Ceramic Petrography of Woodland Period Swift Creek Complicated Stamped pottery in Florida and the lower Southeastern United States

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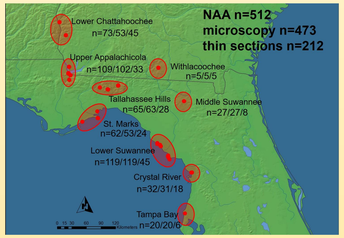
1. Introduction. Swift Creek Complicated Stamped pottery is a premier material for study of Woodland period social interactions in the SE U.S. Unique design impressions of individual paddles are found on pots at multiple sites, sometimes hundreds of kilometers apart, reflecting a broad range of social interactions. This research combines records of paddle impressions with NAA and petrography In order to characterize these interactions. The petrography results are reported here.

2. Sampling. This study focuses on the Gulf coastal plain of Florida and southern Georgia area of the Swift Creek region.



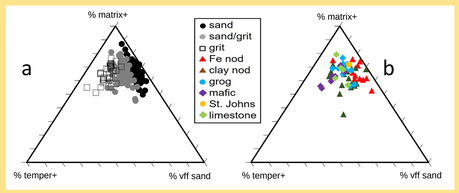
Sites: 28 from nine regional clusters.
Sites types: multi-mound civic-ceremonial centers, villages with 1 or 2 burial mounds, habitation sites without mounds.
Samples: 512 sherds analyzed by NAA of which 212 were thin sectioned; 91 clay samples from most of the site clusters, and other regions, included for comparison.

3. Methods. Traditional microscopy on 473 of 512 NAA samples for gross temper and fabric. Petrographic analysis for evaluating and quantifying compositional and textural variability:

- thin sections initially gross sorted by temper or principal constituent.
- thin sections fine sorted by presence/abundance of mica and siliceous microfossils (sponge spicules, phytoliths, and diatoms) to define petro-fabrics.
- point-counting for quantification, after Stoltman (1989, 1991, 2000).

4. Gross tempers. Tempers or constituents include quartz, polycrystalline quartz, ferric and clayey-phosphatic nodules, grog (sherd) temper, amphibole-rich intermediate igneous rock ("mafic"), sponge spicules, and limestone. Quartz sand is a predominant constituent in most categories.

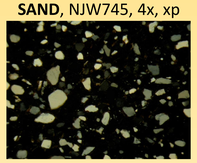
gross temper or constituent	NAA pottery	TS pottery	TS clays	description
sand	134	58	25	quartz; very fine to fine sizes
sand/grit	167	69	21	quartz; very fine to coarse sizes
grit	63	28	7	quartz and polycrystalline quartz; medium through very coarse sizes
ferric nodule	39	13	7	composition includes Fe rich nodules; also quartz component comparable to sand/grit and sand
clay/phosphate nodule	29	17	9	composition includes phosphatic and/or indurated clay nodules; also quartz component comparable to sand/grit and sand
grog	24	14	0	crushed sherd temper; also quartz component comparable to sand and sand/grit
mafic	7	7	0	amphibole grains and rock fragments; also quartz/ quartzite component comparable to sand/grit, grit
St. Johns	4	1	3	sponge spicules and very fine to fine quartz
limestone	6	5	5	micritic limestone nodules; also quartz component comparable to sand/grit (shell in clays)
clay	0	0	4	very few aplastic constituents (except for silt in one)
calcareous	0	0	10	variable aplastics but calcareous matrix



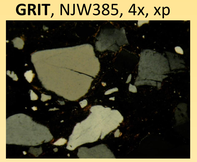
Ternary plots show marked clustering and overlap of pottery samples, but separation between sand, sand/ grit, and grit categories in plot "a".

