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RECENT WOODLAND ARCHAEOLOGY OF COASTAL NORTH CAROLINA

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This chapter presents a brief retrospective of Woodland archaeology on North Carolina's Coastal Plain conducted over the past quarter century with special attention to pottery, ceramic analysis, and future research. It begins with a survey of pottery sequences, reviews the contributions of several projects conducted since 1983, considers the implications of these findings for pottery typology, proposes a few possible solutions to some taxonomic inconsistencies, and identifies challenges and promising directions for future research. Only pottery types for which there is a reasonable amount of chronometric and geographic information are reviewed in the text. Formal type descriptions are referenced, but not provided, so readers are advised to consult original sources for those details. An abbreviated summary of all chronometric data for the Coastal Plain of North Carolina is presented in a table at the end of this chapter (Table 4-1). Much of this information was compiled in collaboration with the late Mark Mathis, NC-OSA. Subsequently I have tried to fill in the details and expand the database to include data published up to the time when this paper was compiled (winter 2009). For radiocarbon dates the contextual information was evaluated, but is included in the table only as a list of associated "target" pottery types. Associations are not always clearly established, and consequently each reader is encouraged to consult the original contract reports to evaluate the validity of associations. In most cases, it has been possible to include the bibliographic reference numbers for technical reports on file at the NC-OSA; but for a few dates, casually referred to in texts or passed on by personal communications in the distant past, the details remain unknown. The association of pottery samples with luminescence dates obviously requires no evaluation, but the validity of the results of the dating procedure itself appear to strike some researchers as dubious, and a few reject it outright. Here too the reader is advised to consult the literature and come to their own conclusions.

THE EARLY WOODLAND

Stallings

Fiber-tempered Stallings pottery (Griffin 1943; Sassaman 1993; Stoltman 1972, 1974) is considered to be the earliest pottery in both South and North Carolina. On the North Carolina coast, any pottery that exhibits lacunae within the body of the ceramic resulting from the oxidation of fiber (presumably Spanish moss) is considered to be fiber tempered and is classified as Stallings. Stallings has been found from the Altamaha River in Georgia (Sassaman 1993) to the Chowan River near the North Carolina-Virginia line, where it occasionally turns up along tributaries from the upper Coastal Plain slightly beyond the Fall Line to the Atlantic coastal margin (Phelps 1983). Despite this vast geographic range, the frequency of Stallings in North Carolina is relatively low and the distribution drops off with distance from the core area in the middle Savannah River valley, South Carolina (Herbert 2003:204–206, Figure 6.1 and 6.2; 2009:116, 148–150; Phelps 1983:26–28, Figure 1.4).

The margins of the distribution of fiber tempered ware are geographically broad and weakly defined, suggesting that the first pottery did not revolutionize cooking technology, but

rather, the concept and practice of hardening mud into vessels by fire caught on slowly and was largely ignored by the majority of hunter gatherers.

Although a wide variety of drag-and-jab punctuate decorative patterns characterize classic period Stallings styles in the Savannah Valley and along the central South Carolina coast, fiber-tempered ware of the same period found in North Carolina typically exhibits mostly plain, smoothed surfaces. Although not yet dated in North Carolina, Stallings appeared in South Carolina at approximately 2500 B.C. and persisted to at least 1100 B.C. (Sassaman 1993). The idea for this technology is assumed to have originated there, diffusing over several hundred years among the cultures of North Carolina Coastal Plain.

Thom's Creek

The next innovation in the history of pottery making technology, wherein the step of adding Spanish moss to clay was deemed unnecessary and dropped from the protocol, appears to have developed independently in several areas of the Middle Atlantic and elsewhere in the Southeast. The fine, sand-tempered or temperless Thom's Creek series (Anderson et al. 1982: 263–264; DePratter et al. 1979; Phelps 1968; Trinkley 1980; Waring and Holder 1968) is thought to have emerged from Stallings in South Carolina at about 2000 B.C., and persisted up to 1200 B.C. Thom's Creek Punctate appears to represent a continuation of Stallings decorative styles applied to fiberless paste. It is found along the lower coast of North Carolina in assemblages from Brunswick to Onslow Counties, but rarely further north (Herbert 2003:213–214, Figure 6.9; 2009: 155–157). Restricted to the coastal margin and exhibiting a rather sharp northern boundary, this distribution suggests for the first time a cultural boundary demarcating the geographic extent of a cohering body of people whose technology included ceramics which also exhibit a diagnostic suite of technological styles. Decorations on Thom's Creek sherds in southern North Carolina consist mostly of random punctuations, missing much of the richness and diversity of drag-and-jab decoration seen in the Savannah drainage. One recent exception has been found at the Barnards Creek site (31NH747) in the lower Cape Fear valley near Wilmington, where Thom's Creek Punctate (square stylus, reed and periwinkle, linear drag-and-jab) is well represented (n=393, or 68 percent of the assemblage) (Moser et al. 2009). This suggests that although the protocols for making Thom's Creek Punctate vessels were faithfully practiced on the southern coast of North Carolina, the decorative embellishments that flourished in the core area were only occasionally communicated to this distant point on the periphery. The lack of punctuate embellishments may also signal a time difference, with the North Carolina coastal expression representing the late-stage tail of the temporal trajectory; verification of this hypothesis will require additional chronometric data.

Refuge

Sand-tempered, Refuge series pottery follows the Thom's Creek series in the sequence, emerging about 700 B.C. in the Middle Savannah drainage and persisting up to about 400 B.C. (Anderson et al. 1982, 1996:224; Stoltman 1972, 1974:276–277). As is the case for all sand-tempered pottery in Carolina, classification is made easier if some surface treatment other than plain (smoothed) is present. On the North Carolina coast, Refuge is most often recognized in its manifestation as Refuge Punctate *variety Allendale*. This type is decorated with random punctuations, quite distinct from the Stallings and Thom's Creek drag-and-jab pattern,

resembling pine-cone rouletting (Herbert 2003:63; 2009:156–158). Although the geographic range of the Refuge series is vast, extending well into Georgia, Allendale is found no farther south than central South Carolina, and in North Carolina the distribution is almost identical to that of Thom's Creek Punctate, with the two series often co-occurring, suggesting some cultural relationship among the makers of these types (Barse et al. 2001, Plates 4.19 and 4.25; Herbert 2003:214–215, Figure 6.10).

Chronological data for Refuge Allendale from North Carolina consists of two dates: a radiocarbon date (1950±80 B.C.) from the Cape Island site for a feature including Hamp's Landing sherds (Jones et al. 1997), and a luminescence date (2080±230 B.C.) from a site in the Sandhills (McNutt and Gray 2009). The fact that these two dates are in close agreement lends some measure of confidence in their accuracy, but both are 1000 years older than the earliest dates for Refuge from South Carolina. These data, together with the similarity of paste characteristics, suggest that Allendale, as manifested on the North Carolina coast, may in fact be best placed in the Thom's Creek rather than the Refuge series.

Hamp's Landing

Hamp's Landing is a limestone- or marl-tempered series found on coastal sites from northern South Carolina up to the Tar-Pamlico valley (Hargrove 1993; Hargrove and Eastman 1997, 1998; Herbert and Mathis 1996; Herbert 2003; Mathis 1999; Terrell et al. 2000). This distribution closely approximates the area in which marl and limestone were commercially mined in the 20th century (Loughlin et al. 1921). The southern boundary of the distribution is thought to be near Charleston, but certainly Wando is relatively common in Horry County South Carolina (Hargrove and Eastman 1997) where marl-tempered pottery is classified as the Wando series (Adams and Trinkley 1993). The northern boundary of the distribution is clearly circumscribed by finds on the northern coast of the Pamlico River (Figure 4-1).

There have been six attempts to date Hamp's Landing pottery from North Carolina, with age estimates ranging from 3056 B.C. to A.D. 634 (Figure 4-2). The oldest and youngest dates in this series were luminescence dates for samples associated with Feature 10 at the Riegelwood site (31CB114), and both were determined to be unreliable due to excessive scatter in the growth curve or anomalous fading (Herbert 2003:163–168, Table 4.20). Among the remaining four dates, two almost identical radiocarbon dates (cal 2080±50 and cal 2080±40 B.C.) were derived from charcoal collected from flotation samples associated with pottery clusters (Features 6 and 10) at the Riegelwood site (Abbott et al. 1999:61, Figure 6-9). In both cases, however, multiple pottery types were included in the features. In addition, the data describing an AMS assay (approximately 865 B.C.) of soot from the surface of a vessel fragment found at site 31NH771 (Barse et al. 2001:3.4) are incompletely reported. Consequently, the most reliable date for Hamp's landing at present appears to be a luminescence date (221±239 B.C.) for a cord-marked vessel found in association with a cremation (Feature 1) at the Riegelwood site (Herbert 2003:163–168).

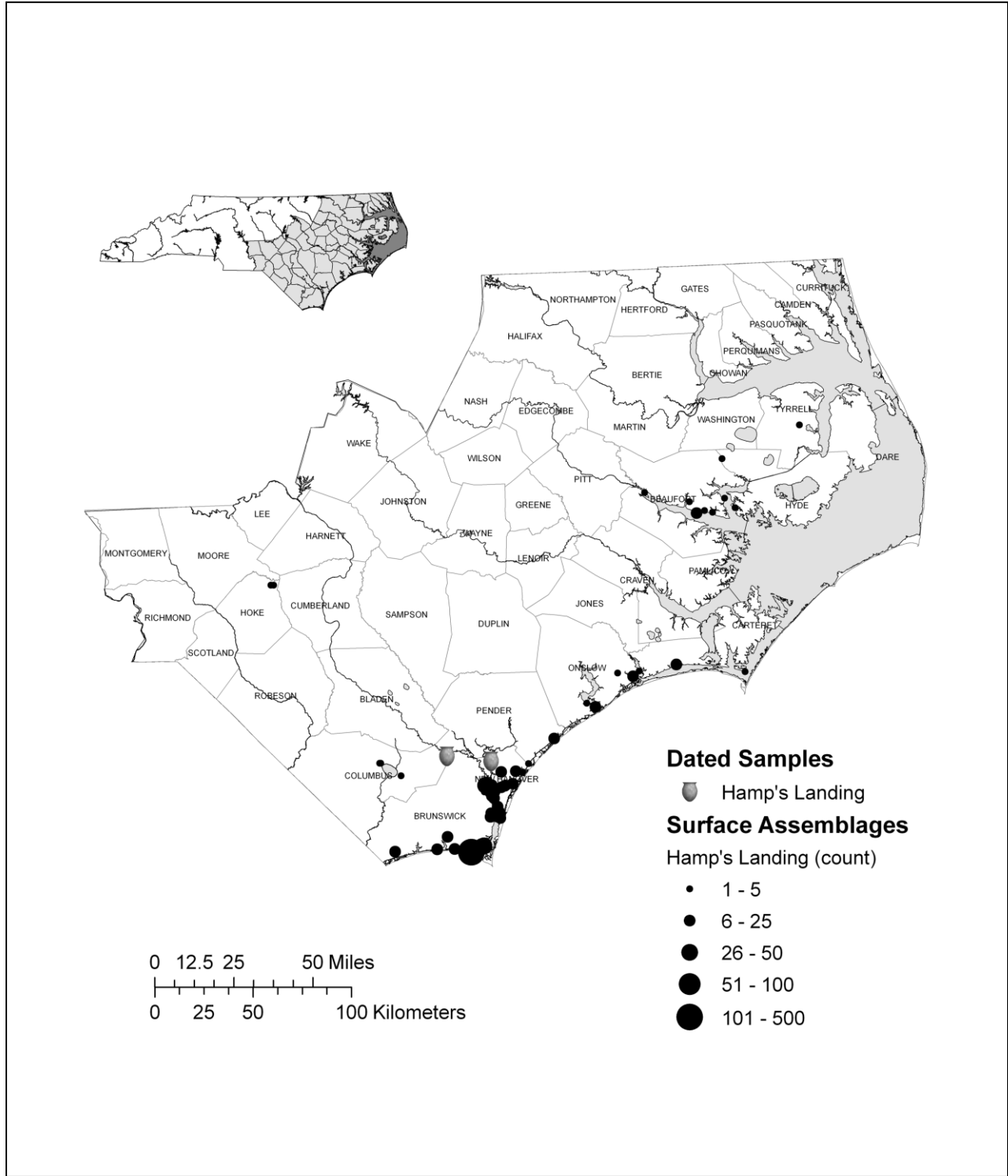


Figure 4-1. Geographic distribution of the Hamp's Landing series.

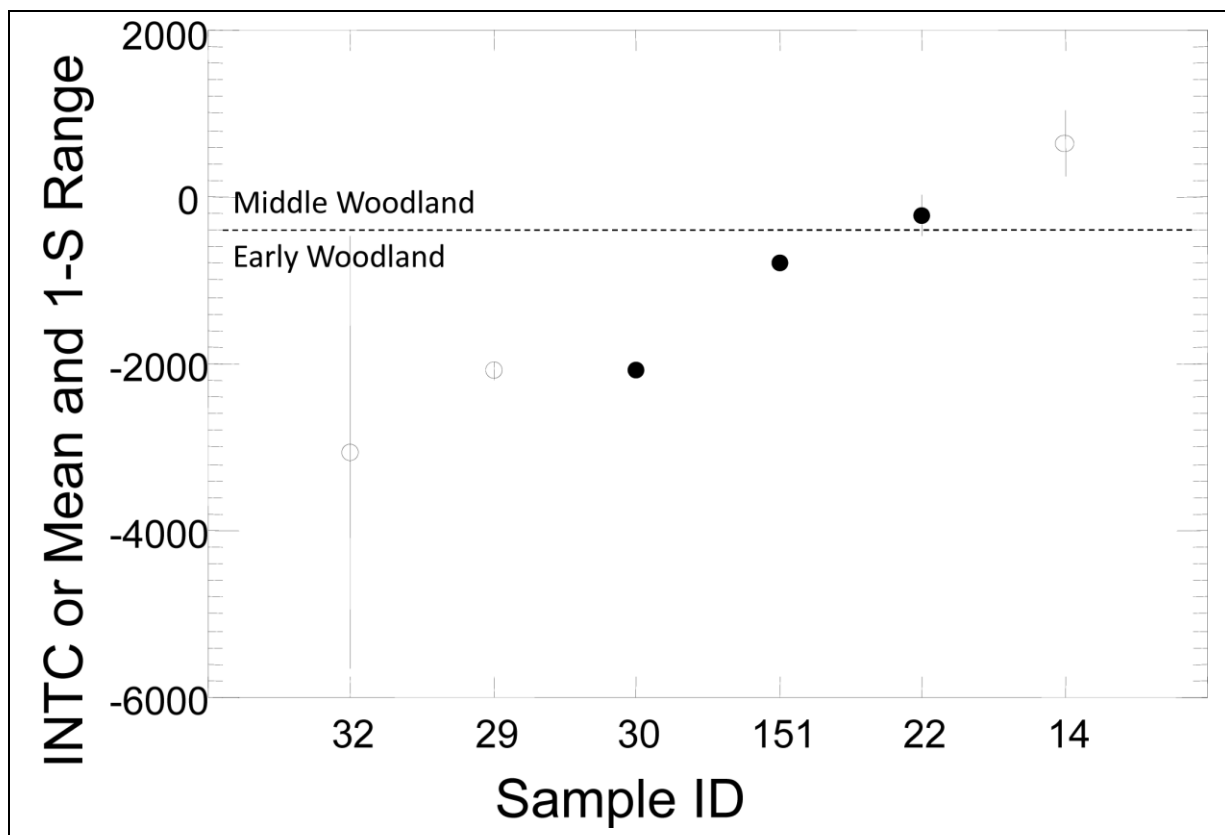


Figure 4-2. Dates associated with the Hamp's Landing series.¹

New River and Deep Creek

With the New River and Deep Creek series we encounter the first of several instances of what might be called regionally redundant archaeological taxa. During the period when Loftfield (1976) was formulating a ceramic sequence for his dissertation research in the New River basin, Phelps (1983) was busy constructing a ceramic sequence for pottery in his research domain, north of the Neuse River. Neither the Loftfield nor Phelps schemes incorporated the work of Gary Crawford (1966), whose thesis research included the formulation of a pottery series for the Lenoir County area. As a consequence, Crawford, Loftfield and Phelps independently crafted typologies for their regions with some of their types describing the same classes of pottery (e.g., Lenoir, New River and Deep Creek, respectively). In this case, the territories of prehistoric pottery practice did not conform to the territories of archaeological research. As a result, most subsequent work has selected one or the other taxonomic scheme according to the research territory in which they were working. I have made the case elsewhere for the use of a single series, New River, for the pottery in this class (Herbert 2003, 2008, 2009). It seems reasonable to propose that the Early Woodland Deep Creek culture phase is represented by New River series pottery in assemblages throughout the North Carolina Coastal Plain including the Sandhills and very likely on the South Carolina coast as well.

New River is characterized by quartz sand temper in high proportion, and homogeneous compact paste, with net-impressed, cord-marked, fabric-impressed, simple-stamped, and plain (smoothed) surface treatments (Loftfield 1976:149; Phelps 1983:29). The presence of coarse

sand in high proportion seems to be a key element in identifying the series. Pottery tempered with coarse sand and "grit" (used here to denote very coarse sand and occasional granule size particles) was first described for materials found in Lenoir County and defined as the Lenoir series (Crawford 1966:34). Crawford's (1966:101) seriation of these materials suggested an Early Woodland association. Loftfield (1976:187) also used the seriation of 48 assemblages from Onslow, Carteret, Jones, and Pender Counties, to determine that the New River series was an Early Woodland period manifestation. Ceramics of the same description were also reported by Phelps (1975:77–79) from the Parker site on Deep Creek in Edgecombe County where they were found in contexts with soapstone-tempered Marcey Creek and Stallings, both Early Woodland types.

