as in a memorial), but actively engaged. When Deloria and others (e.g., Norton-Smith 2010) describe the experience of such places, they describe not a reformulation of past events, nor a reenactment, but rather a "re-presencing" in which the divide between past and present is blurred through the intrinsic power of particular places and the entities residing there.

Some have described that Euro-Americans perceive time as linear and Native Americans view time as circular (Fixico 2003). This interpretation oversimplifies a much more complex situation as Euro-Americans also ascribe to temporal circles (such as returns to innocence) and Native Americans also ascribe to distinct temporal sequences (such as the four different Hopi worlds) (see discussion in Fowles 2013). The more detailed investigation into time offered by Burkhart, Deloria, and other Native philosophers, demonstrates a more fundamental difference between Native Americans and Euro-Americans that hinges less on how time is conceived (circular vs. linear) and more on how each group understands the very nature of time and place. Viewed as inseparable, Native philosophers show us that it is impossible to talk about abstract time or space as such concepts have little meaning when knowledge of the world is built on the direct experience of individuals.

This view of time/space means that memories, histories, and myths are not simply stories about what happened in the past (based on distance in terms of time) but can be re-experienced and "re-presenced" through appropriate practices, rituals, and actions conducted at appropriate locales. We suggest archaeologists ought to consider this worldview when studying Native American engagement with the past as it provides both a more respectful political engagement with current communities and, we contend, a more stable theoretical viewpoint than that offered by Euro-American philosophers who draw from a very different intellectual tradition. Mark Rifkin (2017) argues that Native people have long labored under the weight of various colonial injustices, including the demand that subjugated populations accept Euro-American notions of time. Instead, Rifkin argues, Native peoples deserve their own "temporal sovereignty" (Rifkin 2017: 2) in which their understandings of the world are respected and brought to the forefront.

We attempt such a project in the following pages as we consider how later peoples might have seen Late Archaic shell rings as revelatory locales – places holding intrinsic knowledge key to creating stronger social networks with local human and non-human communities.

4.1. Late Archaic Shell Rings

Shell rings are arcing middens, consisting primarily of mollusk shells, encircling broad open spaces with few or no significant shell deposits (Russo 2006; Sanger 2017; Saunders 2014; Thompson and Andrus 2011). Shell rings include middens that are circular, U or C-shaped, hexagonal, and other shapes (Russo 2004). Ring size varies from massive formations that can be several hundred meters long and several meters tall to much more modest deposits measuring less than 50m across and less than a meter in height (Russo 2006). Coastal peoples began building shell rings by at least ca. 5200 cal B.P. although older sites may be inundated by sea levels that have increased since the Late Archaic (Russo 2006). By 4800 cal B.P., Native Americans began forming numerous shell rings in the Georgia Bight, a portion of the Atlantic coastline spanning South Carolina, Georgia, and northern Florida (Marrinan 2010; Sanger and Thomas 2010; Thompson 2007; Trinkley 1985). This region quickly became the epicenter of shell ring formation with more than a dozen known sites established by 4200 cal B.P. (Russo 2006; Turck and Thompson 2016; Walker 2016).

Archaeologists debate why coastal peoples created shell rings. Later coastal residents also created shell middens - at times quite massive - but few were deposited in such a structured manner as those created by ring-builders (Russo 2014). Debates over shell ring use often attempt to address the circular form of the middens, with some seeing them as refuse piles mounded outside of homes arranged in a circle (DePratter 1976; Trinkley 1980). Others see the deposits as more than simple accumulations of daily trash and instead suggest coastal peoples formed them, at least in part, during large gatherings in which groups converged to feast on foods, including shellfish, which they then deposited in broad circles to mark the gathering point (Saunders 2004, 2014). There is a growing consensus that coastal peoples likely used rings as both places of residence and periodic gatherings (Russo 2004), an interpretation strengthened by seasonality studies showing occupation across all four seasons along with evidence for mass consumption events and notable ritual or ceremonial practices (Sanger and Ogden 2018; Thompson and Andrus 2011).

4.2. Shell Rings as Mortuary Locales

McQueen Shell Ring on St. Catherines Island, Georgia exemplifies this growing consensus as it was occupied year-round and was used as a burial locale (Cannarozzi and

Kowalewski 2019; Colaninno 2012; Quitmyer and Jones 2012; Sanger et al. 2018, 2019, 2020). While archaeologists have excavated dozens of shell rings, very few have ever encountered any human remains (e.g., Marrinan 1975). Typically, human remains are isolated finds intermixed within the midden (Russo 2006). Lacking any formal burials, archaeologists largely assumed shell rings were not mortuary locales until the discovery of a burial pit holding tens of thousands of highly fragmented calcined bones in the direct center of McQueen Shell Ring (Figure 2) (Hill et al. 2019; Sanger et al. 2018, 2019). Excavators originally assumed the bones were not human as they were heavily calcined and fragmented and several were clearly deer, but later analysis revealed the remains represented a wide range of animals including at least seven humans as well as fish, deer, dog, rays, birds, and even a sperm whale (Colaninno and Reitz 2015). After consulting with local Native American representatives, studies continued showing the human and non-human cremains were exposed to the same high heats (at least 1100℃ for several hours) and may have been manually pulverized (Sanger et al. 2018, 2019). Importantly, the act of cremating the bones did not occur in the ring center as the burial pit showed no signs of thermal alteration, nor was there much ash or charred wood within the deposit (although those materials might have eroded over time). Radiometric results show that the cremation took place 4100-3980 cal B.P., during the height of site occupation and roughly 200 years before midden deposition ceased (Sanger et al. 2018, 2019). The burial held a unique material assemblage, including a copper band from the Great Lakes (Hill et al. 2019; Sanger et al. 2018) and at least three stone tools cremated alongside the bones (Sanger and Ogden 2018).

The discovery of a burial pit at McQueen Shell Ring has not been replicated at any other shell ring making it unclear how extensive these mortuary practices may have been. To that point, it is also important to note that the condition of the bones made them very difficult to identify, so it is possible similar cremains have gone unnoticed at other sites. Likewise, excavations at McQueen only encountered a single pit in the direct center of the plaza, which could have easily been missed. Indeed, relatively few archaeologists have tested the centers of the ring plazas (Sanger and Ogden 2018).

4.3. Terminal Late Archaic and the End of Ring Building

Ring building largely ceased along the Georgia and South Carolina coast by 3800 cal B.P., likely in response to changing climatic and environmental conditions, including a drop in sea levels. At the height of ring building, roughly 4200 cal B.P., sea levels along the Georgia Bight reached approximately 1.2m below present (mbp), then dropped to 2.5 mbp by 3800 cal B.P., and 3.5 mbp by 3100 cal B.P. (Gayes et al. 1992; Ritchison et al. 2021; Turck and Alexander 2013). The ecological impact of this drop in sea levels varied across the coast, with areas fed by relatively large river systems (deltaic areas) able to retain a level of marsh productivity over time while non-deltaic areas were more starved of nutrients and other important resources, resulting in a more dramatic decline in marsh vitality (Thompson and Turck 2010; Turck and Thompson 2016). This period of sea level drop and prior to a rebound during the onset of the Woodland period, defines the terminal Late Archaic (3800-3000 cal B.P.) along the Georgia Bight (Ritchison et al. 2021).

Long understudied, in part because of a lack of shell rings and other large shell-bearing sites, it is only recently that archaeologists have begun to focus on the terminal Late Archaic (Ritchison et al. 2021; Thompson and Turck 2009, 2010; Turck and Thompson 2016). Despite the dramatic environmental and ecological changes, local populations remained remarkably

resilient (Ritchison et al. 2021; Thompson et al. 2020) with some shifting residential and subsistence strategies yet remaining in the same areas occupied by their ancestors. These groups no longer formed shell rings, or other large shell deposits, and instead lived in slightly less structured sites, with homes more randomly dispersed rather than arranged in distinct circular patterns (Ritchison et al. 2021). These sites were also less intensively occupied, perhaps with fewer people or by a more mobile population, or perhaps by a combination of factors (Ritchison et al. 2021; Thompson 2018). Lacking shellfish middens, there is less direct dietary evidence for terminal Late Archaic groups, but it is assumed that they focused more on resources found in forests, ponds, and rivers, including fish, deer, mast, and birds, while possibly also traveling more significant distances to acquire shellfish and other estuarine resources from the few areas where such resources remained (Ritchison et al. 2021; Turck and Thompson 2016). Although they may have been somewhat more mobile, living in less dense settlements, and reliant on a broader range of food resources, peoples living along the modern coasts of Georgia and South Carolina during the terminal Late Archaic continued to gather and conduct "inter-community integrative activities" (Ritchison et al. 2021: 90) such as feasts and ceremonial events as evidenced by the presence of large roasting pits.

4.4. Post-Occupational Use of Shell Rings

Made up of the remnants of ceremonial gatherings and daily residential life, shell rings are among the most visible archaeological site types in the coastal Southeast U.S. where large earthen mounds are relatively rare (Thompson and Worth 2010; Turck and Thompson 2016). This is in part because when amassed in large numbers, mollusk shells deteriorate slowly and create an environment where other organic materials, particularly bone, remain intact for long periods of time (Colaninno et al. 2015). The long-lasting visibility of shell rings is particularly evident at the largest constructions, such as Sapelo 1 where the circular midden rises several meters above the forest floor to form an enclosure obvious to even a casual visitor (Waring Jr and Larson 1968). Other massive rings, such as Fig Island 1, are so large that they form their own small islands (Saunders 2002). Even smaller shell rings have enough topographic rise to be noticeable on the otherwise flat coastal landscape (Davis et al. 2019). Shell rings also create notable ecological environments as decaying shells leach large amounts of calcium into nearby soils and certain plants thrive in calcium-rich soils and can be found growing on top of shell rings (Smith and McGrath 2011).

Perhaps because of their visibility, archaeologists have encountered a wide range of materials in and around shell rings that postdate their construction (e.g., DePratter 1976; Marrinan 1975; Russo 1991, 2006; Saunders 2002; Thompson 2006). Searching for and reporting on post-Archaic occupations is rarely the goal of research at shell rings, so Victor Thompson's (2006, 2007) work stands out as he conducted excavations to test for the presence of non-ring occupations and found evidence for both earlier and later occupations outside of the Sapelo shell rings. The later occupation was only partially explored as it consisted of a small assemblage of objects just outside of the ring that postdated the formation of the midden by roughly 300-600 years during the terminal Late Archaic.

Other than Thompson's work, there has been little systematic or published studies describing post-occupational deposits at or near shell rings in the Georgia Bight. Rochelle Marinnan (1973) found scant evidence for Woodland-era occupations at the St. Simons Island shell rings. Recent work at the Pockoy shell rings has perhaps encountered the most significant post-occupational deposits as excavations found numerous shell-filled pits within the interior of

one of the rings (Karen Smith, personal communication 2020). These pits have not yet been directly dated, but based on pottery, appear to be Late Woodland or Mississippian in age. It appears that the shell-filled pits relate to a neighboring residential site and that the ring may have somehow been incorporated into this village, although further work is needed to test this theory (Karen Smith, personal communication 2020).

5. Sea Pines Shell Ring

Our research is focused on the Sea Pines Shell Ring, located in the southern portion of Hilton Head Island (Figure 1). Radiometric results show island residents formed the ring over 900 years (ca. 4800 – 3700 cal B.P.) (Table 1; Figure 3). Over this span of time, island residents fashioned a relatively small circular midden, measuring roughly 60 m across and between .4 and 1 m tall (Figure 2). Much like other rings (Russo 1991; Thompson 2007; Trinkley 1980), our excavations uncovered numerous pits, pot drops, and other features in the ring interior that are contemporaneous with the shell midden. We report these findings in future publications.

Our current focus is a series of features that postdates the original occupation by roughly 1000 years. These series of features are in the northern portion of the ring plaza and include postholes, a wall trench, and prepared floors that define the presence of two distinct structures, each with large (>1 m wide) pits in their centers (Figure 4).

