In Search of Earliest Bermuda:

Preliminary Executive Report on the 2022-2024 Field Seasons at Smallpox Bay and Oven Site, Smith's Island, Bermuda

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and Ty Tempalski, with Edward Schultz

A Report submitted to the Bermuda Government Department of Parks
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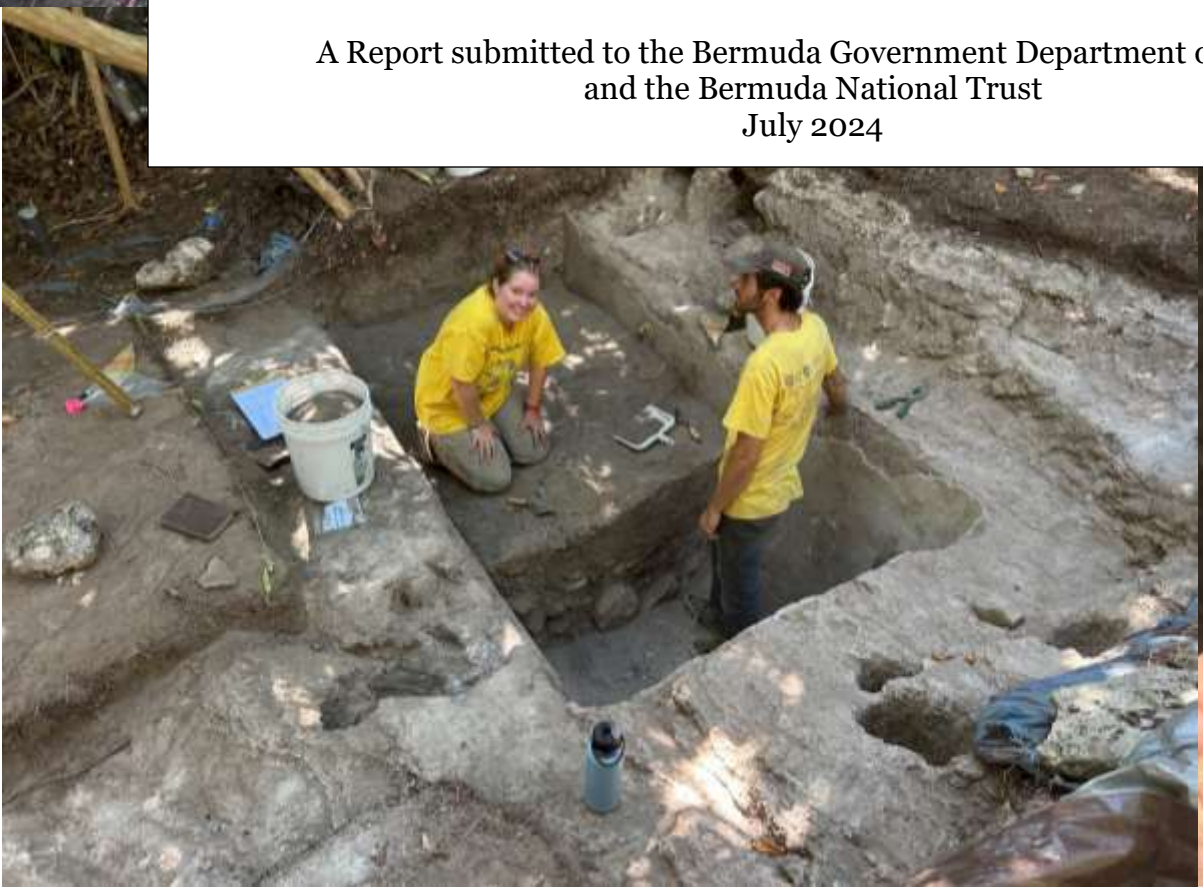

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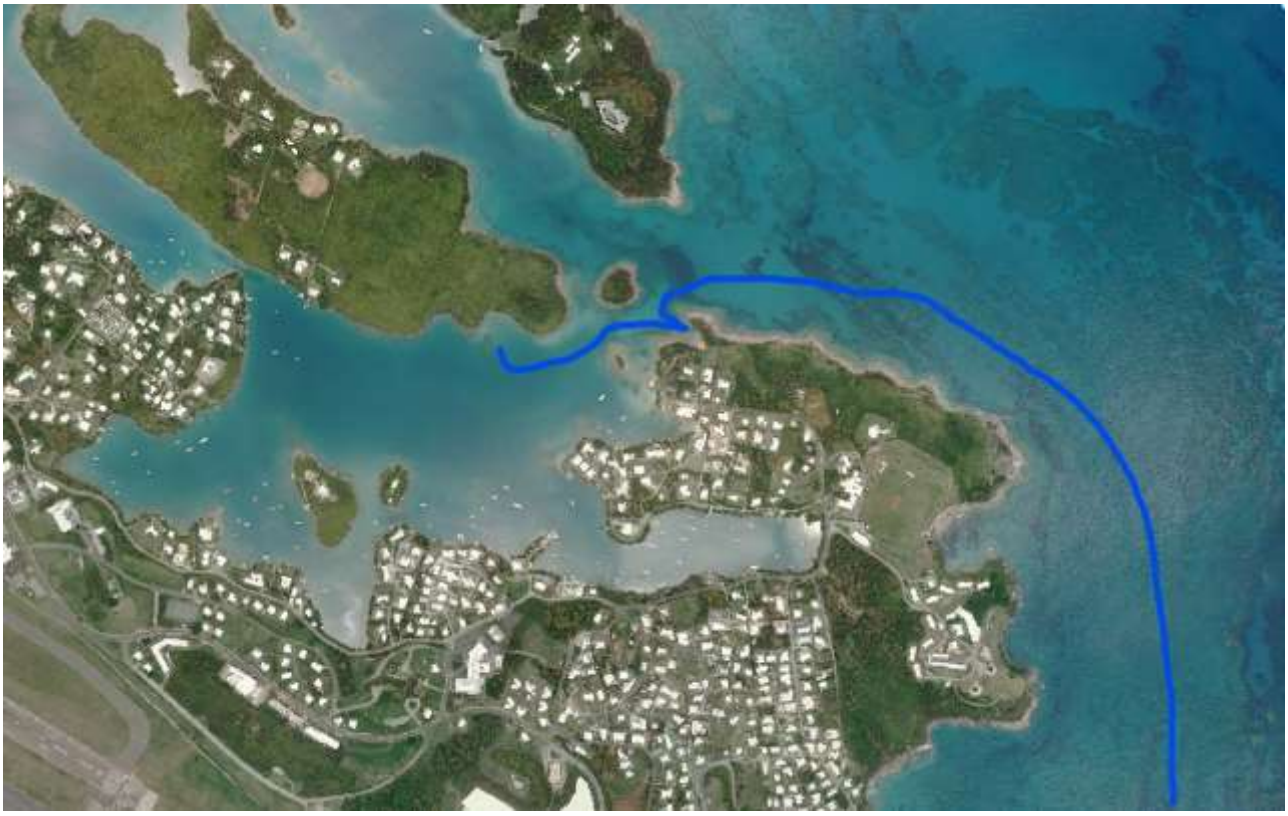


Figure 1. Probable route of the Plough*, July 1612, superimposed on a 2012 Aerial Survey (Planning Department, Bermuda Government)*

Introduction

On the morning of July 13, 1612, Governor Richard Moore came ashore with Bermuda's first sixty colonists at Smith's Island after completing a ten-week transatlantic crossing in the Virginia Company ship *Plough*. The island was already home to Christopher Carter, Edward Waters, and Edward Chard, three sailors who voluntarily stayed behind on the island after Sir George Somers' fatal 1610 visit. In the two years before the *Plough*'s arrival, the men had cleared land, built boats and houses, and planted an acre of crops as Bermuda's sole inhabitants. Moore, a Master Carpenter and London Guild member, immediately began to build houses and clear land for his capital. The settlers no doubt took advice from Carter, Chard, and Waters about how to build in this new environment, working with thick stands of cedars and peculiar limestone bedrock beneath a shallow soil cover.

If the *Plough* settlers were grouped six to a house, Moore's fledgling town consisted of at least ten buildings and, if he followed earlier precedents at Jamestown (the other Virginia colony), a large structure able to hold the entire settlement for meetings and church services would have been among the first to be raised. The governor's construction efforts were soon interrupted by a near civil war after he discovered that Carter, Chard, and Waters had found and concealed a huge lump of valuable ambergris and the *Plough*'s officers and sailors schemed to land and seize it - violently if necessary.

Moore armed and mustered his settlers to fend off the sailors' attack, but fortunately it never materialized and peace was restored.

Moore's town was well advanced when the *Plough* departed in late August or early September. Alongside housebuilding, "many of the company digged certain plats of ground, and sowed diverse sorts of seeds to make trial of the ground, and for certain they were seen above the ground sprung up the fourth day after their sowing," according to one settler's letter. "Amongst all the rest of the seeds, the Cowcumber [cucumber] and the Mellon were [most] forward. We have set and sowed fourscore and one sorts of seeds. It was ten days before the ship's coming away [the *Plough* departed], and for the most part they are all come up." Ten would-be colonists apparently opted to return to England on the *Plough* but fifty remained, including women, children, and George Keith, a Scottish clergyman. The Virginia Company instructed Moore to give each family a quarter-acre lot to farm, but he probably kept the entire group clustered in one place.

During those first few weeks, Englishmen began to transform into islanders as these urban Londoners learned to cast nets, cook turtles, harvest shellfish, burn lime and adapt traditional medieval wattle-and-daub building methods to a place without mud to use. They cooked and feasted and fished and perhaps considered themselves blessed. On August 2, 1612, they also wrote and ratified arguably the first written constitution in English America, which took the form of a Christian covenant wherein all settlers pledged to live under God and God's biblical laws, King James I, and the Virginia Company's statues. Perhaps with a fortune in valuable ambergris in mind, the compact concludes with the creation of a militia under Moore's command.

Several months into his colonial project, Governor Moore realized that Smith's Island was not big enough to accommodate his group and the farmsteads they were promised, nor did it have an adequate water supply to support their needs. By this time the group had fully reconnoitered the harbour and Moore decided to relocate his company to St. George's Island, where the *Sea Venture* castaways had already extensively cleared the cedar and palmetto forest. A new town site was chosen in a bowl-shaped valley and centered around a cove sheltered by two small islands. Moore framed a "handsome" two-story house for himself and his family while other settlers built new houses on the new site, having "practiced" at the earlier Smith's Island site and perhaps taking some of the timber they had cut with them.

Moore's "false start" town was quickly forgotten. It would seem that Carter, Chard, and Waters joined Moore's group in St. George's, abandoning their Smith's Island farmstead. Perhaps a settler or a family remained at the first town site for a while to tend the experimental garden that Moore had planted. If so, it wasn't for long. By the time a young would-be pearl diver named Norwood conducted Bermuda's first full land survey in 1616, no one occupied the First Town site. As the rest of the island became available for tobacco farming on long-term leases thanks to Norwood's survey, the hundreds of new settlers flocking to Bermuda flowed past Smith's Island and on to freehold shares in western tribes. Within a generation, Bermuda's first town site passed into obscurity and faded from memory.

Figure 2. Selected SIAP sites identified 2010-2022

Project History and Overview, 2010-2024

The Smith's Island Archaeology Project (SIAP) was created in 2010 to identify and study all terrestrial and submerged sites of human activity on the sixty-acre island and surrounding waters, including Smith's Sound, Town Cut Channel, and St. George's Harbour. By combining archaeological, archival, architectural, and environmental research, SIAP takes a holistic interdisciplinary approach to most fully understanding the experiences of the fullest range of Bermudians across more than 410 years of continuous occupation and explore cultural change as inhabitants reacted and adapted to economic, political, ecological, and social shifts across four turbulent centuries. Smith's Island was chosen for its wide array of well-preserved potential archaeological sites reflecting Bermudian responses to local, Atlantic, and global events and its robust historical documentation in maps, sketches, and printed and manuscript primary sources. Demarked on Richard Norwood's 1616 and 1663 surveys, Oven Site was among the first archaeological sites located (2010), along with the possible location of the "Three Kings'" 1610-1612 homestead. A standing stone ruin near Smallpox Bay dated architecturally to the late 18th or early 19th century was first excavated in 2013.

2021

Based on the excavation of numerous post holes in and around the Smallpox Bay ruin and observation of early 17th-century ceramics, some in post hole fill contexts, PI Jarvis revised site interpretation in 2020 from a single early settlement household to the location of Governor Richard Moore's first town. After visiting and consulting with Historic Jamestowne and digital capture and study of early 17th-century wattle-and-daub building reconstructions at Jamestown Settlement (March 2021), Jarvis undertook

new excavations around the Smallpox Bay ruin in May 2021 (as soon as COVID restrictions allowed resumption of fieldwork) in which he established the existence of multiple earth-fast structures through spatial patterning and distinctive differences in post hole size, depth, and shape. He also recovered hundreds of sherds of Surrey borderware, Werra, North Italian Marbleized Slipware, North Devon, tin-glazed earthenware, and other ceramic types found on the *Sea Venture* shipwreck and at Jamestown and other early Chesapeake archaeological sites.

Figure 3. Extent of excavations at Smallpox Bay, 2013-2017 (gray) and 2021 (yellow)

Figure 4. Selection of 17th century ceramics excavated during the 2021 season.

Extending excavations to the scale needed to identify an entire settlement promised to be a daunting venture. Extensive terraforming had occurred during the 1970s to support hydroponic farming operations and had compromised or destroyed the archaeological potential of large portions of eastern Smith's Island; it was possible that some or all of the Moore Town site had been wiped out unknowingly in order to flatten hills for greenhouses (Figure 5). Close examination of the 1962 and 1974 Bermuda Government aerial imagery and Ordnance Surveys demarked the Smallpox Bay stone structure as a ruin even then and revealed the area immediately west and south to be a mechanically farmed field. Since the commercial farm's abandonment around 1987, a dense forest of allspice, Mexican pepper, and fiddlewood trees has fully reclaimed the area and further impacted the archaeological record – an enormous flora biomass that would need to be cleared in order to survey and excavate the area.

Figure 5. 1973 Aerial Photo of eastern Smith's Island showing the hydroponic farming greenhouse complex, open fields, and farm buildings. Note the area south and west of the Smallpox Bay stone ruin was plowed fields (image courtesy Dept. of Planning, Bermuda Government)

2022

On the strength of this new evidence, Jarvis obtained a $35,000 Pump Primer II grant from the University of Rochester. In April 2022 he secured the help of Historic Jamestown Director of Archaeology David Givens and Geospatial Survey Systems, Inc. (GSSI) Lead Archaeologist Peter Leach in conducting the first ground penetrating radar archaeological survey in Bermuda in a large area south and east of the Smallpox Bay stone ruin. The results were strongly encouraging in both the efficacy of using GPR technology given Bermuda's soil and geological conditions and in revealing numerous anomalies in Smith's Island's shallow limestone bedrock surface consistent with the size and depth of previously excavated post holes. The GPR survey also located two larger anomalies thought to be pits or significant natural depressions.