Later, Phelps (1983:29–32) proposed a culture-historical model for the Deep Creek phase including three periods characterized by differences in pottery surface treatment, resembling Evans' (1955:69–74) model for the Stoney Creek pottery series from coastal Virginia. The first period was characterized by a majority of cord-marked, with some fabric-impressed, and occasionally plain and net-impressed types. A second period comprised mostly cord-marked, net-impressed, and fabric-impressed types with the presence of a simple-stamped type (presumably related to Deptford), and the third period was distinguished by a decrease in the frequency and eventual disappearance of simple-stamped specimens (Phelps 1983:29). The model continues to be cited, although it has never been demonstrated archaeologically with reasonable certainty. Martin (2004, 2008) reanalyzed Phelps' excavated assemblage of sand-tempered pottery from the Barber Creek site and concluded that Phelps' tripartite model was supported. However, the data from the Barber Creek excavation exhibit only very slight differences in the frequency of surface treatment types from each level, providing only a the suggestion of temporal trends. Consequently, the existence of three Early Woodland culture phases corresponding to three ceramic stylistic periods must for the present remain a hypothetical model until more comprehensive data demonstrate unequivocal temporal patterns. Nevertheless, Phelps' three-phase model is presumably based on decades of excavation in the region north of the Neuse River, and may well prove applicable for articulating stages of cultural evolution within the long Early Woodland period in the larger geographic region as more data come to light.

New River pottery has been dated from several sites on Fort Bragg, in the lower Cape Fear Valley, and along the New River on Camp LeJeune. Sites with significant Deep Creek phase components have also been found in the lower Pamlico Valley, and on the Currituck Peninsula (Figure 4-3).

There are currently 22 dates for pottery, or associated charcoal, originally identified as Deep Creek (n=6) or New River (n=16). The earliest two dates, 2850±40 B.C. (Daniel et al. 2008) and 2898±50 B.C. (Sanborn and Abbott 1999:6, Tables 1–2) are radiocarbon dates for charcoal that appears to have been unreliably associated with the target pottery (Figure 4-4). These are outliers; each are about a thousand years older than other dates in this series, and about seven hundred years older than the earliest reliable dates for Stallings from the Savannah River basin (Sassaman 1993). Likewise, the three youngest dates (two luminescence and one radiocarbon) post dating A.D. 400 are either erroneous or, more likely, indicate a continuation of this tradition into the Middle Woodland period. Otherwise, 12 dates for this series range from 1865–130 B.C., agree nicely with Phelps' predictions from 1983.

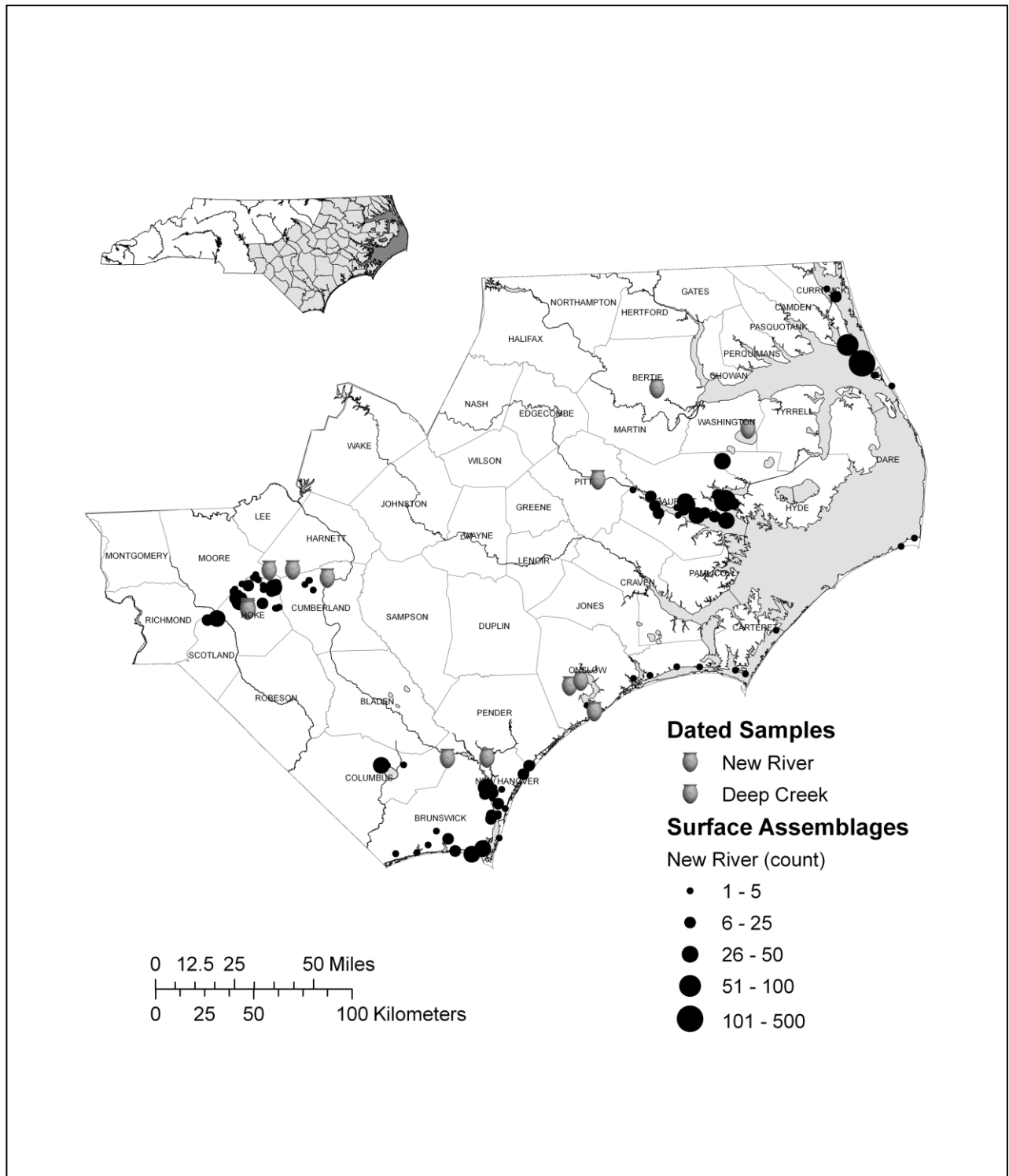


Figure 4-3. Geographic distribution of the New River series.

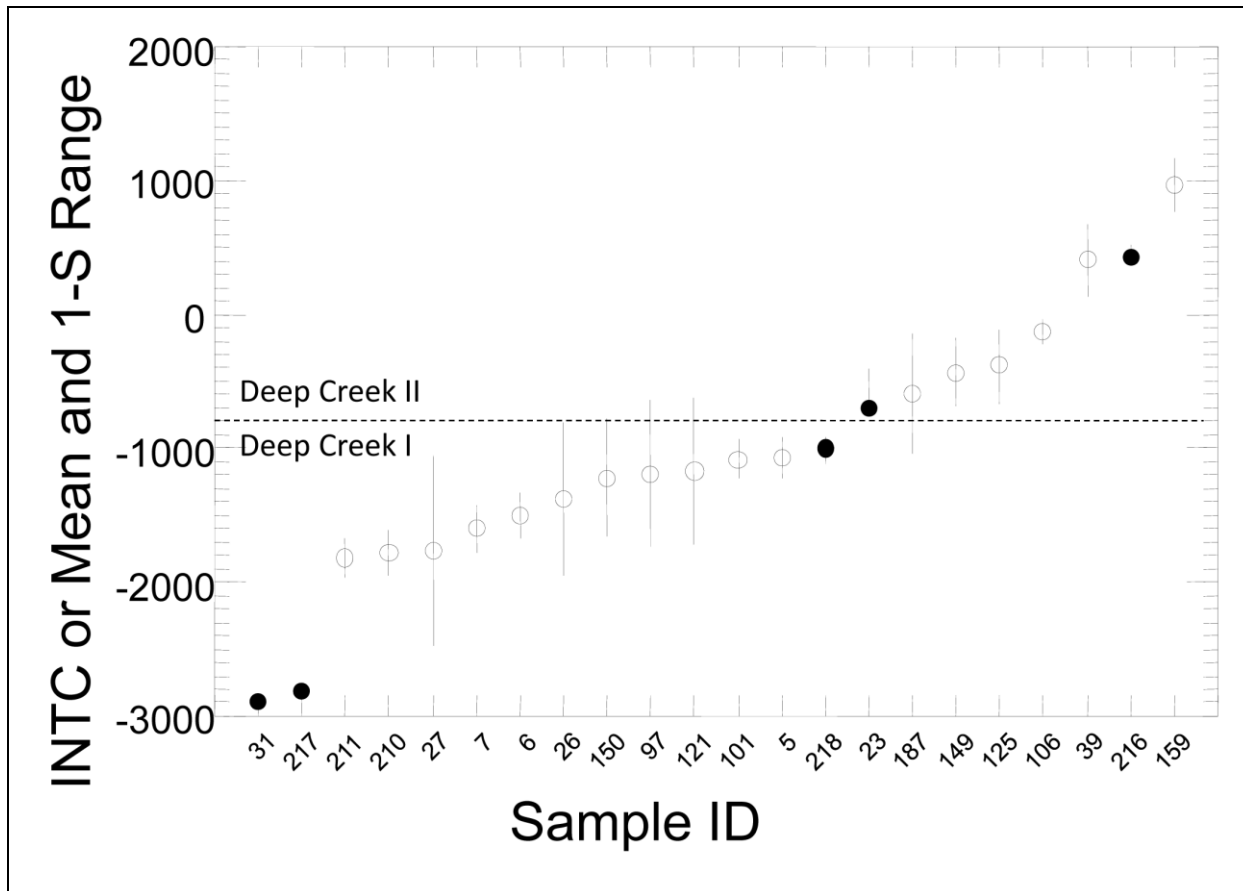


Figure 4-4. Dates associated with the New River series.

There are several other Early Woodland pottery types occurring primarily in the Albemarle Sound region, including Water Lily, Currituck, Croaker Landing, and Marcey Creek, for which we have no chronometric data from North Carolina. They are not described here but are summarized elsewhere (Herbert 2008).

THE MIDDLE WOODLAND

Yadkin

The Yadkin series was interpreted by Coe (1964:30–32) as a direct descendant of the Early Woodland Badin series, and thus the product of a long period of gradual change characterized by improvements in technology culminating in the addition of very coarse sand–pebble size (1–8 mm), angular fragments of quartz, in very high (40–50 %) proportion (Coe 1964:31, 1995:154). The definition of the series, as characterized by very large, angular quartz particles in very high proportion, has in certain instances been relaxed to include sand-tempered pottery thought to be associated with the Yadkin culture phase (e.g., Blanton et al. 1986; Claggett and Cable 1982). It is said that Joffre Coe identified the pottery from the 1986 project as Yadkin (Espenshade, personal communication 2011). This suggests that he viewed the Yadkin series as a marker for the Middle Woodland pottery in general, and certainly, the

definition of Yadkin became more inclusive in Coe's (1995) later work to include pottery with very different sorts of temper found at the Town Creek site. It seems that the idea was that pottery made during the Yadkin culture phase was characterized by a wide variety of tempering technologies, and consequently ceramics tempered with sand or grog, if found to be associated to the appropriate period and region, could justifiably be classified as Yadkin. In contradistinction, the position taken in this paper is that although the Yadkin culture phase may be represented by pottery reflecting different tempering technologies, the Yadkin pottery series should be exclusively characterized by the inclusion of large amounts of angular quartz, or other rock fragments. The position taken here is that pottery containing only sand, or some combination of sand and grog, should not be classified to the Yadkin series. How to classify pottery found to exhibit a combination of angular quartz (or other crushed rock) and grog is at present an open question.

The Yadkin pottery series is typically not considered a Coastal Plain series, but is regularly represented in assemblages from the Sandhills, although more common in the Eastern Piedmont. The absence of Yadkin series pottery elsewhere on the Coastal Plain suggests a cultural boundary in the Sandhills. The current suite of ten dates (seven luminescence and three radiocarbon) associated with Yadkin series pottery suggests an age range of 400 B.C.– A.D. 400 (Herbert 2003:184–185).

Mount Pleasant

The Mount Pleasant phase was defined by Phelps (1984:32–36) for the Middle Woodland culture of the northern coastal region. The Mount Pleasant pottery series was described by him as tempered with fine and medium sized sand, with granule or pebble sized, rounded and subrounded, quartz inclusions (Phelps 1984:41–44). Surface treatments include fabric-impressed, cord-marked, net-impressed, and plain, with vessel forms including jars with restricted and unrestricted necks, and bowls of simple, hemispherical and globular shape (Bamann 2004; Green 1987; Jorgenson 2001; Millis 2001; Phelps 1983, 1984).

Included in Phelps's (1984:41) definition of the Mount Pleasant series is the comment, "apparently within the normal range of temper variation are some specimens with only fine to medium sand temper..." This observation, along with contextual co-occurrence, is what led to the conclusion that the Mount Pleasant and Deep Creek series were part of a "traditional continuity" with Deep Creek varying only in "a *possibly* higher frequency of net-impressed surface finish, a *trend toward* larger clastic temper" and the addition of incising (Phelps 1983:33, emphasis added). Such equivocal language indicates that Phelps understood that the data with which he was attempting to discriminate among Deep Creek (New River) and Mount Pleasant pottery was somewhat ambiguous, with a sand-tempered variant lacking any granule or pebble inclusions seeming to occur throughout the Early and Middle Woodland periods. Since Phelps's first descriptions, the sand-tempered continuum has been further articulated by Clay Swindell's study of Mount Pleasant pottery from the Fishing Creek site (Holm et al. 1999), suggesting that a late expression of the tradition may indeed lack granules and pebbles. At this site, data from excavated sherd-bearing (although not dated) zones suggest "an increase in the use of smaller sands, minus larger clasts... apparent and pronounced throughout time" (Holm et al. 1999:47). Following discussions with Phelps, Swindell dubbed the late Mount Pleasant phase sand-tempered variant, Middle Town. As described below however, there is now little doubt that this sand-tempered ware is a Late Woodland in age, and the question of its relationship to the Middle

Woodland Mount Pleasant phase, and its taxonomic status as either a variant (Mount Pleasant *variety Middle Town*, or alternately, the Middle Town series) must be given renewed consideration.

Pottery classified to the Mount Pleasant series is represented on sites from southern Virginia to northern South Carolina. Although the distribution of this ware suggests a core area north of the Neuse River in the Upper Coastal Plain portion of the Pamlico basin (Figure 4-5), Mount Pleasant pottery occurs in low frequencies in assemblages from both the lower and upper Cape Fear valley, suggesting a gradually thinning distribution as one moves south from the core area.

The number and range of radiocarbon dates associated with pottery classified as Mount Pleasant is one of the biggest surprises in North Carolina coastal archaeology of the past 25 years. In its initial formulation five dates were presented for Mount Pleasant (Phelps 1983:32) and none were added in the subsequent decade (Eastman 1994:21, Figure 23). Currently there are 24 radiocarbon dates possibly associated with pottery classified as Mount Pleasant series (Figure 4-6). Phelps proposed 300 B.C. as a beginning date for the Mount Pleasant phase, with its termination around A.D. 800. At present, only one assay from the Liberty Hill site predates A.D. 300 (Phelps personal communication 1997). Seven other assays, mostly from Phelps' excavations, fall within the latter half of the Middle Woodland range (A.D. 300–800). The balance of Mount Pleasant dates (16 recently obtained) fall within the age range of the Late Woodland period and six of these are from contexts containing the carbonized remains of corn (Millis 2001). The suite of Late Woodland dates for Mount Pleasant series pottery is significantly influenced by 17 assays from the Contentnea Creek site where it is described as primarily fabric-impressed with moderate amounts of subangular, medium sized quartz sand and granule inclusions (Millis 2001:397). Vessels in this assemblage include mostly jars with unrestricted necks, rounded lips, and brushed interiors, often stamped 1–3 cm down the interior neck. Six of the 17 features from the Contentnea Creek site that contained Mount Pleasant series pottery and plant remains dated to the Late Woodland period also included examples of a provisional Late Woodland pottery series (Series 1 and 2) thought to be related to, or perhaps an early expression of, Cashie series pottery. Only one feature from the Contentnea Creek site contained both Mount Pleasant and Hanover series sherds, suggesting little temporal relationship between these two pottery types at this site.

Three assays of carbonized plant remains from contexts at the Mabrey Bridge site thought to be associated with Mount Pleasant pottery yielded age estimates in the Late Woodland period (cal A.D. 1100–1220) (Bamann 2004). The assemblage of pottery associated with these assays comprised mostly fabric-impressed (52%) and cord-marked (17%) types tempered mostly with very coarse and granule size quartz (Bamann 2004:193, Table 9).