Photomicrographs of some "temper" categories (width of 4x images ~2mm) :

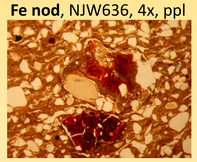
SAND, NJW745, 4x, xp



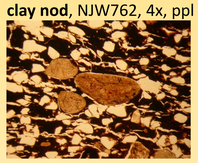
GRIT, NJW385, 4x, xp



Fe nod, NJW636, 4x, ppl

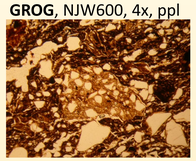


clay nod, NJW762, 4x, ppl

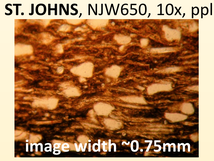


Photomicrographs of some "temper" categories (width of 4x images ~2mm) continued:

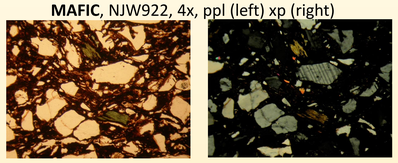
GROG, NJW600, 4x, ppl

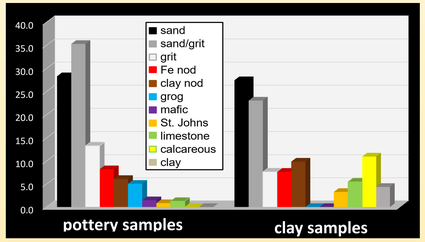


ST. JOHNS, NJW650, 10x, ppl

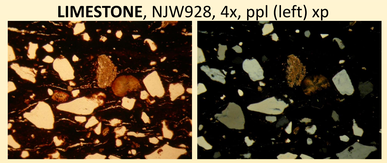


MAFIC, NJW922, 4x, ppl (left) xp (right)





LIMESTONE, NJW928, 4x, ppl (left) xp

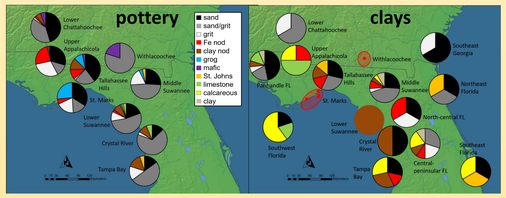


All gross "temper" categories well represented in sampled clays, with obvious exceptions of grog and mafic tempers.

A few clay samples characterized by paucity of aplastics (designated "clay" in bar chart).

The distributions show: local manufactures feasible in all regional clusters for sand, sand/grit wares; and in many regional clusters for mixed nodules, which may have been naturally present, rather than added tempers.

regional distribution of tempers/constituents



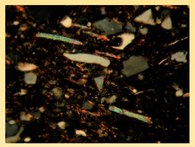
Limited occurrence of gritty clays may indicate nonlocal provenance for grit-tempered pottery in peninsular Florida. Grog-temper provenance restricted to the more northern site clusters. Mafic pottery non-local in this study region, on basis of Swift Creek pottery from central and northern Georgia (Stoltman and Snow 1998). St. Johns paste may have multiple manufacturing origins. Limestone occurs in many clays, but with calcareous matrix compositions, absent in pottery samples. Local production of limestone-tempered pottery restricted to the Lower Suwannee and Crystal River regions.

petro-fabrics	n pottery	n clays	description
A	96	7	frequent to common mica
B	50	53	none to rare mica
C	17	7	like A, but with Si fossils (sponge spicules, phytoliths)
D	16	5	like B, but with Si fossils
Ea	9	0	like C, but also with diatoms
Eb	23	6	like D, but also with diatoms
F	1	3	frequent to common sponge spicules
G	0	10	calcareous matrix

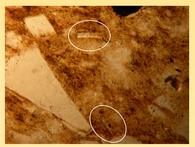
5. Petro-fabrics. Eight petro-fabrics defined for pottery and clays. A, C and Ea are micaceous, distinguished by presence and/or type of siliceous microfossil. B, D, and Eb are non-micaceous and likewise distinguished by presence and/or type of siliceous microfossil. F is equal to St. Johns spiculate paste. G refers to clays with a calcareous matrix.