Structure 1 is somewhat oblong, measuring roughly 4 m north-south and 3 m east-west (Figure 4). Located roughly 25 cm below the modern surface (Figure 5), the structure is defined by a series of pits along its edge, each measuring between 10-35 cm wide and 10-40 cm deep. We also define the structure by an absence of iron-rich nodules encountered elsewhere in our block excavations. These iron-rich nodules are small (2-4 cm) clumps of sand with high amounts iron oxide found as a thin lens across much of the ring plaza (labeled S05 on Figure 5). We do not yet understand how these iron-rich nodules formed, but it is our working theory that they are associated with an over-wash event in which the site was inundated, allowing small iron particles in the sand to become suspended and then converge into small formations as the site dried. If this is correct, then the lack of iron-rich nodules within the structure might be evidence it was standing during the overwash event and its walls kept at least some of the water out. We are certain that these iron-rich nodules are not examples of "beach rock," a limonite or humate cemented sandstone often found underlying the older Pleistocene portions of the Sea Islands (Bishop et al. 2009: 203) as we encountered these deposits at the base of our excavations (roughly 1m below surface) and they are larger, lighter in color, and less dense than the iron-rich nodules.

Structure 2 is similar to Structure 1 in shape and size, measuring roughly 4.5 m east-west and 3.5 m north-south (Figure 4). We defined the western edge of the structure by the presence of a wall-trench. This trench measured 7-12 cm wide, 20-30 cm deep, and made at least one right angle. The eastern edge of the structure is lined by small postholes (8-15 cm wide) that are numerous enough that they likely represent at least two different construction episodes.

The two structures overlap slightly, with Structure 1 above Structure 2 (Figure 5). Structure 2 was covered by the lens of iron-rich nodules, which suggests its walls were no longer standing when the nodules were deposited. Structure 2 is also different in that it is at least partially subterranean. Our excavations recovered a distinct soil within Structure 2 in comparison to outside of the walls. The interior soil was typically darker in hue, browner in color, and more compact than the surrounding anthrosols. This interior soil formed a relatively thick (18-25 cm)

layer that cut through the underlying anthosol and into the underlying sands that predate ring formation.

We encountered large (>1m wide) pits filled with hard and dense deposits in the centers of both structures (Figures 4 and 5). These deposits entirely filled each pit and were so dense that we could not excavate them with hand tools and described them as "concrete-like." Lining each pit and embedded within the concrete-like materials were small amounts of broken oyster shells. The soils surrounding the two concreted features were dark in hue and tightly packed (F05, F06, and F07 in Figure 4). These darkened soils had diffuse borders and blended into one another. Because of their diffuse boundaries, as well as lacking any cultural materials, shell, recognizable botanicals, or faunal remains, we interpreted these darkened soils as forming through leaching from the cemented pit fill. To the east and west, the pit was bound by small (15-20 cm wide) pits that we interpreted as small postholes (F03 and F04 in Figure 5). We do not know if these posts were structural, perhaps holding up the center of the roof, or were directly associated with the use of the pit, perhaps to hold something directly above it.

We removed the cemented pit fill from Structure 1 to determine how it was formed. We attempted to recover a sample using handheld corer, which failed. We then bisected the feature revealing a single, large depositional layer capped by two smaller deposits (Figure 5). The matrix making up most of the pit (Layer 3 on Figure 5) was very hard and compact, and medium grey in color. The matrix encapsulated hundreds, if not thousands, of tiny, calcined bone fragments. Several dozen larger bones were also visible in the bisect, some of which were warped or bent. The only bone that we were able to identify was a deer tooth fragment. Based on their color, density, morphology, and overall nature, we estimate the bones were exposed to a range of temperatures from 500° to over 1100° C (cf. Walker et al. 2008: 132–133). A few shells were also visible within this layer, along with several ceramic sherds, all of which were fiber tempered, a distinct indication of Late Archaic pottery. The bone and pottery were widely distributed throughout the layer and no internal stratigraphy was visible. The two thin lenses at the top of the pit were similar to the lower deposit in that they were hard and compact, although the uppermost lens was a lighter color brown while the second was a dark grey (Figure 6). We found very few bones, shell, or ceramics in these upper layers.

We used a portable Bruker Tracer III X-ray fluorescence spectrometer (pXRF) to better understand the chemical composition of the cemented feature. Taking readings every 5 cm along a vertical transect of the feature's profile (Figure 6) we found the matrix did not notably change based on depth (Figure 7). We compared the matrix to readings from representational shell, bone (of an unknown species), and ceramic samples from within the feature (also marked on Figure 5) as well as from a turtle, fish, and deer bone recovered from the shell midden and two soil samples drawn from the anthrosol surrounding the feature. In most instances, the matrix is most similar to the bone sample and to a somewhat smaller degree, to the shell sample while dissimilar to all the other samples (Figure 7). We found that the bone and matrix samples shared a distinct calcium to strontium ratio (Figure 7A) – suggesting that the matrix is largely made up of very tiny, almost powdered, bones. We also found that the bone materials had a spike in bromide (Figure 8), which is possible evidence that the animals incinerated within the pit consumed aquatic animals as these species often acquire higher amounts of Bromide than terrestrial animals (Dolphin et al. 2013). We dated a small fragment of carbonized wood embedded in the edge of the cemented feature showing it formed 2950-2770 cal. B.P. (University of Georgia Lab # 38996), roughly 750-1000 years after the shell midden and during the transition between terminal Late Archaic and Early Woodland periods (Table 1, Figure 3).

Excavations in the direct center of the shell ring plaza encountered a second set of features including numerous pits, a prepared floor, and a wall trench (Figure 9). We first encountered these features only 15-30 cm below the surface, well above the Late Archaic depositional layers described earlier, including the lens of iron-rich nodules. Our radiometric results, drawn from four different features, support the stratigraphic data in that they demonstrate a serial reoccupation of the ring center over a thousand-year period spanning the Middle and Late Woodland periods as well as the Early Mississippian (ca. 1700-700 cal B.P.) (Table 1, Figure 3). Our excavations were limited in size, but it appears that there is at least one, if not two overlapping buildings in the ring center (Figure 8). One of the structures is outlined by a wall trench and a series of moderate-sized pits. The second possible structure is less clear as it includes a second line of pits, and if present, is likely an earlier or later version of the first structure as they overlap. All these features surround a prepared floor, discernible by its lighter color and low level of artifacts. A small fire pit was in the center of the prepared floor. We recovered a relatively large number of lithic flakes from these Woodland and Mississippian-era features as well as in the contemporaneous anthrosols surrounding them. In comparison to the large number of lithics, we recovered far fewer pottery sherds and faunal materials, and virtually no shell in the ring center.

Despite the serial reoccupation of the ring center during the Woodland and Mississippian periods, we did not recover any diagnostic objects from these periods within the shell midden where all of the diagnostic objects (including ceramics and stone tools) date to the Late Archaic. Although we did not recover any diagnostic Woodland or Mississippian artifacts, we did run a radiometric assay on a nutshell (likely hickory) from the upper part of the shell heap in the southeastern portion of the site that returned a Mississippi period date (926-795 cal B.P.).

6. Cremation at Shell Rings

While other interpretations are possible, we view our findings as evidence of people returning to visit Sea Pines roughly a millennia after it was initially formed, during which they incinerated numerous animals, likely including humans, resulting in the creation of at least two large, concretized features. We note that other possibilities also fit the available evidence, including that the bones were cremated elsewhere and then brought to Sea Pines at which point they were placed in the pits. Part of our inability to distinguish between the two possibilities is that we do not have an applicable comparative example of what a high-level fire in a relatively large pit would look like more than 4000 years after it was used. One of the best comparisons is a large pit found at Buckhead Field on Ossabaw Island. This pit is wider and shallower than the pits at Sea Pines and was used to hold at least several "instances of particularly hot fires" (Ritchison et al. 2021: 86) based on the presence of two layers of fire-affected shell. Notably, the soils surrounding the pit were quite similar to what we found at Sea Pines. They were changed to a dark brown or dark greyish brown rather than the more reddish color often thought to be associated with high levels of heat (Ritchison et al. 2021: Figure 3). It is unclear why the sands on barrier islands do not turn more red when exposed to high levels of heat. We believe the strongest evidence for in situ burning comes from the large amount of bone making up the pit matrix, including quite a bit of bone that appears to be reduced to a powder-like form. This suggests to us that the bone broke down within the fires, perhaps with some manual pulverization assisting, and then remained in the pits. Although, we also recognize that these tiny bone bits could have been recovered from a pit located elsewhere and carried in a ceramic vessel to Sea Pines, where they were then interred.

Whether burned in situ or elsewhere, our assumption that humans were interred in these features is based on limited evidence. We were never able to conclusively identify any of the bones as human, but this was largely because the bones were so highly fragmented, bent, and warped. We also respected the wishes of nearby Tribal Nations and did not conduct any further studies (such as DNA) on the bones once we suspected they might be human.

Despite not being able to conclusively identify the bones as human, the temperatures used to process them matches our expectation of a cremation informed by findings from McQueen Shell Ring. As already noted, the fires in the pit reached roughly 1100 ºC, roughly the temperature reached in the center of a massive bonfire and in modern crematories (Schultz et al. 2008: 78–79). Such high heats are not conducive to cooking shellfish, deer, or fish and are far beyond what one would use for roasting nuts or even firing pottery, particularly Late Archaic-era vessels which were typically heated to between 500 – 850 °C (Skibo et al. 1989). Comparisons with the roasting pit at Buckhead further illustrates that the cemented pits at Sea Pines were not used for preparing foods. The roasting pit at Buckhead consisted of successive layers that included large amounts of carbonized wood, intermittent layers of shell, and numerous identifiable non-human bones all within a non-cemented matrix (Ritchison et al. 2021). In contrast, the cemented feature from Structure 1 consisted of one homogenous deposit overlain by two thin deposits that we surmise were formed through later taphonomic processes, including weathering from rainfall and wind.

If the pits were used to hold hot fires, we assume these heats were high and sustained enough that nearly all the wood fuel was turned to ash. There are very few recognizable carbonized wood fragments visible within the bisected feature and none that were identifiable. Lacking any direct evidence of the sort of fuel used, we simply note that oak and hickory trees would have been plentiful at the time, both of which can produce high-heat fires.

Located within small structures, it is unlikely that these fires were used to light activities taking place within the ring plaza, nor to keep large numbers of people warm during colder months. It is also very unlikely that these pits were used to heat these small structures as they were used only once and reached temperatures that would have been uncomfortable for anyone located nearby. Indeed, these fires would have made these small structures extremely hot and smokey unless the buildings were well-ventilated. Based on the available evidence, we do not know if the structures had roofs or were open air, but we assume they were built to hold the crematory pits rather than as residential structures.

Viewing the structures as non-residential is partially supported by comparing them with residential structures found at other Late Archaic and Early Woodland sites. Notably, the structures at Sea Pines are smaller, measuring roughly 12.5m^2, than domestic structures described at other nearby sites, which typically cover at least 25m^2 (Ogden 2019; Sassaman and Ledbetter 1996) although there are a few instances of some smaller homes likely occupied by small nuclear families (Hanson 1982, Sassaman et. al 1990). Occasional semi-subterranean structures have been documented, although it is unclear why people would have gone to such efforts to build their residences (Ogden 2019; Peterson 1971; Sassaman and Ledbetter 1996). The concreted features found in the center of the Sea Pines structures are unlike central fire pits reported elsewhere which are typically documented as dark stains, measuring less than a meter in width and depth, with complex stratigraphies, often including deposits of charred wood and seeds (e.g., Peterson 1971; Sassaman and Ledbetter 1996).

We recovered relatively few artifacts from either structure and, despite dating multiple components of the midden and other nearby features, we did not document any other

contemporaneous deposits. The lack of substantial midden production and refuse deposition is further evidence suggesting that these structures were used periodically, or perhaps only once, rather than being long-term domestic homes.

