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The Burns Site (8BR85), located within a barrier island along Cape Canaveral, Florida, and an occupational site for people up to about 6,000 years ago, provided an excellent viewpoint into the prehistoric peoples' diet. Upon looking through their trash piles, better known as "middens", we see the discards from fish/sharks, shellfish, turtles, birds, deer, small mammals, and pretty much anything that could be hunted locally as a nutrient source from the land, Atlantic Ocean, or Indian River Lagoon system. Within this collection of food sources, there is a collection of plant-based resources that are difficult to excavate and are not always visible to a naked eye. Our goal is to test and find out what particular organic macroremains were left behind, especially in the shell midden layer, and what other resources that make up what could have been utilized within this subtropical local environment. One focus of paleobotanical study is directed towards the possibility for cultivation, and if so, what were they growing? To figure out what was being eaten and grown along side the magnitudes of animal species, we will use variable types of paleobotanical SMAP-style (Shell Mound Archaeological Project) floatation and dry-sieving methods, to look further into the organic remains found at this site. These methods would uncover the presence of seeds, burnt vegetation, wood, charcoal, and other small organic materials that could tell the story of cultivation, or even just foraging practices.

The people who occupied this region are not known for their extensive trading and connections to people in the north like other native Floridians were (Penders, The Indian River Region during the Mississippi Period). Because of this, the identification of non-local goods is significant in understanding how involved in

trade, and how many connections to varying resources Indian River region people had during the Mississippian period. For example, if excavation efforts would have turned up something as prominent as maize, it would have been a substantial connection between eastern-central Floridians and the people to the North, and/or Mesoamerica. Other factors to consider when looking for organic materials used for sustenance are the environmental variations that had occurred, and which patterns of weather were present during this indigenous occupation. For an agricultural item such as maize, the environment and soil conditions would have to be suitable for cultivation, and since these individuals were known to be mobile, or semi-nomadic, they may not have had the means to dedicate time to cultivation of items like maize, and the conditions may have been inapt. According to Andrew E. Douglass in the American Antiquarian, it could be a possibility that the semi-nomadic people located within this region could have still traveled, leaving behind planted fields to come back to later while carrying out hunting and foraging in the mean-time, typically the winter season; which is an untested settlement-subsistence model hypotheses, but with paleobotanical recovery methods, could turn out to be more likely than what was first presumed. If any field cultivations were carried out, I would presume it would be a practice for locations close to the lagoon system, which attributes access to a fresh-water resource, and more nutrient-based soil compared to the sandy earth found closer to the other side of the barrier island along the Atlantic.

For any cultural analysis, and any evaluation of sustenance, it is important to analyze what we already know about the acquirable resources, their engagement with these resources, and their utilization. What we can analyze from the size of the

shell-midden located on the Burns Site, and the fact it is still full of information even though it was half-pulverized by the United States Air Force without archaeological consideration, is that these native Floridians of this region practiced a similar cultural practice as many other native peoples of the southeast by eating plentiful shellfish from local water resources, and discarding the inedible remnants in massive collection heaps, if the shells were not otherwise used as tools. Through excavation, within Test Unit 'E' and Test Unit 'F', we were able to uncover the types of foods eaten in this region. Along with numerous shells, once belonging to a magnitude of species that were utilized as food, there was also the recovery of fish bones, small mammal bones, and large mammal bones, and even occasionally alligator, all of which are localized species. According to Thomas Penders, "bony fish made up more than 80 percent of the vertebrate diet, and included sea catfish, sea trout, Atlantic croaker, black drum, redfish, and mullet (Bellomo 1996; Deming and Horvath 1999)." Unfortunately, normal excavation and sieving methods are unable to locate some of the smaller artifacts and ecofacts, some including seeds and charcoal and the plant materials we have little information about.

Test Unit 'E' is worth mentioning in the discovery of paleobotanical remains of this period. During the excavation of this unit, there were substantial amounts of food waste including bones and immense amount of lemon-shark vertebrae, unlike any found in any local units or test-pits. The collection of food waste was so large, it could be presumed that this particular area around Unit 'E' was utilized in some way for cooking, and there was also the possible recovery of an earthen oven. The proposed earthen oven was uncovered along the west wall of Unit E, and in future

studies of this site, it would be practical to do some kind of floatation method or dry-sieving method to recover what miniscule eco-facts could be present within a soil sample in relationship to the cooking earthen-oven.

