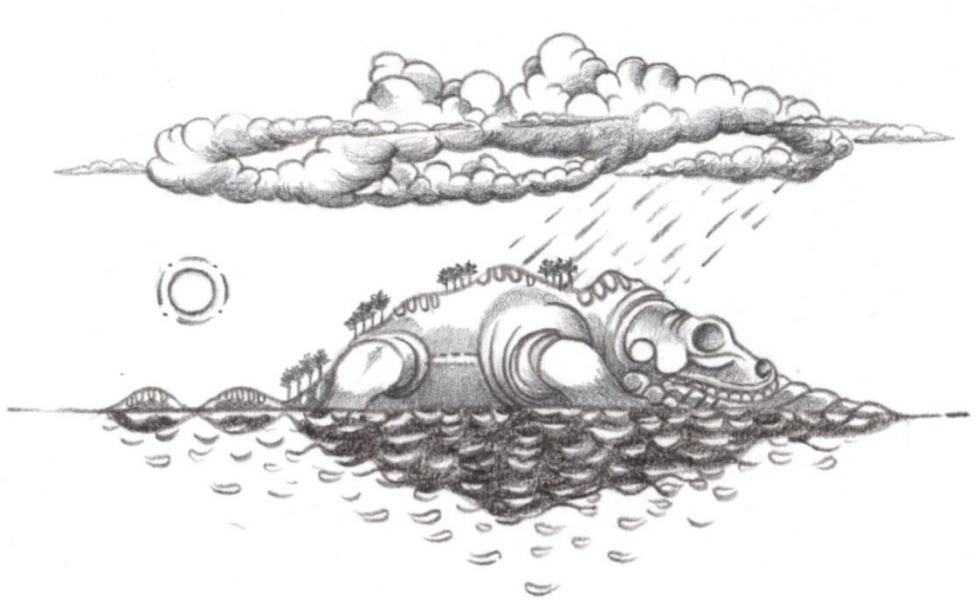

Guana Archaeology – Prehistory Project Report for the October 2012 Field Season

Submitted by Deborah Davis, JD, MA

May 13, 2013

Abstract

Following a comprehensive review of archaeological investigations of the prehistoric use and occupation of the British Virgin Islands, an initial program to reinvigorate the Guana Island Archaeology Project, Prehistoric Investigations, was initiated. Taking up the lines of investigation laid down by the late Elizabeth ("Holly") Righter, a field crew of geologists with archaeological expertise conducted limited survey of certain areas of Guana Island with narrowly focused goals, chiefly to identify areas of previous excavation and testing to avoid duplication of efforts in future work, to visit sites believed by other researchers to hold pre-Columbian cultural deposits, to identify potential prehistoric sites not previously known, and to find the artifacts, such as the intact Elenan-Ostionoid bowl that was the cover of Righter's 2008 report, and the human remains described in that report. The team found both, as well as finding cultural deposits of special significance. An anthropomorphic figure of the goddess of the winds, Guabancex, was found establishing a clear connection with the Taino society. A fresh water source that would have been readily and easily available to early settlers was found. A layer below the known occupational horizon with suspected coral tools that may indicate the earliest settlers on the island, pushing back the estimated date of the arrival of the first people on Guana Island by as much as possibly 1,000 years. Additionally, the team conducted a geological survey of the island crafted to inform the prehistoric environment and meteorological conditions, and to create an accurate GPS map of known archaeological sites and the topographic data of the island in ArcGIS. Despite the limited time frame and the broad and ambitious goals, the field team conducted their work admirably, bringing back with them

evidence of Guana's role as a Taino outpost, and possibly evidence of an earlier, previously unknown small settlement established on Guana in the Archaic age. Preliminary review[1] of the results of the team's findings added to previous investigation results indicate that Guana Island is uniquely poised to make a significant contribution to the understanding of the role of the pre-Columbian Caribbean.

Foreword & Acknowledgments

The author would like to extend her thanks to the Jarecki family for their generous support in funding accommodation on Guana for the team and for granting permission for access to the island to conduct investigation. This project would not have ever gotten started without the cooperation of Dr. James D ("Skip") Lazell. His unwavering support of the project has our everlasting gratitude. This project was several years in germination from an initial desire to know more about the prehistory of the BVIs culminating in the preparation of my master's thesis and planning of the October 2012 field season. Sadly, due to medical issues, I was unable to go and sat eagerly by the computer awaiting updates. Our former expert consultant, Alfredo Figueredo, was also unable to attend due to medical issues but I thank him for his generous advice and mentoring throughout the planning and execution phases of the project. His advice and contributions to the project cannot be adequately quantified, and he deserves the lions' share of credit for his assistance with the project. Finally, I want to thank our field crew led by the esteemed Dr. Tina Niemi, Professor of Geology at the University of Missouri at Kansas City, and her students, John Rucker, Theresa Goyette (especially for all the text and email updates!), Amy Amies, and Joseph Andrews, Ph.D., of KU for mapping and pedestrian survey, as well as his digging skills and general willingness to pitch in wherever needed. Finally, the author would like to thank those she contacted and who donated their time generously during the writing of her thesis and in the planning of this project.