The ultimate formation of a cemented fill within the pits likely resulted from the chemical reaction of bone, wood ash, pulverized shell, and water. Material science research shows that both bone and wood ash are suitable additions in the creation of mortar or concrete and result in long-lasting and hard substances over time (Chowhurdy et al. 2015; Kotb et al. 2010). It is possible that the visitors to the ring recognized that this would be the end result of their actions and may have even purposefully created these durable deposits, although we have no proof that this was their intent.

7. Discussion: Reverence and Power at Shell Rings

As highlighted in our earlier review, many Native American authors describe the formation of a sacred landscape defined by the presence of revelatory locales where knowledge of the world is shared with humanity (Burkhart 2004; Deloria 1973). Often, these revelatory locales are defined based on their ability to transcend time (Van Dyke 2019). While much of the world changes over the years, certain places are viewed as powerful because they resist deterioration and have an ability to connect the deep past with the present and distant future. For many Native American communities, time and space are nonbinary categories that can be collapsed and manipulated at particular locales. Through this manipulation, living people can engage with their ancestors and other non-human entities thereby gaining insights about their place in a broader social web that keeps the universe viable and vibrant (Cordova 2007; Norton-Smith 2010; Verney 2004; Welch 2019). It is also through an understanding of their place in this broader social web that individuals and communities identify themselves as residents of a certain place, a foundational identification upon which many groups are built (Basso 1996; Burkhart 2019). Over time, numerous locales are revealed which together form a sacred landscape that defines how individuals and communities become emplaced within a particular homeland (Deloria 1973).

Informed by Native American writers, we view shell rings as powerful places, in part because of their ability to resist the erosion of time. To this point, it is important to understand that the coastal environment had undergone a massive shift between the original occupation of the Sea Pines Shell Ring (ca. 4800-3700 cal B.P.) and when people returned a millennia later (ca. 2951-2770 cal B.P.). As noted earlier, the original ring residents lived when sea levels stabilized at a high point near modern levels (DePratter and Howard 1981; Gayes et al. 1992; Scott et al. 1995; Thompson and Worth 2010). A thousand years later, sea levels had dropped precipitously, leaving the ring several dozen kilometers or more from the ocean's edge (Colquhoun and Brooks 1986; Thompson and Turck 2009). Visitors to the Sea Pines Shell Ring created the cemented feature at the time when sea levels had just started to rebound at the end of the terminal Late Archaic and beginning of the Early Woodland. Based on the pottery found in the pit, these groups continued to use fiber as a tempering agent, a practice more similar to their Archaic forebearers than later Woodland potters who relied more heavily on sand tempering.

With sea levels at or near their lowest point since the early Holocene, the Sea Pines Shell Ring, as well as many of the other rings found on modern sea islands, would have been a notable reminder of a time when things were quite different. Later peoples would have recognized the presence of clam and oyster shells, fish bones, crab claws, and other aquatic animal remains as out-of-place in comparison with the contemporaneous location of the shoreline many kilometers distant. Visitors to the rings would have also encountered pottery and stone tools similar to their

own crafts as traditions had not changed much during this period of time. We do not know if oral histories documented the changing ecological conditions that resulted in the distance between the ring and the shoreline or how later visitors to the ring might have understood these sites but their presence would have been notable. The Sea Pines Shell Ring is one of the smallest known rings, yet its small rise is quite obvious as is the unique plant community growing in and around it.

We posit that later visitors to Sea Pines Shell Ring were struck by its presence and conducted ceremonies designed to (re)connect themselves with the powers and knowledge residing within the ring. We can only guess at the exact goals of these visitors, but their incineration of human and non-human bodies at high temperatures over long periods of time echoed similar activities taking place a millennium earlier at McQueen, roughly 80 km to the south. Other than a single deer bone we do not know the makeup of the animals incinerated at the Sea Pines Shell Ring, but at McQueen the non-human animals included birds of prey, an eagle ray and an alligator, deer heads, as well as a whale bone that was not burned but buried intact along with the cremains (Colaninno and Reitz 2015; Sanger et al. 2019). This conglomeration of animals is rarely (if ever) found in midden deposits and instead reflect a conscious effort to "bundle" together powerful non-human entities alongside human remains, perhaps in an effort to establish communications with these forces (see Sanger 2021 for a more in-depth description of bundling at shell rings). Lacking similar information about the animals found in the crematory pit at Sea Pines, we can only wonder whether these visitors likewise incinerated an analogous conglomeration of bones.

Visitors to the rings conducted at least two cremations at Sea Pines, perhaps many more if similar features are located in the unexcavated portions of the ring (only about 10% of the ring plaza has been excavated). The use of structures to surround the crematory pits is notable as it suggests that the act of incineration was not for public consumption, but rather designed to be viewed by very few people. We do not know if the incineration of the bones was the only activity taking place, or if some of the bones were removed and buried elsewhere, as appears to be the case at McQueen Shell Ring, in part because the most likely burial spot – the center of the plaza – has been serially reused by Woodland and Mississippian-era peoples whose activities have obliterated earlier deposits. Whether the act of incineration was a singular event or part of a broader series of actions, the reuse of the ring as a stage for handling human remains strongly suggests it had accumulated a level of social and perhaps cosmological gravity that pulled people back to it multiple times long after it had originally formed. Indeed, the serial reuse of the center by Woodland and Mississippian-era peoples suggests that the ring had become a memory anchor that was incorporated and reincorporated many times into the social landscapes of people living in the region over many thousands of years.

It is likely that Sea Pines was part of a much broader constellation of revelatory locales that included other shell rings. Archaeologists working at other shell rings, including at the Ford's Shell Ring also located on Hilton Head Island, have reported finding additional concreted features (e.g. Calmes 1968; Trinkley 1980). It is difficult to determine how similar these features are as they are rarely detailed in written reports, so we know little about their age, constituent materials, or internal stratigraphy, but there is evidence that they were only used once and formed through the application of remarkably high temperatures (Marrinan 1975; Trinkley 1980). Typically, these features are interpreted as cooking pits, but these conclusions were drawn prior to work at McQueen Shell Ring showing Late Archaic peoples cremated their dead and at least occasionally buried them at shell rings. As such, these earlier studies operated within a paradigm in which shell rings were understood as non-mortuary sites which may have influenced

researchers to interpret their findings as representing more mundane activities. It is therefore possible that crematory activities, by both ring residents and later visitors, were far more common than currently assumed.

8. Conclusion

For many Native American communities, time and space are fluid and contextual with particular locations acting as points in which time can be collapsed and communication with non-human entities established (Burkhart 2019; Cordova 2007; Deloria 1973, 2012; Norton-Smith 2010; Welch 2019). This collapsing of time often allows a direct engagement with past peoples (human and non-human), events, and conditions. This direct engagement produces knowledge critical to human existence as it reveals the place of humanity in the world.

For residents of the Georgia Bight, the serial refashioning of the coastline during the Late Archaic may have demanded a recurrent need to better understand their place in a world that was often in flux. For later visitors to the Sea Pines Shell Ring, dropping sea levels had left the sea islands far from the water's edge, yet these landforms held large circular rings that reflected a time when rich marshlands were present. These rings were at once timeless as they contained recognizable food remains and material culture yet also marked how much the landscape had changed. Perhaps these places were points at which people came to engage with their ancestors and other non-human entities by conducting powerful ceremonies, including cremating the dead, to learn from this earlier world or to stabilize their relations with the present world.

Future work at other shell ring sites should be cognizant that they are operating within a context that likely had deep meaning for both the original residents and later peoples. While at Sea Pines, we reached out to local Native American communities to keep them abreast of our studies and to ask for their assistance in conducting respectful fieldwork. When working at the site, we conducted periodic smudgings and other traditional ceremonies to show respect for the possible ancestral remains at the site and to protect our field members. Once determining that the pit was likely used for cremation, we ceased any invasive work and again contacted local community members. Based on these discussions, the crematory pit and associated materials have been reburied at their original location within the ring and efforts are being made to erect signage that will alert visitors to the site about its use and the need for respect while on the premises. The desire to return these ancestral remains to their original resting place reflects the continuing importance of the ring for Native American communities as does its successive uses over thousands of years.

Acknowledgements: We wish to thank the Sea Pines Community Service Associates, particularly David Henderson, who provided support for our fieldwork. The Coastal Discovery Museum and the Hilton Head Chapter of the Archaeological Society of South Carolina provided volunteers and docents. We also appreciate the community members who made our work possible, particularly Ruth Bartlett, who provided housing over multiple years, as well as Lenore and Marty Gleason and Kay and Tom Sharp, who each housed our crews for a summer. Quinn Monique-Ogden provided critical insights while Astar Kelly conducted periodic smudgings on site. We also thank Victor Thompson and the Center for Applied Isotope Studies at the University of Georgia for carrying out the radiometric assays.

Data Availability Statement: All data and objects, with the exception of the cemented feature which was reburied on site, are held by the Coastal Discovery Museum on Hilton Head Island.

Funding: This work was supported by the National Science Foundation (Grant 1748276) and National Geographic (Grant HJ-107R-17).

Figure Captions

Figure 1: Left: Generalized location of selected shell rings in the Southeast U.S. with a selected portion of the Georgia Bight outlined. Right: Detail of outlined selection with location of known shell rings.

Figure 2: Outline of significant shell deposits, excavations, and discussed features at the Sea Pines and McQueen shell rings.

Figure 3: Radiometric plots for Sea Pines Shell Ring.

Figure 4; Location of features and outline of two structures located within Sea Pines Shell Ring.

Figure 5: Drawing of stratigraphy taken from north facing profile of bisect crossing the cemented feature in Structure 1.

Figure 6: Stratigraphic drawing of cemented feature from the center of Structure 1 located in Sea Pines Shell Ring.

Figure 7: Compositional makeup of objects and matrix from the cemented feature derived from pXRF.

Figure 8: Scatter from pXRF with spike in Bromide found in bone samples labeled Br.

Figure 9: Features dating to the Woodland and Mississippian periods located in the center of Sea Pines Shell Ring.

Table 1: Radiometric Results, Sea Pines Shell Ring

Lab no.	Description	δ13C (‰ VPDB)	d14C age years, BP	pMC	error pMC	Radiocarbon age calibrated (± 2σ, 95.4%)	Contexts
38995	hickory	-27.51	5010 ± 25	53.61	0.16	5893-5608[1]	Ring Interior Feature, F100B, 4.7-4.6m
38994	nut shell	-28.17	4170 ± 25	59.53	0.17	4830-4617	Southwest Shell Unit (N184 E479), ash lens under shell, 4.88-4.78m
39844	charcoal	-26.45	4160 ± 20	59.56	0.15	4826-4584	Southwest Shell Unit (N184 E479), ash lens under shell, 4.88-4.78m
43773	nut shell	-28.01	4100 ± 25	59.99	0.17	4801-4523	Southwest Shell Unit (N184 E479), basal deposit, 5.0-4.9m
43767	deer bone	-22.31	3660 ± 20	63.38	0.18	4084-3892	Northeastern Shell Unit (N209 E512), middle deposit, 5.1-5.0m
39843	charcoal	-23.77	3640 ± 30	63.57	0.24	4084-3849	Ring Interior Feature, F100B, 4.7-4.6m
43766	deer bone	-22.03	3650 ± 20	63.46	0.18	4082-3895	Northeastern Shell Unit (N209 E512), upper deposit, 5.3-5.2m
43771	nut shell	-24.98	3650 ± 20	63.47	0.18	4082-3895	Southwest Shell Unit (N184 E479), upper deposit, 5.3-5.2m
43775	nut shell	-23.54	3650 ± 20	63.45	0.18	4082-3895	Southeast Shell Unit (N178 E513), middle deposit, 5.2-5.1m
43768	nut shell	-23.25	3640 ± 20	63.59	0.18	4078-3889	Northeastern Shell Unit (N209 E512), basal deposit, 5.0-4.9m
43772	nut shell	-26.42	3620 ± 25	63.69	0.19	3984-3849	Southwest Shell Unit (N184 E479), middle deposit, 5.2-5.1m
43776	nut shell	-25.28	3570 ± 20	64.1	0.18	3964-3775	Southeast Shell Unit (N178 E513), basal deposit, 5.1-5.0m
43770	cf. nut shell	-26.94	3540 ± 20	64.34	0.18	3894-3722	Northwestern Shell Unit (N212 E485), basal deposit, 5.0-4.9m
43769	deer bone	-22.65	3490 ± 20	64.73	0.18	3832-3696	Northwestern Shell Unit (N212 E485), upper deposit, 5.33-5.28m
38996	hickory	-24.1	2760 ± 40	70.94	0.37	2951-2770	Cemented Pit, F43, 4.6-4.5m
50122	charcoal	-25.48	1740 ± 20	80.52	0.21	1704-1568	Plaza Center Feature, 4.8-4.77 m
50124	charcoal	-25.69	1700 ± 20	80.9	0.2	1692-1537	Plaza Center Feature, 5.0-4.8 m

50123	charcoal	-26.76	1510 ± 20	82.85	0.21	1409-1346	Plaza Center Feature, 4.9-4.8m
43774	cf. nut shell	-25.16	970 ± 20	88.61	0.24	926-795	Southeast Shell Unit (N178 E513), upper deposit, 5.4-5.2m
50125	charcoal	-26.74	790 ± 20	90.59	0.23	728-677	Plaza Center Feature, 5.0-4.9m

Notes: 1: This date is likely incorrect as subsequent date (Lab# 39843) on same context returned a more recent date.