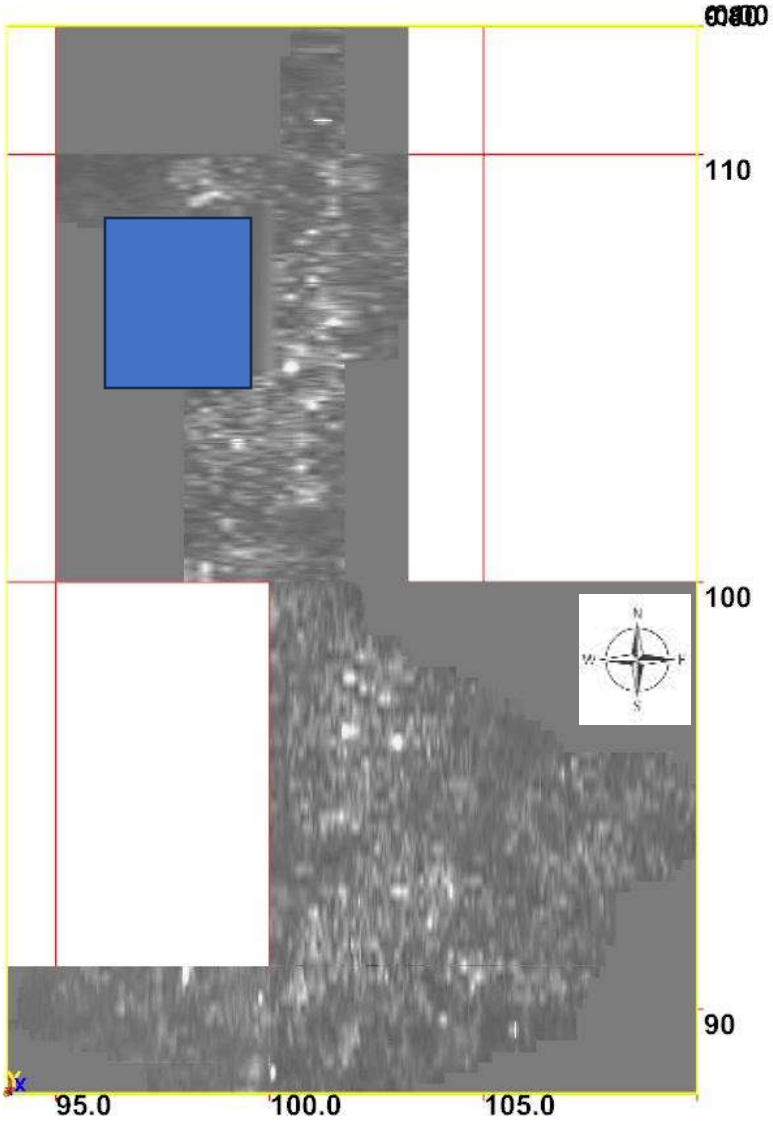


Figure 6. Ground Penetrating Radar survey image showing anomalies at a depth of 70 cm below ground surface, suggesting multiple post holes. The footprint of the stone ruin is marked in blue. Survey image courtesy of Peter Leach, GSSI.

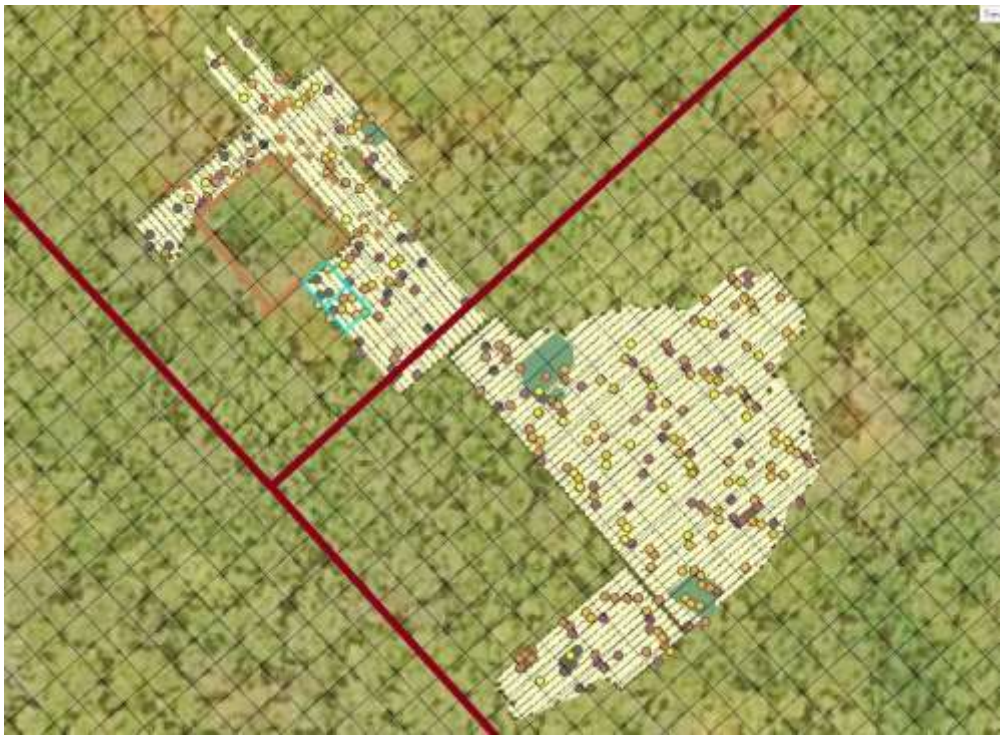


Figure 7. Radan 7 GPR Survey imagery in ArcGIS showing survey line tracks (25cm spacing) with post hole-sized (circles) and large (green) potential features superimposed on the Smallpox Bay site grid

Guided by this remote sensing data, Jarvis recruited thirteen University of Rochester and University of Southampton (UK) students and an aspiring college-bound Bermudian archaeologist to conduct a six-week excavation season in July-August 2022 directed by Ewan Shannon and Peyton Harrison. We employed an extensive Phase III clearing strategy atop the GPR survey area to literally ground-truth its located anomalies. Detailed results are reported below in the relevant site report section, but broadly speaking the excavations revealed several new lines of post holes representing additional structures while also adding significantly to the variety and count of early 17th-century artifacts – as well as providing a wealth of new information about civilian 18th-century quarantine sojourners and the periodic occupation of the whole peninsula by British Army Regiments and garrison personnel (and their wives and children) between the 1790s and 1860s.

Figure 8. 2022 field Season excavation locations (green) and new locus designations (blue lines)

Expansion of the target area led to the creation of three new 25-meter by 25-meter site grid blocks (Locus B, C, and D) to integrate new findings, with Locus A being the location of all prior excavations. Previously excavated test pits and exploratory trenches were all integrated into a new Master Site Grid system set up in ArcGIS. A total of 74 meter-square units were excavated: 10 in Locus A and 64 in Locus B.

2023

The success of the 2022 field season enabled Jarvis to apply for and obtain a National Endowment for the Humanities Archaeological and Ethnographic Fieldwork grant providing $130,000 of funding over two years, with a matching funds option that could yield an additional $40,000. Notification of funding came very late (in April 2023), leading Jarvis to convert a planned low-enrollment academic field school into a professional dig on short notice starting June 1 directed by Ewan Shannon and Hannah Chhibber. Six University of Rochester students and five professional archaeologists participated in a six-week season. Taylor Brown oversaw SIAP's new archaeology lab in the cellar of the Bermuda National Trust Museum in St. George's, which operated currently with field excavations and greatly expedited ongoing analysis and interpretation.

Running from mid-May to July 1, the 2023 season was hampered by unseasonably rainy weather – we experienced the rainiest June ever recorded in Bermuda history. Excavations focused on exposing the area between Locus A and B in order to follow along two lines of post holes, extend south to clarify a seemingly deep large feature ("Jared's Pit") that the GPR had indicated, and fully exposing and excavating a large pit indicated by the GPR survey whose edge we had found at the end of the 2022 season.

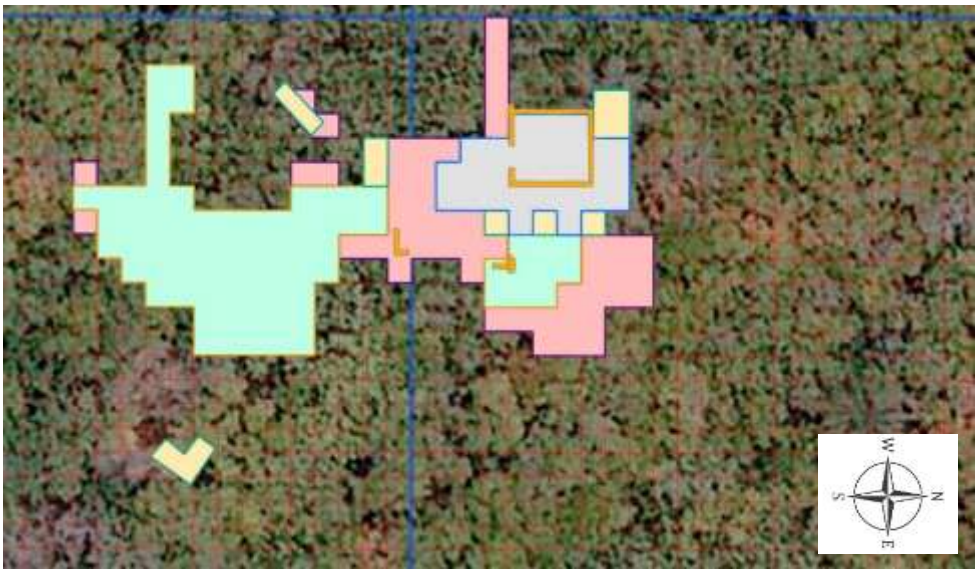


Figure 9. 2023 season excavation units (pink) linked the previously exposed areas of Locus A and B and also revealed new clusters of post holes in a western exploratory trench.

Although "Jared's Pit" turned out to be a shallow natural declivity, the large four-foot by eight-foot pit excavated principally by Supervisor Hannah Chhibber yielded some of SIAP's most significant finds to date. Filled in around 1700 and sealed by masonry wall

footings likely associated with the construction of the standing stone ruin, the four-foot-deep pit cut into bedrock contained six discrete fill layers abounding with ceramics, faunal remains and large quantities of concrete-like daub.

Figure 10. Smallpox Bay Pit feature mid-excavation, showing the second of three daub destruction debris layers. Note the 18th-century wall footing built over the feature fill to the south and a large whale rib protruding from the sidewall in the upper right area.

Three daub rubble fill layers relate to one or more very early structures that apparently survived into the 1680s or 1690s, showing remarkable durability. Daub fragments were smoothly plastered on one side (the interior or exterior surfaces) but on the other had fine-grained casts of the lathe and other structural members into which they were pressed. Many daub fragments showed layers of surface plaster (suggesting long endurance and repeated repainting) while others exhibited signs of "self-healing" akin to ancient Roman cement: visible cracks that had filled themselves in over time through the migration of dissolved lime. Vernacular building expert Larry Mills was initially skeptical that the concrete-hard fragments could date to the seventeenth century but has since actively joined ongoing mechanical, chemical, and experimental archaeology investigation into early daub creation and uses. Variations in thickness and coloration among the more than thousand daub fragments recovered strongly suggest they came from at least three different structures.

"Hannah's Pit" further yielded thousands of well-preserved fish bones of impressive size as well as three large fragments of whale bone. While the purpose of digging the pit is still not clear since it is not tarris plastered or otherwise lined, it essentially has served as a tightly sealed time capsule reflecting marine exploitation in the late 17th century as well as the final resting place of the remains of multiple early timber-framed wattle and daub structures.

2024

This season is the second of two funded through the NEH Archaeology Fieldwork grant. In fall 2023, $20,000 in external funds were raised with the generous support of the

Bermuda Aquarium, Museum, and Zoo, Mark and Mariette Smith, the St. David's Historical Society/Rick Spurling, and the St. George's Foundation/Peter Barrett, as well as individual University of Rochester alumni donors. These funds unlocked the NEH $20,000 match and enabled the purchase of a dual frequency GSSI ground penetrating radar system with specialized training in its operation. In March 2024, Jarvis and Ewan Shannon conducted GPR surveys at Smallpox Bay North and Oven Site North to guide placement of summer excavation units with strong signal results.

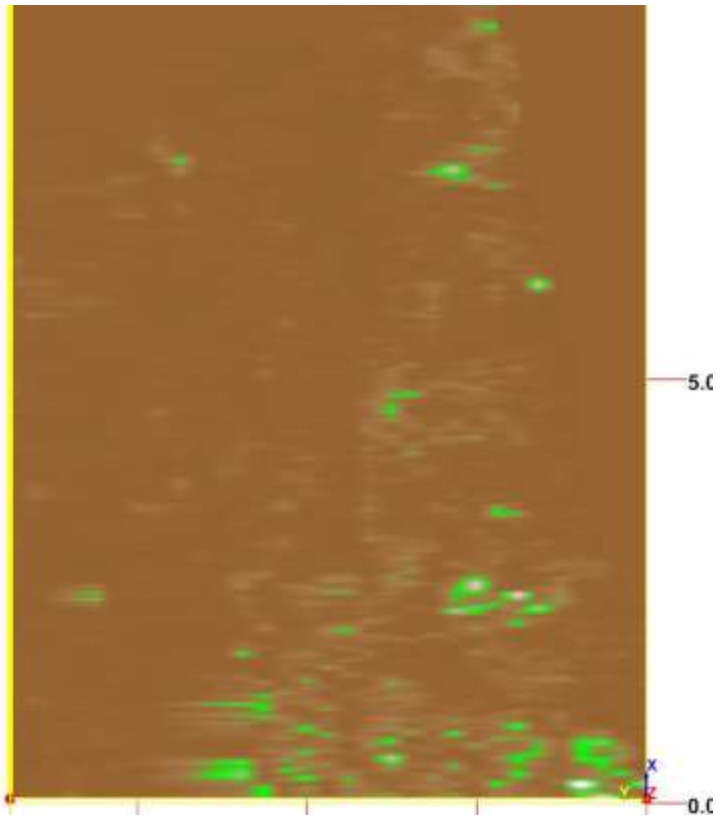


Figure 11. March 2024 GPR survey of Oven Site North (8 m x 10 m grid), Radan 7 slice of anomalies at 31 cm below surface +/- 15 cm

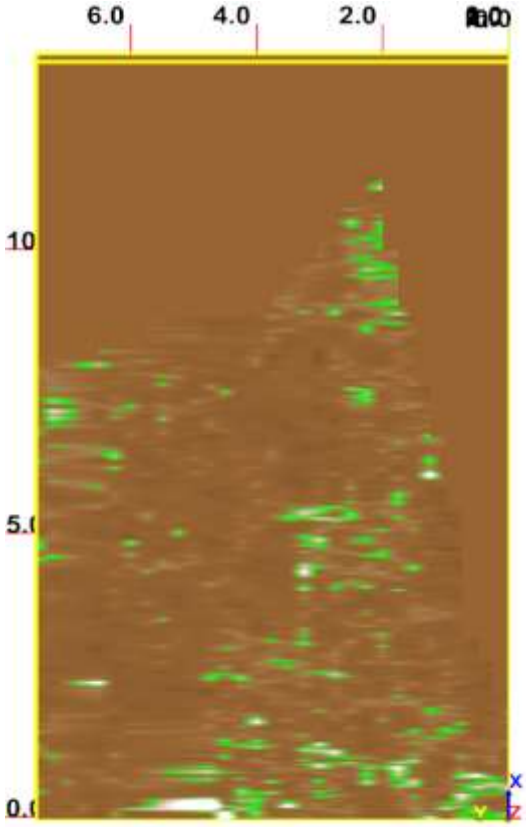


Figure 12. March 2024 GPR survey of Smallpox Bay North (8 m x 10 m grid), Radan 7 slice of anomalies at 27 cm below surface +/- 9 cm

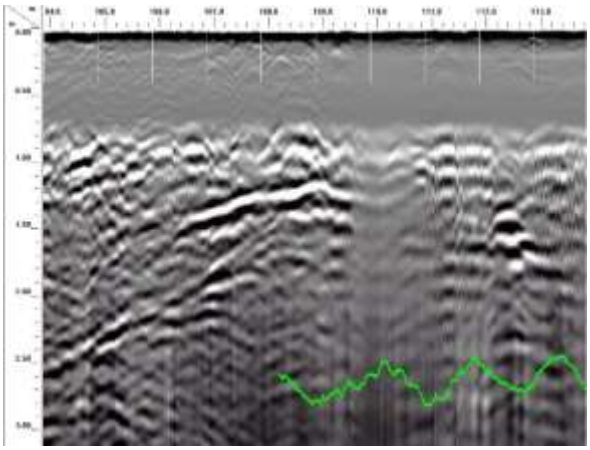


Figure 13. March 2024 GPR survey of Oven Site North, vertical survey line 21 showing bedrock surface at appx. 60cm, a signal floor of approx. 2.5 m, and surface anomalies 3-6 m along the survey track

Figure 14. SIAP Field Crew in late May wearing our famous site shirts ("not available in stores!")

The 2024 SIAP team was composed of 23 full-time archaeology interns, field technicians, and supervisors as well as specialists in lab and data management structural engineering, multispectral imaging, artifact photography, and faunal identification. The team included students and graduates from five US and three UK universities and employed two Bermudian archaeologists in leadership positions. This year's team was the largest of any SIAP groups and was ably supervised by Ewan Shannon and Xander Cook in the field while Rhiannon Flaig supervised students and volunteers doing lab work. Accommodations were secured at the Department of Youth, Sport, and Recreation's Paget Island Camp. Boats were vital for linking Smith's, Paget, and St. George's Island and were provided by the Bermuda Aquarium, Museum, and Zoo, the Island Boat Club, and Bill Zuill. SIAP processed and stored all of its artifacts at the Bermuda National Trust Archaeology Lab in the cellar of the Globe Museum in St. George's.