Photomicrographs of some petro-fabrics:

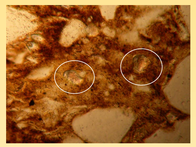
mica in fabrics A, C, Ea: NJW537, XP, 10X image width ~0.75mm



siliceous microfossils in fabrics C, D, E: fragmentary sponge spicules (ppl, 25x, image width ~0.3mm)

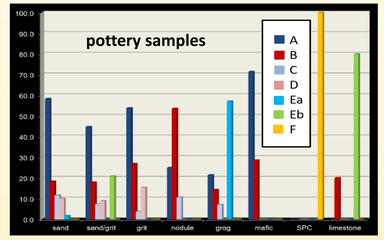


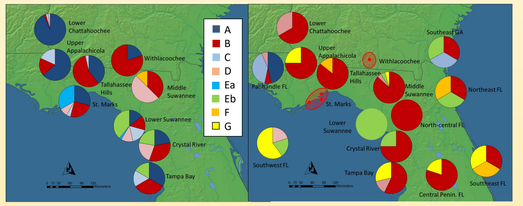
phytoliths (ppl, 25x, image width ~0.3mm)



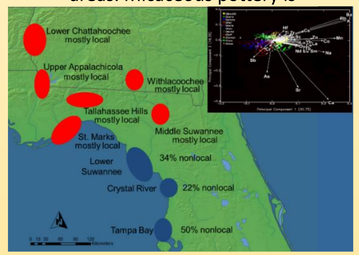
siliceous microfossils in fabrics Ea, Eb (ppl, 25x; image widths : a:~0.2mm; b: ~0.3mm)
a) diatom chain
b) UID siliceous microfossil

5. Petro-fabrics continued**.**
Most fabrics variable in temper except for St. Johns and grog temper. Micaceous fabrics A, C and non-micaceous B common among temper groups. Micaceous, diatomaceous fabric Ea occurs mainly with grog temper. Non-micaceous, but diatomaceous fabric Eb occurs with limestone and sand-grit temper. All fabric categories within pottery samples occur in the clay samples, except for Ea.

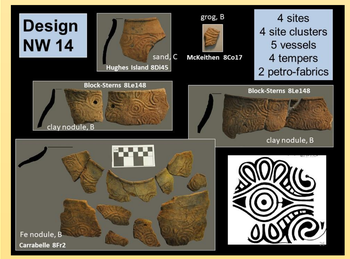




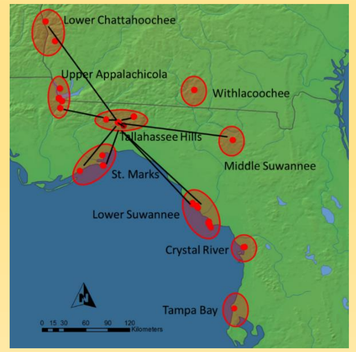
A/C micaceous clays: absent in Peninsular Florida. Most are from panhandle, west of northern site clusters. But relative abundance of micaceous pottery in these site clusters, as well as NAA data, indicate local manufacture of micaceous pottery within these areas. Micaceous pottery is certainly nonlocal to most of peninsular Florida. Non-micaceous B and perhaps D clays: at least state-wide distribution. Spiculate group F clays: also present in multiple regions. Diatomaceous but non-micaceous Eb clays: restricted to coastal counties of peninsular Florida. Calcareous fabric G clays: occur widely, but not used for making pottery.



6. Integration with designs and paddle matches
Over 400 distinct designs represented in NAA sample. 27 distinct designs have matches with ≥1 vessel lot



lot from multiple sites within and without study area, representing: **55** study samples (+ 10 not sampled); **18** sites; **6** regional clusters; **5** tempers (**all but mafic, St. Johns, limestone**); **5** petro-fabrics (**all but Eb, F); 17 temper/ fabric combinations;** and **10** unknowns
For example, the **Tallahassee Hills** regional cluster shown below shows near and far reaching connections relating: 13 designs, 36 vessels; 11 sites, 6 regional clusters; 5 tempers, 4 petro-fabrics, 11 temper-fabric combos and 1 unknown.



7. Conclusions. Paddle matches between sites within more northern clusters represent mostly exchange of paddles or movement of people among sites. Paddle matches between southern and northern clusters represent movement of actual pottery vessels from northern sites, mostly from large ceremonial centers. Interaction in or study region was dominated by (1) gift offerings of vessels transported from ceremonial centers to distant burial mounds, (2) exchange of wooden paddles to or from ceremonial centers, and (3) travels of individuals or small groups among sites on journeys that almost always included one or more ceremonial centers.

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