References Cited

Alcock, Susan E., 2002. Archaeologies of the Greek Past: Landscape, Monuments, and Memories. Cambridge University Press, Cambridge.

Basso, Keith H., 1996. Wisdom Sits in Places: Landscape and Language among the Western Apache. University of New Mexico Press, Albequerque.

Bender, Barbara, 2002. Time and Landscape. Current Anthropology 43s4, S103–S112.

Bishop, Gale A., Thomas, David Hurst, Sanger, Matthew C., Meyer, Brian K., Vance, R. Kelly, Booth, Robert K., Rich, Fredrick J., Potter, Donald B., & Keith-Lucas, Timothy, 2009. Vibracores and Vibracore Transects: Constraining the Geological and Cultural History of St. Catherines island. In: Bishop, G. A., Rollins, H. B., and Thomas, D. H. (Eds.), Geoarchaeology of St. Catherines Island, Georgia. Anthropological Papers of the American Museum of Natural History 94, New York City, pp. 183–207.

Boric´, Dusan (ed.) 2009. Archaeology and Memory. Oxbow Books, Oxford.

Bradley, Richard, 2002. The Past in Prehistoric Societies. Rutledge, New York.

Burkhart, Brian Yazzie, 2004. What Coyote and Thales can Teach Us: An Outline of American Indian Epistemology. In: Waters, Anne (Ed.), American Indian Thought. Blackwell Publishing, Malden, MA., pp. 15-26.

Burkhart, Brian Yazzie, 2019. Indigenizing Philosophy Through the Land: A Trickster Methodology for Decolonizing Environmental Ethics and Indigenous Futures. Michigan State University Press, East Lansing, Michigan.

Cajete, Gregory A., 2000. Native Science: Natural laws of Interdependence. Clear Light Publishers, Santa Fe, New Mexico.

Cajete, Gregory A., 2005. American Indian Epistemologies. New Directions for Student Services 109, 69–78.

Calmes, Alan, 1968. Test Excavations at Three Late Archaic Shell Rings on Hilton Head Island, Georgia. Southeastern Archaeological Bulletin 8, 45–48.

Cannarozzi, Nicole R. & Kowalewski, Michal, 2019. Seasonal Oyster Harvesting Recorded in a Late Archaic Period Shell Ring. PloS one 14(11), e0224666.

Chowdhury, S., Maniar, A., O.M. Suganya, 2015. Strength development in concrete with wood ash blended cement and use of soft computing models to predict strength parameters. Journal of Advanced Research 6, 907–913.

Colaninno, Carol E., 2012. Evaluating Formational Models for Late Archaic Shell Rings of the Southeastern United States Using Vertebrate Fauna From the St. Catherines Shell Ring, St. Catherines Island, Georgia. Journal of Island and Coastal Archaeology 7(3), 338–362.

Colaninno, Carol E. & Compton, J. Matthew, 2018. Integrating Vertebrate and Invertebrate Season of Capture Data from Ring III of the Sapelo Island Shell Ring Complex (9MC23), Georgia, USA. Journal of Island and Coastal Archaeology 14(4), 560–583.

Colaninno, Carol E., Hadden, Carla S. & Emmons, Alexandra L., 2015. Testing Archaeofaunal Collections for Differential Fragmentation. Journal of Archaeological Science 61, 17–24.

Colaninno, Carol E. & Reitz, Elizabeth J., 2015. Animal Remains from Two Late Archaic Shell Rings on St. Catherines Island, Georgia (USA). Report submitted to the American Museum of Natural History. Copies available from the American Museum of Natural History, New York.

Colquhoun, Donald J. & Brooks, Mark J., 1986. New Evidence from the Southeastern US for Eustatic Components in the late Holocene Sea Levels. Geoarchaeology 1(3), 275–291.

Connerton, Paul, 1989. How Societies Remember. Cambridge University Press, Cambridge.

Cordova, Viola Faye, 2004. Approaches to Native American philosophy. In: Waters, Anne (Ed.) American Indian Thought,. Blackwell Publishing, Malden, MA, pp. 27-33.

Cordova, Viola Faye, 2007. How it is: The Native Philosophy of V. F. Cordova. Edited by K. D. Moore. University of Arizona Press, Tucson.

Davis, Dylan S., Sanger, Matthew C. & Lipo, Carl P., 2019. Automated Mound Detection using Lidar and Object-based Image Analysis in Beaufort County, South Carolina. Southeastern Archaeology 38(1), 23–37.

Deloria, Vine, 1973. God is Red. Fulcrum Publishing, Golden, CO.

Deloria, Vine, 1999. Spirit and Reason: The Vine Deloria Reader. Edited by B. Deloria, F. Kristen, and S. Scinta. Fulcrum Publishing, Golden, CO.

Deloria, Vine, 2012. The Metaphysics of Modern Existence. Fulcrum Publishing, Golden, CO.

DePratter, Chester B., 1976. The Shellmound Archaic on the Georgia Coast. South Carolina Antiquities. University of Georgia.

DePratter, Chester B. & Howard, James D., 1981. Evidence for a Sea Level Lowstand Between 4500 and 2400 years B.P. on the Southeast Coast of the United States. Journal of Sedimentary Petrology 51(4), 1287–1295.

Dolphin, Alexis E., Naftel, Steven J., Nelson, Andrew J., Martin, Ronald R. & White, Christine D., 2013. Bromine in Teeth and Bone as an Indicator of Marine Diet. Journal of Archaeological

Science 40(4), 1778–1786.

Duncan, James, 1990. The City as Text: The Politics of Landscape Interpretation in the Kandyan Kingdom. Cambridge University Press, Cambridge.

Fixico, Donald L., 2003. The American Indian Mind in a Linear World: American Indian Studies and Traditional Knowledge. Routledge, New York.

Fowles, Severin M., 2013. An Archaeology of Doings: Secularism and the Study of Pueblo Religion. School for Advanced Research Press, Santa Fe, NM.

Gayes, Paul T., Scott, David B., Collins, Eric S., Nelson, Douglas D., 1992. A Late Holocene sea level fluctuation in South Carolina. In: Fletcher, C. H. and Wehmiller, J. F. (Eds.), Quaternary Coasts of the United States: Marine and Lacustrine Systems. SEPM Society for Sedimentary Geology, Special Publication 48, pp. 155–160.

Golden, Charles, 2010. Frayed at the Edges: Collective Memory and History on the Borders of Classic Maya Polities. Ancient Mesoamerica 21, 373–384.

Hamilakis, Yannis, 2013. Archaeology and the Senses: Human Experience, Memory, and Affect. Cambridge Univeristy Press, Cambridge.

Hanson, Glen T. Jr., 1982. The Analysis of Late Archaic-Early Woodland Adaptive Change Along the Middle Savannah River: A Proposed Study. Notebook 14, 1-38.

Hill, Mark A., Lattanzi, Gregory D., Sanger, Matthew C. & Dussubieux, Laure, 2019. Elemental Analysis of Late Archaic Copper from the McQueen Shell Ring, St. Catherines Island, Georgia. Journal of Archaeological Science: Reports 24, 1083–1094.

Holtorf, Cornelius J., 1997. Megaliths, Monumentality and Memory. Archaeological Review 14(2), 45–66.

Jojola, Ted, 2004. Notes on Identity, Time, Space, and Place. In: Waters, Anne (Ed.), American Indian Thought. Blackwell Publishing, Malden, MA, pp. 87-96.

Jones, Andrew, 2007. Memory and Material Culture. Cambridge University Press, Cambridge.

Joyce, Rosemary A., 2004. Unintended Consequences? Monumentality as a Novel Experience in Formative Mesoamerica. Journal of Archaeological Method and Theory 11(1), 5–29.

Kotb, M., Assas, M., Abd-Elrahman, H., 2010. Effect of grounded bone powder addition on the mechanical properties of cement mortar. WIT Trans. Ecol. Environ. 138, 201–212.

Kuijt, Ian, 2008. The Regeneration of Life Neolithic Structures of Symbolic Remembering and Forgetting. Current Anthropology 49(2), 171–197.

Littleton, Judith & Allen, Harry, 2007. Hunter-gatherer Burials and the Creation of Persistent Places in Southeastern Australia. Journal of Anthropological Archaeology 26(2), 283–298.

Lucas, Gavin, 2005. The Archaeology of Time. Routledge, New York.

Marrinan, Rochelle A., 1975. Ceramics, Molluscs, and Sedentism. PhD. dissertation, Department of Anthropology, University of Florida, Gainesville.

Marrinan, Rochelle A., 2010. Two Late Archaic Period Shell Rings, St. Simon's Island, Georgia. In: Thomas, D. H. and Sanger, Matthew C. (Eds.), Trend, Tradition, and Turmoil: What happened to the Southeastern Archaic? American Museum of Natural History Anthropological Papers Number 93, New York, pp. 71-102.

Meskell, Lynn, 2003. Memory's Materiality: Ancestral Presence, Commemorative Practice and Disjunctive Locales. In: Van Dyke, Ruth and Alcock, Susan E. (Eds.) Archaeologies of Memory. Blackwell Publishers, Malden, pp. 34-55.

Mills, Barbara J. & Walker, William H. (Editors), 2008. Memory Work: Archaeologies of Material Practices. School for Advanced Research Press, Santa Fe, NM.

Norton-Smith, Thomas M., 2010. The Dance of Person and Place: One Interpretation of American Indian Philosophy. Suny Press, Albany.

Ogden, Quinn-Monique, 2019. Seasonal Homes of the Lowcountry: Three Late Archaic/Woodland Semi-Subterranean Structures at 38BK2091– Rebellion Farms, Berkeley County, South Carolina. South Carolina Antiquities 51, 41–60.

Oliver, Laurent, 2004. The Past of the Present: Archaeological Memory and Time. Archaeological Dialogues 10, 204–213.

Olivier, Laurent, 2011. The Dark Abyss of Time: Archaeology and Memory. Altamira, Lanham, Maryland.

Olsen, Bjørnar, 2010. In Defense of Things: Archaeology and the Ontology of Objects. Altamira, Lanham, Maryland.

Peterson, Drexel A., 1971. Time and Settlement in the Archaeology of Groton Plantation, South Carolina. PhD Dissertation, Department of Anthropology, Harvard University.

Quitmyer, Irvy R. & Jones, Douglas S., 2012. Annual Incremental Shell Growth Patterns in Hard Clams (Mercenaria spp.) from St. Catherines Island, Georgia: A Record of Seasonal and Anthropogenic Impact on Zooarchaeological Resources. In: Reitz, Elizabeth J., Quitmyer, Irvy R., and Thomas, David. H. (Eds.) Seasonality and Human Mobility Along the Georgia Bight. American Museum of Natural History Anthropological Papers Number 97, New York, pp. 135–148.