Field recording and excavation methods adhered to established professional standards and are documented in Jarvis, *Smith's Island Archaeology Project Field and Lab Manual* (Rochester, 2022). All contexts were manually documented descriptively with precise spatial measurements and photographed; the entirety of the Smallpox Bay and Oven sites were recorded photogrammetrically at several times during and at the conclusion of excavations to create high resolution 3D models and sub-cm resolution orthophotos for later study. All artifacts were inventoried and will be entered into the SIAP master database and particularly relevant diagnostic artifacts were photographed for later consultation. Director Jarvis consulted with ceramics expert Richard Hemery and others for the identification of ambiguous and unusual finds.

The 2024 field season ran from May 22 to June 28, with an additional ten days of artifact processing and field data curation. This preliminary report provides an overview of work and methodologies employed and an assessment of how well we realized our research goals; a more substantial interim report will follow reflecting further analysis and interpretation once artifact databasing is completed and field drawings are fully integrated into the SIAP GIS.

Michael Jarvis
Penfield, NY
July 20, 2024

1. Smallpox Bay Excavations

Ewan Shannon, Site Supervisor

Continuing our work from 2022 and 2023, we conducted excavations in three main areas of the site with two main goals in mind: 1) to continue to uncover material shedding light on undocumented realities of the site's military quarantine period, and 2) to further strengthen our claim that Smallpox Bay was the site of Moore's Town by finding evenly spaced lines of post holes that outlined the footprints of at least two buildings. Excavation was carried out in three areas: Locus A, the Locus A/B interface, and a southeastern portion of Locus B.

Figure 1.1. Smallpox Bay GIS data, including our grid system. The blue lines mark the outlines of Locus A and Locus B

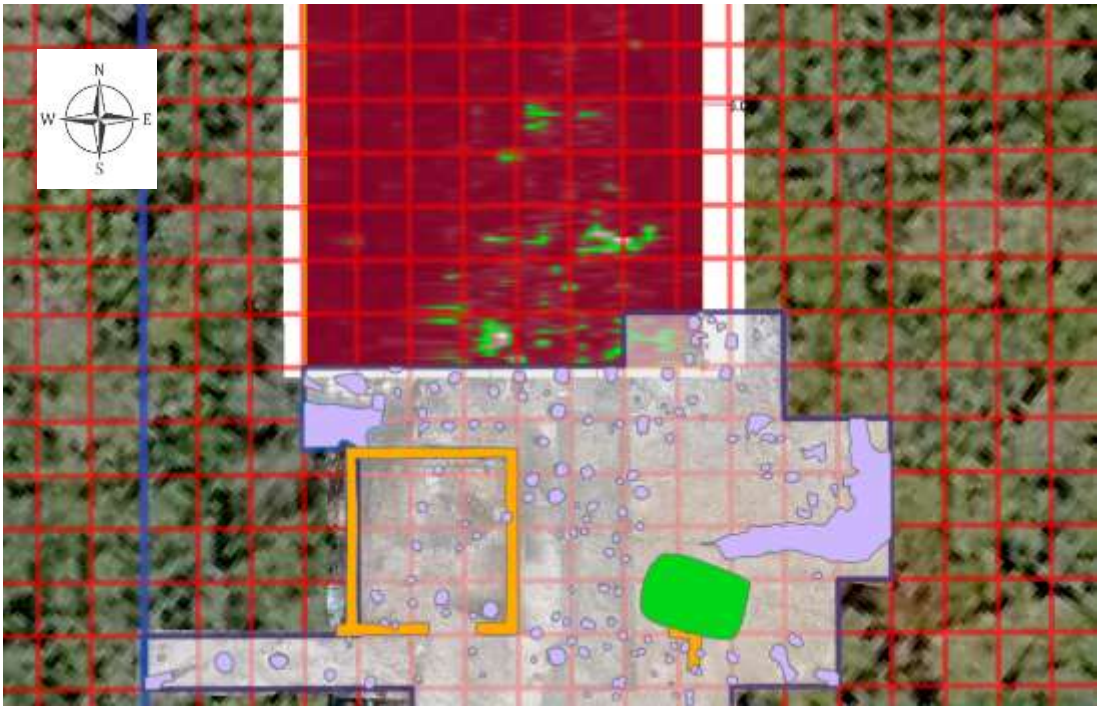


Figure 1.2. Ground penetrating radar imagery from the March 2024 Locus A survey, overlaid on GIS data showing site grid and mapped features. The standing ruin is indicated in orange.

This season, we expanded our working area of Smallpox Bay significantly. Before proper digging could begin, we first had to clear our target areas of all vegetation. Species invasive to Bermuda (mainly allspice trees) were cut down flush with the ground surface. Endemic species, including a young palmetto growing in the middle of our site, were removed and relocated to areas that would remain undisturbed. To the north, east, and west, trees were removed and the ground surface was raked to prepare the area for ground penetrating radar (GPR) survey and subsequent excavation.

GPR investigation at Smallpox Bay began in March with a survey of the area north of the standing ruin. Two additional surveys were conducted in May and July in areas east of the Locus A-B interface and west from the ruin into Locus D. Results from these surveys had mixed success; although the imaging of Locus A did identify major depressions in the limestone bedrock that were later confirmed through excavation of the area, the imaging of the Locus A/B interface proved indeterminate due to variable signal reflection off very shallow bedrock and dense root mass.

Excavations were conducted between May 20 and June 26. A total of 371 contexts were assigned and excavated across 95 units – an area nearly double that of the previous year. Over the duration of our fieldwork, we were joined by thirteen Bermudian volunteers who each dedicated at least two days to digging with the main team and contributed their invaluable work ethic and insights.

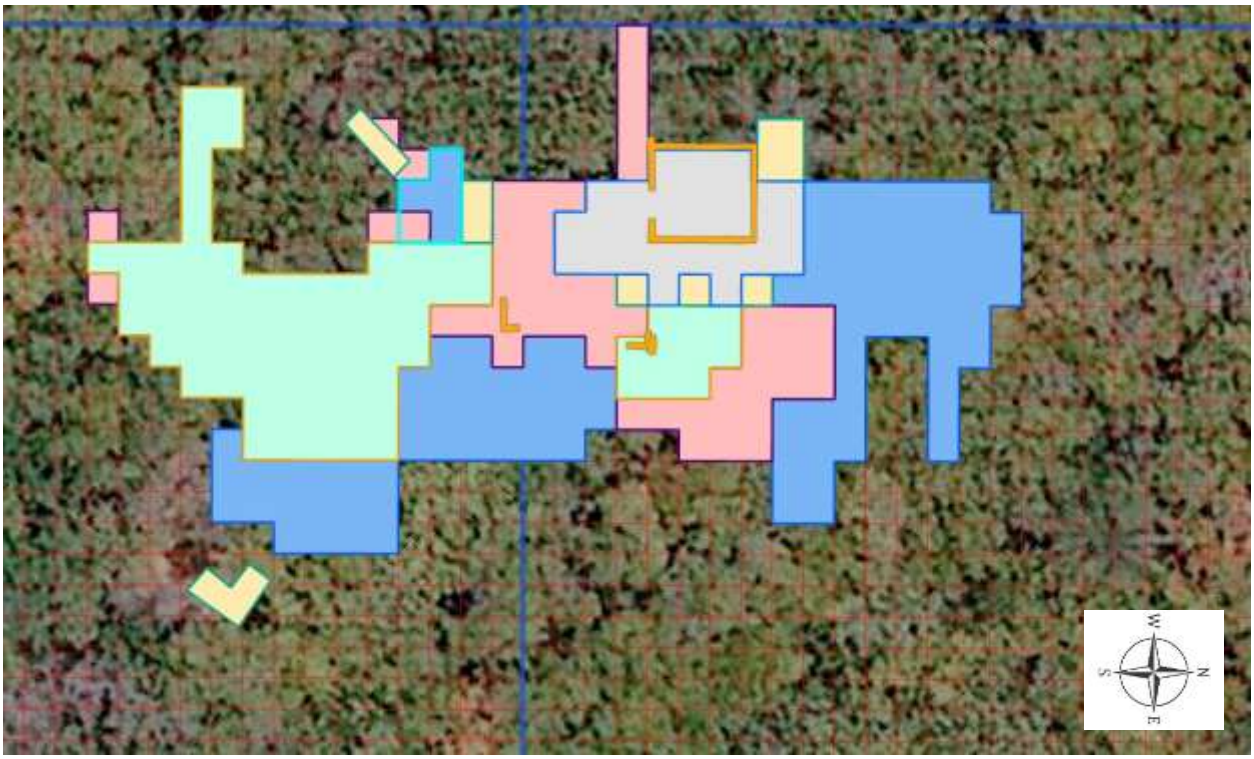


Figure 1.3. Smallpox Bay 2024 season excavations. New units are shown in blue.

Field Season	*Layers*	*Feature Fills*	*Feature Cuts*	*Total Contexts*
2024	210	108	53	371
2023	104	118	88	310
2022	156	51	34	241
2021	21	20	22	63
2017	11	26	26	63
2015	10	8	9	27
2014	12	14	15	41
2013	5	3	0	8

Table 1.1. Summary of Contexts assigned at Smallpox Bay 2013-2024. Feature fill totals exceed feature cuts because in many cases they filled natural depressions and declivities.

Continuing work from the prior two seasons, we expanded the excavation of our site following already identified features. Because a main priority of this field season was locating and defining the footprint of at least two structures, the site was expanded following the projected continuation of known posthole lines. Units were also dug in the same areas that were surveyed with GPR to confirm the survey's imaging results

Layers

Except in some areas where the topsoil surface layer (Master Context [MCxt] 001, rife with 1960s-1980s trash) could be safely shovel-shaved, all meter-square units were stratigraphically dug by hand using trowels. The second layer (MCxt002) covers the entire site and is a plow zone mixing of earlier individual strata; artifacts range from early 17th century to late 20th century and have likely shifted from their original site of deposition. The eastern portion of Locus B slopes downward from the peninsula's flat middle and the depth of MCxt 002 increases accordingly. Along the eastern edges of Locus A and B, a third layer (MCxt 141 and 432, respectively) was found below the plow zone layer. Material from this layer generally dates to the 17th-18th centuries and sealed features cut into bedrock. Soil from all layer contexts was screened through ¼-inch mesh. All recovered artifacts were sent to our laboratory in St. George for washing and inventorying.

Features

Due to Bermuda's unusually shallow stratigraphy, all features uncovered were carved directly into the limestone bedrock. After being exposed, these features were mapped in plan and excavated by trowel, tablespoon, and teaspoon. Soil was screened through 1/8-inch mesh. The entirety of the fill of six post holes was collected for flotation and incremental wet screening in our lab. All apparent features were assigned context numbers for their fill deposits; when excavation revealed them to be human-made alterations to the bedrock, we assigned an additional feature cut context number. Features that were only partially exposed and extended into unexcavated units were mapped and flagged with tape for future seasons but not excavated.

Before and after features were excavated, they were recorded using standard field forms in plan and profile. They were also photographed in order to create high-resolution photogrammetry models of them individually and across the entire site using Metashape Professional software. These models not only digitally preserve Smallpox Bay as it currently exists, but also allow us to clearly visualize the depth, shape, and layout of all excavated features and link them seamlessly to previous years' excavation plans.

As in prior seasons, all exposed areas of the site were reburied after excavations were concluded. Feature cuts were re-filled with soil after a dated coin or bottle cap was

placed at the bottom to indicate to future archaeologists when these features were previously excavated. Tarps donated by SIAP supporters were spread atop all exposed bedrock and then backfill soil was distributed across the site in an even layer over the tarps to return the bedrock surface to a previous geological equilibrium. It is hoped that the Bermuda Parks Department can plant grass over the excavated area to protect it from the regrowth of aggressive invasive plant species.

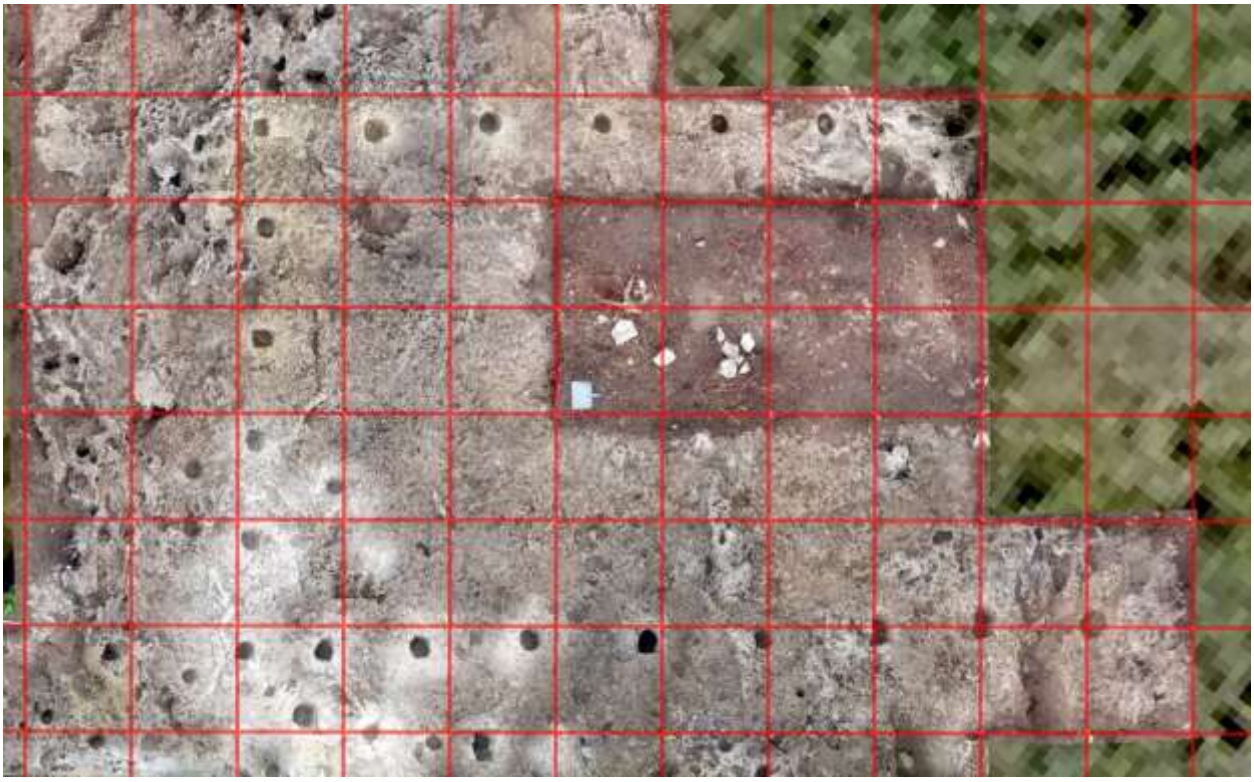


Figure 1.4. Orthophoto of Smallpox Bay Locus A, showing the array of post holes. Note the rectangular outline of a structure clearly visible.

Preliminary Interpretations

Results from the season have been promising. We met our principal goal of establishing the outline of two distinct structures. The first of these, a smaller building found in Locus B to the south of the standing ruin, is now defined and excavated in its entirety after the first two walls were identified in prior seasons. A second much larger structure has been identified in Locus A (Figure 1.4). With post holes spaced at three-foot center intervals delineating walls, this structure is much larger than we had anticipated finding at Moore's Town. Measuring 16 feet by at least 28 feet, the southern, western, and northern walls have all been identified but the eastern wall remains to be found. Two irregular double post holes in the south wall with slightly wider spacing may represent a doorway (Figure 1.5); if this doorway is symmetrically positioned, this would suggest the structure is 42 feet long. Post hole depths of 18 inches to 2 feet (not including depths cut

through the since-eroded 1612 ground surface) suggest walls of a significant height, perhaps two stories or with a high roof.