As for plants, local flora sustenance is associated in this region to mass diversity, including prickly pear cactus, cabbage palm, sea oats, and then some other plants that we know of that not only existed and could grow in this region at this time, but that were also highly utilized, maybe for reasons beyond food (Penders, The Indian River Region during the Mississippi Period). I know from other Florida Archaeology sites, like the Windover site located nearby in Titusville, that the utilization of cabbage palmetto made up majority of the textiles recovered from there, meaning that Cabbage palmetto plant was plentiful, and they could have also used the heart of palm in cooking, or also the fruit that grows from the palm tree. This is a demonstration of diverse application of flora and fauna species in this region for a magnitude of pursuits, including food, clothing, and tools.

In order to really discover the magnitude to which plants were eaten or used for projects other than textiles, botanical remains can be recovered in a floatation operational process. In Paleoethnobotany, A Handbook of Procedures, Deborah Pearsall describes the method of floatation as, "all systems by which manual agitation of a soil sample immersed in water results in botanical material being released from the soil and floating to the surface, where it is skimmed off." As for our recovery method at the Burns Site, we used a SMAP-style floatation device, which stands for Shell Midden Archaeological Project. Based off the name alone, this would be the most practical utilization method for recovery, but this method was

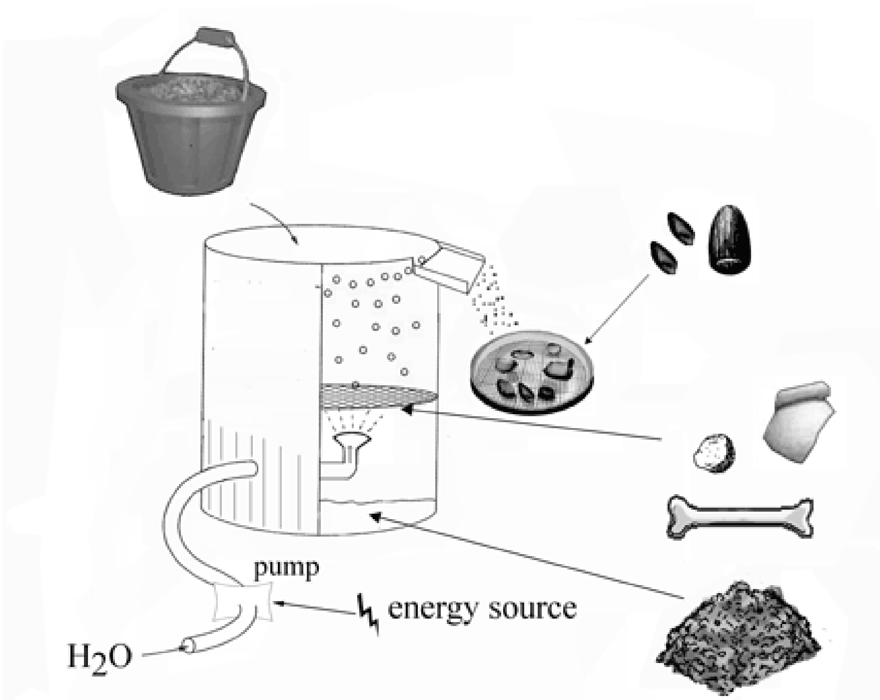
only introduced to most archaeological sites in the New World about 20 years ago, and little work has been done in terms of floatation for the soil midden matrixes that make up soil compositions across areas of the southeast Unites States of America, and has never been utilized at the Burn's Site until this year.

SMAP floatation can be carried out inexpensively and conveniently at any archaeological site. We set up our SMAP mechanism by the Cape Canaveral Air Force Station Light house, and setting up took no longer than 15 minutes. Below is an image of the SMAP set-up on the one day we used water recovery methods on three soil samples, 50, 34, and 29.

Photo by: Gabriella Siberski-Valentín

The mechanism for floatation was the construction of three buckets, essentially. Bucket A, the largest trash bin, had Bucket B suspended within it, Bucket B also having its own mesh screen on the bottom for the collection of a heavy

fraction from the soil matrix. The collection of water-surface material is made by bucket C; a small pail located on an attachment to bucket A, where the runoff is allowed by a hole, that also protrudes through to Bucket B. At the bottom of Bucket B is a hose faucet connected to the propulsion of water that can be adjusted with a turn-knob. The propulsion of water is an important utility for the separation of materials from the soil matrix, composed of organic and inorganic material. D. Q. Fuller provided a diagram online of what exactly a simple construction of a SMAP-style floatation device would look like..