Rifkin, Mark. 2017. Beyond Settler Time: Temporal Sovereignty and Indigenous Self-Determination. Duke University Press, Durham, NC.

Ritchison, Brandon. T., Thompson, Victor D., Lulewicz, Isabelle Holland, Tucker, Bryan, Turck, John A. 2021. Climate Change, Resilience, and the Native American Fisher-hunter-gatherers of the Late Holocene on the Georgia Coast, USA, Quaternary International, 584: 82–92.

Rowlands, Michael, 1993. The Role of Memory in the Transmission of Culture. World Archaeology 25(2), 141–151.

Russo, Michael, 1991. Archaic Sedentism on the Florida Coast: A Case Study from Horr's Island. PhD. dissertation, Department of Anthropology, University of Florida, Gainesville.

Russo, Michael, 2004. Measuring Shell Rings for Social Inequality. In: Gibson, Jon L. and Carr, P. J. (Eds.), Signs of Power: The Rise of Cultural Complexity in the Southeast. The University of Alabama Press, Tuscaloosa, Alabama, pp. 26–70.

Russo, Michael, 2006. Archaic Shell Rings of the Southeast U.S. National Historic Landmarks - National Register of Historic Places Theme Study. Tallahassee: Report submitted to the National Register of Historic Places. Copies available from Southeastern Archaeological Center, National Park Service, Tallahassee.

Russo, Michael, 2014. Ringed Shell Features of the Southeastern United States. In: Roksandic, Mirjana, Sheila Mendonça de Souza, Sabine Eggers, Meghan Burchell, and Daniela Klokler (Eds.), The Cultural Dynamics of Shell-matrix Sites. University of New Mexico Press, Albuquerque, pp. 21–39.

Sanger, Matthew C., 2010. Leaving the Rings: Shell Ring Abandonment and the End of the Late Archaic. In: Thomas, David H. and Sanger, Matthew C. (Eds.) Trend, Tradition, and Turmoil: What Happened to the Southeastern Archaic? American Museum of Natural History Anthropological Papers Number 93, New York, pp. 201–216.

Sanger, Matthew C., 2017. Evidence for Significant Subterranean Storage at Two Hunter-Gatherer Sites: The presence of a Mast-based Economy in the Late Archaic Coastal American Southeast. American Antiquity 82(1), 50–70.

Sanger, Matthew C., Hill, Mark A., Lattanzi, Gregory D., Padgett, Brian D., Larsen, Clark S., Culleton, Brendan J., Kennett, Douglas J., Dussubieux, Laure, Napolitano, Matthew F., Lacombe, Sébastien & Thomas, David Hurst, 2018. Early Metal use and Crematory Practices in the American Southeast. Proceedings of the National Academy of Sciences 115, 7672–7679.

Sanger, Matthew C., Padgett, Brian D., Larsen, Clark S., Hill, Mark, Lattanzi, Gregory D., Colaninno, Carol E., Culleton, Brendan J., Kennett, Douglas J., Napolitano, Matthew F., Lacombe, Sébastien, Speakman, Robert J. & Thomas, David Hurst, 2019. Great Lakes Copper and Shared Mortuary Practices on the Atlantic Coast: Implications for Long Distance Exchange during the Late Archaic. American Antiquity 84(4), 591–609.

Sanger, Matthew C., Quitmyer, Irvy R., Colaninno, Carol E., Cannarozzi, Nicole R. & Ruhl, Donna L., 2020. Multiple-proxy Seasonality Indicators: An Integrative Approach to Assess Shell Midden Formations from Late Archaic Shell Rings in the Coastal Southeast North America. Journal of Island and Coastal Archaeology 15(3), 333–363.

Sanger, Matthew C., 2021. Joining the Circle: Native American Philosophy Applied to the Study of Late Archaic Shell Rings of the Southeast U.S. Journal of Archaeological Method and Theory, in print.

Sanger, Matthew C. & Ogden, Quinn-Monique, 2018. Determining the use of Late Archaic Shell Rings using Lithic Data: 'Ceremonial Villages' and the Importance of Stone. Southeastern Archaeology 37(3), 232–252.

Sanger, Matthew C. & Thomas, David Hurst, 2010. The Two Rings of St. Catherines Island: Some Preliminary Results From the St. Catherines and McQueen Shell Rings. In: Thomas, David H. and Sanger, Matthew C. (Eds.), Trend, Tradition, and Turmoil: What Happened to the Southeastern Archaic? American Museum of Natural History Anthropological Papers Number 93, New York, pp. 45–70.

Saunders, Rebecca, 2002. The Fig Island Ring Complex (38CH42): Coastal Adaptation and the Question of Ring Function in the Late Archaic. Submitted to the South Carolina Department of Archives and History, Columbia.

Saunders, Rebecca, 2004. Spatial Variation in Orange Culture Pottery: Interaction and Functions. In: Saunders, Rebecca and Hays, Christopher (Eds.), Early Pottery, Technology, Function, Style, and Interaction in the Lower Southeast. University of Alabama Press, Tuscaloosa, pp. 40–62.

Saunders, Rebecca, 2014. Shell Rings of the Lower Atlantic Coast of the United States. In: Roksandic, Mirjana, Sheila Mendonça de Souza, Sabine Eggers, Meghan Burchell, and Daniela Klokler (Eds.), The Cultural Dynamics of Shell-matrix Sites. University of New Mexico Press, Albuquerque, pp. 41–55.

Sassaman, Kenneth E., Brooks, Mark J., Hanson, Glen T., & Anderson, David G., 1990. Native American Prehistory of the Middle Savannah River Valley. Savannah River Archaeological Research Papers 1. Occasional Papers of the Savannah River Archaeological Research Program. South Carolina Institute of Archaeology and Anthropology, University of South Carolina, Columbia

Sassaman, Kenneth E. and Ledbetter, R. Jerald, 1996. Middle and Late Archaic Architecture. In: Sassaman, Kenneth & Anderson, David G. (Eds.), Archaeology of the Mid- Holocene Southeast. University of Florida, Gainesville, pp. 75-95.

Schlanger, Sarah H., 1992. Recognizing Persistent Places in Anasazi Settlement Systems. In: Rossingnol, J. and Wandsnider, L. (Eds.), Space, Time and Archaeological Landscapes. Interdisciplinary contributions to archaeology, Springer, New York, pp. 91–112.

Schneider, Tsim, 2015. Placing Refuge and the Archaeology of Indigenous Hinterlands in

Colonial California. American Antiquity 80, 695–713.

Schultz, John J. Warren, Michael W. & Krigbaum, John S., 2008. Analysis of Human Cremains: Gross and Chemical Methods. In: Schmidt, Christopher W., and Symes, Steven A. (Eds.), The Analysis of Burned Human Remains. Academic Press, London, pp. 75–94.

Scott, David B. Gayes, Paul T. & Collins, Eric S., 1995. Mid-Holocene Precedent for a Future Rise in Sea-level along the Atlantic coast of North America. Journal of Coastal Research 11(3), 615–622.

Shorter, David Delgado, 2009. We Will Dance our Truth: Yaqui History in Yoeme Performances. University of Nebraska Press, Lincoln.

Skibo, James M., Schiffer, Michael Brian, & Reid, Kenneth C., 1989. Organic-tempered Pottery: An Experimental Study. American Antiquity 54(1), 122–146.

Smith, C. Ken & McGrath, Deborah A., 2011. The Alteration of Soil Chemistry through Shell Deposition on a Georgia (USA) Barrier Island. Journal of Coastal Research 27(1), 103–109.

Stanton, Travis W. & Magnoni, Aline (Editors), 2008. Ruins of the Past: The Use and Perception of Abandoned Structures in the Maya Lowlands. University Press of Colorado, Boulder.

Stockett, Miranda K., 2010. Sites of Memory in the Making: Political Strategizing in the Construction and Deconstruction of Place in Late to Terminal Classic Southeastern Mesoamerica. Ancient Mesoamerica 21, 315–330.

Thompson, Victor D., 2006. Questioning Complexity: The Prehistoric Hunter-Gatherers of Sapelo Island, Georgia. PhD. dissertation, Department of Anthropology, University of Georgia, Athens.

Thompson, Victor D., 2007. Articulating Activity Areas and Formation Processes at the Sapelo Island Shell Ring Complex. Southeastern Archaeology 26(1), 91–107.

Thompson, Victor D., 2018. Collective Action and Village Life During the Late Archaic on the Georgia Coast. In: Birch, Jennifer & Thompson, Victor D. (Eds.), The Archaeology of Villages in Eastern North America. University Press of Florida, Gainesville, pp. 20–35.

Thompson, Victor D. & Andrus, C. Fred T., 2011. Evaluating Mobility, Monumentality, and Feasting at the Sapelo Island Shell Ring Complex. American Antiquity 76(2), 315–344.

Thompson, Victor D., Rick, Torben, Garland, Carey J., Thomas, David H., Smith, Karen Y., Bergh, Sara, Sanger, Matthew, Tucker, Brian, Lulewicz, Isabelle, Semon, Anna M., Schalles, John, Hladik, Christine, Alexander, Clark, & Ritchison, Brandon T., 2020. Ecosystem Stability and Native American Oyster Harvesting along the Atlantic Coast of the United States. Science Advances *6*(28): eaba9652

Thompson, Victor D. & Turck, John A., 2009. Adaptive Cycles of Coastal Hunter-gatherers. American Antiquity 74, 255–278.

Thompson, Victor D. & Turck, John A., 2010. Island Archaeology and the Native American Economies (2500 BC-AD 1700) of the Georgia Coast. Journal of Field Archaeology 35(3), 283–297.

Thompson, Victor D. & Worth, John E., 2010. Dwellers by the Sea: Native American Adaptations along the Southern Coasts of Eastern North America. Journal of Archaeological Research 19(1), 51–101.

Trinkley, Michael B., 1980. Investigation of the Woodland Period along the South Carolina Coast. PhD. dissertation, Department of Anthropology, University of North Carolina, Chapel Hill.

Trinkley, Michael B., 1985. The Form and Function of South Carolina's Early Woodland Shell Rings. In: Dickens, Roy S. and Ward, H. Trawick (Eds.), Structure and Process in Southeastern Archaeology. University of Alabama Press, Tuscaloosa, pp. 102–118.

Turck, John. A. & Alexander, Clark R. 2013. Coastal landscapes and their relationship to human settlement on the Georgia coast. In: Thompson, Victor D. & Thomas, David H. (Eds.), Life Among the Tides: Recent Archaeology on the Georgia Bight. American Museum of Natural History Anthropological Papers Number 98, New York, pp. 169–190.

Turck, John A. & Thompson, Victor D., 2016. Revisiting the Resilience of Late Archaic Hunter-gatherers along the Georgia Coast. Journal of Anthropological Archaeology 43, 39–55.

Van Dyke, Ruth M., 2009. Chaco Reloaded: Discursive Social Memory on the Post-Chacoan Landscape. Journal of Social Archaeology 9(2), 220–248.

Van Dyke, Ruth M., 2017. Chaco Canyon: A Contested Memory Anchor in the North American Southwest. In: Hofmann, Kerstin P., Bernbeck, Reinhard, and Sommer, Ulrike (Eds.), Between Memory Sites and Memory Networks. Freie Universität Berlin, Berlin, pp. 199-226.

Van Dyke, Ruth M., 2019. Archaeology of Social Memory. Annual Review of Anthropology 48, 207–225.

Verney, Marilyn Notah, 2004. On Authenticity. In: Waters, Anne (Ed.), American Indian Thought. Blackwell Publishing, Malden, MA, pp. 133–139.

Walker, Martin, 2016. Tracking Trajectories: Charting the Changes of Late Archaic Shell Ring Formation and Use. MA Thesis, Anthropology Department, University of Tennessee, Knoxville.