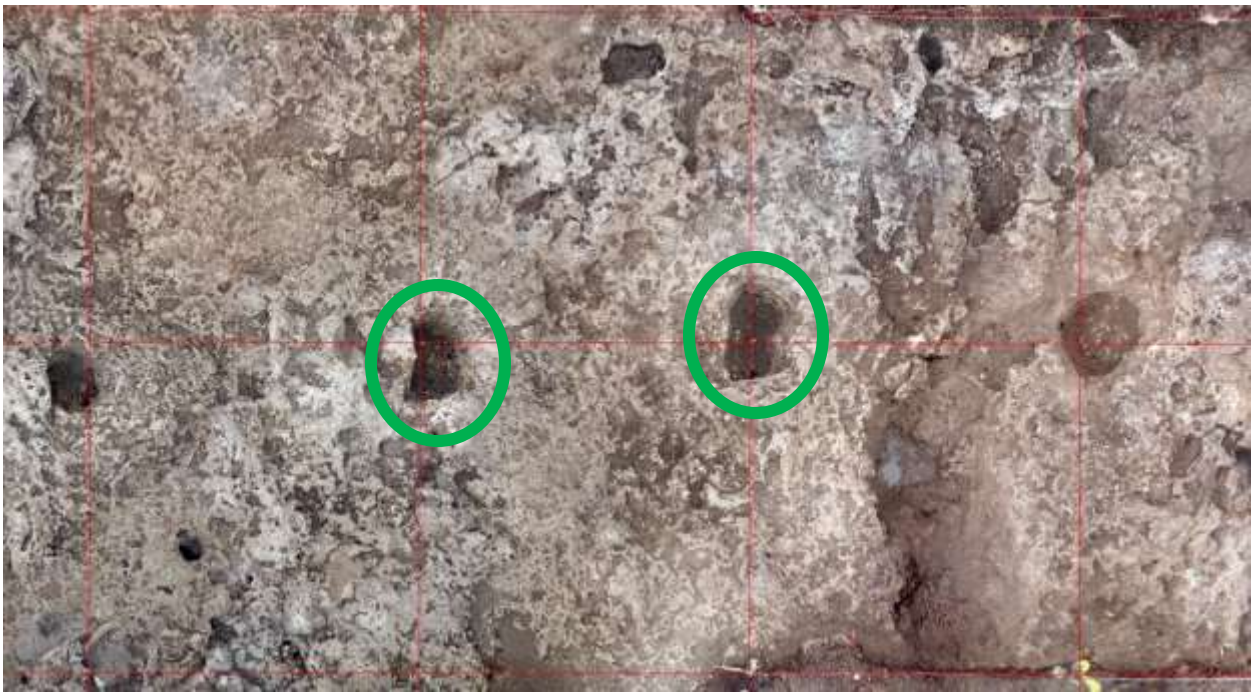


Figure 1.5. Irregular double-post holes in the northern corners of unit N9 E14, possibly representing a doorway

These characteristics suggest this large building was likely a large warehouse or public meeting house and church, where Minister George Keith who arrived on the *Plough* would have held divine services. If this interpretation is correct and based on the positioning of the 1608 church within James Fort, this structure is likely positioned at the center of Moore's Town and can help us discern the layout of the rest of the settlement.

Another find helped resolve a long-running hypothesis pertaining to the interpretation of an extensive array of regularly spaced parallel tool marks across the bedrock across much of Locus B. This year we recovered a hoe head that fit the exact dimensions of the marks chipped into the bedrock (Figure 1.6). Workers manually breaking up Bermudian soil for planting with hand hoes chipped into the bedrock surface methodically in parallel lines, producing these regular tool marks. This artifact establishes that the marks were agricultural and human-made as well as revealing at least one of the sorts of tools that early Bermudians used to clear and plant their fields. Variations in the direction and angle of the hoe marks further suggest that hand plowing was done at various times perhaps decades apart, or by different individuals working alongside each other at a single original clearing moment.

Figure 1.6. Orthophoto detail documenting tool marks running diagonally across bedrock in Locus B. Red lines demarcate our standard meter-square excavation units

Figure 1.7 & 1.8. Hoe blade recovered in plow zone layer (MCxt 002), Locus B, Smallpox Bay

Conclusion

Archaeological evidence uncovered this season reveals that the Smallpox Bay peninsula was clearly the site of Governor Richard Moore's first town, given the large number of aligned postholes representing multiple structures, the recovery of hundreds of pieces of early 17th-century material, and the lack of any other documented 17th-century occupation of the area on Norwood's 1616 and 1663 surveys. The identification of more than a hundred post holes establishes that construction was on a larger and more complex scale than previously thought.

Tentative identification of the large, still incompletely excavated building as the town's central meeting house will help guide future seasons' focus radiating out from this central location in order to discern the first town's layout. We know much about the layout of late 16th-century English plantations in Ireland; 1600s-1610s settlements in early Virginia at Jamestown, Flowerdew Hundred, Martin's Hundred, and Governor's Land; the 1607-1608 Popham Colony at Sagadahoc, Maine; and 1620s settlements at Avalon and Cupid's Cove, Newfoundland, and Plymouth, Massachusetts. Built by men, women, and children on an island without an indigenous population, how might Bermuda's first town resemble or differ from these other English colonial prototypes?

Figure 2.1. Plan of previous excavations at Oven Site 2010-2023: Green (2023) and Blue (2017) units adjoin 2024 fieldwork

2. Oven Site

Alexander Cook, Site Supervisor

Overview

During the 2024 SIAP summer season, archaeological investigations at Oven Site were resumed after a six-year pause. Excavations focused on the Cistern (first discovered in 2015) and the area north of the Oven Site Kitchen, designated Oven Site North. Oven Cistern units were positioned to extend earlier 2015 and 2017 season excavations and recover more material from this important pre-1710 site. Oven Site North units were placed to extend two test units excavated in 2023 (N 17-18 E2) and investigate anomalies revealed in the March 2024 ground penetrating radar survey. All contexts were excavated between June 15 and 25, with the exception of Cxt 269 and 270 (excavated on June 28).

Methodology

All contexts were excavated with trowels and soil sifted through ¼-inch screens. All soil artifacts were appropriately bagged, labeled with the corresponding unit information, and sent to the lab daily. Unit placement and elevation data were integrated by

extension from the Oven Site grid established in 2010, situated with a 100 meter- by 100-meter Locus A. A dumpy level was used to transfer initial datum elevation points from the original datum point (located on an ancient cedar trunk next to the oven for which the site is named) to the new excavation areas and fixed by driving nails into adjoining trees. Stringed line levels were used thereafter to calculate opening and closing elevations of layers.

A total of 50 contexts were assigned in the two excavation areas: 25 in Oven North and 25 in Oven Cistern. A total of 11 Master contexts were assigned: MCxt 201-205 represented layers while MCxt 206-211 documented feature fill and cut occurrences. The standard SIAP context sheet was used document each context and opening photos taken at the start of each unit's excavation. High-resolution photos were taken of the bedrock surface and at different stages of the Cistern's excavation to produce 3D photogrammetry models of the site for future analysis.

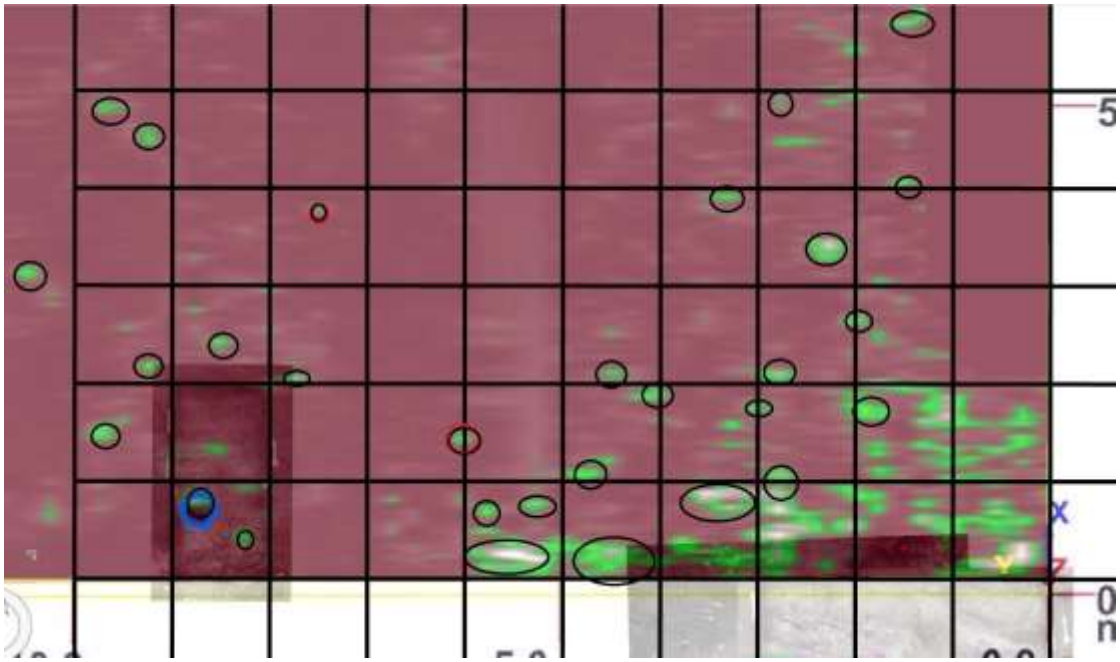


Figure 2.2. Radan 7 image of March 2024 GPR survey projected onto the Oven Site grid, with anomalies marked

Oven North

Investigation commenced with removing the backfill from the two 2023 test units and re-establishing the Oven Site grid across the target area. Due to the misplacement of the 2023 context forms, new master contexts were assigned to discernable layers in the unit side walls and soil below the flat plane (approximately 25-30cm down) where 2023 excavations stopped. This unexcavated layer was designated MCxt 203. Excavations in the N20 E3 unit were hampered by the thick root matrix of Bermuda palmetto and allspice trees.

The surface layers of Oven North were a typical 20th-century modern trash layer with few finds (MCxt 001) and a mixed 19th-20th-century layer with a wide variety of artifacts and an abundance of roots (MCxt 201). The next layer (MCxt 202) had very dark soil with medium to large limestone rubble pieces and covered the southern half of unit N18 E3. It potentially may be the fringe edge of an early 2010s spoil heap but did contain artifacts such as badly fired brick, heat treated limestone, a ceramic sherd, and a small non-native stone. This lens petered out in the northern half of N17 E3 and overlays MCxt 203.

MCxt 203 was a highly compact soil layer containing a mixture of 18th- and 19th-century artifacts. A flint flake was also recovered near the bottom of Cxt 536.

The surface of MCxt 204 was first exposed in 2023 but not excavated at the time because it appeared to be the fill of a linear feature. Our excavations revealed that the apparently man-made linear edge visible in unit N18 E2 was actually a natural vertical face that extended approximately 18cm deep before bedrock levelled out in a sloping plane in the southern section of unit N17 E3. Northern units N 18-20 E3 were excavated to investigate other GPR anomalies but did not expose any post holes.

MCxt 205 was defined by its contrasting yellow-orange colour first found in the northern edge of N17 E3. It contained few artefacts of note other than a large oyster shell found in a cleft in the bedrock. Removal of this layer exposed GPR anomalies that were all found to be natural divots in the rock or tree fossils with no artifacts (Cxt 558, 564, 565, 566). There were numerous bones within these lower layers but these are likely prehistoric or migrated downward in the stratigraphy due to rain, scavengers. or root actions.

Figure 2.3 Orthophoto Plan of Oven North excavation units showing bedrock anomalies.

Figure 2.4. Stratigraphic profile of Oven Cistern fill facing east, exposed during 2017 excavations

Oven Cistern

Investigation started with removing the 2017 backfill of previously excavated units and re-establishing the Oven Site master site grid. A 2-meter by 2-meter (N10-11 E 10-11) area was laid out east of the units excavated in 2017 and excavated layer by layer simultaneously. The surface layer (MCxt 001) and second layer (MCxt 131) contained a mixture of 19th- and 20th-century artifacts, with the most notable find being a non-native stone button (Cxt 526). Unit N10 E10 (Cxt 541) yielded a wide array of artifacts, including cross-mendable sherds of a tin-glazed earthenware hand-painted vessel and some pieces of daub. This layer's deposits relate to quarrying activities in the 18th and 19th centuries after the Captain's House had been abandoned and destroyed and seal entirely all deposits within the cistern below it.

MCxt 155 is a rubble layer that seals the cistern's vertical plastered walls and covers all feature fill layers below. It was full of cut and broken limestone fragments, daub, and quicklime pieces, suggesting a period of destruction and the earliest days of limestone quarrying. Notable finds include a copper button in Cxt 544, bones with butchery marks in Cxt 544, an abundance of Mother of Pearl shells, a boar tusk, and a roulette-stamped sherd of late 16th-century German stoneware in Cxt 547. These artifacts suggest that material in this layer may have been redeposited from other areas near the Captain's House and date to its original construction.

Figures 2.5 & 2.6. Boar's tusk (above) and large fish bone concentration (right) recovered from MCxt 155 layer of Oven Cistern fill

Figure 2.7. Oven Cistern with top of MCxt 166 exposed

MCxt 166 marked the uppermost layer of feature fill fully contained within the walls of the cistern, so the decision was made to slightly extend unit sizes to 100 cm by approximately 140 cm as N10+ E 9-10. Artifacts included fish scales (Cxt 552), a coarse earthenware pipestem, large bones with butchery marks, and sherds of low-fired micaceous ceramics (Cxt 554).

The soil in MCxt 169, the next layer, contained numerous charcoal flecks that in some places discolored the soil and contained some very large pieces of coarse red-bodied lead-glazed earthenware in hollow-ware forms and a substantial amount of mother of pearl shell. Sherds from at least two coarse earthenware bowls cross-mended between the two contexts and were thus deposited at the same time. Excavations revealed a large hole had been cut through the waterproof lining plaster into the northern wall in N10+ E9. The fill of this hole was later excavated on June 28 and treated as a horizontal feature. Interpretation of this layer can be that of burning trash or material associated with food preparation. The southwestern corner of this layer contained a substantial concentration of mother of pearl shell and fish bones, supporting the interpretation that this was a food preparation disposal layer.

Figure 2.8. Emily English excavating the feature cut into the northern face of the Oven Cistern

MCxt 171 had the same soil color profile as the layer above but had increasingly dense concentrations of limestone rubble pieces as well as a massive piece of daub, absent in the layer above. Artifacts included burnt bone and continued abundance of mother of pearl shells (Cxt 560).

MCxt 172 was a rubble-filled loosely packed soil layer sealing the final layer of the cistern. This layer had many artifacts, including daub, several large bone fragments, heat treated limestone, and small sherds of semi-glazed and engobe early white salt-glazed stoneware cups or mugs dating to the 1680s or 1690s, all found in Cxt 563. The presence of daub logically associated with the destruction of the Captain's House suggests that the cistern was filled in after the house was destroyed, enabling structural wall fragments like daub to be deposited. Heat-altered limestone fragments may indicate that the Captain's House was destroyed by fire or, alternatively, that they are derived from limestone burning to make quicklime in the early quarrying period.

MCxt 175 was the bottom-most layer of Cistern feature fill and was composed of mottled lighter-colored soil and exceptionally large limestone rubble and rock fragments, including several stones that were cemented to the cistern's bottom with dissolved and hardened quicklime (Cxt 567 and 568). This layer also contained a large dorsal whale vertebrae with butchery marks, high concentrations of very large fish bones and mother

of pearl shell, and additional pieces of the 1680-1690s white salt-glazed stoneware. The original bottom surface of the Cistern was flat and smooth and plastered with tarris cement (a mixture of brick dust, sand, slaked lime and quicklime) and designed to hold water. Hard-set quicklime residue atop this surface indicates that after the cistern ceased to be used to store water, it served a final purpose of being used to slake quicklime fired in a nearby but as yet undiscovered limekiln.

Examination of the sidewalls of the Cistern shows that it had been repaired and replastered on at least two occasions (Figure 2.9), suggesting that it had a considerable lifespan. The most recent replastering was done with a limestone "tarris" slurry with a considerably concentrated brick dust composition.

Figure 2.9. North face of Cistern interior, showing multiple plaster patching episodes

Conclusions

The Oven Site Cistern continues to be exceptionally bountiful in both its artifacts as well as its potential for further research. The large variety of intriguing artefacts such as a boar's tusk, coarse-earthenware pipe stem, large quantities of ceramics, and vast assemblage of pelagic faunal material reflects Oven Site's early and extended period of habitation. Future analysis can shed light on occupation and activities across the first five generations of Bermuda's colonization as well marine ecological conditions and human exploitation strategies in the 1690s and 1700s when the Cistern was filled in.