Consequently, the original case for Mount Pleasant pottery series as the index marker for the Middle Woodland Mount Pleasant culture phase is now thrown into question. On one hand it appears appropriate to conclude that the technological styles characterizing the Mount Pleasant pottery series persisted until A.D. 1400 (that would be about 1700 years of ceramic technological and stylistic continuity). On the other hand, it might be more prudent to consider Middle Town as a provisional Late Woodland culture phase characterized by a settled village agricultural economy and a sand-tempered pottery making technology derived from the Mount Pleasant tradition. Further complications are introduced by Swindell's evidence for a Late Woodland

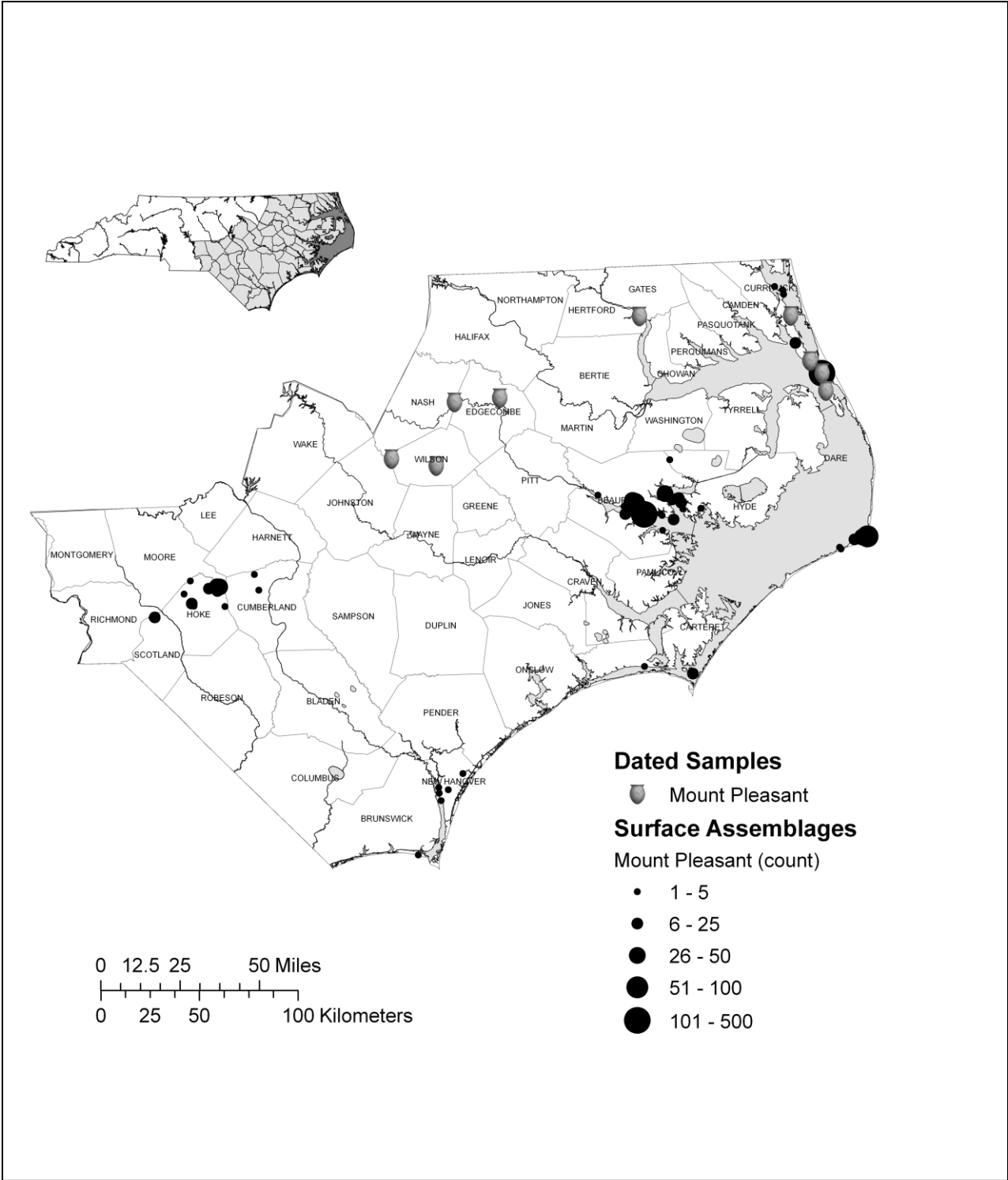


Figure 4-5. Geographic distribution of the Mount Pleasant series.

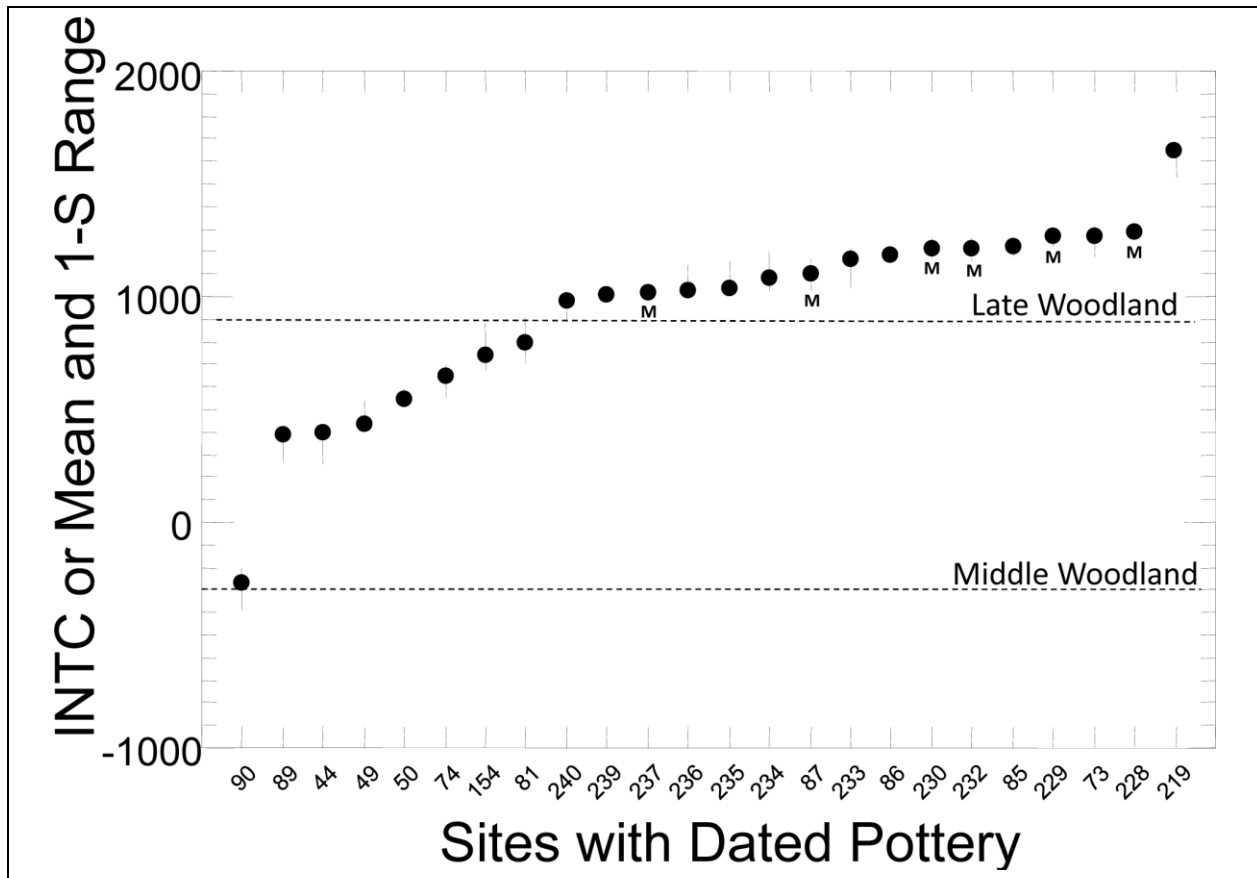


Figure 4-6. Dates associated with the Mount Pleasant series.

variant of the Mount Pleasant series pottery that does not include granules. As it stands, the assumption of technological and stylistic continuity with Early Woodland New River series leaves open the early end of the sequence, and recent dates and associations clearly leave open the late end of the sequence and continuity with the Cashie series. Consequently, every effort should be made to characterize and date details in vessel form, surface treatment, decorative embellishments, and production techniques, as the inclusion of granules in the paste does not appear to be a necessary criterion for identification of the Mount Pleasant series.

Hanover

The Hanover series was first defined by South (1960:16–17) for the Middle Woodland period pottery of the lower Cape Fear Valley. The series was originally considered to date to 400 B.C.–A.D. 200 (South 1976:28, Figure 12), and was assumed to be related to the grog-tempered Middle Woodland Wilmington series of the Georgia and South Carolina coasts (Caldwell 1952:316). South (1976:28) described Hanover as tempered with “large lumps of aplastic clay...that appear to be crushed sherds.” Loftfield (1976:154–157) described the same ware from the New River Basin, calling it the Carteret series, and characterized the temper as crushed sherds or “fire-hardened pieces of clay” in a paste that was “poorly kneaded being

lumpy and contorted” and feeling “very chalky to the touch.” South (1976) identified only cord-marked and fabric-impressed types; Loftfield (1976:157) added a smoothed or plain type.

By virtue of naming convention, the southern extent of the Hanover series is in the northern coastal counties of South Carolina. If combined with the Wilmington series, the southernmost distribution extends into northern Georgia. A reduced frequency of grog-tempered ware in the Albemarle Sound region prefigures its gradual diminution and disappearance on the southern coast of Virginia (Figure 4-7).

Opportunities for dating Hanover series pottery have been pursued with diligence over the past 10 years. Eastman (1994:19–21) reported two dates associated with Hanover pottery; at present there are 48 (Figure 4-8). One very important factor contributing to this increase is the use of luminescence dating, accounting for 66 percent of all Hanover dates. AMS radiocarbon dating of soot and sherd organics (n=3) (see Johnson 1988), and assays on shell and bone (n=4) also contributed. The current range of dates associated with Hanover pottery is 780 B.C. to 1675 A.D., excluding one luminescence date of 3170±310 B.C. (McNutt and Gray 2009) that is problematic. The majority of Hanover dates fall within in the Middle Woodland period (300 B.C.–900 A.D.), although 36 percent are Late Woodland. Where surface treatment was identified among the dated samples (n=36) most were fabric impressed (n=24), with seven cord-marked, and two check-stamped samples.

One unfortunate effect of such a very broad range of dates, spanning virtually the entire Woodland era, is that the pottery in question loses its specificity as a chronological indicator and cultural marker. These results are a compelling justification for reevaluating the Hanover culture phase and the pottery taken as evidence of it. Further consideration of the implication of these dates and the difficulty of identifying grog is addressed later in this chapter.

Cape Fear

The Cape Fear culture phase was defined by South (1960, 1976:18) for the Middle Woodland period on the southern coast of North Carolina. This phase is signified by the Cape Fear pottery series, first defined as a sand-tempered ware with cord-marked, fabric-impressed, and net-impressed types. A key distinction between Cape Fear and New River sand tempering seems to be the proportion of sand; the New River series having a higher proportion. Research based on data from sites in the lower Cape Fear Valley and Sandhills prompted several possible adjustments to South’s original model (Herbert 2003; Herbert et al. 2002). It was proposed that the Cape Fear series not include a net-impressed type, net impressing seeming to occur only in the Early Woodland period and therefore diagnostic of the New River series. It was also suggested that the cord marking found on Middle Woodland sand-tempered ware was often applied in a distinctively perpendicular pattern, with the fabric used to impress the surface made by interweaving cordage weft over non-fiber warp elements, such as a rush or reed, to produce a more rigid textile characterized by a more linear warp pattern. In contrast, Early Woodland cord marking is more often parallel or haphazardly oblique, and earlier period fabric typically made with a cordage weft interwoven or twined with flexible, fibrous warp. Such flexible fabric, when wracked, produces impressions distinct from those made by “fabric” with inflexible, linear warp elements.

Pottery classifiable to the Cape Fear series is present in assemblages from every part of the North Carolina coast (Figure 4-9). Sites with sand-tempered, perpendicular cord-marked

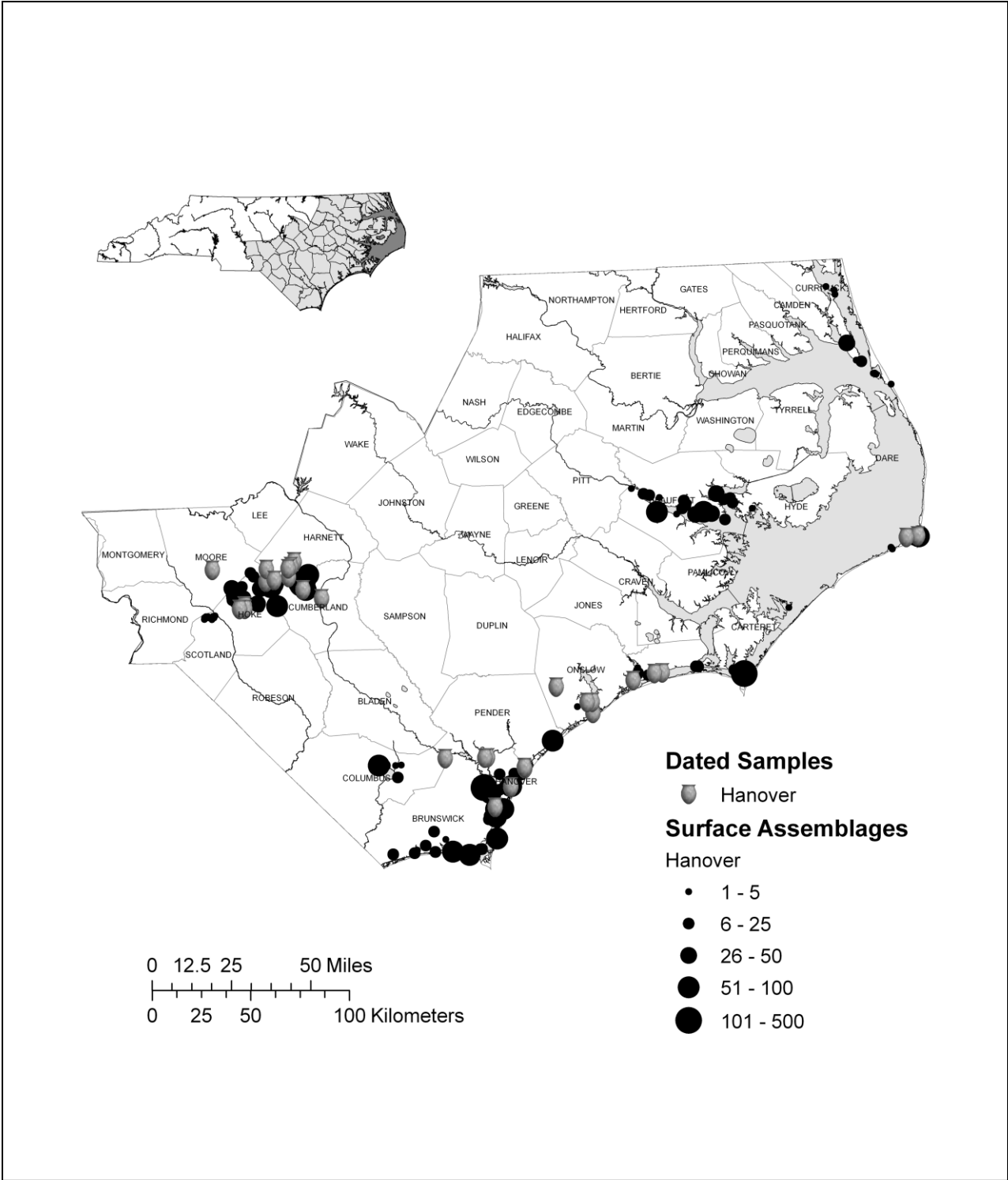


Figure 4-7. Geographic distribution of the Hanover series.

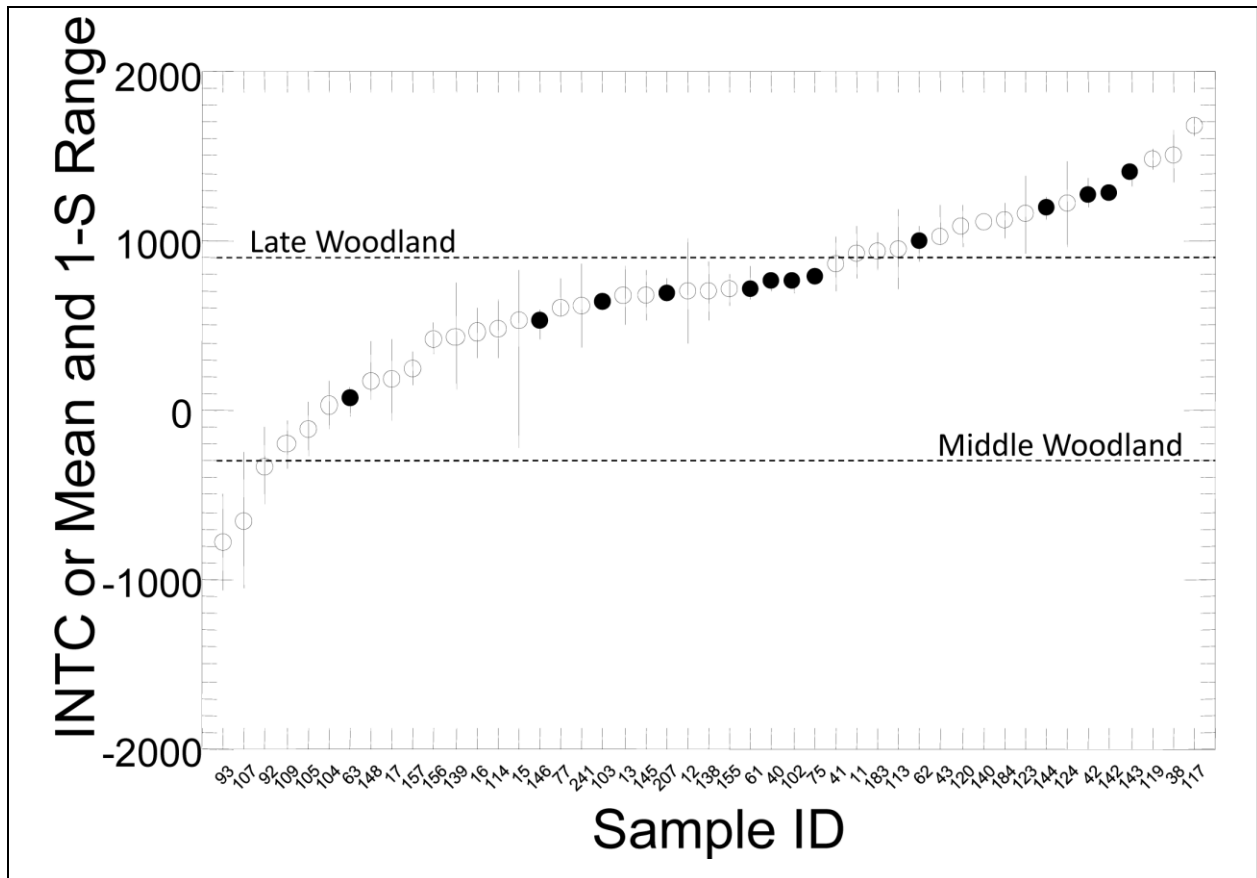


Figure 4-8. Dates associated with the Hanover series.

sherds are found in Currituck County and the Outer Banks, along the central coast and especially in the Pamlico drainage, lower Cape Fear Valley, and Sandhills. On sites where Cape Fear pottery is found, the frequency percentage, calculated as the proportion of the subtotal of Middle Woodland age sherds at each site, is often over 60 percent. Cape Fear Fabric Impressed sherds are also distributed widely over the North Carolina coast with proportions suggesting an area of particularly intensive occurrence in Carteret County, the lower Pamlico, and Outer Banks. The surprisingly widespread presence of Cape Fear reflects, in part, different regional naming conventions. These calculations and interpretations are complicated by the fact that at present there appears to be no taxonomic distinction between the Cape Fear and Middle Town series (or Mount Pleasant *var. Middle Town*, as may be preferred).