Fuller, D. Q. Floatation Machines [Online image]. Retrieved March 30, 2018 from URL (https://sites.google.com/site/archaeobotany/siraf)

Using SMAP floatation, we tested Soil Sample #50 from Unit E first, the sample taken prior to the discovery of the earthen-oven context. Sample #50 was slowly dumped into Bucket B, which was filled with water and with a 1.6 mm size

screen mesh on the bottom, which protects organic particles from escaping into the even larger bucket (Bucket A) that Bucket B sits within. While the soil is being dumped, a flow of water pushes up organic materials, to which we separate into a smaller bucket (pail) from the surface with a 0.7 mm size screen mesh on the bottom, and we were able to gather a collection of samples of organic material called our light fraction and heavy fraction from the bottom of the pail and bucket. These wet materials, with the potential to become moldy, are then separated and wrapped in a cloth to keep dry for further analysis in the lab and are labeled by light or heavy fraction, and the soil sample number. This first test came out successfully, as it was carried out by multiple team members and the momentum within that mechanism allowed for adequate separation of materials.

Soil Sample #34 from Unit F was tested next, and due to buoyant soil conditions, the floatation method provided inconclusive results with absolutely no testing materials. The same soil-buoyancy difficulties were met with Soil Sample #29 from Unit E, with thick and heavy dirt sediment limiting the separation in the water- but enough material was able to be collected until we adapted a dry sieving methods for further research. According to Pearsall, she states “manual agitation may not be vigorous enough to float some dense material, resulting in incomplete recovery”, which may have very well been the issue we were facing when using water to recover our materials, even though we did have help from hose pressure. Another issue I found that Pearsall points out is that the soil sample being tested should be absolutely dry before testing, and without clumps. Alteration to soil composition can affect how organic material is separated by water, and could also

have been the issue with our soil samples, since the bags did appear to have small amounts of condensation from sitting out, and this small variable factor could have led to the negative water recovery attempts.

Soil Sample	**Results using Wet Recovery**
50, Test Unit-E	Conclusive, pending lab results
34, Test Unit- F	Inconclusive
29, Test Unit- E	Conclusive, small lab sample

Water recovery did not have desirable results, but I believe it should still be further used as a method of gathering data and information from this site. In the image provided below, there are three team members being assisted by Dr. Neil Duncan on the recovery of material from Soil Sample 50. As you can see in the image, effort was being provided by multiple people for this sample, as opposed to the other two samples tested which gave inconclusive samples. To use water recovery, future excavators should consider the floatation process being taken on by multiple individuals for the best results.


Photo by: Gabriella Siberski-Valentín

In an effort to have better results for our soil samples, we would also have to adopt dry-sieving methods that are more detailed than that of which is carried out typically by the locality of the excavation unit. The dry-sieving method is similar to the latter, but instead of one-quarter mm sized meshed screen, the more detailed sieving method will have three screens that materials can pass through, to give us more detailed recovery of the organic material not so easily perceived by the naked eye. The dry sieving samples will go through three nested screens to separate materials, the first sieve at 4mm, the second 1.5mm, and the last 0.5 mm, and this is a recovery technique that should be carried out by any future excavations on this site to avoid more loss of soil samples, as well as more participant enriched water recovery methods (Dr. Neil Duncan, on-site).

From the floatation recovery done on-site, the only certain material we were able to recovery was a peanut shell, and even then this material looked modern and could have been discards from a contemporary lunch, and without further lab analysis would we be able to fully understand and identify the amounts of plant remains discarded in relationship to the shells, bones from animals, and other materials we know people of this time were eating and utilizing.

Future preservation for this site and excavation are important for understanding this transitional culture and their relationship, if any, to the other natives around them. Diversification of pottery, tools, and food remains recovered has already revealed immense intelligence on the native people who thrived well before Spanish acquisition in this area. Quite as well, they may have had little interaction, if any (possible olive jar interaction from scavenging them from ship

wrecks) with the Spanish, and whatever information can be provided is from the native people's own remnants and without the record of written history. This site should be preserved for future generations, and future archaeologists, to delve into the splendid history of people who lived along the central east coast of Florida up to 6,000 years ago, and also should be a site of interest for paleobotnaical research, and also future water recovery methods, especially near future excavations of Unit E at the Burn's Site.

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