Although excavations at Oven North did not reveal post holes marking the location of the still-elusive Captain's House, they were useful in helping to determine natural and man-made anomalies in the GPR data. A large area of the survey still remains to be archaeologically tested. The presence of an oyster shell in the lowest layer of N18 E3 reflects early consumption of marine life and, with the proximity of the Cistern, is suggestive that the Captain's House is nearby.

Figure 3.1. Entry room of the BNT Archaeology Lab

3. SIAP Archaeology Laboratory Methodologies and Preliminary Assemblage Summary

Rhiannon Flaig, Lab Supervisor

This season, the lab processed its greatest volume of contexts to date. Lab operations had three main goals this season: 1) to handle the significant intake of artifacts from contexts during the largest and busiest season in SIAP history, 2) to begin re-inventory and analysis of prior seasons' contexts in order to standardize data across all years of fieldwork, and 3) to re-house all material into new boxes for prolonged storage and easier future analysis. Additional goals included formulating better uses of space within the BNT Globe Museum archaeology lab, incorporating new processing techniques, and creating more streamlined interactions with Bermudian volunteers

Full-time lab personnel consisted of Rhiannon Flaig (lab supervisor), Ty Tempalksi (faunal analyst), Heidi Klein (artifact photographer), a rotating slate of field

archaeologists doing mandatory lab work placements, and more than a dozen Bermudian volunteers that included three near-full-time participants. Volunteers and rotating field archaeologists cleaned artifacts sent in from Smallpox Bay and Oven Sites while archaeologists and trained volunteers created itemized inventories of washed and dried artifacts by context. Tempalski, the faunal analyst, assisted the lab supervisor in pulling contexts from previous seasons for analysis and also inventoried faunal material coming into the lab during this season's excavations. Klein photographed notable finds from the 2024 season as well as specific artifact types from past seasons associated with the military-period and early occupations of Smallpox Bay.

During the 2024 SIAP season, the lab processed 367 layer and feature fill contexts: 319 from Smallpox Bay and 48 from Oven site. Ten Bermudian volunteers helped process artifact intake, four of whom were consistent returnees and became very proficient in lab methods by the end of the season.

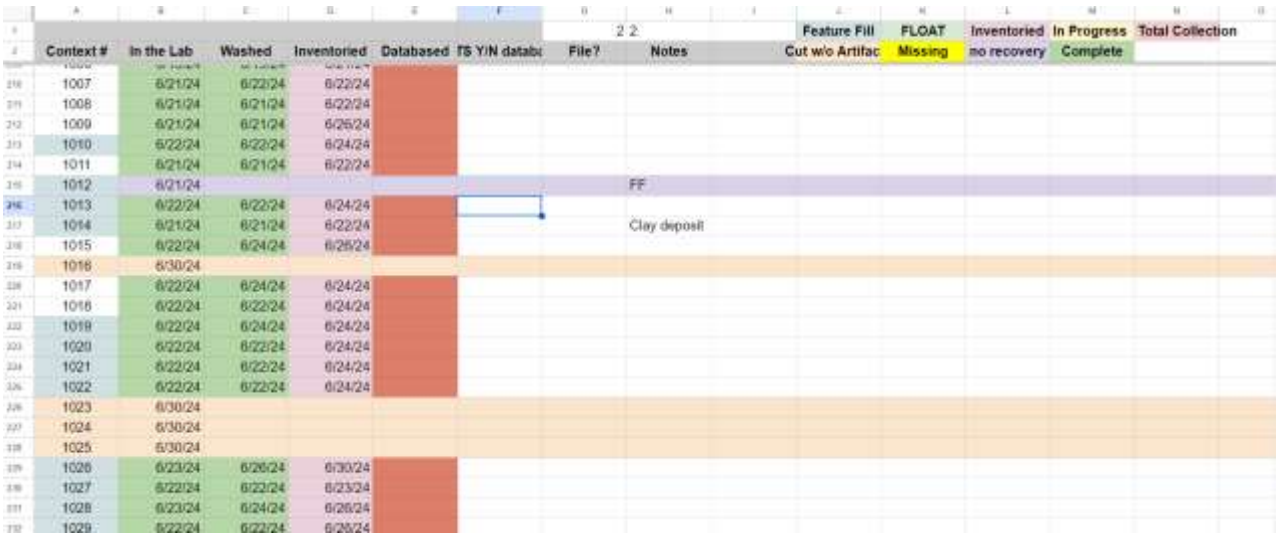
Site	Total Contexts	Total Features	Floatation samples collected	Flotation Samples processed
Smallpox Bay	319	108	15	7
Oven Site	48		1	0

Table 3.1: Types of contexts that came through the lab

Processing Protocols

Lab processing begins when artifacts come in from the field. Bags containing artifacts from each completed context were transferred to the lab daily and entered into a spreadsheet tracking log. This tracker is used to monitor each context through the entire processing system, including contxt type, arrival, washing, artifact and faunal inventorying, photographing, databasing, and long-term storage location (Figure 4.2).

Once entered into the tracking database, each context was sorted and prepared to be washed. Artifacts were washed using water and brushes to remove dirt and residue. The wet material was laid on screens for at least one night to dry. Artifacts that were not suitable for wet cleaning such as quicklime and fragile bones were dry brushed and laid out on trays away from wet material.



						2 2		Feature Fill	FLOAT	Inventoried	In Progress	Total Collection	
Context #	In the Lab	Washed	Inventoried	Databased	TS Y/N databa	File?	Notes	Cut w/o Artifac	Missing	no recovery	Complete		
1007	6/21/24	6/22/24	6/22/24										
1008	6/21/24	6/21/24	6/22/24										
1009	6/21/24	6/21/24	6/26/24										
1010	6/22/24	6/22/24	6/24/24										
1011	6/21/24	6/21/24	6/22/24										
1012	6/21/24						FF						
1013	6/22/24	6/22/24	6/24/24										
1014	6/21/24	6/21/24	6/22/24				Clay deposit						
1015	6/22/24	6/24/24	6/26/24										
1016	6/30/24												
1017	6/22/24	6/24/24	6/24/24										
1018	6/22/24	6/22/24	6/24/24										
1019	6/22/24	6/24/24	6/24/24										
1020	6/22/24	6/22/24	6/24/24										
1021	6/22/24	6/22/24	6/24/24										
1022	6/22/24	6/22/24	6/24/24										
1023	6/30/24												
1024	6/30/24												
1025	6/30/24												
1026	6/23/24	6/26/24	6/30/24										
1027	6/22/24	6/22/24	6/23/24										
1028	6/23/24	6/24/24	6/26/24										
1029	6/22/24	6/22/24	6/26/24										

Figure 3.2. SIAP Lab Artifact Context Lab Tracking Database

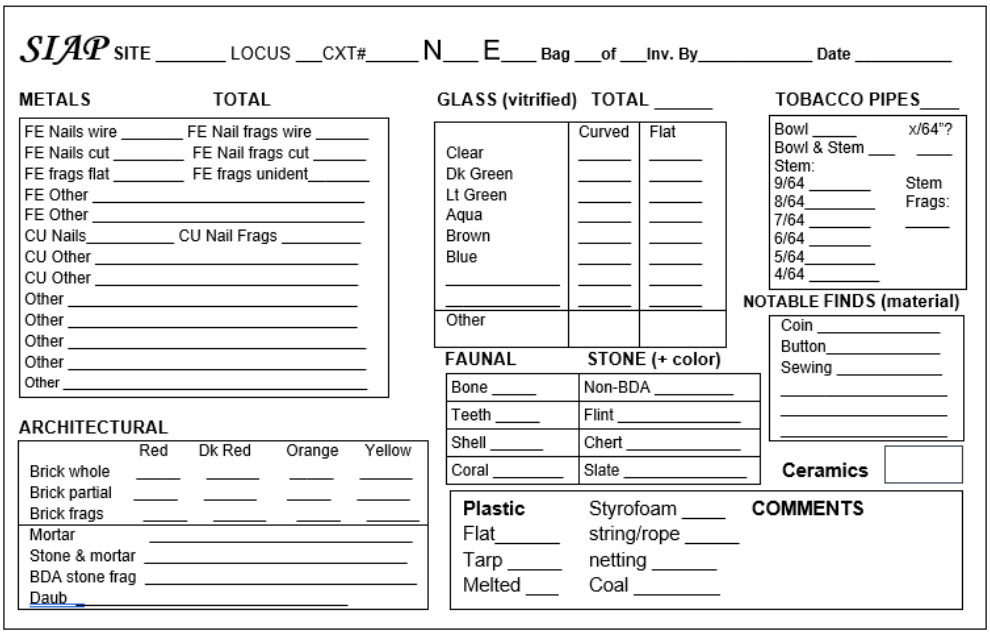
This year SIAP purchased two ultrasonic cleaners to assist in the washing of artifacts for improved efficiency and in order to reuse water given the need for conservation in Bermuda. Through a rigorous testing process, the lab manager determined the types of material that could be safely processed in the ultrasonic cleaners and optimal intervals for cleaning different items. It was quickly discovered that tin-glazed earthenware's fragile glaze sometimes flaked off in the cleaner so was accordingly removed and washed by hand. Other material such as brick, coarse ceramics, and bone were durable but did not clean well in the ultrasonic cleaner, which could not shake soil off their irregular texture. Porcelain, stoneware, and refined earthenware however did exceedingly well in the cleaners, as did teeth and mother of pearl shells. At the beginning of trials, artifacts were left in the cleaners for 20 minutes. Over time, however, we discovered that 10 to 15 minutes was the ideal interval. Trials on metals were inconclusive. Ferrous objects did not have a noticeable change in appearance after cleaning and further testing is required.

In addition to standard artifact washing, the lab also conducted floatation and graduated wet-screening of total soil collections done in the cases of feature fill and contexts of particular significance. In these cases, all of the soil in the feature or context is collected and sent to the lab to be analyzed for small artifacts that would otherwise be missed in field 1/8-inch mesh screening. To begin the floatation process, the soil is wet-sifted through a graduated screen with 7 mm, 5 mm, and 3 mm mesh sizes and the floating "light fraction" is removed with a fine hand strainer from the top. All recovered material is then moved to muslin cloth and dried for 2-3 days. Once dry, artifacts are picked out from among natural material and inventoried by size group. Because artifacts such as small teeth, seeds, and otoliths are too small to catch during a normal field

screening, floatation and total soil collection enables SIAP to sample ecofacts and small artifacts that would otherwise be missed.

Figure 3.3. Floatation and fine-screen processing: 3 mm mesh recovery awaiting the "picking" stage

Once all artifacts have been completely dried, lab workers systematically inventory all artifacts in each context. The standardized SIAP inventory sheet divides artifacts into material group categories and subgroups based on physical and use attributes.


SIAP SITE _____ LOCUS ___CXT#_____ N___ E___ Bag ___of ___Inv. By_____ Date _____

METALS TOTAL

FE Nails wire _____ FE Nail frags wire _____
FE Nails cut _____ FE Nail frags cut _____
FE frags flat _____ FE frags unident_____
FE Other _____
FE Other _____
CU Nails_____ CU Nail Frags _____
CU Other _____
CU Other _____
Other _____
Other _____
Other _____
Other _____
Other _____

ARCHITECTURAL

	Red	Dk Red	Orange	Yellow
Brick whole				
Brick partial				
Brick frags				

Mortar _____
Stone & mortar _____
BDA stone frag _____
Daub _____

GLASS (vitrified) TOTAL _____

	Curved	Flat
Clear		
Dk Green		
Lt Green		
Aqua		
Brown		
Blue		
_____		
_____		
Other		

FAUNAL

Bone _____
Teeth _____
Shell _____
Coral _____

STONE (+ color)

Non-BDA _____
Flint _____
Chert _____
Slate _____

TOBACCO PIPES____

Bowl _____ x/64"?
Bowl & Stem ___ ____
Stem:
9/64 _____ Stem
8/64 _____ Frags:
7/64 _____ ____
6/64 _____
5/64 _____
4/64 _____

NOTABLE FINDS (material)

Coin _____
Button_____
Sewing _____
_____
_____
_____

Ceramics

Plastic
Flat_____
Tarp _____
Melted ___

Styrofoam ____
string/rope _____
netting _____
Coal _____

COMMENTS

Figure 3.4. SIAP Artifact inventory sheet, front

Porcelain (P)		
Ch Blue underglaze	Chin Plain	Eur Soft
Ch Poly overglaze	Chin Brown	Porc. unid
Stoneware (SW)		
Rhen BR	WSG plain	Notts
Rhen GR	WSG engobe	Bristol ginger
WWD plain	WSG mold	Derby (19th dry)
WWD BL	WSG Scr BL	19th c other
WWD BL-Purp	Mid Purp	
WWD Sprig	Fulham	SW unid
Coarse Earthen (CEW)		
CE R no glaze	TGE no glaze	BGR
CE buff no glaze	TGE plain	Iberian coarse
CE GR no glaze	TGE BL	Metrop.
CE R lead glaze	TGE Poly	N Devon plain
CE buff lead glaze	TGE pink body	N Devon sgraffito
CE GR lead glaze	Red Ital Marb	Werra
SBord Green	Staff mottled	Buckley
SBord BR	Staff combed	
SBord Y	Staff slip/dot	CE unid
Refined Earthen (REW)		
CW plain dark	PW TP BLK	WW plain
CW plain	PW TP GRN	WW HP
CW HP	PW Sponge	WW TP
CW molded	Jackfield	WW flow BL
CW sprig	Whieldon	Annular band
PW plain	Astbury	Annular, mocha
PW mold edge	Black Basalt	Annular, roulette
PW HP BL	Rosso Antico	Annular, marble
PW HP Poly	Yellowware	Annular, cable
PW TP BL	Canary	Annular eng turn
PW TP BR	Agate	Annular, other
PW TP Red	Sunderland	Rockingham
PW TP Purp	Lusterware	REW unid
Other/diagnostic attributes: Rev 2024		**CONTEXT #** **Ceramics Total**

Figure 3.5. SIAP Artifact Inventory, back (Ceramic types)

When identifying and categorizing artifacts, notable finds are particularly flagged on the inventory sheets for photography and follow-up analysis. After each artifact group is counted, they are labeled and bagged separately by material and placed within a processed context bag and logged as inventoried in the lab tracker. Contexts are thereafter boxed numerically or separated into layer or feature groupings for further analysis.

One of the goals this season was to improve the storage space for our collections by improving environmental conditions and making it easier to access specific material for study. Thanks to the generosity of the Cook family, the Bermuda National Trust was able to purchase an industrial dehumidifier capable of servicing the entire Globe Cellar. This unit lowered the humidity level in the lab space in order to both improve working conditions for lab personnel and prevent mold and the degradation of artifact storage boxes. The BNT also purchased new standardized storage boxes to provide dry and

consistent placement for collections. The boxes were arranged on shelves to prolong their integrity and make it easier to find specific materials. Further planned improvements include substituting rigid plastic banker boxes for the current cardboard ones and creating a larger curatorial shelving arrangement in the lab's northwestern room to house all BNT-affiliated archaeological site assemblages.

Smallpox Bay

This site has produced the widest variety of different artifact types across the widest range of time periods. Surface layers often contained high concentrations of modern materials such as plastic, whiteware, wire nails, agricultural netting bags, car parts, brown beer bottles, two shoe soles, and other modern trash. Mixed among these modern artifacts were pieces of older ceramics and pipestems that provide evidence of soil disturbance, notably plowing during the 1960s-1980s farming period. Locus A yielded a higher concentration of flat plastics and debris from hydroponics farming, including planting labels; especially in its southeastern corner and at a trash pit in the center of the grid, Locus B yielded high levels of melted plastic and wire.

Evidence of military occupation is apparent throughout the entire site. Numerous regimental, Royal Engineers, and Royal Artillery buttons were found, as well as gunflints, lead shot, and a Hussars' uniform chin strap (identified with the help of Edward Schultz).