Currently there are 16 dates associated with Cape Fear series pottery, only one of which is a conventional radiocarbon date (Figure 4-10). Among the 16 dates, nine (56%) fall within the Middle Woodland period, ranging from 300 B.C.–A.D. 300, three fall within the Early Woodland (960–1240 B.C.), and four within the Late Woodland (A.D. 1000–1320).

Mockley

The Mockley series, defined by Stephenson and others (1963:105–109) is characterized by thick vessel walls, abundant, coarse shell temper, cord-marked or net-impressed surfaces, and

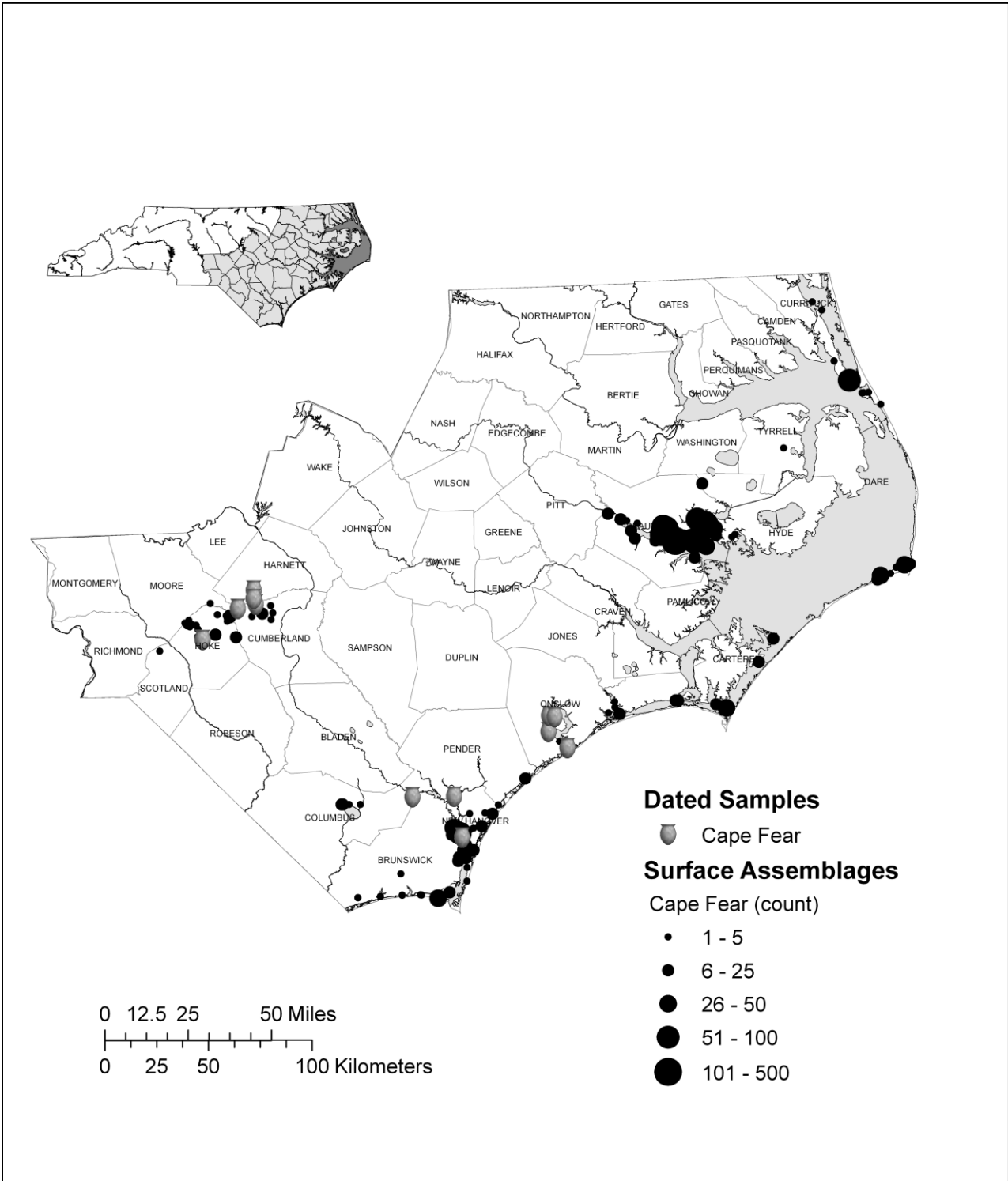


Figure 4-9. Geographic distribution of the Cape Fear series.

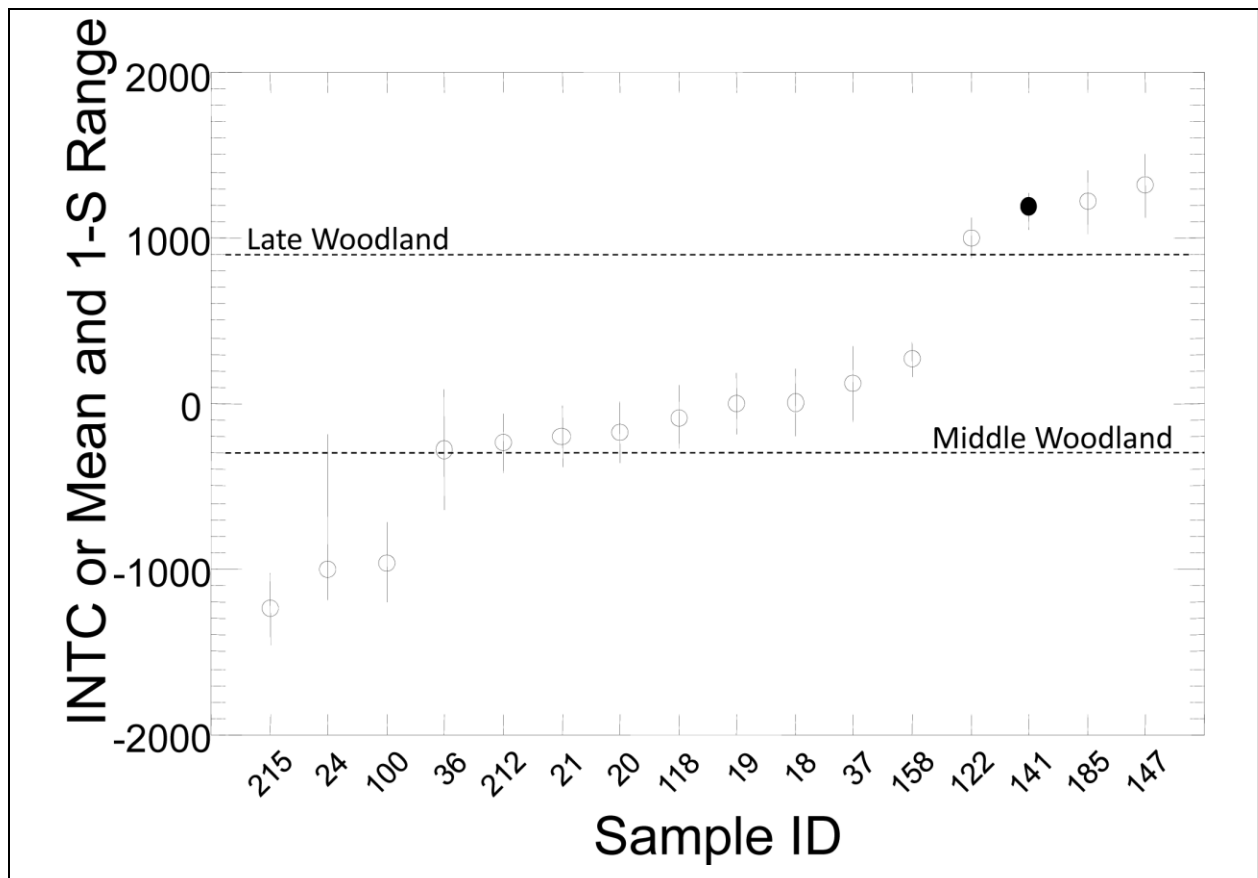


Figure 4-10. Dates associated with the Cape Fear series.

simple conical jar forms with unrestricted necks (Potter 1982:124). The geographic distribution of this ware is quite broad, from Delaware to central North Carolina (Herbert 2008). Potter (1982:124) suggested that among Mockley materials from the Northern Neck of Virginia, cord marking was more common in the earlier part of the phase, and net impressing more common in the later part. This sequence appears to be reversed in southern Maryland (Herbert 1995:20) and on the coast of North Carolina, where net impressing is the more common of the two surface-treatment styles early in the sequence, with cord marking becoming more popular in the later part of the period, persisting into the earliest portion of the Late Woodland (A.D. 800–900).

Mockley series pottery has been dated to the latter half of the Middle Woodland period with dates ranging from about A.D. 200 to A.D. 880 (Artusy 1976:9; Barka and McCary 1977:43; Gardner and McNett 1971:29; Opperman 1980:4; Potter 1982:121; Waselkov 1982).

THE LATE WOODLAND

Townsend

Late Woodland Townsend series pottery is found throughout the Middle Atlantic Chesapeake region including coastal Delaware, Maryland, Virginia and North Carolina (Blaker

1963; Clark 1976:178–208; Egloff and Potter 1982:107–108; Griffith 1982; Herbert 2003; Peck 1978:19–22; Potter 1993:114–119; Stephenson et al. 1963; Steponaitis 1980:16, 1986:191–192; Wright 1973:16–24). Blaker (1963) originally defined the Townsend series as a shell-tempered, fabric-impressed ware, and several types were subsequently defined on the basis of decorations made by incision or direct cord-impression (Clark 1976:178–208; 1980; Peck 1978:19–22; Steponaitis 1980:16, 1986:191–192; Wright 1973:16–24). The shell-tempered pottery defined by Phelps (1983) as Colington Fabric Impressed, and that defined by Loftfield (1976) as White Oak Fabric Impressed appear to be identical to Townsend, or practically so based on current data, and should be considered as part of the Townsend series. Marshall (1999) suggests that Colington Fabric Impressed and White Oak Fabric Impressed be distinguished based on the extent of stamping on the interior of vessel necks. Should such differences prove to apply to larger samples from a broader region, this might be interpreted as local, or sub-regional, variation in the Townsend Fabric Impressed type. This would also be the case should future analyses demonstrate sub-regional differences in the frequency of occurrence, or style, of decorative incising. Certainly, the demonstration of variation in stylistic elements from one locale to another could indicate territorial boundaries of different cultural or ethnic groups, or the social influence of potters with different pottery making techniques.

The distribution of the Townsend series extends to the lower Cape Fear basin, although it is not common on sites south of the New River (Figure 4-11). In contrast, Townsend Fabric Impressed pottery is the principal Late Woodland marker for sites in the New River basin, Pamlico, and Albemarle Sound region.

Currently, there are 66 dates associated with Townsend series pottery from North Carolina (Figure 4-12). These data include a radiocarbon assay of clam shell (193 ± 60 B.C.) from the Uniflite site (Loftfield 1979) that is not considered to be accurately associated with Townsend pottery, and is not included in the graphed data. The remaining 65 dates range from A.D. 536–1784, with 60 percent of the dates occupying a 300-year period, A.D. 1200–1500 (Figure 4-12). There is some suggestion that incised decorative motifs executed on Late Woodland shell-tempered pottery from the North Carolina coast may be geographically and temporally diagnostic, but the nature of these patterns has yet to be documented.

Colington

Roanoke Simple Stamped was defined for shell-tempered, simple-stamped pottery found on Roanoke and Hatteras Islands (Blaker 1952:257–258; Harrington 1948:251–252). This ware was subsequently renamed Colington Simple Stamped (Phelps 1983). Colington Simple Stamped comprises two varieties of simple stamping, invariably executed on shell-tempered vessels. The first is characterized by narrow (typically < 3 mm) impressions with rounded cross section, and the second, more common type is characterized by wide (about 5 mm) flat impressions that are rather shallow, suggesting that they were applied when the vessel was approaching the leather-hard stage of drying, or that the simple-stamped surfaces were partially smoothed following stamping.

The placement of the Colington Simple Stamped type outside of the Townsend series might be justified based on stylistic, geographic and temporal evidence. All of the Townsend series types, including the decorated types, Rappahannock Incised, Townsend Corded, and Townsend Herringbone, are executed on fabric impressed vessels (Blaker 1963:14–16; Potter

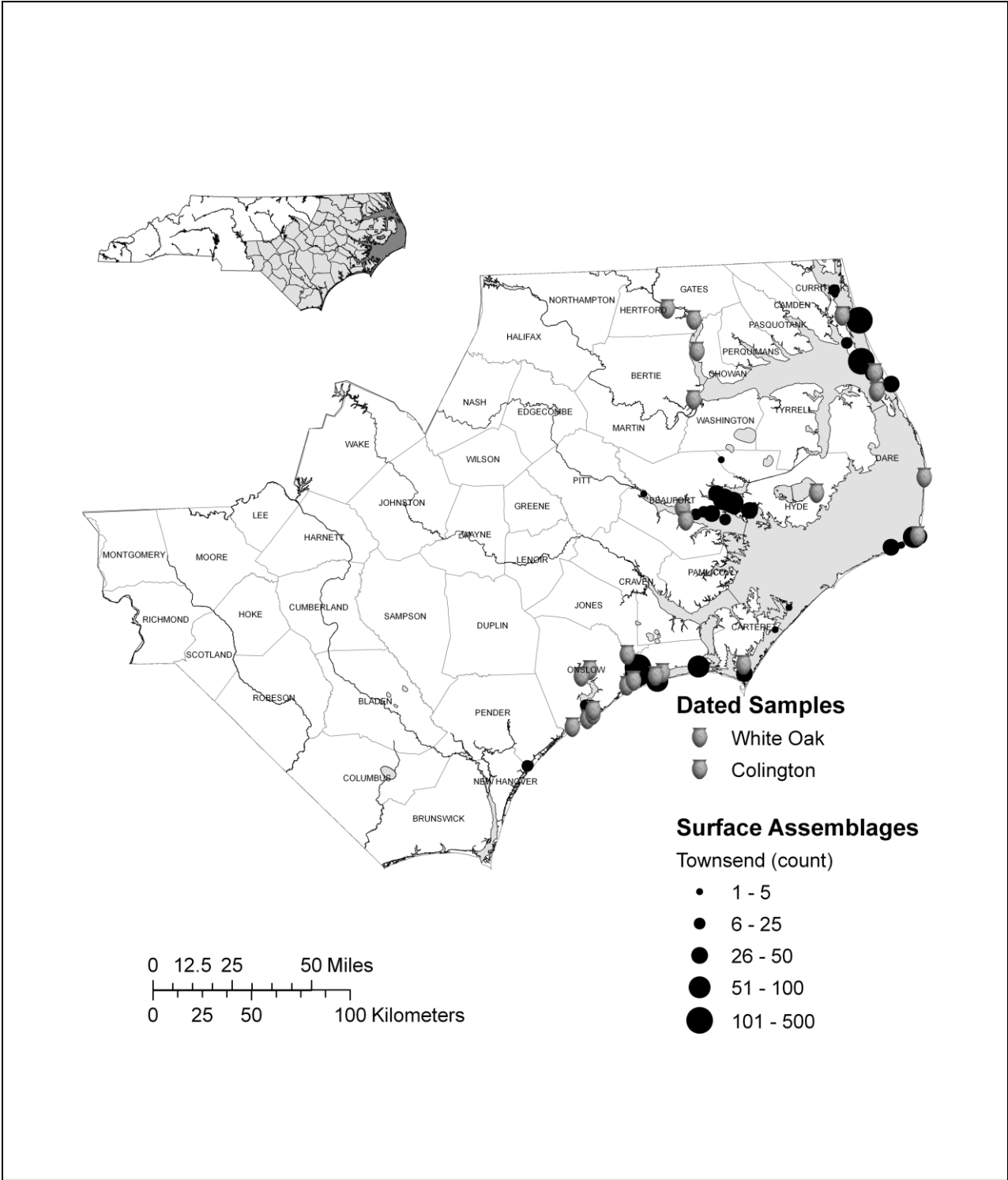


Figure 4-11. Geographic distribution of the Townsend series.