Walker, Phillip L., Miller, Kevin W. P. & Richman, Rebecca, 2008. Time, Temperature, and Oxygen Availability: An Experimental Study of the Effects of Environmental Conditions on the Color and Organic Content of Cremated Bone. In: Schmidt, Chrsitopher W. & Symes, Steven A.

(Eds.), The Analysis of Burned Human Remains. Academic Press, London, pp. 129–136.

Wallis, Neil J., 2008. Networks of History and Memory: Creating a Nexus of Social Identities in Woodland Period Mounds on the Lower St Johns River, Florida. Journal of Social Archaeology 8(2), 236–271.

Waring Jr, Antonio J. & Larson, Lewis, 1968. The Shell Ring on Sapelo Island. Papers of the Peabody Museum of Archaeology and Ethnology 58, 263–280.

Warrior, Carol Edelman, 2015. Baring the Windigo's Teeth: The Fearsome Figure in Native American Narratives. PhD dissertation, Anthropology Department, University of Washington.

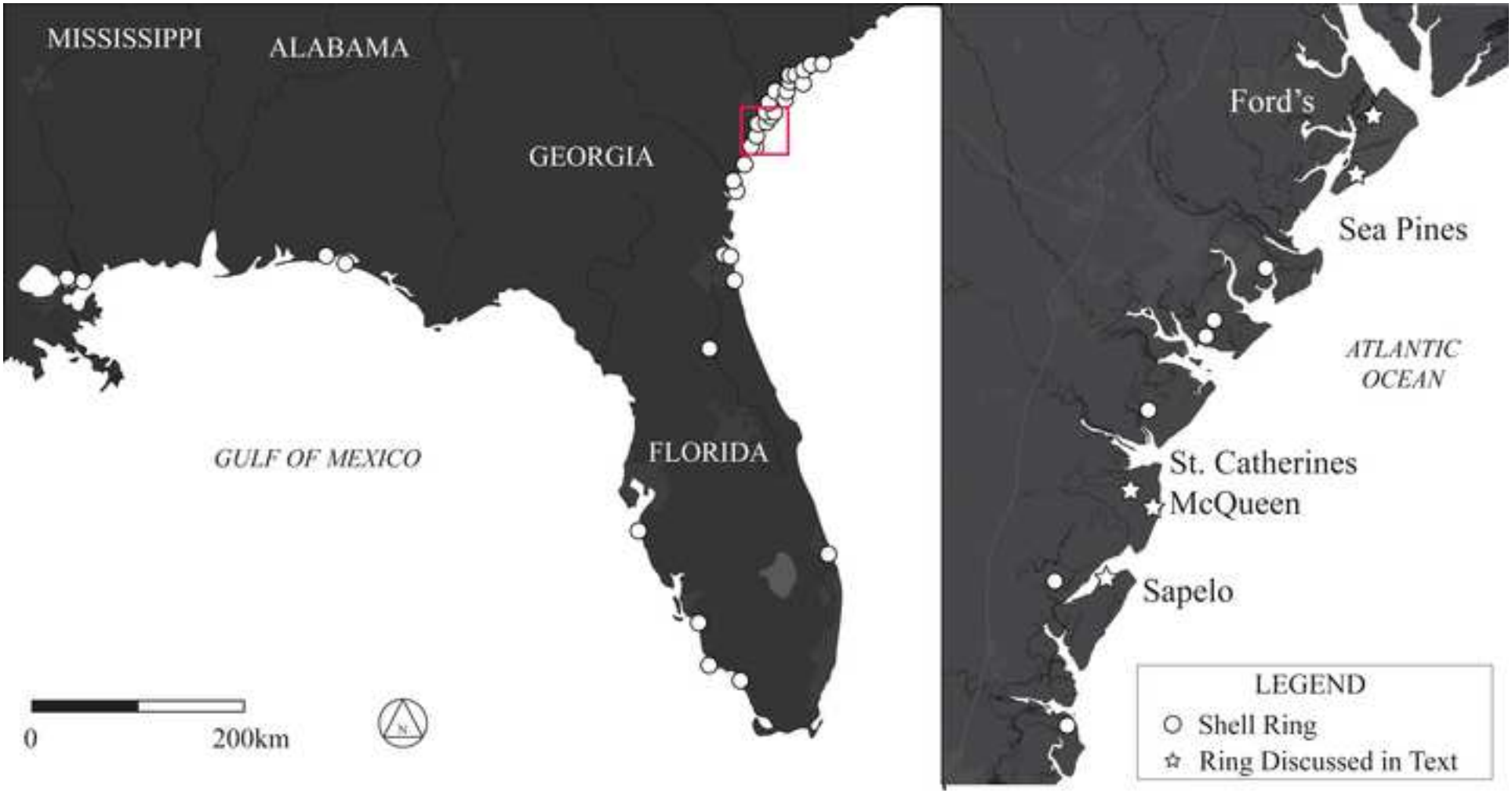
Waters, Anne (editor), 2004a. American Indian Thought: Philosophical Essays. Blackwell Publishing, New York.

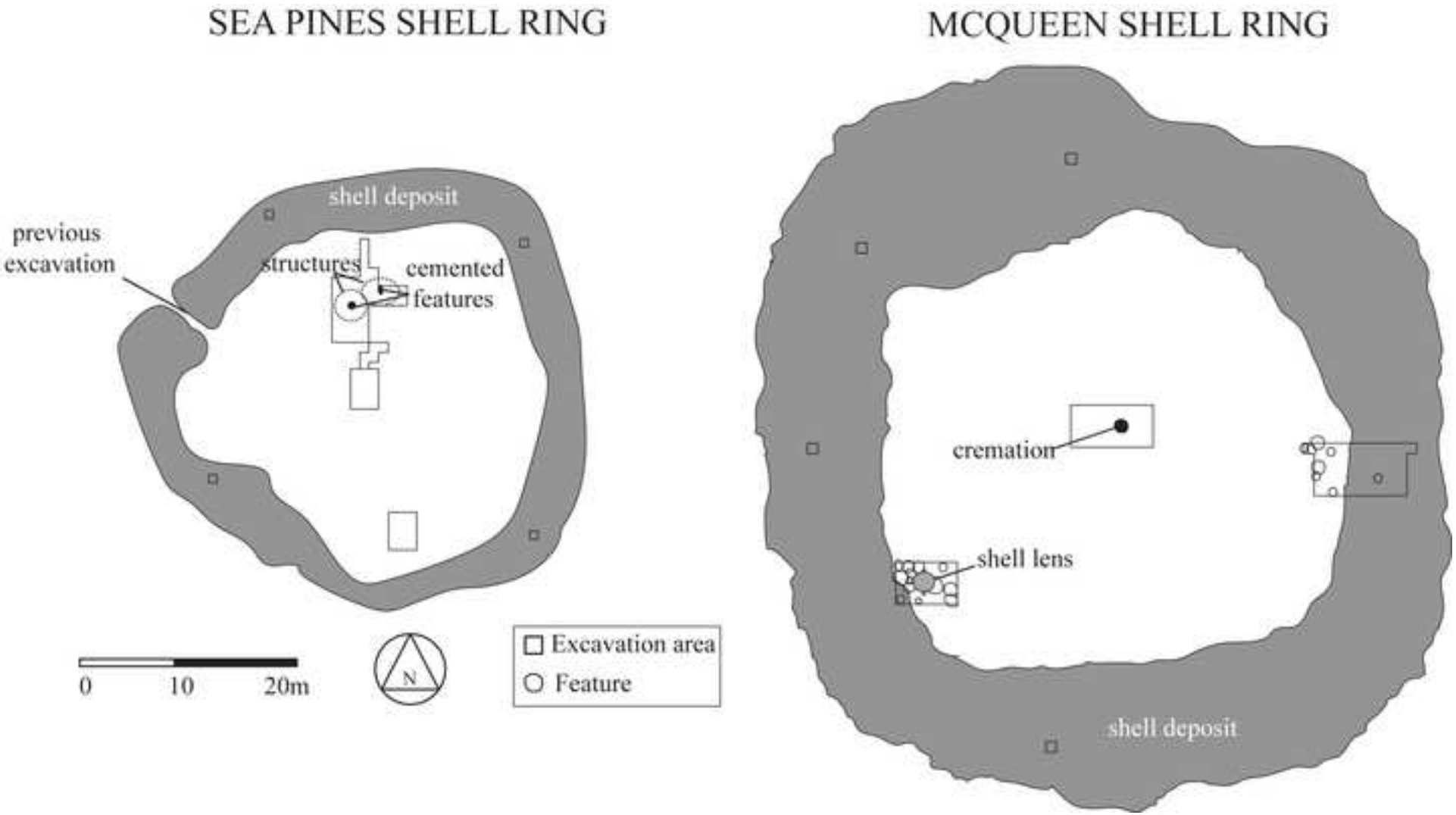
Waters, Anne, 2004b. Ontology of Identity and Interstitial Being. In: Waters, Anne (Ed.), American Indian Thought. Blackwell Publishing, Malden, MA, pp. 153–170.

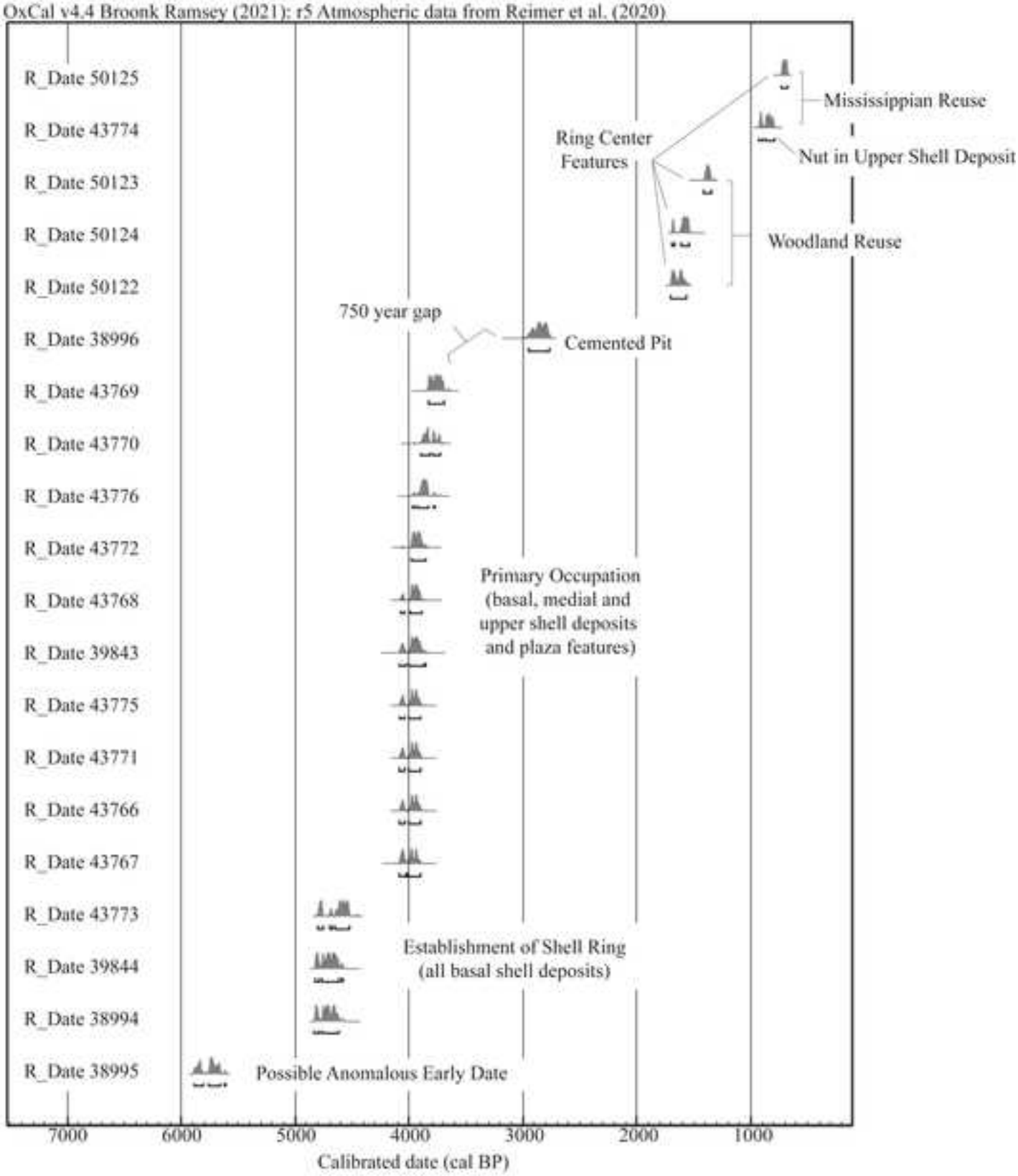
Welch, Shay, 2019. The Phenomenology of a Performative Knowlege System: Dancing with Native American Epistemology. Palgrave Macmillan, Cham, Switzerland.