Figure 3.6. 20th Regiment button (old style) from Locus B; other buttons have the number "20"

Surprising evidence of civilian presence includes civilian bone and copper-alloy buttons, fragments of broken jewelry, mother of pearl fan blades, clay and stone marbles, porcelain doll parts, a copper-alloy toy cannon barrel, and other children's toys. The fill from features cut into bedrock such as post holes appears to be undisturbed soil. While most such features contain no artifacts (consistent with being made at the dawn of settlement, before items were broken or lost and able to be deposited within them), some post holes had bone, shell, charcoal, architectural material, and coarse earthenware ceramics.

Figures 3.7-3.9. Artifacts reflecting the presence of women and children at Smallpox Bay during 19th-century military quarantine occupations include buttons (above), broaches, fan blades, sewing items, beads, and a bone-handled hairbrush (right). Evidence of children (below) includes a toy cannon, marbles and a broken "Frozen Charlotte"-type porcelain doll arm. Photos by Heidi Klein.

The ceramics found at Smallpox Bay vary greatly in type across both loci. Many types of stoneware were present. Early wares include Rhenish gray and brown, Westerwald, Fulham, and as-yet-unidentified dry bodied proto-stonewares. Later wares include

white-salt-glazed turned and molded, Nottingham, Derby, and Bristol ginger. Coarse earthen wares were numerous and predate the military occupation period. The most common wares were Surrey borderware, North Devon plain and sgraffito, Tin glazed and black glazed earthenware, Staffordshire manganese mottled and dotted slipware, and post-medieval London redwares. It is notable that Metropolitan ware, North Devon gravel-tempered, Buckley ware, and other mid- to late-17th-century coarse earthenware ceramics were not encountered. Among refined earthenware types, creamware, pearlware, various annularwares, Jackfield, and whitewares predominated.

Oven Site

Oven Site North and Cistern yielded a variety of artifacts that largely contrasted with those found at Smallpox Bay, which is not surprising given that its dates of occupation (1615-c.1712) straddled that of Smallpox Bay (1612, 1740-1870, 1960-1987). Oven Site North produced relatively few artifacts and none from features.

Figure 3.10. Daub, bone, shell, stoneware and earthenware from Oven Cistern MCxt 172

In contrast, the Oven Cistern fill contained a large volume of artifacts, with a majority of these being bone and shell reflecting food consumption. That the majority of shell included mother-of-pearl fragments might also indicate the disposal of waste from using this material to manufacture buttons and other decorative items. Whale bones were also present in the cistern's lowest layers, perhaps associated with rendering oil to mix with lime in order to create mortar.

The Cistern also had a high concentration of architectural material. Daub, brick, and mortar were present in almost every context. There were also iron artifacts such as hand-wrought nails and other unidentified fragments but these were low in number.

Ceramics recovered in the Oven Cistern fill were entirely stoneware and coarse earthenware. Rhenish brown, early engobe white salt-glazed stoneware, and tin-glazed earthenware were the most common ceramics processed in the lab, although several very large sherds of two lead-glazed bowls or pitchers were also found.

In general, Oven Site's assemblage had a much smaller volume of ceramics than at Smallpox Bay, as well as a smaller number of domestic artifacts. On the other hand, the Cistern's faunal assemblage was considerable, with much larger fish specimens in better condition than those found at Smallpox Bay.

Figure 4.1. Fragment of a whale rib with butchery marks, Oven Cistern Cxt 560. Photo by Heidi Klein.

4. Preliminary Faunal Analysis

Ty Tempalski

During the 2024 field season, I was recruited onto the SIAP team as a faunal analyst to undertake identification and close study of faunal material as it was recovered as well as to begin analysis of material recovered at Smith's Island sites in previous years. Due to time constraints, my research concentrated only on contexts that were particularly relevant to the project's research goals and principal focus on the 17th-century. From among SIAP's very large faunal assemblage, priority was placed on the 1640s-1710s earthen floor of the Oven Site Kitchen (MCxt 006 and 009) excavated 2010-2015 (not discussed in this report), contexts linked to a large deep pit at Smallpox Bay excavated in 2023 (N 5+ E 10+ & 11+, "Hannah's Pit"), and all Smallpox Bay feature fills, particularly those believed to be post holes.

Reference materials utilized in my analysis included Reitz and Wing (2007), Sterrer (1992), Beisaw (2013), Broughton (2016), Cannon (1987), Fricke (2016), Schmid (1972), Gilbert (1990), and Hillson (1992), as well as the comparative faunal type collection

housed in the Bermuda National Trust archaeology lab and two Cahow skeletons housed at the Bermuda Aquarium, Museum, and Zoo.

The process of faunal analysis begins with a categorization of the elements represented in a specimen whenever possible, ideally taken to the species level. 'Specimen' refers to any individual fragment of bone recovered through excavation. 'Element' is the bone or tooth from which a specimen originated. Although rare in archaeological contexts, a specimen that is an entirely intact bone is also an element. Elements and specimens representing elements were sorted by side when attributes allowing for this were present. Any taphonomic (post-mortem) processes detected on specimens such as butchery marks, burning, or weathering were recorded, as were discernable relationships between bones within contexts such as articulations.

Specimens were initially into the largest applicable taxonomic categories – first by class, then order, family, and genus. In cases of identifiable specimens, particularly for mammals and birds, I next undertook to classify specimens to the most specific level possible – generally to family and order and ideally to genus or species. Bones which could not be identified were sized instead. I applied size categories put forth by Beisaw (2013) in analyzing mammals and birds. In Bermuda's specific context, very large mammals are likely whales, and large mammals included horses and/or cattle. Medium mammals were likely sheep, pigs, goats, or dogs while small mammals were probably rats or cats. Medium-large terrestrial mammals are entirely absent.

For fish, the following size categories were used:

Small - Herring - <0.5 kilograms
Medium-Small – Bermuda Bream - 0.5-2.4 kilograms
Medium - Grey Snapper - 2.5-14.9 kilograms
Medium Large – Great Barracuda – 15-39.9 kilograms
Large - Black Grouper - >40 kilograms

Several primary methods of quantification were used in analyzing faunal remains. A count of the Number of Identified Specimens (NISP) was created whenever taxonomic identification was possible. NISP tallies the number of specimens assigned to a particular taxonomic group. Unidentified or unidentifiable bone fragments were used to compute a Total Number of Fragments (TNF) count. In cases where multiple specimens represented the same element of the same animal, the NISP count was altered to reflect the Minimum Number of bone Units (MNU). MNU counts were only provided when neglecting this data might skew interpretation – a single grouper maxilla which was broken in two, for instance, would be assigned a NISP of 2 but an adjusted MNU of 1 to avoid double-counting. Finally, the Minimum Number of Individuals (MNI) was calculated by combining sided, sized, and identified specimen counts. While MNI

measures the minimum number of individual animals reflected in a deposit, the actual number of animals would fall somewhere between the MNI and NISP.

Two record-keeping methods were employed to aid in faunal analysis: individual physical paper context faunal inventory sheets and an online database. Paper sheets detailed the provenience of an inventoried context, as well as the TNF, MNI, and present species of each taxonomic class. The total MNI and total species count for the entire context were then computed and associated with the artifacts they identified. The database digitized the same paper sheet information in more detail in a shareable format that also enabled macro-analysis. The SIAP faunal database exists separately from the larger artifact and context database used to categorize all artifacts found on site and focused only on units which had been subjected to faunal analysis. Whereas paper forms allowed all information about a given unit to be seen at a glance, the database was able to provide in-depth information and discern patterns among particular elements, taxonomic data on the animals those elements belonged to, and associations with specific artifacts and depositional contexts.

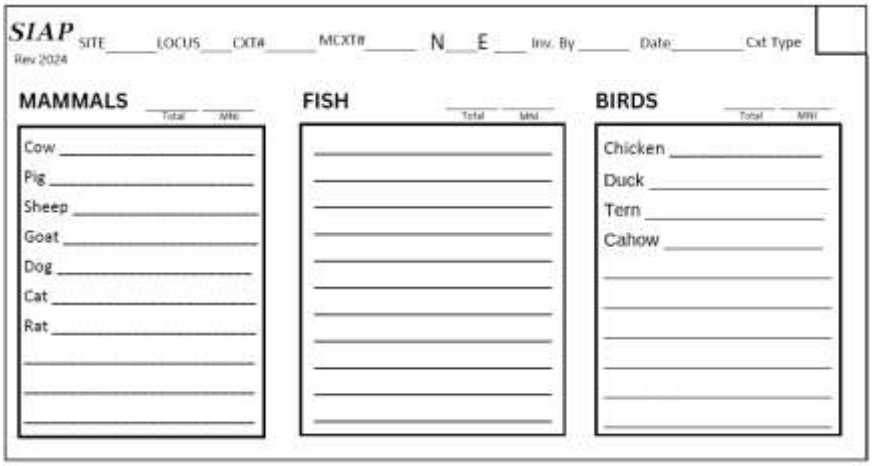


Figure 4.2. Blank faunal analysis inventory (front), placed within fully inventory context bags. Specimens that are not mammals, fish, or birds can be listed on the reverse side along with comments, noted finds, shells, and total MNI and species counts.

Initial Results

At present faunal analysis has been completed on 160 contexts related to the three season priorities. At Smallpox Bay all 117 features have been inventoried, of which 88 were excavated at Smallpox Bay this season and nine were layer-contexts from the large 2023 pit feature. Identification and analysis at the Oven Site Kitchen was completed on 21 contexts representing an earthen floor. Finally, another 22 contexts were analyzed that did not belong to either of the above categories. Table 4.3 shows the number of indeterminate and identified specimens in each area.

	# Cxts	Total	Identified	% Identified	Unidentified	% Unidentified
SPB individual Features	108	1240	263	21.2%	977	78.8%

SPB Large Pit Features	9	1238	426	34.4%	812	65.6%
Oven 006	11	424	144	34.0%	280	66.0%
Oven 009	10	1631	473	29.0%	1158	71.0%
Other	22	2953	758	25.7%	2195	74.3%
All Contexts	148	8357	2182	26.1%	6175	73.9%

Table 4.1. Totals of identified and unidentified faunal specimens analyzed during the 2024 field season

In the primary research assemblage 88 contexts which were excavated this year were analyzed – all feature fills from Smallpox Bay. Of these, 56 contained any bone. This preliminary report will focus solely on these contexts.

Initial impressions from early-stage faunal analysis is that fuller research can provide valuable information about the environment that Bermuda's first settlers inhabited and exploited and about their interactions with marine and terrestrial animals within that environment. Post holes thought to be filled in late 1612 after Moore's Town was moved to St. George's represent a tightly dated, nearly unique window into Bermuda's environment at the dawn of settlement and the non-native animals introduced into the island's ecosystem. Remains from the following species are identified in post hole features excavated this season:

Actinopterygii:

- Groupers
  - Black Grouper (*Mycteroperca bonaci*)
  - Coney Grouper (*Cephalopholis fulva*)
  - Multiple unidentified species
- Mangrove Snapper (*Lutjanus griseus*)
- Bermuda Bream (*Diplodus bermudiensis*)
- Hogfish (*Lachnolaiumus maxiumus*)

Mammallia:

- Rats (*Rattus rattus*)
- Mice (*Mus musculus*)
- Pigs (*Sus scrofa*)
- Sheep (*Ovis aries*)

Aves:

- Unidentified remains

Invertebrates:

- Crabs (Multiple species)

- Shellfish (Multiple species)

MNI and NISP counts for each of these groupings and counts of unidentified fragment totals are presented in Table 4.4:

Class	Common Name	MNI	NISP	TNF
Actinopterygii	Unidentified	5		1026
	Grouper (Unidentified)	5	28	
	Grouper (Coney)	1	3	
	Grouper (Black)	1	1	
	Mangrove Snapper	1	1	
	Bermuda Bream*	1	51	
	Hogfish	1	6	
Mammallia	Unidentified	1		100
	Rat	1	1	
	Mouse	1	1	
	Sheep	1	3	
	Pig	1	3	
Aves	Unidentified	1		16
Invertebrates	Unidentified	3		5
	Crab	2	3	

Table 4.4. Faunal remains from Smallpox Bay features excavated in 2024. The total number of breams is almost certainly large. Multiple specimens representing dentition elements were extremely fragmentary and only interfered when other diagnostic elements were observed.

Artifacts were recovered from 67 of the 88 post hole features excavated in 2024 (76%); of these, 56 post holes had faunal material (bone and/or shell, 63.6% of total, 83.5% of post holes with artifacts). Fish were the most prevalent class in the assemblage – of the 56 features which preserved faunal remains, 52 contained fish bones (59% of total, 96% of post holes with faunal material). Groupers were by far the most prevalent group of fish identified in this sample; a minimum of seven individuals were present in post hole fill contexts, represented by 32 specimens. The comparatively large presence of grouper bones suggests that early settlers showed a strong preference toward grouper as a prey species or that they were more easily caught. Alternatively, grouper remains – especially those belonging to the Black Grouper (*Mycteroperca bonaci*) – are larger and more robust than those of other present species and may reflect a depositional survivor's bias. Bermuda's soil conditions are extremely good for preserving bone – even thin, fine juvenile specimens and fish scales – so it is more likely that Black Groupers were among the first fish caught, consumed, and disposed of in the first weeks of settlement housebuilding: they clearly were present, certainly eaten along with the other present fish species. It should be noted that all observed fish species are still eaten by Bermudians today, although some fishermen regard the Bermuda Bream poorly.

Mammal remains were markedly less common than those of fish. Among domesticated animals, both sheep and pigs were certainly present, both represented solely by teeth. Evidence suggests where was only individual of each represented. Culturally, it may be the case that mammal remains were maximally processed after slaughter, leaving few osteological traces. One unidentified tibia fragment belonging to an animal the size of a pig shows signs of a percussion impact fracture intended to break open the bone for marrow extraction. Specimens uncovered at other Smith's Island excavations exhibit the same taphonomies, indicating that this was or became a common practice in early Bermuda.

As is the case at most archaeological sites, very few bird bones were recovered, due to their hollow form, small size, and general fragility. Those identified were either fragmentary or vertebrae, which makes taxonomic identification to any level more specific than class exceedingly difficult. The vertebrae found belonged to a small to medium bird. The only insight to be drawn from them is that they did not belong to a chicken or another domestic bird because they were too small and dissimilar in form.

It was originally hoped that fill from Smallpox Bay post holes dating to the 1610s would yield numerous Cahow bones, finds that would both help date the features to the earliest years of Bermudian settlement before Cahow populations were decimated and the birds rendered nearly extinct and also to aid CariGenetics' Bermudian Genomic Sequencing initiative by providing specimens from which ancient DNA could be extracted, sequenced, and studied. The absence of Cahow bones in post holes initially caused consternation about feature dating, but upon review of the historical record it became clear that there were no Cahows present in July-September 1612 for the *Plough* arrivals to exploit, since the Cahow breeding season runs from mid-October to June.

Invertebrate remains included the valves of small shellfish and several fragmentary dactyls belonging to mid-sized crabs. Since invertebrate remains were not the focal point of analysis, species level identification was not attempted.

Conclusions

Faunal remains recovered from Smallpox Bay this season can begin to shed highly specific light on the activities of the island's early human inhabitants and the environment they began to modify from the moment of their arrival. The small sample size intrinsic with c. 1612 post hole features, however, is inadequate to advance observations other than that reliance on fish, particularly grouper, was strong from the start. Although domesticated animals were present – either sheep or pigs carried on the *Plough* or feral wild Spanish boars caught nearby, they were not apparently a significant food source. Expanding faunal analysis to include material from all other Smallpox Bay post holes will almost certainly expand and refine our understanding of the earliest settlement's foodways.

Faunal analysis on the rich extensive assemblages excavated in Smallpox Bay's large pit and the Oven Cistern promises to make important contributions to our understanding of Bermuda's 17th-century environment and cultural facets of Bermudian foodways across its first century of human occupation. Datable artifacts suggest that both of these substantial features date to the 1690s and are near-contemporary, offering two comparative assemblages reflecting exploitation of the same coastal waters and island

landscape. Although the people who dug and filled in the Smallpox Bay pit remain unknown, the last occupants of the Oven Site Kitchen (1707) were Smith's Fort Captain Boaz Sharpe and nine enslaved Native Americans (likely two adult couples and their five children). As such, the Oven Cistern's assemblage provides an intersectional case study likely intertwining ethnicity, race, class, gender, and inter-generationality.