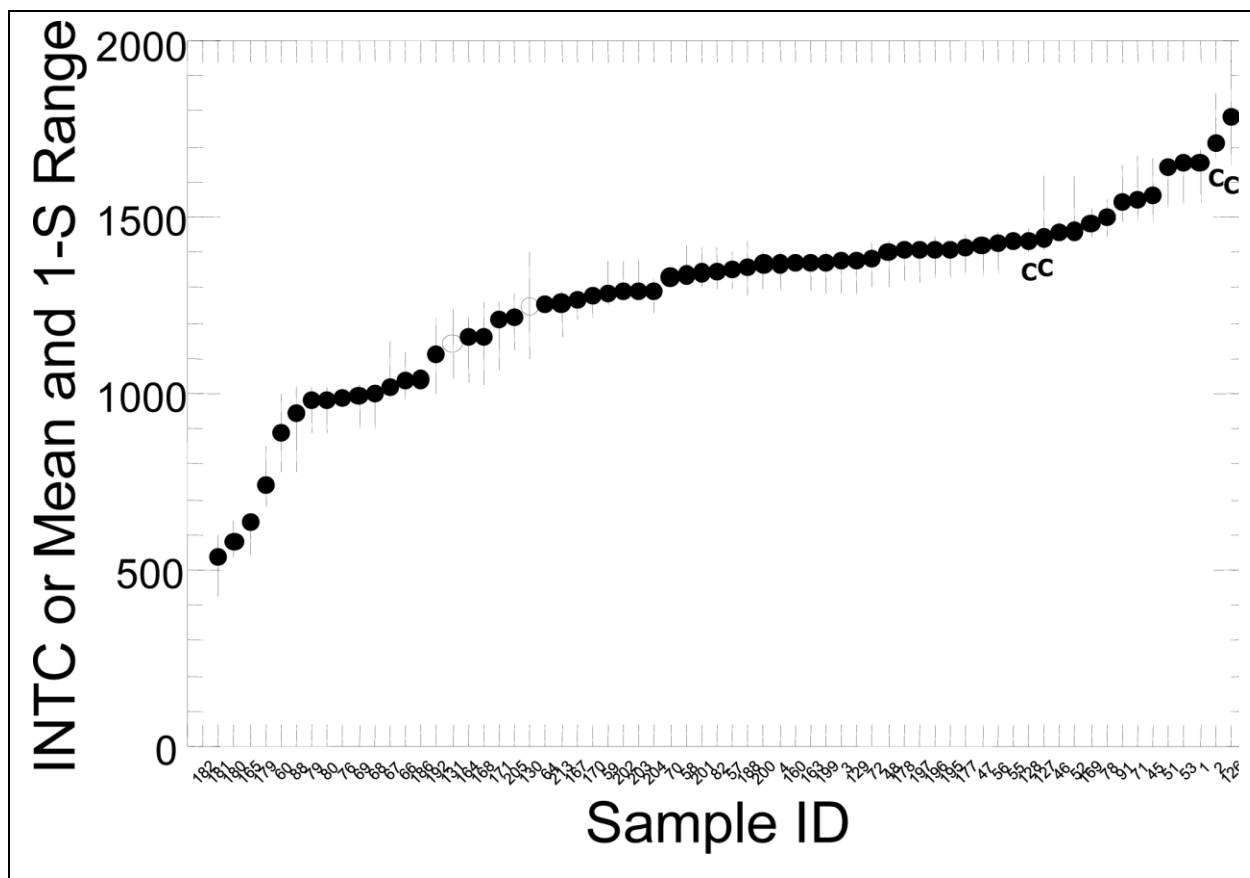


Figure 4-12. Dates associated with the Townsend series.

1982:127; Stephenson et al. 1963:109–110). Shell-tempered simple-stamped pottery is not found farther north than the southernmost coastal counties of Virginia, was not represented in the assemblages of Townsend series pottery from extensive excavations of shell middens on Virginia's Northern Neck (Potter 1982; Waselkov 1982), and is uncommon south of the Pamlico River. In surface collections from the North Carolina coast, Colington Simple Stamped appears to be common along the north bank of the lower Pamlico River, on Hatteras Island, Dare and Currituck Counties (Figure 4-13).

Four dates, included in the Townsend data set for North Carolina, are associated with Colington Simple Stamped pottery, and those four dates range in age from A.D. 1484–1734. All other dates associated with pottery classified as Colington series are undifferentiated as to surface treatment type and are here assumed to be associated with Colington Fabric Impressed, Townsend series. Based on this evidence, it would seem that the practice of simple stamping was adopted by the coastal makers of Townsend in the Proto-Historic period, perhaps influenced by communication with the Tuscarora makers of Cashie Simple Stamped pottery. There is little doubt that the practice of simple stamping was incorporated into an already mature tradition that specialized in the production of shell-tempered pottery; a tradition with considerable time depth in coastal North Carolina (Herbert 2008).

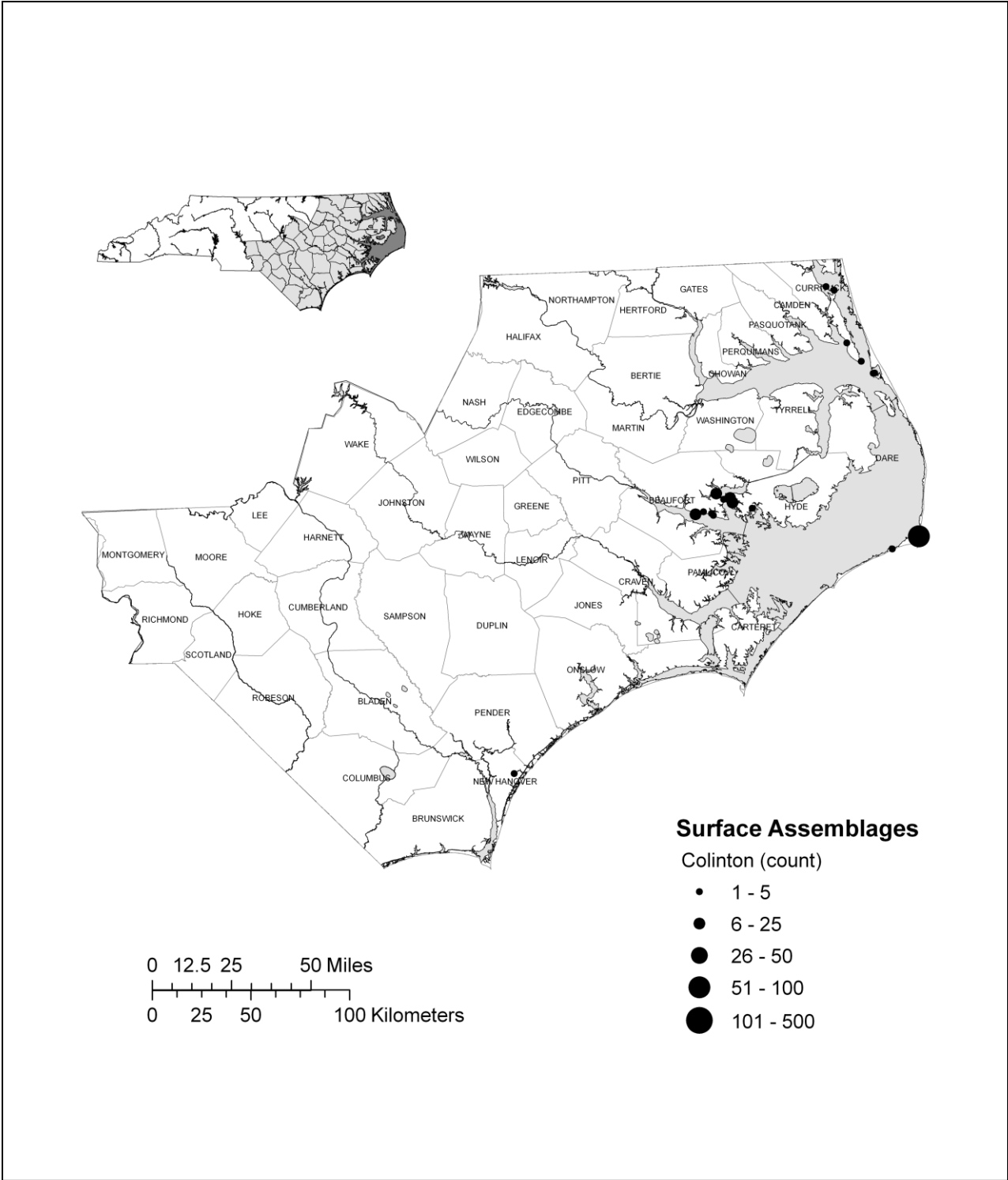


Figure 4-13. Geographic distribution of the Colington series.

Cashie

The Cashie phase and pottery series was first described by Phelps (1983) and later revised (Phelps and Heath 1998), based on data recovered from several key sites in the northern Coastal Plain (Herbert 2003). The Cashie series is tempered with quartz sand in a range of size grades up to granule and pebble and includes fabric-impressed, simple-stamped, incised, and plain types. In addition, Phelps and Heath (1998) note that floated or very well smoothed interiors is another common feature. Cashie simple-stamped is considered equivalent to Gaston simple-stamped (Coe 1964) from the Roanoke Rapids area, and to Branchville (Binford 1964) and Sturgeon Head (Smith 1971) in the Meherrin and Nottoway River basins. Minority surface treatment types found in the Gaston and related series (e.g., cord-marked, cob-marked, and check stamped) have not been observed in the Cashie series.

The extensive and unique ceramic assemblage from the Neoheroke Fort site (Heath, this volume) provides an exceptional example of pottery from the final decades of the Cashie phase that has allowed Phelps and Heath (1998) to discriminate two periods within the Cashie series, comprising four vessel forms including large conoidal-based jars, small, thin-walled jars, bowls, and dippers. Large and small jars are primarily simple-stamped while bowls and pouring vessels are mostly fabric impressed. Decoration, usually restricted to the rim and neck, generally consists of punctated patterns including solid and hollow circles, solid semicircles and ovoid shapes. Incising is also common, especially on the small jar forms. Paste, temper and construction methods do not change significantly between Cashie I (A.D. 1200–1650), and Cashie II (A.D. 1650–1715), although fabric impressing and some vessel form variants disappear, leaving a less rich array in the Colonial period.

Cashie series pottery has been found on sites from the Neuse to the Meherrin River in southeastern Virginia, and from the Piedmont fall line to the westernmost tidal estuaries of the Pamlico and Albemarle Sounds. Ten radiocarbon dates are currently associated with Cashie pottery, ranging from A.D. 778–1665 (Figure 4-14). The two oldest dates in this sequence, from the Tower Hill (Eastman et al. 1997) and Thorpe (Phelps 1980a) sites, are not unimpeachable; at Tower Hill, the dated feature was complex and mixing cannot be ruled out, and at the Thorpe site the dated feature did not actually include Cashie pottery. Excluding these two, the range for Cashie series pottery is A.D. 1230–1665.

Swansboro

The Swansboro series is thought to date to the latest portion of the Late Woodland period, the Contact, and Colonial periods. This ware may be related to the Yeocomico series found on the Virginia coast (Potter 1982; Waselkov 1982) and to the Warekeck series (Binford 1965), a Colono-ware found on sites in southeastern Virginia, principally in Southampton County. Taxonomically, it is not included in the Townsend series, but it appears to be a late manifestation of the shell-tempering tradition and future researchers may choose to classify it as a component type in the Townsend series.

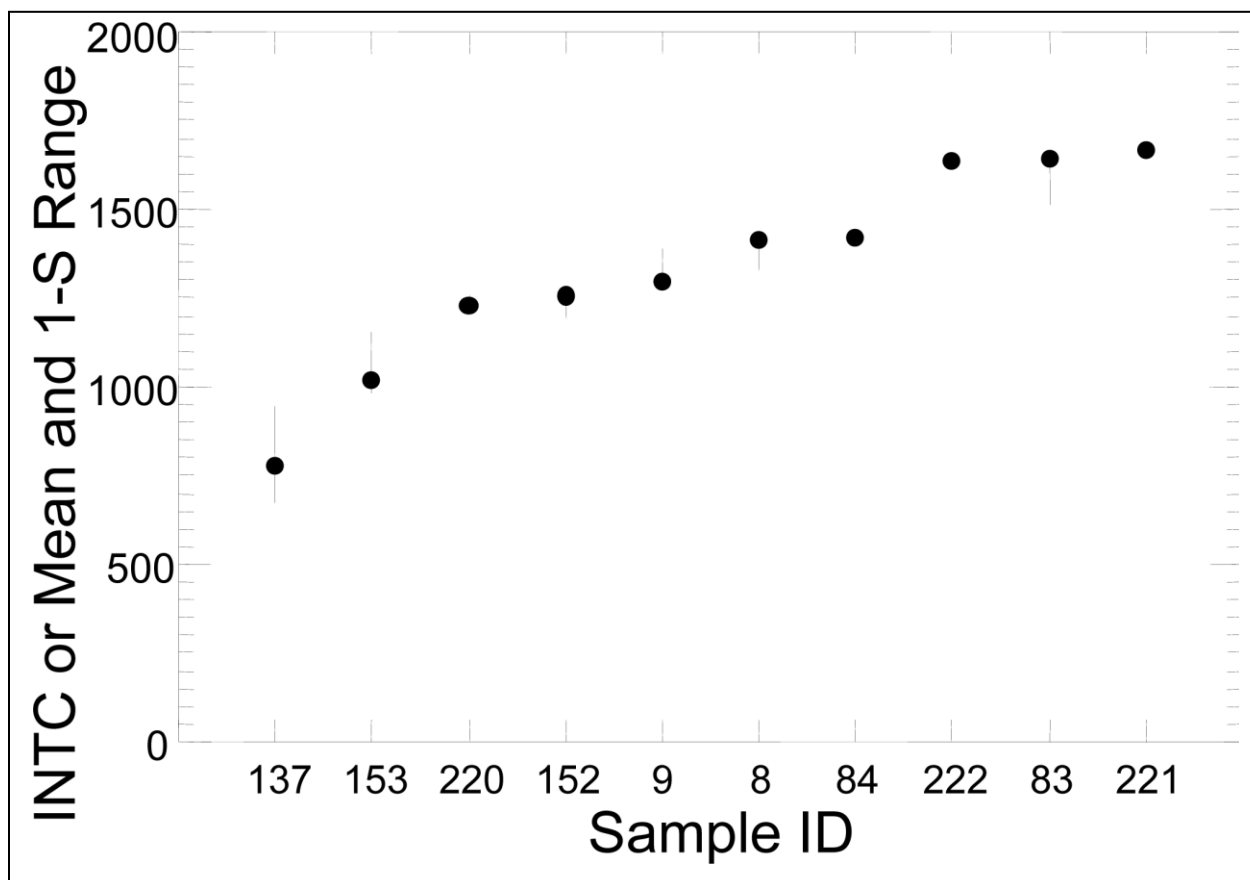


Figure 4-14. Dates associated with the Cashie series.

Brunswick

Brunswick is a Pre-Contact–Colonial period (A.D. 1400–1700) series defined by South (1960) to describe Colono-Indian ware found at Brunswick Town and Bath, North Carolina. Brunswick shares with other colono-wares from coastal Virginia and South Carolina the characteristics of fine paste, burnished finish, and mimicry of European vessel forms.

CHALLENGES AND DIRECTIONS

The foregoing synopsis describes typological conventions and chronometric results that raise questions and pose challenges for future research. In the following discussion I draw attention to some of the more obvious areas of concern, inquire into their causes, and suggest possible steps for addressing them.

Some difficulty arises from the fact that most Woodland pottery is not ornamental, but utilitarian; mostly consisting of cooking pots with few decorations adorning simple rim forms, applied to a relatively narrow range of vessel shapes. Pottery styles apparently persisted many hundred years with perhaps 40 or 50 generations of potters replicating very similar styles,

regardless of their ethnic or linguistic affiliation. In other words, the pottery in question is often characterized by an array of traits that exhibit very little change over long periods of time and vast geographic regions. As a consequent, archaeologists have sought leverage through the observation of slight shifts in temper constituents over time and space that might reflect the contours of the prehistoric cultural landscape. An important challenge to future research in coastal North Carolina will be to determine the extent to which temporal and geographic differences in the tempering traits observed in archaeological pottery reflects purposive pottery making practices that relate to culturally transmitted traditions.

Temper Types and Surface Treatments

Without question, significant difficulties are presented by sand-tempered pottery, and this problem is generally acknowledged throughout the Southeast. For example, a comprehensive list of pottery types appearing in technical reports submitted to the Office of Archaeological Research in Alabama was recently compiled, described, and mapped (Futato 1998). A quick perusal of the table of contents indicates no less than 149 different types of sand-tempered pottery. Even accounting for the variation in surface treatment that distinguishes many of these types, there also exists a great deal of redundancy, which may tend to mask rather than illuminate regional cultural patterns. Fortunately, in coastal North Carolina we have many fewer sand-tempered types with which to contend. Our situation is nevertheless challenging. The practice of adding sand to clay paste appears in the earliest pottery tradition, Stallings, and persists through the Colonial period. Sand-tempered fabric-impressed pottery is characteristic of Early Woodland New River, Middle Woodland Cape Fear, Middle Woodland Mount Pleasant, Late Woodland Middle Town, and Contact and Colonial period Cashie types. The distinction between these types must be demonstrable; differences in geographic or chronometric context are not sufficient to justify the definition of a ceramic taxon.