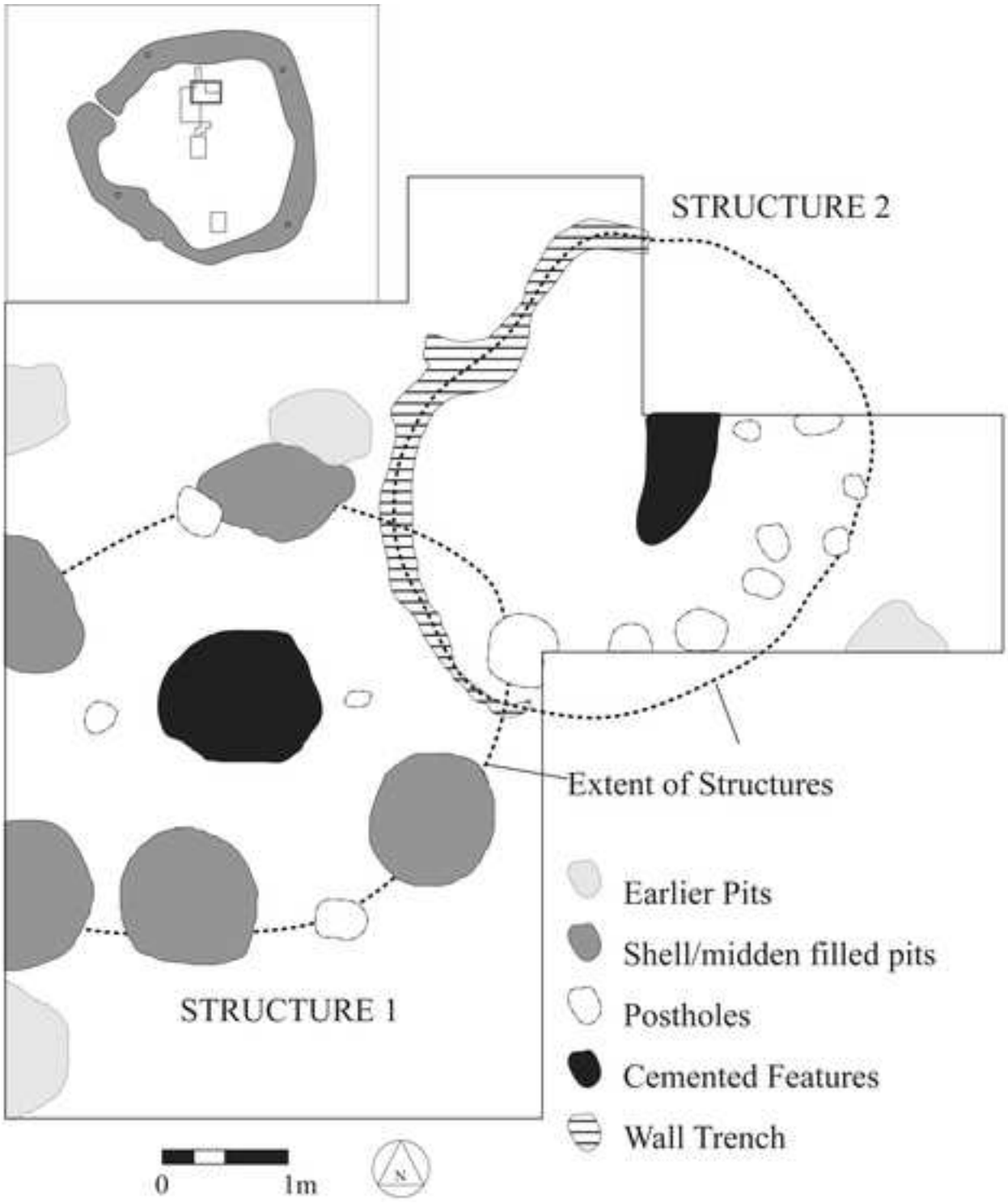
Yoffee, Norm, 2007. Negotiating the Past in the Past: Identity, Memory, and Landscape in Archaeological Research. University of Arizona Press, Tucson.

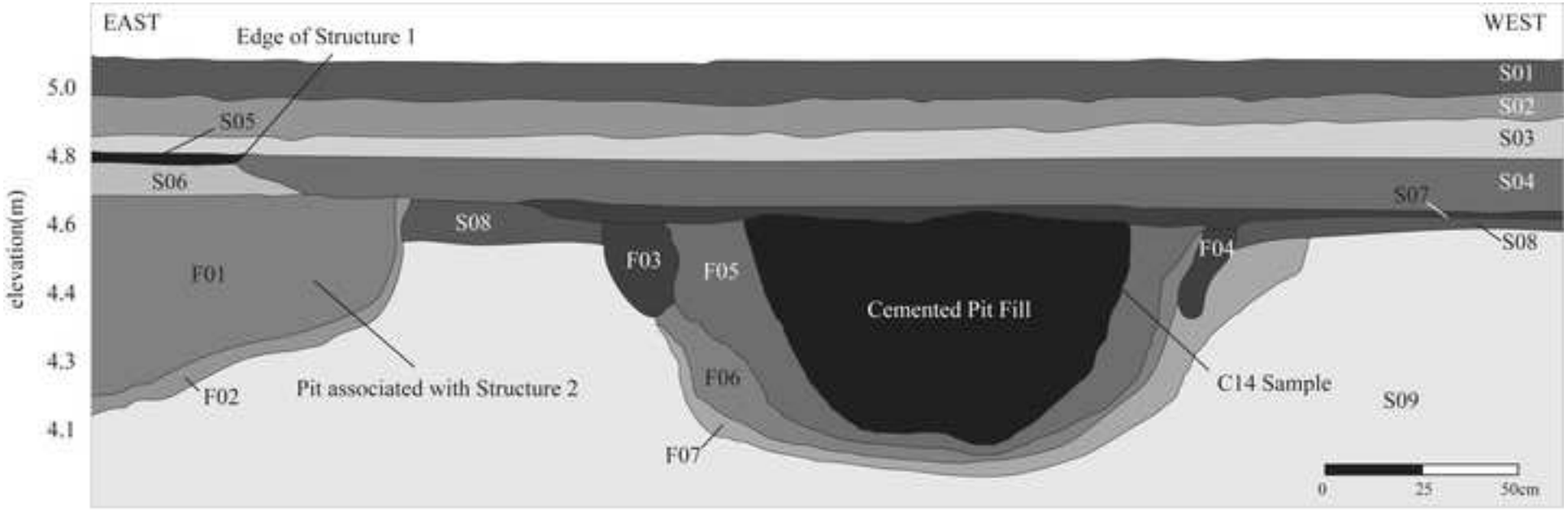
Zedeño, María Nieves & Bowser, Brenda J. (editors), 2009. The Archaeology of Meaningful Places. University of Utah Press, Salt Lake City.