5. Amphibious Archaeology: A Preliminary Underwater Survey of Smith's Sound Adjoining Smallpox Bay

Michael Jarvis, Edward Schultz, & Alexander Cook

At a fundamental level, islands profoundly shape the people who inhabit them and the cultures they develop. Islands – especially small islands such as Bermuda – are intrinsically maritime in nature, places where distinctions between land and sea blur and mingle in myriad ways (Evans 1973; Dawson 2019). The sea has been Bermudians' primary site of transport and source of food for at least their first three centuries of history; they have lived with and on the ocean for more than twenty generations.

Disciplinarily, historical archaeology has traditionally been divided into terrestrial and underwater/maritime/nautical archaeology fields due to field methods, the types of sites investigated, and (in the United States) the vast continental domain of archaeological sites that has rendered terrestrial archaeology the predominant workplace. Such sharp distinctions make little sense at small maritime island sites like Bermuda, however, and maintaining them actively distorts the interpretation of terrestrial and underwater sites alike.

What is needed instead is an "amphibious archaeology" framework that emphasizes the interplay between land and water (at multiple scales, from adjoining bays and channels to reef platforms to the open ocean) in overlapping ecological, economic, social, and cultural contexts that is also sensitive to change over time and differences in land-sea blending shaped by the race, age, and gender of our subjects. In the 18th century for instance, gender was more determinative than race in shaping Bermudians' relationship with oceanic spaces. While the majority of both white and black Bermudian men worked on ships and traveled as much as 5,000 miles a year between Atlantic ports, very few Bermudian women ever left the island of their birth; that said, women regularly swam, sailed boats, fished, helped process whales, and made constant use of maritime resources to support their families and maintain their households (Jarvis 2010; Andrews 2012).

Drawing on the expertise of two Texas A&M Nautical Archaeology graduate students in the team, SIAP undertook a preliminary examination of Smallpox Bay in 2023 in order to complement recovery of material culture items from terrestrial contexts. British military occupants and likely many others before them used the bay to access the site (as attested to by the angled davit post holes we exposed and re-used on the bay's western side), harvest shellfish, and dispose of their trash. Dana Carris and Rebecca Bowles conducted two visual surface surveys of shallow Smallpox Bay using gridded baseline tapes, noted the presence of several 19th-century finds, and began to clean up the huge quantity of modern bottles that have accumulated at the head of the bay.

During the 2024 season, a more ambitious, larger-scale non-invasive reconnaissance underwater survey was conducted in consultation with DENR's Custodian of Historic Wrecks Dr. Philippe Rouja that included waters in Smith's Sound adjoining the entire southern coast of Smith's Island bordering the Bermuda Government Nature Reserve. Because this area included deeper water, survey participants necessarily had to be

SCUBA trained and experienced in shipwreck survey techniques. Edward Schultz kindly volunteered use of his boat, SCUBA gear, and considerable knowledge in executing underwater surveys to SIAP and supervised Xander Cook and volunteer Katryn Smith in conducting the survey on June 25 and 26, 2024.

The survey team searched for the presence of any submerged artifacts or significant underwater cultural features that relate to the 400+ years of human habitation at this location. The team used Edward Schultz's twenty-one-foot Mako fiberglass boat powered by a 200 hp Yamaha 4-stroke engine (Figure 5.1) to tow scuba divers on either a trapeze attached to a nylon tow line (Figure 5.2) or with them wearing a twenty-pound lead towing weight (Figure 5.3). All team members were equipped with standard SCUBA equipment (face mask, single hose regulator, buoyancy compensator vest, neoprene wet suit, weight belt, dive fins) while engaged in the underwater search process and used a GoPro underwater camera to document the survey area and record finds.

Figures 5.1-5.3. Mako survey boat (above), trapeze (upper) and weighted (lower) tow ropes

Methodology

On the first day of the search, a series of weighted reference buoys were positioned south of Smith's Island to establish the offshore perimeters of the search grid (Figure 5.4). The divers, in full SCUBA gear, were then towed back and forth across the grid in an east-west direction on trapezes in search corridors placed approximately 10 feet (3 meters) apart. The boat operator also served as a spotter for the divers who were instructed to let go of the towline and remain on the surface in cases when they identified objects of interest. Any significant finds were then marked with additional

weighted buoys after both divers examined the object/location of interest in detail while the boat operator maintained a safe distance from the divers.

Figure 5.4. SIAP 2024 underwater survey area, Days 1 (above) and 2, with reference buoys.

Two problems with this search method soon became apparent. Because this area of Smith's Sound had severely limited underwater visibility (10 feet or less at times) and much of the search area is shallow in depth (15 -20 feet in some sectors), the divers could not continuously see the sea bottom at all times, leading them potentially to miss spotting significant finds during this phase of the survey.

The second problem was that the currents and prevailing winds at the time of the survey made it difficult to operate the surface vessel in consistent alignment with the ideal ten-foot wide survey search corridors. These conditions also made it dangerous to conduct the search too close to what was a "lee" (downwind) shore. The initial search method was accordingly abandoned by midday on June 25th. Later, during that afternoon, four experienced SCUBA divers in teams of two each, were deployed to conduct an intensive visual search of the sea bottom. The area encompassed within the perimeter buoys was basically divided in half with each two-diver team covering their respective half of the search zone. The prominent rocky point which extends underwater and separates the two small bays on the south shore of Smith's Island was arbitrarily selected as the "dividing line" for the two search parties because its prominence allowed it to serve as a visual reference for the divers – both on the surface and when submerged (Figure 5.5). During this process two divers carried five-foot-long, one-inch diameter PVC pipes to gauge the depth of soft silt on the sea bottom as well as determine the presence of hard

packed sand in the search area. Neither of these potential findings could be determined visually with any degree of reliability. -

Figure 6.5. Map of the two sectors manually searched by pairs of divers on June 25. In both sectors, search tracks were followed perpendicular to shore moving from west to east.

On the second day of the survey (June 26), the search perimeter was extended south further offshore (Figure 5.5) roughly halfway across Smith's Sound. Once again, the boat deployed two divers using full SCUBA gear and towed them along search corridors approximately 10 feet (3 meters) apart. However, this time both divers utilized twenty-pound lead weights attached to their towlines (Figure 5.3), which enabled them to remain in close proximity to the sea bottom during the survey.

Deteriorating weather conditions curtailed the survey during the afternoon of the second day, but not before the divers had completed a fairly thorough search of the area of interest.

Results

A notable paucity of 17th-, 18th-, and 19th-century artifacts were discovered during this survey, in sharp contrast to large deposits of 20th century bottles and other trash being found in the area searched. This modern refuse appeared to be mostly of post-World War II origin and was concentrated primarily along the immediate shoreline of Smith's Island; much of it was likely drift material washed in from nearby heavily populated St. David's Island.

The manual visual inspection that pairs of divers performed on the afternoon of June 25 in the western sector found only one fragment of a red brick likely dating to the 18th

century and the base of a mold-blown 18th-century "black glass" spirits bottle. Both artifacts appeared to be of English origin and were left in situ. The two divers searching the eastern sector located a single mid-19th-century black glass case gin" bottle with a damaged shoulder, possibly having been discarded previously by a "bottle diver" searching for relics in this area (Figure 5.6). It was also left in situ. Oral history relates that Smith's Sound was heavily worked by U.S. military and other recreational divers in the 1960s and 1970s in search of intact bottles and other artifacts, a revelation that accords with the survey's finding of a dearth of pre-20th-century material culture. No significant underwater cultural features were discovered during this survey.

The sea bottom in the deeper regions of the search area is heavily silted, as are the shallow depths of the small bay located to the west of the Smallpox Bay peninsula. The rocky prominence separating the two small bays extends in a southerly direction for a significant distance underwater. The sea bottom to the east of this rocky prominence is composed largely of hard-packed sand and coral / limestone rubble as well as scattered accumulations of silt that vary in depth.

Figure 5.6. Case bottle found on June 25 and left in situ at the eastern edge of the sector 2 survey area (Photo by Philippe Rouja)

Discussion

The work undertaken constitutes a rudimentary preliminary survey that was primarily conducted to assess whether further time and resources should be invested in either more advanced geophysical surveying techniques that could reveal artifacts and features buried in silt deposits or testing excavations and the possible mapping and recovery of submerged cultural resources associated with the early settlement and habitation of Smith's Island.

Although this survey's search methods were quite crude by today's standards, they have revealed that very little submerged cultural material can be visually located at the site on the sea bottom surface. It is highly unlikely that a large volume of artifacts have not been deposited at this site over the centuries, so some explanation regarding their absence requires consideration.

First, search conditions at the time of the survey were generally quite poor, with very limited underwater visibility, few remarkable underwater features to orient divers, and very heavy silting of the sea bottom to the west of the rocky prominence separating the two small bays. Silt deposits in this area were measured to a depth of 3 to 4 ½ feet (approximately 1 -1.5 meters) using a 1inch (2.54 cm) internal diameter PVC probe. Although the sea bottom east of the rocky prominence is composed of hard packed sand and coral / limestone rubble in many areas, there are also moderately deep deposits of

silt in that location as well. Furthermore, this particular part of the search area is more exposed and vulnerable to currents and wave action passing through the inlet to the open ocean lying between St. David's and Smith's islands. Heavy seas associated with Bermuda's frequent tropical storms and intense winter gales would likely physically move or bury artifacts in this area despite the presence of densely packed sand. It is thus not too surprising that so little was found, due to these environmental factors.

Another important variable to consider is that any previously exposed artifacts in this area may have already been collected by past generations of relic hunters. During World War II, the American Government established a military base and airfield on St, David's Island, which was operated continuously by the U.S. Army Air Corps, U.S. Air Force, and U.S. Navy until its closure in 1995. During the 1960's and 1970's the U.S. bases boasted the largest dive club in Bermuda (the "Reef Roamers") and many of their members were avid "bottle divers". The south shore of Smith's Island that we surveyed is actually within swimming / SCUBA diving range of St. David's Island, where many of these service men and women lived and was even easier to access for those who owned boats. A small number of Bermudians have continued to hunt for bottles and artifacts in this area until the present day. The case gin bottle referenced above may represent hard evidence of this activity. It was perhaps unearthed from the sea bottom but then discarded because it was not completely intact.

Figure 5.7. Google Map image of the underwater survey area, noting the locations of a modern boat wreck, a whale bone, and the 19th-century case bottle discussed previously.

How else can we account for the relative paucity of artifacts on the south shore of Smith's Island as compared with more extensive accumulations of broken glass and ceramics dating to the 17th, 18th, and 19th centuries located in shallow waters along Smith's Island's northern coast? Much of this northern material may represent either bottle drift from the Town of St. George's or deposits from dump sites associated with residences located along Smith's Island's north shore. Smith's Island's south shore, by contrast, remains largely undeveloped to this day –maybe it just never was a very popular area for the disposal of terrestrial trash.

The preliminary non-invasive visual survey conducted succeeded in providing valuable information about the subsurface topography of Smith's Sound, especially the thick layer of silt and sand covering much of the sea bottom. On the one hand, this subsurface strata renders invisible artifacts and even the remains of boats and ships that may lie in the area. On the other hand, the same thick sediment layer that obscures these heritage objects also preserves them from movement and decay. Archaeologically speaking, there is no "low hanging fruit" to immediately identify and preliminarily assess. Instead, future surveys will require magnetometer and other remote sensing instrumentation to plumb the depths of the silt-covered Sound.

6. Public Archaeology Outreach

Michael Jarvis

Figure 6.1. SIAP blog sidebar with navigation and visitor count

The Smith's Island Archaeology Project has prided itself on a long tradition of public engagement and research transparency dating back to 2012, when it launched a blog, Smithsislandarchaeology.blogspot.com, in order to report excavation activities, research and artifact findings, and evolving historical interpretations in real time. Because our sites are relatively inaccessible and most Bermudians are not able to visit them, SIAP has developed numerous ways to bring scholars and members of the public alike "virtually" to our sites and disseminate our discoveries. At the time of writing, more than 170,00 unique viewers have visited the SIAP Blog drawn from all over the world, raising awareness and appreciation of Bermuda's unique history, archaeology, and cultural heritage globally.

SIAP also actively seeks out Bermudians and involves them in co-discovering their heritage by training them in field excavation and lab analysis methods. Although most Bermudians participate on a short-term volunteer basis, Xander Cook, Olivia Adderley, Richard Goodwin, Eleanor Desmond, and Martin Kenney were key full-time members of the 2024 team in the field and lab.

Bermudian interest in SIAP was primed through coverage of the project's history and 2024 goals in a *Royal Gazette* story by Sarah Lagan published on April 12.[1] Head of Cultural Heritage Charlotte Andrews also featured SIAP in The Bermuda National Trust newsletter. Together, these publicity sources attracted more than a dozen local volunteers and helped secure donations of buckets, tarps, and other field equipment. Andrews also secured a $25,000 grant from the Corporation of St. George's World Heritage Site Fund to renovate and improve the Globe Museum Archaeology Lab, which SIAP uses as its base.

The SIAP team partnered with the St. George's Historical Society to give a well-attended public talk on May 30 at the beginning of the season. Besides an overview of the project's history and current season's excavation strategies and goals, University of Rochester Mechanical Engineering student Charles Herman also presented his research on the composition and properties of Bermudian daub recovered from a Smallpox Bay pit in 2023.

[1] https://www.royalgazette.com/general/news/article/20240412/archaeological-dig-seeks-to-confirm-site-of-first-settlements/

The BNT Globe Archaeology Lab was the principal physical site of public engagement. The lab was open to the public and numerous visitors to Bermuda stopped in to learn about archaeology and talk with Rhiannon and volunteers. Displays of historical ceramics and typical 17th- and 18th-century artifacts were used to educate volunteers and visitors alike about how archaeologists use material culture to refine stratigraphic interpretations and reveal aspects of trade, activities, and daily life over time.

Outreach to educators at Bermudian secondary schools resulted in two Smith's Island archaeology tours in which students participated in excavations and sifting. Fourteen Bermuda High School students spent June 21 on site learning from BHS alum Olivia Adderley.

Figure 6.2. Xander Cook poses with US visitors to St. George's who stopped by the Globe Lab

Figure 6.3. BHS students and teachers listening to Olivia Adderley during their site visit

BNT Education officer Anna Stevenson worked with Bermuda Government schools to introduce advanced secondary students to archaeology at Smallpox Bay a week later. Members of the Bermuda Government Planning Department and Department of Environment and Natural Resources also visited the sites.

In keeping with long-running tradition, the Bermuda National Trust chartered a boat to facilitate public tours of Smallpox Bay and Oven Site on June 23, which were attended by more than 30 people. SIAP students and supervisors conducted the tours and ably

explained their methods and interpretations to visitors, attuning them professionally to the importance of public archaeology engagement..

Figure 6.4. Smallpox Bay Site Supervisor Ewan Shannon leading one of three BNT public tours of his site

NEH awarding of a major grant to SIAP has attracted popular media attention to Bermuda's history and first settlement. In early June Andrew Lawler visited the Smallpox Bay site and interviewed SIAP researchers and Bermudian heritage experts on behalf of *Smithsonian Magazine*, a major international publication. When published, the article will draw global attention to Bermuda generally and our early 17th-century sites in particular, meeting one of the mandates of the NEH grant.

Finally, all preliminary report authors have committed to presenting their research at the Society for Historical Archaeology's Annual Conference on January 8-11, 2024 in a symposium session featuring seven papers about the Smith's Island Archaeology Project since its inception in 2010.

7. Preliminary Conclusions and Future Research

Michael Jarvis

At the end of the second and last NEH-funded fieldwork season, we can happily report that the main goal of identifying the **Smallpox Bay** site as that of Governor Richard Moore's briefly occupied First Town has been achieved. During the 2024 season the entirety of a one-room, one-story 13-foot by 16-foot structure was uncovered in Locus B and a large but still incomplete portion of a sixteen-foot by at least twenty-eight-foot post-in-ground building exposed in Locus A. The fact that the fill within all of the associated post holes either had no artifacts or only a few items (bone, early ceramic, daub) consistent with a 1612 arrival and subsequent rapid abandonment strongly supports this interpretation. Variation among the post holes in diameter, shape, and depth further points to the presence of multiple buildings of different sizes in close proximity. The absence of post footings in the post holes is consistent with Moore having his settlers dismantle their houses and take away their post framing in order to re-erect them in St. George's.