Another area of concern for distinguishing temper classes is the accurate identification of grog. Less is actually known about the characteristics of grog-tempered pottery than might be hoped. South (1960) described Hanover as “sherd tempered” leaving no doubt about the source of grog particles. Loftfield’s (1976:154) description of Carteret (Hanover) temper as crushed sherds, or “fire-hardened pieces of clay” that “soften and lose definition in relation to the plastic portion of the paste”. Such a characterization suggests that the “grog” may be something other than crushed pottery. In retrospect, the shift from the identification of crushed sherds, to hardened clay, and ultimately to lumpy paste, appears to represent a slippery taxonomic slope upon which one could slide from purposefully added crushed pottery, to naturally occurring lumpy clay representing very different technological processes. At the same time this blurring of class distinctions has taken place, ceramic petrography has risen in popularity. Unfortunately, ceramic petrographers have no more experience distinguishing between crushed sherds, fire-hardened clay, and natural lumps than do archaeologists. The petrographers’ job is further complicated by commonly occurring argillaceous clots, ferric or limonitic concretions, and opaque bodies (Cuomo di Caprio and Vaughan 1993; Whitbread 1986, 1987) that may look a lot like grog. Consequently, at present there is considerable uncertainty about the perceptible characteristics that distinguish grog from natural inclusions.

In both the instances mentioned, sand and grog temper must be identified with care and described in detail (see, Espenshade 1996:44–46). The chances for accurate identification are immensely improved by low-powered (10-x) binocular microscopy with fiber-optic lighting,

focusing on freshly broken or cut and polished sherd cross-sections. Description of particle sizes with Wentworth classes (Shepard 1985:118, Table 5), and particle angularity and relative abundance descriptions that follow standard soil science protocols (Schoeneberger et al. 2002; U.S. Department of Agriculture 2002) could also help to sharpen distinctions. Future research and experimentation will be critical in addressing concerns with distinguishing incidental naturally occurring inclusions from temper.

Expanding Date Ranges

The contributions to Middle and Late Woodland research provided by the Contentnea Creek (Millis 2001) and Mabry Bridge (Bamann 2004) projects cannot be overestimated. The many radiocarbon dates for features in which Mount Pleasant pottery, Roanoke triangular projectile points, and maize was found provide unequivocal evidence of a Late Woodland component characterized by pottery consistent with the Mount Pleasant culture phase, but in this case dating as late as A.D. 1300 (Millis, this volume). At the Contentnea Creek site, the frequency of Mount Pleasant Fabric Impressed pottery (88 percent) was much higher than Mount Pleasant Cord Marked (8 percent) but otherwise, the pottery found in the features that dated to the Late Woodland period is essentially indistinguishable from earlier Mount Pleasant ware. Future research focused on precise documentation of Mount Pleasant pottery from dated contexts is needed to expose additional temporally sensitive differences.

Mitigation of the Wiccocan site (31HF99) recovered an assemblage of several thousand sherds consisting entirely of pottery identified as Mount Pleasant series (Holm et al. 1999). Careful analysis of variation in particle size led Holm and others (1999:41–52) to conclude that six subsets of temper could be lumped into two broad classes: one with granule and pebble sized quartz inclusions, and one without. The former class, with larger inclusions, was interpreted as Mount Pleasant, following Phelps' original definition for the series, and comprised 38 percent of the identifiable pottery from the site. The second class, also considered representative of the Mount Pleasant series but lacking granules, comprised 62 percent of identifiable sherds. Although members of these two temper classes were not dated at the Wiccocan site, the authors conclude that the materials lacking granules are a late variant of the Mount Pleasant series referred to as Middle Town (Holm et al. 1999:45–46, Table 5). As part of the Pomeiooc Project (Green 1987:23), Middle Town was defined as a provisional taxon for sand-tempered pottery from “closed stratigraphic context below the Colington occupation” at site 31HY43. Recent reanalysis of the pottery from the Bandon site (31CO1) shell midden clearly illustrates a similar pattern: granule-tempered, net-impressed pottery dominates the lowest five levels and very coarse, sand-tempered, fabric-impressed ware exhibits the highest relative abundance in the upper ten levels (Herbert 2003:84–94). This very coarse sand-tempered ware from the Bandon site was tentatively classified to the Cape Fear series to emphasize a lack of conformity to the definition of Mount Pleasant that specifies the presence of pebble inclusions, but perhaps classifying it to the Mount Pleasant series Middle Town type, would be more appropriate. Proposing a Late Woodland Mount Pleasant type lacking pebble inclusions is not without problems: the Mount Pleasant pottery from the Contentnea Creek site that was dated to the Late Woodland period *is* tempered with granules. So it seems there remain some important gaps in our knowledge regarding sand-, or pebble-tempered ware from the northern coastal region. Future research that distinguishes these temper types, documents and dates single-type components, and assesses the geographic distribution of these types is necessary to evaluate the

appropriateness of the proposed Middle Town type and its relationship to the Mount Pleasant series.

Another surprising development over the past decade is the significant number of Late Woodland dates associated with Hanover pottery. With 35 percent of the 48 dates for Hanover pottery now falling in the Late Woodland period, the question could reasonably be asked whether the Late Woodland pottery classified as Hanover differs in any way from that dating to the Middle Woodland period. Answering this will of course require an in-depth comparison of Hanover collections.

Moreover, this expansion of the date range for Hanover is exactly what might be expected to result if the identification of grog has become less precise or more inclusive over the last 25 years (the slippery slope referred to earlier). If the criteria for classifying pottery as Hanover has shifted from the identification of crushed sherds as temper, to hardened clay lumps, or lumpy paste, then this shift could potentially result in an expansion of geographic and temporal domains; the meaning of the series definition having shifted from one focused on detecting the technological process of using crushed pottery as temper, to one reflecting the use of clay resources with inherently lumpy texture. Solving this potential problem will require a systematic evaluation of clay resources in the region, and replication of technological processes necessary to provide unequivocal examples of the traits exhibited by pottery made using each of the two methods.

Without a doubt, the analysis of pottery from the North Carolina Coastal Plain has become a more sophisticated science over the past quarter century. Accelerator mass spectrometry dating of surface soot and sherd organics, together with luminescence, have greatly expanded opportunities to obtain absolute age estimates that more accurately date the cultural event of interest. The routine use of low-powered microscopy, petrography, and optical mineralogy is elevating to a new level analytical methods for identifying and quantifying ceramic constituents. The data resulting from these advances holds great promise for resolving some of the problems mentioned above, but the effectiveness of future research will be measured by the degree to which it explains phenomena in the context of a clear understanding of the technological processes appropriate to the historic cultures of interest.

Table 4.1. Chronometric Data and Associated Woodland Pottery from Coastal North Carolina.

Sample ^a	Site	Name	Target	Lab Number	Material	Age ^b	Error ^c	2- σ ^d	1- σ	Intercepts or Mean	1- σ	2- σ	Reference
126	31HY43	Amity	Colington Simple Stamped	B-31110	charcoal ^e	210	50	1530	1648	1665, 1784, 1789	1947	1949	Gardner 1990
2	31BF58	Midgette Point	Townsend and Hanover Series ^f	Si-1	oyster shell ^g	320	60	1566	1666	1707	1850	1950	Claassen 1980
117	31HT355	Fort Bragg	Hanover I Fabric Impressed, var. 3 ^h	UW-445	TL	324	59	1559	1616	1675	1734	1791	Herbert et al. 2002
221	31WL37	Contentnea Creek	Cashie; Mount Pleasant; Series-1 (provisional)	B-136679	wood charcoal	210	70	1615	1645	1665	1685	1955	Millis 2001
1	31BF25	Archbell Point	Colington Simple Stamped	Si-2	oyster shell	570	60	1488	1546	1655	1691	1816	Claassen 1980
53	31CR218	Broad Reach	Townsend	B-58943	human bone ⁱ	410	70	1479	1534	1653	1681	1943	Mathis 1999
219	31W170		Mount Pleasant	B-48782	charcoal	270	50	1484	1525	1645	1662	1946	Hargrove 1992
51	31CO5	Hollowell	Townsend	B-73740	human bone	490	60	1476	1524	1641	1666	1796	Hutchinson 2002
83	31ED333	Mabrey Bridge	Cashie Simple Stamped; Mount Pleasant Fabric Impressed	B-178118	charcoal	290	60	1460	1510	1640	1660	1950	Bamann 2004
222	31WL37	Contentnea Creek	Cashie; New River; Series 2 (provisional)	B-132253	wood charcoal	300	50	1460	1615	1635	1650	1665	Millis 2001
45	31CK9	Baum Kitty Hawk Bay	Townsend	UGa-1089	oyster shell	635	70	1442	1490	1562	1665	1706	Phelps 1980b, 1983
71	31DR14		Townsend	UGa-3847	oyster shell	630	80	1437	1488	1547	1672	1796	Phelps 1981a
91	31HF30	Liberty Hill	Townsend Fabric Impressed	B-8134	nutshell	310	50	1451	1490	1531, 1545, 1635	1649	1790	Phelps 1984b
38	31CD594	Fort Bragg	Hanover II Fabric Impressed, var. 2	UW-397	TL	496	156	1197	1347	1503	1659	1809	Herbert et al. 2002
78	31DR33	White Court	Townsend Fabric Impressed	UGa-1087	oyster shell	720	65	1402	1444	1498	1551	1660	Phelps 1981a
119	31HT392	Fort Bragg	Hanover II Fabric Impressed, var. 2	UW-447	TL	518	58	1367	1423	1481	1539	1595	Herbert et al. 2002
169	31ON305	Flynt, Ossuary	Townsend	B-30209	human bone	560	60	1415	1442	1479	1526	1645	Loftfield 1987b
223	31WL37	Contentnea Creek	none noted	B-132256	maize	400	70	1410	1575	1460	1625	1650	Millis 2001
52	31CR14	Piggott	Townsend	B-72741	human bone		20	1420	1440	1460	1620	1640	Truesdell 1995
46	31CK9	Baum	Townsend	B-77127	human bone	640	40	1421	1439	1456	1486	1521	Phelps, personal communication 1997
54	31CR218	Broad Reach	none noted	B-58947	wood charcoal	500	50	1407	1430	1444	1473	1622	Mathis 1999
127	31HY43	Amity	Colington Simple Stamped	B- 17507	wood charcoal	450	100	1300	1405	1441	1616	1652	Gardner 1990

Sample ^a	Site	Name	Target	Lab Number	Material	Age ^b	Error ^c	2- σ ^d	1- σ	Intercepts or Mean	1- σ	2- σ	Reference
128	31HY43	Amity	Colington Simple Stamped	B-34062	charcoal	480	80	1302	1403	1434	1469	1631	Gardner 1990
55	31CR218	Broad Reach	Townsend	B-52529	wood charcoal	480	50	1331	1412	1434	1445	1483	Mathis 1999
56	31CR218	Broad Reach	Townsend; Hanover	B-53075	human bone	670	80	1297	1337	1424	1459	1522	Mathis 1999
47	31CK9	Baum	Townsend	B-73734	human bone	510	60	1304	1334	1421	1441	1478	Phelps, personal communication 1997
84	31ED333	Mabrey Bridge	Mount Pleasant, Cashie	B-178119	nutshell	510	30	1400	1410	1420	1430	1440	Bamann 2004
177	31ON33	Uniflite	Townsend; Hanover	UGa-2552	oyster shell	855	50	1303	1338	1415	1449	1490	Loftfield 1979
10	31BW73	Bluff Island	Hanover I Fabric Impressed, var. 1	B-7353	charcoal	830	50	1302	1325	1415	1437	1448	Wilde-Ramsing 1984:73
8	31BR7	Jordan's Landing	Cashie (ladle)	UGa-1086	charcoal	525	70	1298	1328	1414	1440	1480	Phelps 1983
224	31WL37	Contentnea Creek	Series-1 (provisional)	B-136688	maize	550	60	1295	1390	1410	1425	1445	Millis 2001
195	31ON665	Hammocks Beach West	Hanover Cord-Marked; Mockley Net-Impressed; Townsend Fabric-Impressed	B-127359	wood charcoal	540	50	1302	1329	1409	1431	1443	Daniel (1999:160) Table 8.1
196	31ON665	Hammocks Beach West	Townsend	B-127369	oyster shell	870	60	1290	1325	1407	1446	1490	Daniel (1999:160, Table 8.1).
197	31ON665	Hammocks Beach West	Hanover Fabric-Impressed; Townsend Fabric-Impressed and Plain	B-127360	charcoal	550	70	1292	1313	1406	1435	1353	Daniel (1999:160) Table 8.1
198	31ON665	Hammocks Beach West	none noted	B-127364	wood charcoal	550	60	1297	1322	1406	1431	1445	Daniel (1999:160) Table 8.1
178	31ON33	Uniflite	Townsend	UGa-2550	charcoal	550	65	1295	1318	1406	1433	1449	Loftfield 1979
225	31WL37	Contentnea Creek	Series-1 (provisional); Series-2 (provisional); Hanover; Roanoke Small Triangular	B-136686	wood charcoal	570	60	1290	1380	1405	1425	1440	Millis 2001
143	31NH331	Eagle Point	Hanover	B-128620	wood charcoal	560	50	1298	1322	1403	1422	1439	Hargrove 2000
48	31CK9	Baum	Townsend	B-73735	human bone	560	80	1284	1302	1403	1435	1471	Phelps, personal communication 1997
72	31DR14	Kitty Hawk Bay	Townsend Fabric Impressed	UGa-1090	oyster shell	905	65	1258	1305	1385	1432	1473	Phelps 1981a
129	31HY43	Amlty	Townsend	B-30866	charcoal	660	50	1275	1286	1299, 1375, 1375	1390	1404	Gardner 1990
3	31BR1	Shipyard Landing	Townsend Fabric Impressed; maize	B-4395	wood charcoal	660	60	1262	1284	1299, 1375, 1375	1393	1410	Phelps 1983

Sample ^a	Site	Name	Target	Lab Number	Material	Age ^b	Error ^c	2- σ ^d	1- σ	Intercepts or Mean	1- σ	2- σ	Reference
199	31ON665	Hammocks Beach West	coarse sand-tempered (unspecified); Hanover Fabric Impressed; Townsend Fabric Impressed	B-127363	wood charcoal	650	70	1258	1284	1301, 1372, 1378	1398	1423	Daniel (1999:160) Table 8.1
160	31ON190	Cape Island	New River Simple Stamped; Townsend Plain	B-104465	charred wood	650	60	1266	2186	1301, 1372, 1378	1396	1413	Jones, Espenshade and Kennedy 1997
163	31ON196	Permuda Island	Townsend Fabric Impressed	B-11939	charcoal recovered from washings	650	50	1277	1289	1301, 1372, 1378	1393	1407	Loftfield and Watson 1985
176	31ON309	Jarretts Point	none noted	UGA-5467	human bone	615	65	1264	1297	1318, 1368, 1387	1408	1430	Loftfield 1987a; 1990
200	31ON665	Hammocks Beach West	Townsend Fabric Impressed	B-127357	wood charcoal	630	50	1281	1295	1304, 1367, 1385	1398	1414	Daniel (1999:160) Table 8.1
4	31BR1	Shipyard Landing	Townsend Fabric Impressed; Roanoke Triangular point	B-4394	nutshell and wood	630	60	1277	1293	1304, 1367, 1385	1401	1423	Phelps 1983
188	31ON624	Jarman Point (NRAS)	Hanover; sand/grit tempered (unspecified); shell/grog tempered (unspecified)	B-112272					1275	1355	1435		Botwick and Neville 1998
57	31CR218	Broad Reach	Townsend	B-58944	wood charcoal	610	50	1285	1299	1323, 1350, 1390	1403	1423	Mathis 1999
82	31DR38	Hatteras Village	Townsend	B-77128		600	70	1279	1297	1327, 1346, 1393	1413	1439	Phelps, personal communication 1997
201	31ON665	Hammocks Beach West	Townsend Fabric Impressed	B-127366	wood charcoal	590	60	1286	1300	1329, 1343, 1395	1413	1437	Daniel (1999:160) Table 8.1
58	31CR218	Broad Reach	Townsend Fabric Impressed	B-58946	wood charcoal	570	50	1297	1312	1334, 1336, 1400	1417	1438	Mathis 1999
189	31ON624	Jarman Point (NRAS)	none noted	B-112271					1235	1330	1425		Botwick and Neville 1998
70	31DR1	Cape Creek	Colington I Phase, Townsend series	B-140202	scallop shell	1030	70	1250	1295	1320	1310	1445	Phelps personal communication 2008
147	31NH690	Papanow	Cape Fear Cord Marked, var. 2	UW-225	TL	631	192	943	1127	1319	1511	1695	Herbert 1997
226	31WL37	Contentnea Creek	Mount Pleasant; Series-1 (provisional); Series-2 (provisional); Roanoke Small Triangular	B-136687	wood charcoal	650	60	1265	1285	1300	1395	1415	Millis 2001