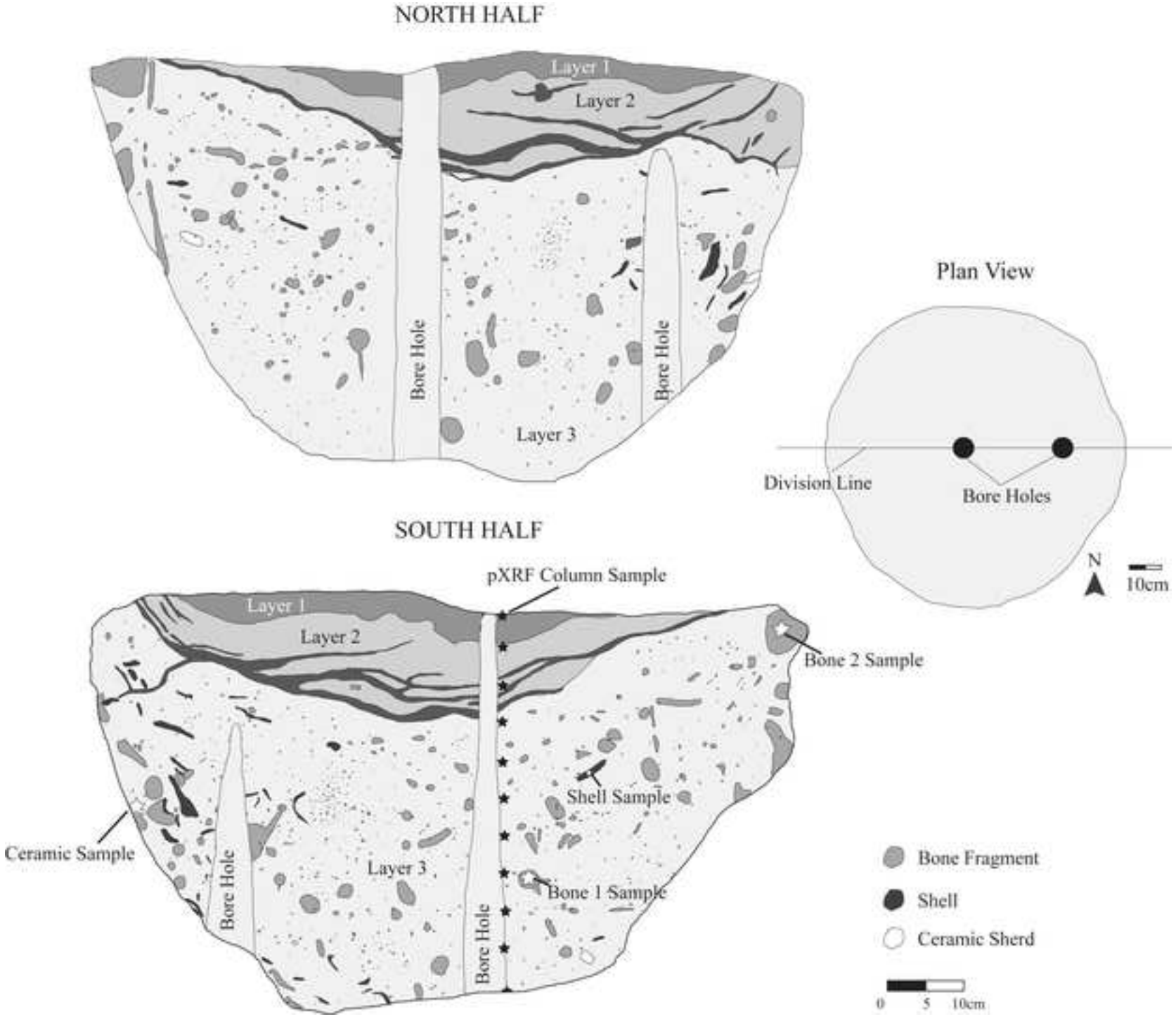


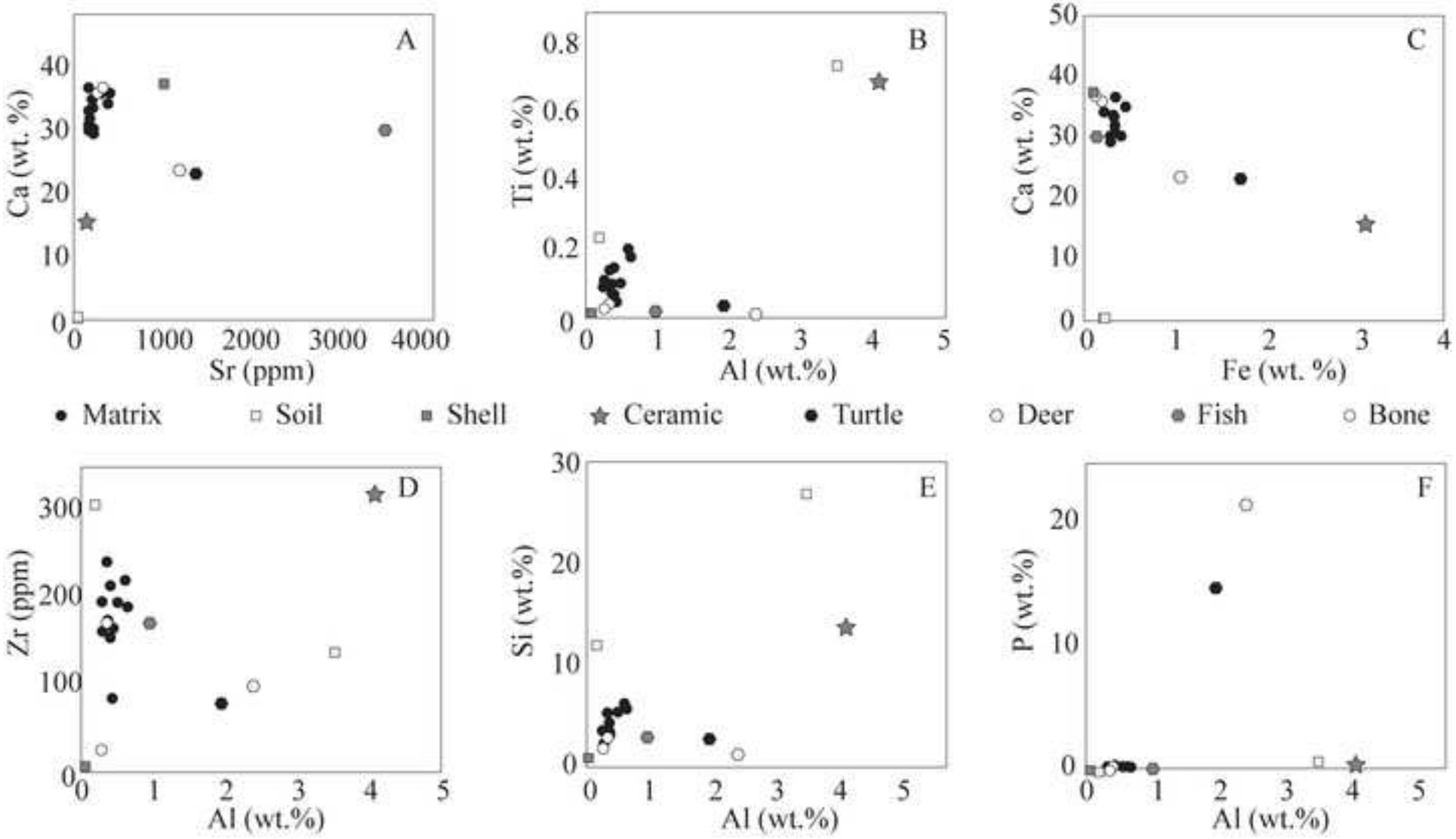


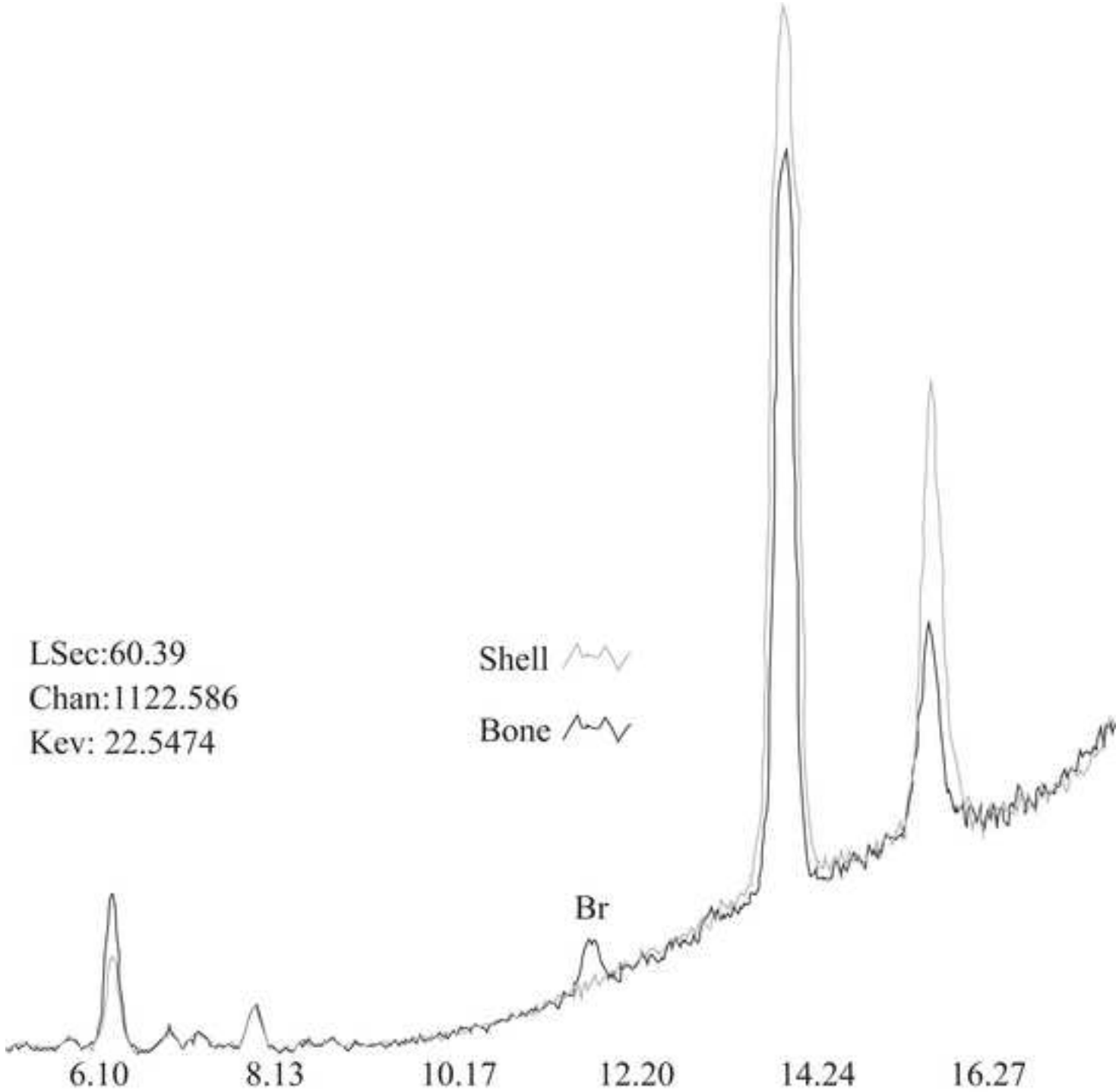


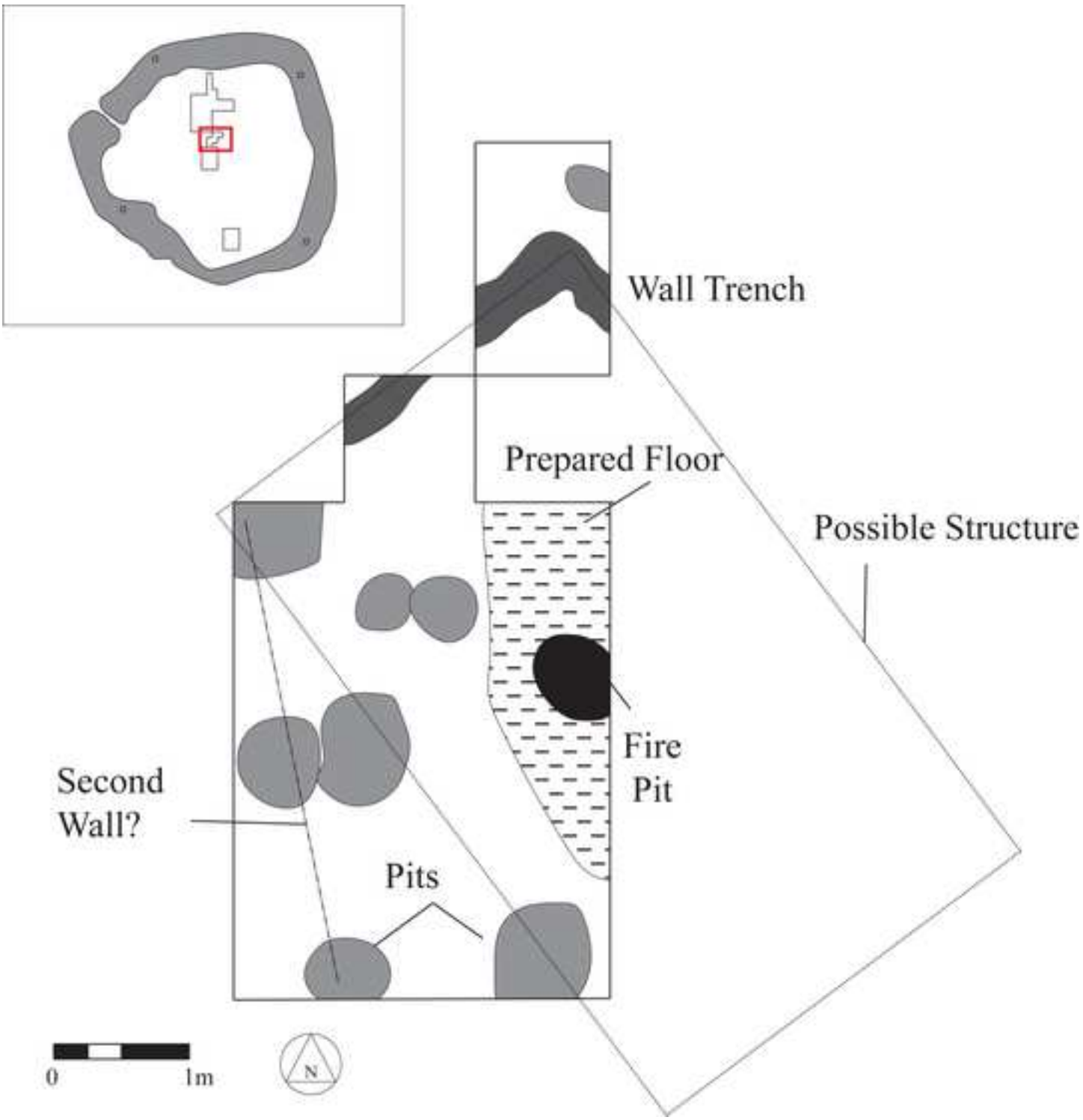


S01: Modern ground surface, 10YR 3/1
S02: A Horizon, 10YR 3/2
S03: Leached B, 10YR 4/3
S04: Anthrosol, 2.5Y 4/2
S05: Iron-Rich Nodules, mix 2.5Y 5/4, 5YR 4/4, 10YR 4/3
S06: Anthrosol, 10YR, 5/4
S07: Anthrosol, 10YR 3/2
S08: Buried A, 10YR 4/2
S09: C Horizon, 2.5Y 7/4
F01: Feature Fill, 2.5Y 6/3
F02: Leached Feature Fill, 2.5Y 6/1
F03: Feature Fill, 10YR 3/2
F04: Feature Fill, 10YR 3/2
F05: Feature Fill, 2.5Y 3/1
F06: Feature Fill, 2.5Y 3/2
F07: Feature Fill, 2.5Y 4/3









We have no conflicts of interest to declare.

Author Statement