Besides this substantial preponderance of earth-fast building construction (a practice dating only to Bermuda's first decades of settlement), there is no documented occupation of this part of Smith's Island in either maps or records throughout the 17th century, nor were sherds of Metropolitan, North Devon gravel tempered, Buckley, and other mid- to late-17th-century ceramics recovered – strong evidence of a solely early 17th-century occupation. The expansive covering of much of Locus B with hoe marks cut into the bedrock surface, along with the recovery of a broken hoe consistent with the tool marks, points to later 17th- or 18th-century use of the site area for farming purposes after the First Town site was abandoned and forgotten.

Although filled in the late 17th or early 18th century, the large pit in Locus A excavated in 2023 provides evidence of multiple types (or formulaic mixes) of daub that was impressively hard and durable. The buildings that this daub covered lasted many decades, as testified by multiple layers of plaster on some surfaces and evidence of self-repair of cracks, which would have taken years to occur. New areas of Smallpox Bay site uncovered this season show places where the bedrock surface is discolored through heat alteration (likely sites of internal domestic hearths or surface lime-burning) and a small portion of a packed clay earthen floor found within the footprint of the large Locus A structure begins to enable us to hypothesize about the interior layout and activities within First Town households. In other areas on the bedrock surface and abutting post holes, spilled lime mortar or cement has stuck to exposed ground surfaces, revealing other aspects of early settler construction techniques.

Material recovered from Smallpox Bay plow zone layers continues to expand our knowledge of how British military personnel and their families rode out different episodes of relocation during yellow fever epidemics in the 19th century. The recovery of numbered regimental buttons has remained consistent with the years of yellow fever

outbreaks. We have further added to our collection of material associated with women and children, who are entirely undocumented occupants.

A substantial quantity of late 18th-century material (most notably creamware and hand-painted pearlware) found in Locus A, along with most of a hand-blown mallet-type bottle, is beginning to shed light on the known but as yet largely elusive occupation of Smallpox Bay during its civilian smallpox quarantine period (c. 1730-c.1800). The spatial patterning of this concentration of 18th-century material suggests that an earlier "pest house" predating the standing stone "GR" ruin may lie to the north or east of our 2024 excavation area.

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Despite promising GPR survey results, our limited excavations at **Oven Site** failed to turn up firm evidence of the Captain's House in the Oven Site North area. Admittedly an apparent vertical cut with deep soil adjoining it exposed in 2023 fooled us into thinking we had the edge of a cellar and skewed our excavation unit placement. The presence of numerous other geophysical anomalies nearby and the logic of the site's layout vis a vis the kitchen immediately south and shoreline to the north strongly suggests that the location is nearby.

Careful recovery of nearly all material from the **Oven Cistern** provides us with a wealth of information about the last years of the Oven Kitchen and Captain's House sites specifically and, by abstraction, about Bermuda's larger historical shift from agriculture to seafaring between 1685 and 1715. The high concentration of fish bones and evidence of Bermudian whaling are particularly significant for bioarchaeological study and longitudinal comparisons both within Bermuda and with faunal assemblages in other contemporaneous Anglo-American historical sites. Much of the Oven Cistern assemblage is also likely the product of enslaved people living and working at the site; as such, future study can illuminate both the marine and land environments which occupants exploited and perhaps culturally distinct foodways of the Native American and African-descended individuals who caught, prepared, and disposed of diet-related faunal remains.

Regarding methodological, analytical, and capacity-building advancements, the 2024 season significantly improved its research remit by hiring a full-time faunal analyst and beginning the highly promising work of studying environmental and dietary change using material from multiple SIAP sites. SIAP lab procedures were improved through further standardizing field and artifact recording, expanding photography of diagnostic artifacts by context, and more advanced training of long-term volunteers. The addition of an outside washing facility and two ultrasonic cleaners increased our ability to wash the volume of material arriving from the field and accelerated the pace of processing while also conserving fresh water as a scarce resource. Finally, adding floatation and graduated mesh recovery techniques for total collection feature fill contexts furnishes future researchers with new bioarchaeological data samples for analysis.
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Future Research

While this preliminary report outlines the major accomplishments of the 2024 field season, there is still much work to be done. Jarvis will fully process at the highest resolution levels the twelve photogrammetry model sets captured between May 26 and July 8 and incorporate orthophotos derived from these into the SIAP Master ArcGIS site. Paper context sheets and plan and profile drawings will be digitized and transcribed into the SIAP Master Database.

Although artifacts from all excavated contexts were inventoried and catalogued and their recording sheets photographed, each of these need to be entered into the SIAP Master Database by SIAP student participants during the 2024-2025 academic year at Jarvis's University of Rochester lab. Interpretation of the faunal analysis of the Smallpox Bay Pit and other inventoried areas and continued faunal identification of previously excavated SIAP assemblages (especially the Oven Cistern) are still outstanding.

In the specific context of studying Bermuda's earliest architecture, research is ongoing about the composition of multiple daub samples found in 2023, which were legally exported to Rochester along with sand, clay, and rock samples in March 2024. Close analysis of all Smallpox Bay post holes can produce a typology of forms from which may emerge spatial groupings of specific buildings, fence lines, outbuildings, and other features. Post hole depth in particular should reflect the height and load-bearing expectations of particular architectural elements. Variations in post hole shape can shed light on the tools used to make them and perhaps different individual craftsmen's digging techniques that might be region-specific within 1610s England. Finally, cuts, gouges, and other impacts on post holes' edges may reveal how posts were seated into place and evidence of their removal and/or a building's destruction.

Close, comparative analysis of the near-contemporaneous faunal assemblages within the Oven Cistern (c. 1700) and Smallpox Bay Pit (1690s) are especially promising. When fully analyzed, these assemblages can shed light on the last years of tobacco cultivation, Bermudians' expanding access to other British colonial and international markets, and the state of Bermuda's pelagic and reef marine ecosystems. Preliminary findings reveal that the bone sizes of many of the fish species examined are literally off the charts: they are bigger than the biggest measurement in modern size charts. This revelation is somewhat surprising, given that historical evidence suggests that the Bermudian population had reduced the island's fishery by the 1690s, after four generations of sustained exploitation. Full analysis of the Cistern and Pit faunal material will establish the size, age, species variety, and species ratios of fish being consumed by two different neighboring households, as well as reflecting how dominant fish and shellfish were in Bermudians' diet. This last factor forms a core element in Bermudians' distinctive Anglo-Atlantic culture which sets them apart from a typical English and Anglo-North American diet where pigs, cattle, sheep, birds, and wild mammalian game predominate.

Regarding future archaeological investigation, considerable work over many years will be necessary to reveal the layout and households of the First Town site. The *Plough's* fifty to sixty settlers required a minimum of eight households while Governor Richard Moore would necessarily have built several additional storage and work houses, including a large central meeting hall for church services. Excavations to date have uncovered portions of at least four post-in-ground buildings radiating out from current Smallpox Bay clearings and artifact database patterning has revealed that 1970s plowing has pushed a considerable portion of the original ground surface downslope to the east. SIAP 2013-2024 has investigated perhaps 15% of the total viable area within the Smallpox Bay peninsula suitable for house construction, so (akin to James Fort and its adjoining town in Virginia) there is tremendous potential for the slow methodical excavation of the entirety of Governor Moore's first settlement. Historical records and architectural evidence suggest that the First Town site would have had one or more wells and at least one in-ground limekiln for manufacturing the quicklime used in daub and plaster. Clearly our work is just begun regarding the study of Bermuda's earliest settlement.

Future Oven Site excavations also hold the strong likelihood of exposing the footprint of the Captain's House and initiating close study of an early settler household across the colony's first century of cultural evolution. While GPR survey evidence suggests specific locations in the Oven North area, the surest strategy investigation will expand northward from the cistern's edge and follow out from a post hole uncovered in 2017 in unit N13 E8 at three-foot intervals (the standard spacing exhibited at Smallpox Bay). Daub fragments found in the cistern and in this post hole establish that this site dates to the earliest decades before islanders shifted to framed timber construction with stone block infill, so in terms of a coherent cultural research agenda, study of creolization that took place at the Captain's House (pre-1616-1712?) logically follows from a First Town "first moment" of attempted English cultural replication.

Research will continue through Fall 2024 in Rochester and Bermuda. The authors of this report will present our findings publicly at a special SIAP Symposium held at the Society for Historical Archaeology's 2025 Conference in New Orleans. An expanded Interim 2024 SIAP Report is planned for Spring 2025.

8. Acknowledgements

Successful archaeological fieldwork requires a veritable army of people before, during, and often long after the weeks spent excavating at site. Funding and administrative support for the 2024 SIAP season came entirely from NEH Archaeology Fieldwork Grant RFW-292027-23 and the University of Rochester, respectively, without whom none of this research could have taken place. I especially thank Jacqui Rizzo, Melissa Greisch-Marianetti, Theodore Pagano, and Ruben Flores for their work in taming the sea of receipts, permissions, applications, and other paperwork that large international projects generate. I'm eternally grateful to Anna Jarvis for supporting me in all my summer digs, making reports more readable, and keeping me organized (or rather less disorganized).

The Bermuda National Trust has supported archaeological research in and around St. George's for more than 35 years and has partnered with SIAP since its inception. We thank Karen Border, Mark Orchard, Anna Stevenson, Chris Davies, BNT Archaeology Research Committee members Zoe Brady, Deborah Atwood, and Florence Laino, and especially Charlotte Andrews for providing the Globe Hotel Lab, helping to recruit volunteers and equipment donors, publicizing our finds, organizing public tours, and promoting archaeology and heritage awareness generally. Thanks also to Lyn Llewellyn, Jeannie Olander, and the St. George's Historical Society for hosting our start-of-season public talk and giving us a feast to remember.

Living and working on two small islands is both a pleasure and a challenge, requiring boats, gas, and good weather. For the third year running, the Bermuda Government Department of Youth, Sports, and Recreation has allowed us to rent the Paget Island camp to house our large team; we are especially grateful to Paget Island Caretaker Andre Hollinsid and Kevin for their daily help in keeping us safe and sane and to Outward Bound staff for sharing Paget Island with us. Bill Tatem and the Island Boat Club let us borrow work boats for the field season that were vital in keeping us working and connected, and IBC's Jack Bridges covered the cost of petrol. Thanks also to Ian Walker and the Bermuda Museum, Aquarium, and Zoo for the loan of their whaler and also submitting Bermuda Customs and Immigration paperwork. Richard Wallington and Alexander Lavery graciously allowed us to use their dock on Smith's Island – I hope we were not too disruptive of your ongoing renovations!

Field crews, like armies, run on their stomachs and keeping them well-fed sustained morale and 4000+ calorie burn dig days. For the tenth year running, Somers Supermarket has donated food bar delights ranging from cassava bread and oxtail to wahoo nuggets and apple pies. We LOVE Debbie for taking good care of us and appreciated cooks Ryan and Andre's culinary genius on a daily basis. SIAP alum Samantha Moncrieff helped with numerous grocery store runs up-country to keep us stocked with huge tubs of PB&J, junky cereal, and ice cream.

Today's archaeologists use a wide array of tools ranging from chainsaws, drones, and ground penetrating radars to traditional buckets, dustpans, and trowels. A huge thank you to Mark and Mariette Smith, Ian Walker and the Bermuda Zoological Society, Rick Spurling, and Peter Barrett for contributing funds needed to purchase SIAP's ground penetrating radar, which promises to be a game-changer for Bermudian archaeology. Mark Orchard, Pembroke Paint, Derek Wooley, and Peter Drew donated buckets, drums, and tarps used in the field, while Annette and Adrian Cook funded the purchase of a commercial dehumidifier for the Globe Archaeology Lab. On Smith's Island Cheryl Flook and Alex and Richard lent us wheelbarrows on Fill-in Friday. Using a rather scary brush cutting mower, Peter Drew of DENR made short work of clearing Smallpox Bay of overgrowth at the start of the season, invaluably aided clearing at Oven Site North during the March GPR survey. He also helped us identify and move native species in our excavation areas.

The underwater reconnaissance survey depended heavily on the kindness and generosity of Edward Schultz, who provided use of his boat, survey equipment, dive tanks, and especially logistical and technical expertise in surveying – and allowed us to view his unparalleled collection of 16th-19th-century artifacts. Custodian of Historic Shipwrecks Philippe Rouja performed a pre-survey consultation that expedited our work and offered observations on likely 1610s coastal conditions around Smith's Sound, which encompassed the probable existence of sandy beaches adjoining the Smallpox Bay peninsula. Katryn Smith and Xander Cook endured hours of dragging behind Ed's boat at various depths to visually assess bottom conditions – vital but unrewarding work in this particular case. I'm grateful for all of their assistance, even if it only resulted in the firm knowledge that SIAP coastal waters are blanketed with a thick layer of silt and sand.

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Michael Jarvis
July 27, 2024

Twister

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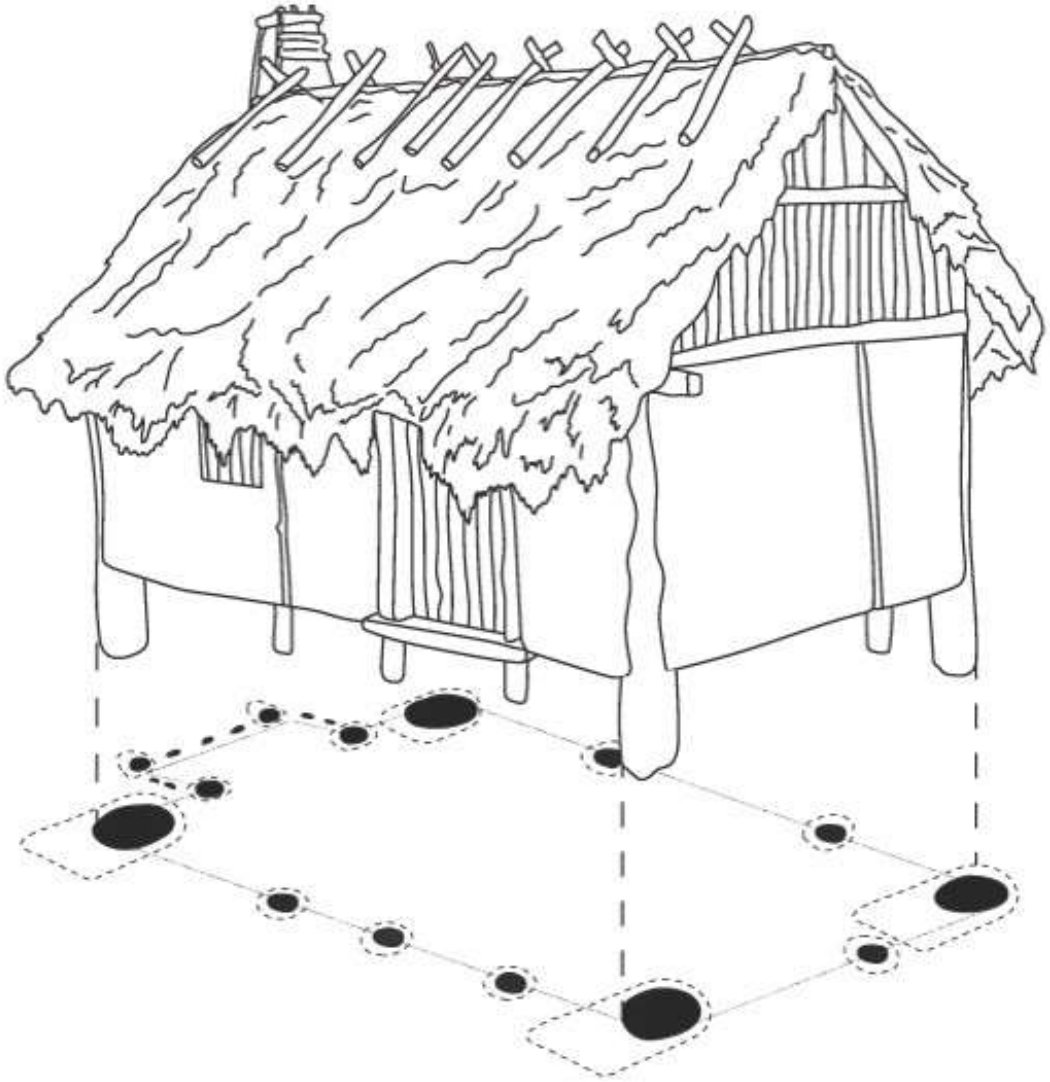

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