Sample ^a	Site	Name	Target	Lab Number	Material	Age ^b	Error ^c	2- σ ^d	1- σ	Intercepts or Mean	1- σ	2- σ	Reference
9	31BR7	Jordan's Landing	Cashie	B-73742	charcoal	670	60	1258	1282	1297	1390	1407	Phelps, personal communication 1997
227	31WL37	Contentnea Creek	Series-2 (provisional)	B-136684	wood charcoal	670	60	1255	1280	1295	1315	1410	Millis 2001
202	31ON665	Hammocks Beach West	Hanover Fabric Impressed; Townsend	B-127365	wood charcoal	700	50	1243	1278	1290	1379	1394	Daniel (1999:160) Table 8.1
203	31ON665	Hammocks Beach West	Townsend Fabric Impressed	B-127368	wood charcoal	700	70	1214	1268	1290	1385	1404	Daniel (1999:160) Table 8.1
204	31ON665	Hammocks Beach West	Hanover Fabric Impressed; Townsend Fabric Impressed; Townsend Plain	B-127361	oyster shell	1020	60	1158	1229	1290	1326	1408	Daniel (1999:160) Table 8.1
228	31WL37	Contentnea Creek	Mount Pleasant; Roanoke Small Triangular	B-136685	wood charcoal	700	60	1225	1270	1290	1305	1400	Millis 2001
142	31NH330	Feature 7	Hanover Fabric Impressed; New River Simple Stamped; New River Fabric Impressed		charcoal	730	60	1257	1275	1282	1291	2198	Hargrove 2000
59	31CR218	Broad Reach	Townsend	B-58945	wood charcoal	730	70	1164	1255	1282	1376	1396	Mathis 1999
42	31CD7	McClellan Mound	Hanover II Fabric Impressed; Pee Dee Plain	B-145510	wood charcoal	760	100	1033	1192	1276	1376	1403	Herbert et al. 2002
170	31ON305	Flynt	Townsend	B-12816	not specified	760	70	1159	1218	1276	1294	1388	Loftfield 1987b
243	31DR1	Cape Creek	Colington I Phase: Townsend series	B-115587	scallop shell	1150	60	1160	1220	1275	1305	1345	Phelps personal communication 2008
161	31ON190	Cape Island	none noted	B-104169				1020	1175	1270	1305	1420	Jones, Espenshade and Kennedy 1997
229	31WL37	Contentnea Creek	Mount Pleasant	B-136683	wood charcoal	770	60	1170	1220	1265	1285	1300	Millis 2001
73	31DR15	Rush Point	Mount Pleasant (with pebbles)	UGa-3849	oyster shell	1060	80	1048	1172	1265	1313	1405	Phelps 1981a
167	31ON235	Pelican Point	Townsend Fabric Impressed; Hanover Fabric Impressed; fine sand-tempered fabric impressed	B-842464	charred wood	780	70	1059	1211	1263	1287	1382	Hargrove 1996

Sample ^a	Site	Name	Target	Lab Number	Material	Age ^b	Error ^c	2- σ ^d	1- σ	Intercepts or Mean	1- σ	2- σ	Reference
213	31ON82	Hammocks Beach East	Townsend Fabric Impressed	B-11937	wood charcoal from flotation sample	800	90	1024	1161	1256	1287	1388	Loftfield 1986
152	31NS3	Thorpe	Cashie Simple Stamped; Cashie Fabric Impressed	UGa-3143	Charred hickory nutshells	800	65	1042	1189	1256	1282	1298	Phelps 1980a
64	31CR53	Shelly Point	Townsend	B-69590	shell	700	60			1250			Reid and Simpson 1994
130	31JN2	Long Point	Townsend	UW- 451	?	1249	149	957	1100	1249	1398	1541	Shumate and Evans 2000
190	31ON624	Cape Island	none noted	B-104167				1085	1180	1240	1285	1315	Jones, Espenshade and Kennedy 1997
191	31ON624	Jarman Point (NRAS)	none noted	B-112275					1175	1235	1295		Botwick and Neville 1998
220	31WL304	Toisnot	Cashie	B-240936	AMS-soot	810	40	1160	1210	1230	1260	1280	Beaman (2008)
85	31ED333	Mabrey Bridge	Mount Pleasant Fabric Impressed; Mount Pleasant Cord Marked	B-178121	charcoal	830	50	1050	1180	1220	1260	1280	Bamann 2004
185	31ON379	Courthouse Bay	Hanover Cord Marked; Hanover Fabric Impressed, Onslow Fabric Impressed; Townsend Fabric Impressed;	UW-633	TL	781	192	844	1028	1220	1412	1596	Greene and Millis 2003
124	31HT450	Fort Bragg	Hanover I Fabric Impressed, var. 2	UW-448	TL	780	256	717	965	1219	1475	1721	Herbert et al. 2002
205	31ON665	Hammocks Beach West	Hanover Fabric-Impressed; Townsend Fabric-Impressed; Townsend Plain	B-127362	oyster shell	1110	60	1039	1126	1218	1283	1318	Daniel (1999:160) Table 8.1
65	31CR53	Shelly Point	fabric impressed (unspecified)	B-69588	shell	830	60	1036	1161	1218	1275	1288	Reid and Simpson 1994
171	31ON305	Flynt	Onslow; Townsend Fabric Impressed	B-12815	charcoal	850	60	1027	1070	1212	1260	1283	Loftfield 1987b
230	31WL37	Contentnea Creek	Mount Pleasant; Roanoke Small Triangular	B-132252	nutshell	840	50	1040	1170	1210	1255	1275	Millis 2001
231	31WL37	Contentnea Creek	Mount Pleasant; Series-1 (provisional); Series-2 (provisional)	B-132257	wood charcoal	840	50	1040	1170	1210	1255	1275	Millis 2001

Sample ^a	Site	Name	Target	Lab Number	Material	Age ^b	Error ^c	2- σ ^d	1- σ	Intercepts or Mean	1- σ	2- σ	Reference
232	31WL37	Contentnea Creek	Mount Pleasant; Series-1 (provisional); Series-2 (provisional); Roanoke Small (provisional); Clarksville Triangular	B-136681	wood charcoal	840	60	1035	1160	1210	1260	1285	Millis 2001
144	31NH331	Eagle Point	Hanover	B-122725	shell			1050	1125	1200	1260	1295	Hargrove 1998
141	31NH28	Cold Morning	Cape Fear; Hamp's Landing	B-1285	human bone	1000	80	1012	1049	1191	1268	1298	Coe et al. 1982; Ward and Wilson 1980
86	31ED333	Mabrey Bridge	Mount Pleasant; Hanover; Cashie	B-178120	nutshell	870	40	1040	1160	1180	1220	1260	Bamann 2004
172	31ON305	Flynt	none noted	B-12353	charcoal	880	50	1024	1043	1163, 1173, 1180	1219	1264	Loftfield 1987b
233	31WL37	Contentnea Creek	Mount Pleasant; Roanoke Small Triangular	B-132260	nutshell	890	50	1025	1040	1170	1210	1255	Millis 2001
168	31ON235	Pelican Point	Townsend Fabric Impressed; Hanover Fabric Impressed	B-79500	charred wood	890	90	984	1024	1161	1256	1288	Hargrove 1996
164	31ON196	Permuda Island	Townsend Fabric Impressed; Carteret Fabric Impressed	B-11940	charcoal from washings	900	60	1018	1033	1160	1216	1264	Loftfield and Watson 1985
123	31HT435	Fort Bragg	Hanover	UW-796	TL	1156	226	713	930	1156	1382	1599	Abbott et al. 2005
131	31JN2	Long Point	Townsend	UW-452	TL	1141	99	947	1042	1141	1240	1335	Shumate and Evans 2000
184	31ON379	Courhouse Bay	Hanover Fabric Impressed; Hanover Plain	UW-632	TL	885	105	910	1011	1116	1221	1322	Greene and Millis 2003
132	31JN2	Long Point	Townsend; Mount Pleasant; Hanover	B-130060	charcoal	940	60	989	1021	1040, 1100, 1116, 1141, 1151	1183	1222	Shumate and Evans 2000
140	31NH142	Hamp's Landing	Hanover	B-63184	shell?					1110			Hargrove 1993
192	31ON624	Jarman Point (NRAS)	sand/grit temper (unspecified); Hanover; Townsend	B-112273					1000	1108	1215		Botwick and Neville 1998
87	31ED333	Mabrey Bridge	Mount Pleasant Cord Marked; Mount Pleasant Fabric Impressed	B-178117	charcoal	930	40	1020	1030	1050, 1100, 1140	1170	1200	Bamann 2004

Sample ^a	Site	Name	Target	Lab Number	Material	Age ^b	Error ^c	2- σ ^d	1- σ	Intercepts or Mean	1- σ	2- σ	Reference
234	31WL37	Contentnea Creek	Mount Pleasant; Roanoke Small Triangular	B-132254	wood charcoal	920	70	995	1025	1055, 1085, 1150	1205	1260	Millis 2001
120	31HT392	Fort Bragg	Hanover II Fabric Impressed, var. 2	UW-398	TL	933	124	841	960	1084	1208	1327	Herbert et al. 2002
94	31HK1546	Fort Bragg	Yadkin Net Impressed	UW-1635	TL*/IRSL/OSL	930	40	1002	1040	1080	1120	1158	McNutt and Gray 2009
186	31ON536	(LeJeune)	Hanover; Townsend	not reported	charcoal	950	60			1040			Davis and Child 1996
66	31CR53	Shelly Point	Townsend; sand tempered (unspecified)	B-136918	clam shell	1270	60	894	983	1035	1115	1212	Davis et al. 2001
235	31WL37	Contentnea Creek	Deep Creek; Mount Pleasant; Roanoke Small Triangular	B-132259	wood charcoal	960	50	995	1015	1035	1155	1195	Millis 2001
43	31CD7	McClellan Mound	Hanover Fabric Impressed; Hanover Plain	M-1354	wood charcoal (pine)	980	110	782	979	1025	1205	1277	MacCord 1966
236	31WL37	Contentnea Creek	Mount Pleasant; Roanoke Small Triangular	B-132255	wood charcoal	980	50	980	1095	1025	1140	1175	Millis 2001
153	31NS3	Thorpe	Cashie	UGa-3142	charcoal	1000	70	894	984	1021	1155	1210	Phelps 1980a
67	31CR53	Shelly Point	White Oak Fabric Impressed	B-131572	charcoal	1010	60	896	984	1020	1148	1162	Davis and Child 1996, 2000; Davis et al. 1997; Davis et al. 2001
237	31WL37	Contentnea Creek	New River; Mount Pleasant	B-136682	wood charcoal	1000	70	895	990	1020	1050	1195	Millis 2001
238	31WL37	Contentnea Creek	Mount Pleasant, Series 1 (provisional); Series 2 (provisional)	B-132258		1020	70	885	980	1010	1040	1175	Millis 2001
239	31WL37	Contentnea Creek	Mount Pleasant	B-136680	wood charcoal	1040	60	888	970	1005	1025	1055	Millis 2001
62	31CR305	Goose Creek	Hanover Cord Marked; Townsend	B-131575	shell	1320	110	726	876	1003	1091	2145	Davis et al. 2001
68	31CR53	Shelly Point	Townsend; sand/grit tempered (unspecified)	B-69589	shell	1040	60	889	904	1000	1025	1157	Reid and Simpson 1994
122	31HT402	Fort Bragg	Cape Fear III Cord Marked	UW-401	TL	1002	123	756	874	997	1120	1238	Herbert et al. 2002
69	31CR53	Shelly Point	White Oak Fabric Impressed	B-131573	shell	1060	60	785	899	991	1022	1152	Davis and Child 1996, 2000; Davis et al. 1997; Davis et al. 2001

Sample ^a	Site	Name	Target	Lab Number	Material	Age ^b	Error ^c	2- σ ^d	1- σ	Intercepts or Mean	1- σ	2- σ	Reference
76	31DR1	Cape Creek	Colington I Phase, Townsend series; Colington Fabric Impressed; Colington Simple Stamped; Colington Punctate	B-140204	wood charcoal	1070	60	870	900	990	1015	1040	Phelps personal communication 2008
173	31ON305	Flynt	New River; Carteret; Onslow; Townsend	B-9381	charcoal from washings	1070	50	887	899	984	1018	1030	Loftfield 1987b
206	31ON665	Hammocks Beach West	Hanover Cord Marked; Hanover Fabric Impressed; Townsend Fabric Impressed; Toownsend Plain; Mockley Cord Marked and Net Impressed	B-127356	wood charcoal	1080	50	785	896	981	1017	1025	Daniel (1999:160) Table 8.1
240	31WL37	Contentnea Creek	Mount Pleasant; Roanoke Small Triangular	B-132261	wood charcoal	1100	60	795	890	980	1005	1030	Millis 2001
80	31DR35	Tillett	Townsend Fabric Impressed; Townsend Plain; Mount Pleasant Fabric Impressed; Mount Pleasant Cord Marked	UGa-3434	charcoal	1090	85	723	886	979	1021	1157	Phelps 1984a
113	31HT344	Fort Bragg	Hanover I Fabric Impressed, var. 1	UW-444	TL	1053	233	489	713	946	1179	1403	Herbert et al. 2002
88	31HF20	Mount Pleasant	Colington	UGa-4011	wood charcoal	1125	95	684	779	898, 921, 945, 946, 955	1017	1154	Phelps 1983, Green 1986
193	31ON624	Jarman Point (NRAS)	none noted	B-112278					865	943	1020		Botwick and Neville 1998
183	31ON379	Courthouse Bay	Hanover Fabric Impressed	UW-631	TL	1062	109	725	830	939	1048	1153	Greene and Millis 2003
11	31CB114	Riegelwood	Hanover II Fabric Impressed, var. 3	UW-656	TL	1070	154	629	777	931	1085	1233	Herbert 2003
174	31ON305	Flynt	Onslow	B-12817	charcoal	1140	60	722	782	894, 925, 935	982	1019	Loftfield 1987b
175	31ON305	Flynt	New River; Carteret; Onslow; Townsend	B-9382	charcoal from washings	1100	50	782	892	904, 910, 976	998	1022	Loftfield 1987b
60	31CR218	Broad Reach	Townsend	B-58942	human bone				775	888	997		Mathis 1999

Sample ^a	Site	Name	Target	Lab Number	Material	Age ^b	Error ^c	2- σ ^d	1- σ	Intercepts or Mean	1- σ	2- σ	Reference
41	31CD750	Middle Toe	Hanover I, Fabric- Impressed var.2	UW-441	TL	1135	160	550	704	864	1024	1178	Herbert et al. 2002
133	31JN2	Long Point	Townsend; Mount Pleasant; Hanover	B-130905	charcoal	1200	50	687	734	782, 790, 815, 842, 859	892	977	Shumate and Evans 2000
81	31DR35	Tillet	Mount Pleasant Fabric Impressed; Mount Pleasant Cord Marked	UGa-3435	oyster shell	1490	85	644	701	798	910	1021	Phelps 1984a
75	31DR1	Cape Creek	Hanover Fabric Impressed; Hanover Cord Marked	B-140203	wood charcoal	1220	60	670	705	785	885	970	Phelps personal communication 2008
137	31L1	Tower Hill	Cashie Fabric Impressed; Cashie Plain	B-43628	nutshell	1230	100	640	673	778	942	1017	Eastman et al. 1997
134	31JN2	Long Point	none noted	B-130059	charcoal	1250	50	662	688	775	860	893	Shumate and Evans 2000
40	31CD7	McClellan Mound	Hanover II Fabric Impressed	B-143709	soot	1250	40	675	700	770	795	880	Herbert et al. 2002
102	31HK1620	Fort Bragg	Hanover Fabric Impressed	B-227811	sherd organics	1250	40	690	690	770	780	880	McNutt and Gray 2009
179	31ON33	Uniflite	Townsend	UGa-2549	charcoal	1265	60	656	676	721, 743, 770	851	894	Loftfield 1979
154	31NS3	Thorpe	Clements Cord Marked	UGa-3144	wood charcoal	1265	75	643	665	721, 743, 770	878	961	Phelps 1980a
61	31CR218	Broad Reach	Hanover Fabric Impressed	B-58941	human bone	1420	90	598	660	718	855	968	Mathis 1999
155	31ON1236	Mile Hammock Bay 2	Hanover Fabric Impressed var. 3	UW-994	TL	1292	92	530	618	710	802	890	Millis 2008
138	31MR241	Fort Bragg	Hanover I Check Stamped	UW-449	TL	1294	174	365	532	706	880	1047	Herbert et al. 2002
12	31CB114	Riegelwood	Hanover II Cord Marked, var. 1 ^j	UW-647	TL	1300	311	91	390	701	1012	1311	Herbert 2003
242	31ON1246		Onslow Fabric Impressed	B-202616	soot	1290	40	660	680	700	770	790	Millis 2009b
207	31ON665	Hammocks Beach West	Hanover Cord-Marked; Hanover Fabric Impressed; White Oak	B-127355	wood charcoal	1300	70	621	659	689	778	890	Daniel (1999:160) Table 8.1
145	31NH486	Pond Trail	Hanover Fabric Impressed, var. 2	UW-222	TL	1270	145	396	535	680	825	964	Herbert 1997
13	31CB114	Riegelwood	Hanover II Cord Marked, var. 2	UW-651	TL	1326	172	338	503	675	847	1012	Herbert 2003
208	31ON665	Hammocks Beach West	none noted	B-127367	wood charcoal	1340	60	603	651	666	765	780	Daniel (1999:160) Table 8.1

Sample ^a	Site	Name	Target	Lab Number	Material	Age ^b	Error ^c	2- σ ^d	1- σ	Intercepts or Mean	1- σ	2- σ	Reference
244	31DR33	Brooks Island	Hanover	B-140206	oyster shell	1760	70	510	595	655	695	775	Skinner 2002
214	31ON82	Hammocks Beach East	none noted	B-119389	charcoal from floatation	1400	60	541	604	652	669	765	Loftfield 1986
74	31DR15	Stick Site	Mount Pleasant (without pebbles)	UGa-1088	oyster shell	1685	65	449	556	643	690	773	Phelps 1981a
209	31ON665	Hammocks Beach West	White Oak Fabric Impressed; Mockley Cord-Marked; Mockley Net Impressed	B-127358	wood charcoal	1430	50	539	599	640	658	680	Daniel (1999:160) Table 8.1
103	31HK1620	Fort Bragg	Hanover Fabric Impressed	B-227812	sherd organics	1420	40	610	610	640	650	660	McNutt and Gray 2009
14	31CB114	Riegelwood	Hamp's Landing Punctate var. <i>Allendale</i>	UW-645	TL	1367	393	-136	241	634	1027	1404	Herbert 2003
165	31ON196	Permuda Island	Townsend Fabric Impressed	B-11941	charcoal from washings	1450	80	427	540	620, 634, 636	660	759	Loftfield and Watson 1985
241	3ON596		Hanover Cord Marked	UW-?	TL	1375	246	139	375	621	867	1103	Reid and Simpson 1997
77	31DR32	Brooks Island	Hanover	B-140205	oyster shell	1740	60	555	620	665	700	775	Skinner 2002
180	31ON33	Uniflite	Townsend	UGa-2547	charcoal	1495	60	426	534	564, 569, 579, 588, 597	640	660	Loftfield 1979
50	31CO167	Riversound	Mount Pleasant Cord Marked; Mount Pleasant Fabric Impressed	B-237696	charcoal	1400	40	484	510	550	590	616	Seibel and Russ 2008
181	31ON33	Uniflite	Townsend	UGa-2548	charcoal	1550	65	386	426	536	600	644	Loftfield 1979
146	31NH556	Stoney Brook	Hanover	B-701 1	charcoal	1560	60	386	425	533	596	639	Wilde-Ramsing 1984:114
15	31CB114	Riegelwood	Hanover I Fabric Impressed, var. 2	UW-659	TL	1473	301	-62	-227	528	829	1118	Herbert 2003
114	31HT344	Fort Bragg	Hanover I Fabric Impressed, var. 2	UW-443	TL	1516	173	144	310	483	656	822	Herbert et al. 2002
98	31HK1616	Fort Bragg	Yadkin Fabric Impressed	UW-1639	TL/OSL	1540	90	294	380	470	560	646	McNutt and Gray 2009
135	31JN2	Long Point	Townsend; Mount Pleasant; Hanover; Hamp's Landing	B-130904	charcoal	1570	60	357	420	422, 448, 468, 482, 530	560	636	Shumate and Evans 2000
16	31CB114	Riegelwood	Hanover I Cord Marked, var. 2	UW-649	TL	1539	148	172	314	462	610	752	Herbert 2003

Sample ^a	Site	Name	Target	Lab Number	Material	Age ^b	Error ^c	2- σ ^d	1- σ	Intercepts or Mean	1- σ	2- σ	Reference
139	31MR93	Fort Bragg	Hanover I Cord Marked, var. 2	UW-450	TL	1564	314	-180	121	435	749	1050	Herbert et al. 2002
49	31CK9	Baum	Mount Pleasant	UGa-1085	Fragments of woven juncus grass mat	1590	65	263	409	433	541	619	Phelps 1980b, 1983
216	31PT259	Barber Creek	none noted	B-150187	charcoal	1630	60	260	380	420	520	560	Daniel pers com 2008
156	31ON1236	Mile Hammock Bay 2	Hanover Fabric Impressed, var. 2	UW-993	TL	1582	92	240	328	420	512	600	Millis 2008
39	31CD622	Fort Bragg	New River Net-Impressed	UW-442	TL	1594	272	-128	133	405	677	938	Herbert et al. 2002
44	31CK32	Point Harbor	Mount Pleasant Fabric Impressed	B-48970	wood charcoal	1670	60	240	261	397	428	537	Mathis (personal communication)
89	31HF30	Liberty Hill	Mount Pleasant	B-73744		1680	70	219	258	388	428	539	Phelps personal communication 1997
99	31HK1616	Fort Bragg	Yadkin Fabric Impressed	UW-1638	OSL	1730	100	84	180	280	380	476	McNutt and Gray 2009
158	31ON1238	Mile Hammock Bay 1	Cape Fear Fabric Impressed, var. 2	UW-996	TL	1736	101	68	165	266	367	464	Millis 2008
157	31ON1236	Mile Hammock Bay 2	Hanover Fabric Impressed var. 3	UW-992	TL	1754	102	48	146	248	350	448	Millis 2008
17	31CB114	Riegelwood	Hanover I Cord Marked, var. 2	UW-648	TL	1817	241	-288	-57	184	425	656	Herbert 2003
148	31NH690	Papanow	Hanover Cord Marked, var. 2	UW-223	TL	1779	228	-274	55	173	401	620	Herbert 1997
166	31ON196	Permuda Island	none noted	B-11942	charcoal from flotation	1840	60	30	85	134, 159, 170, 196, 209	243	340	Loftfield and Watson 1985
111	31HK1649	Fort Bragg	Yadkin Net Impressed	UW-1648	TL	1860	590	-1016	-450	140	730	1296	McNutt and Gray 2009
115	31HT347	Fort Bragg	Yadkin I Smoothed Net Impressed	UW-399	TL	1878	290	-447	-169	121	411	689	Herbert et al. 2002
37	31CD551	Fort Bragg	Cape Fear I Cord-Marked	UW-396	TL	1880	229	-331	-111	118	347	567	Herbert et al. 2002
112	31HT269	Fort Bragg	Yadkin Net Impressed	UW-395	TL	1881	233	-339	-114	118	350	575	Herbert et al. 2002
63	31CR305	Goose Creek	Hanover; Townsend	B-131574	charcoal	1940	80	-150	-38	69	131	243	Davis et al. 2001
95	31HK1567	Fox Ridge	Yadkin Cord Marked	UGA-12557	soot	1980	-51	-47	-38	25, 43, 47	70	124	Ruggiero 2003
104	31HK1620	Fort Bragg	Hanover II Fabric Impressed	UW-1645	OSL	1970	140	-244	-110	30	170	304	McNutt and Gray 2009
194	31ON624	Jarman Point (NRAS)	none noted	B-112276					-180	20	220		Botwick and Neville 1998

Sample ^a	Site	Name	Target	Lab Number	Material	Age ^b	Error ^c	2- σ ^d	1- σ	Intercepts or Mean	1- σ	2- σ	Reference
18	31CB114	Riegelwood	Cape Fear Cord Marked, var. 2	UW-650	TL	1996	206	-399	-201	5	211	409	Herbert 2003
19	31CB114	Riegelwood	Cape Fear Cord Marked, var. 2	UW-655	TL	1997	184	-357	-180	4	188	365	Herbert 2003
118	31HT355	Fort Bragg	Cape Fear I Cord-Marked, var. 1	UW-446	TL	2081	196	-466	-278	-82	114	302	Herbert et al. 2002
105	31HK1620	Fort Bragg	Hanover I Fabric Impressed	UW-1643	OSL	2110	160	-424	-270	-110	50	204	McNutt and Gray 2009
106	31HK1620	Fort Bragg	New River Cord Marked	UW-1642	IRSL/OSL	2140	90	-306	-220	-130	-40	46	McNutt and Gray 2009
20	31CB114	Riegelwood	Cape Fear Cord Marked, var. 2	UW-661	TL	2169	186	-533	-354	-168	18	197	Herbert 2003
182	31ON33	Uniflite	Townsend	UGA-2551	clam shell	2405	60	-379	-336	-193	106	-12	Loftfield 1979
21	31CB114	Riegelwood	Cape Fear Cord Marked, var. 2	UW-652	TL	2200	185	-562	-384	-199	-14	164	Herbert 2003
109	31HK1622	Fort Bragg	Hanover II Check Stamped	UW-1646	OSL	2210	140	-474	-340	-200	-60	74	McNutt and Gray 2009
22	31CB114	Riegelwood	Hamp's Landing Cord Marked, var. 1	UW-654	TL	2222	249	-709	-470	-221	28	267	Herbert 2003
212	31ON765	Highest Use Testing 2	Cape Fear Cord Marked, var. 2	UW-1758	TL	2242	180	-593	-420	-240	-60	113	Millis 2009 a Phelps personal communication 1997
90	31HF30	Liberty Hill	Mount Pleasant	B-73743		2240	60	-402	-390	-360, -273, -260	-202	-124	
36	31CD486	Fort Bragg	Cape Fear I Cord-Marked, var. 2	UW-393	TL	2277	370	-1003	-648	-278	92	447	Herbert et al. 2002
92	31HK1484	Fort Bragg	Hanover II Paddle-Edge Stamped	UW-1633	OSL	2340	230	-781	-560	-330	-100	121	McNutt and Gray 2009
125	31HT471	Fort Bragg	New River Cord Marked, var. 1	UW-394	TL	2368	259	-882	-663	-374	-115	134	Herbert et al. 2002
149	31NH690	Papanow	New River Fabric Impressed, var. 2	UW-226	TL	2384	250	-924	-684	-434	-184	56	Herbert 1997
187	31ON542		New River Plain	UW-?	TL	2589	441	-1457	-1034	-593	-152	271	Reid and Simpson 1997
107	31HK1620	Fort Bragg	Hanover I Fabric Impressed	UW-1644	TL/OSL	2660	400	-1434	-1050	-650	-250	134	McNutt and Gray 2009
23	31CB114	Riegelwood	Hanover; Hamp's Landing; New River	B-115425	wood charcoal	2470	40	-787	-762	-757, -695, -541	-412	-405	Sanborn and Abbott 1999:6, Tables 1-2
93	31HK1540	Fort Bragg	Hanover Fabric Impressed, var. 4	UW-1634	TL/OSL	2790	280	-1329	-1060	-780	-500	-231	McNutt and Gray 2009

Sample ^a	Site	Name	Target	Lab Number	Material	Age ^b	Error ^c	2- σ ^d	1- σ	Intercepts or Mean	1- σ	2- σ	Reference
151	31NH771	Wilmington Bypass	Hamp's Landing		soot					-800			Barse et al. 2001
136	31JN2	Long Point	Townsend; Mount Pleasant; Hanover; Hamp's Landing	B-130061	charcoal	2680	60	-969	-897	-826	-800	-788	Shumate and Evans 2000
100	31HK1619	Fort Bragg	Cape Fear Cord Marked	UW-1640	OSL	2970	240	-1430	-1200	-960	-720	-490	McNutt and Gray 2009
116	31HT347	Fort Bragg	Yadkin I Smoothed Net Impressed	UW-400	TL	2962	356	-1661	-1319	-963	-607	-265	Herbert et al. 2002
159	31ON1241	Mile Hammock Bay 3	New River Cord Marked	UW-995	TL	2972	201	-1364	-1171	-970	-769	-576	Millis 2008
24	31CB114	Riegelwood	Cape Fear Cord Marked, var. 2	UW-653	TL	3001	819	-2605	-1181	-1000	-181	605	Herbert 2003
218	31WH12	Lake Phelps, canoe	New River Net Impressed	B-16675	wood, cypress	2850	60	-1255	-1125	-1002	-920	-836	Bright 1987
5	31BR201	Windsor	Deep Creek Cord Marked	UW-1622	OSL/TL	3080	150	-1364	-1220	-1070	-920	-776	Seibel and Russ 2008
101	31HK1619	Fort Bragg	New River Plain	UW-1641	TL/OSL	3090	150	-1374	-1230	-1080	-930	-786	McNutt and Gray 2009
121	31HT392	Fort Bragg	New River Net Impressed	UW-402	TL	3170	541	-2231	-1712	-1171	-630	-111	Herbert et al. 2002
97	31HK1612	Fort Bragg	New River	UW-1637	TL	3200	550	-2268	-1740	-1190	-640	-112	McNutt and Gray 2009
150	31NH690	Papanow	New River Cord Marked, var. 1	UW-224	TL	3171	436	-2076	-1657	-1221	-785	-366	Herbert 1997
215	31ON834	Highest Use Testing 1	Cape Fear Cord Marked, var. 1; Cape Fear Cord Marked, var. 2	UW-1757	TL	3242	220	-1671	-1460	-1240	-1020	-809	Millis 2009 a
25	31CB114	Riegelwood	Thom's Creek (?) Cord Marked, var. 1	UW-658	TL	3248	329	-1892	-1576	-1247	-918	-602	Herbert 2003
26	31CB114	Riegelwood	New River Cord Marked, var. 1	UW-660	TL	3386	569	-2500	-1954	-1385	-816	-270	Herbert 2003
6	31BR201	Windsor	Deep Creek Cord Marked	UW-1621	OSL	3520	170	-1843	-1680	-1510	-1330	-1177	Seibel and Russ 2008
110	31HK1623	Fort Bragg	Plain	UW-1647	TL/OSL	3530	260	-2030	-1780	-1520	-1260	-1010	McNutt and Gray 2009
7	31BR201	Windsor	Deep Creek Cord Marked	UW-1620	OSL/IRSL	3600	180	-1953	-1780	-1600	-1420	-1247	Seibel and Russ 2008
27	31CB114	Riegelwood	New River Cord Marked, var. 2	UW-662	TL	3766	714	-3164	-2479	-1765	-1051	-366	Herbert 2003
210	31ON751	Highest Use Testing 3	New River Cord Marked, var. 2	UW-1760	TL	3782	170	-2113	-1950	-1780	-1610	-1447	Millis 2009 a

Sample ^a	Site	Name	Target	Lab Number	Material	Age ^b	Error ^c	2- σ ^d	1- σ	Intercepts or Mean	1- σ	2- σ	Reference
211	31ON751	Highest Use Testing 3	New River Simple Stamped, var. 1	UW-1759	TL	3822	150	-2114	-1970	-1820	-1670	-1526	Millis 2009 a
162	31ON190	Cape Island	Hamp's Landing Fabric Impressed; Refuge Allendale Punctate	B-104165	charred wood	3610	70	-2194	-2112	-1950	-1833	-1748	Jones, Espenshade and Kennedy 1997
28	31CB114	Riegelwood	Thom's Creek (?) Cord-Marked	B-115428	wood charcoal	3630	70	-2198	-2130	-2012, -2000, -1978	-1885	-1773	Sanborn and Abbott 1999:6, Tables 1-2
96	31HK1612	Fort Bragg	Refuge Allendale Punctate	UW-1636	TL/OSL	4090	230	-2531	-2310	-2080	-1850	-1629	McNutt and Gray 2009
29	31CB114	Riegelwood	Hamp's Landing Simple Stamped	B-115427	wood charcoal	3700	50	-2273	-2193	-2129, -2082, -2043	-1982	-1942	Sanborn and Abbott 1999:6, Tables 1-2
30	31CB114	Riegelwood	Hamp's Landing Cord Marked; Hamp's Landing Simple Stamped	B-115429	wood charcoal	3700	40	-2200	-2141	-2129, -2082, -2043	-1984	-1957	Sanborn and Abbott 1999:6, Tables 1-2
217	31PT259	Barber Creek	none noted	B-188954	charcoal	4140	40	-2880	-2870	-2850, -2820, -2680	-2800	-2580	Daniel personal communication 2008
31	31CB114	Riegelwood	New River	B-115426	wood charcoal	4290	50	-3018	-2918	-2898	-2881	-2764	Sanborn and Abbott 1999:6, Tables 1-2
32	31CB114	Riegelwood	Hamp's Landing Simple Stamped	UW-657	TL	5057	2598	-8148	-5654	-3056	-458	2036	Herbert 2003
108	31HK1620	Fort Bragg	Hanover I	UW-1644	TL/OSL	5180	310	-3778	-3480	-3170	-2860	-2562	McNutt and Gray 2009
34	31CD403		none noted	B-171292	wood charcoal	4510	70	-3490	-3355	-3330, -3215, -3180, -3155, -3125	-3090	-2930	Terrell et al. 2000
35	31CD403		none noted	B-171291	wood charcoal	5090	80	-4040	-3970	-3940	-3785	-3695	Terrell et al. 2000

^a Sample numbers referenced in text and figures.

^b Measured or conventional age in years B.P.

^c Standard error (1- σ).

^d For luminescence dates standard deviations are mathematically calculated at the 95% (2- σ) and 68% (1- σ) confidence intervals below and above mean age estimates. For radiocarbon dates confidence interval values are calibrated data; where multiple intercepts (and ranges) occur only the uppermost and lowermost values are listed.

^e All radiocarbon dates are calibrated with Calib 4.3 using INTCAL98 and corrected for $\delta^{13}C$ isotope fractionation; non-marine samples use decadal atmospheric curve (Stuiver and Reimer 1993).

^f In cases where more than one pottery type is associated, the types are listed in order of most frequent, to least frequent.

^g Marine shell age estimates are corrected by applying the ΔR value (-5 ± 20) derived from Bahamas coral dates (Stuiver and Braziunas 1993).

^h Fabric impressed varieties are: Var 1, coarse weft-faced (weft diameter > 2 mm, interwoven over non-cordage warp); Var 2, medium weft-faced (weft diameter 1–2 mm, interwoven over non-cordage warp); Var 3, fine weft-faced (weft diameter < 1 mm, interwoven over non-cordage warp); Var 4, flexible warp (coarse–medium weft-faced, interwoven over cordage or fiber warp); Var 5, spaced weft (coarse–fine weft, spaced on non-cordage warp) (Herbert 2003: Appendix A).

ⁱ Samples of human bone collagen are assumed to represent a mixture of 50 % marine and 50 % terrestrial carbon (Herbert 2003: 49).

^j Cord marked varieties are: Var 1, parallel; Var 2, perpendicular/oblique (Herbert 2003: Appendix A).

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