Figure 1. Dr. Tina Niemi, Theresa Goyette, Amy Amies, and John Rucker conducting geological survey of the salt pond. Photo by Joseph Andrews. © 2013 Guabancex, Inc.

[1] This report is meant as a preliminary report for the exclusive use of Guana Island and the Jarecki family. While it may be made publicly available, the author expressly requests that the statements set out herein not be cited as the author's conclusive analysis of the cultural deposits described herein, but may be cited as anecdotal material.

Background

Due to an arbitrary geographical boundary, the archaeological investigations and published data regarding the Virgin Islands has largely been skewed toward the U.S. Virgin Islands as there is a prescribed program for cultural heritage preservation in place that does not yet exist in the British Virgin Islands. The author compiled a broad overview of the archaeological investigations to date of the pre-Columbian occupation and use of the British Virgin Islands as the subject of her Master's thesis in order to address the gap in accessible data for research and knowledge about the British Virgin Islands in the prehistoric. The BVIs are geographically in a very interesting area as perhaps the easternmost outpost of the Taino society, in the border lands of the war between the Tainos and Caribs, and the northern and easternmost points for the possible patterns of migration of Amerindians into the Lesser Antilles. Guana Island, being largely undisturbed in historic times and an ecological preserve, is perhaps the ideal place in the BVIs to conduct archaeological research of the pre-Columbian inhabitants as it presents a unique opportunity to find undisturbed cultural deposits. Review of previously published reports indicated Guana has tremendous potential to inform prehistoric archaeological research as artifacts from the three cultural epochs known for occupation in the BVIs have been found by archaeologists surveying the island.

A brief review of the archaeological work and cultural evidence found on Guana to date is presented as it formed the basis for the investigations conducted by the team in October 2012. Dr. Michael Gibbons found evidence of possible Late Archaic age (50-650 AD) Saladoid use of Guana at the "Bat Cave" which the local press picked up as evidence of a prehistoric barbeque on the island. Gibbons obtained radiocarbon dates for the charcoal samples he recovered, but they are of little use as he indicates they may be off by as much as 30%. A stone axehead and a chert arrowhead were also recovered. The arrowhead is particularly of interest as there is no known source of chert documented in the BVIs, although there are rumors of chert veins on Tortola and Great Thatch Islands. The presence of the chert arrowhead may be evidence of trade with other islands as the nearest known source of chert is in Puerto Rico, more than 100 miles away, or temporary use of the island by people from other islands.[2]

The most extensive research done on Guana concerning the prehistoric peopling of the island was done by the late Dr. Elizabeth ("Holly") Righter. With the assistance of Elaine Acevado and others, she carried out a systematic investigation of the "orchard" area and the flat area by the southwest beach (White Bay) on the island over a period from 1987 through 2008. A rudimentary (not to scale) map was included with one of her published reports, and is the only map publicly accessible that the author had access to at the time the 2012 program for archaeological research was planned. Unfortunately, the author was not able to contact Dr. Righter and had no other means to relocate Dr. Righter's site datum or complete list of shovel tests and areas surveyed. Thus, the 2012 investigations concentrated largely on identifying the areas of Dr. Righter's previous investigations in order to develop a more accurate map of known pre-Columbian sites. Relocating Dr. Righter's areas of investigation was imperative as she found compelling evidence for the use of Guana Island as either a ceremonial site with high status items found (i.e.,

[2] The author contacted Dr. Gibbons who did not recall much of his investigation on Guana at that time. He did not save any field notes and did not know where the chert arrowhead or stone axehead are at present. Finding these artifacts is vitally important as the chert arrowhead could be sent for analysis of the lithic composition (Leiden University, contact Dr. Corinne Hofman) and the actual source of the chert identified (Knippenberg, S. & Ziljlstra, J. J. P. (2008). Chert Sourcing in the Northern Lesser Antilles: The Use of Geochemical Techniques in Discrimination Chert Materials, in *Crossing the Borders: New Methods and Techniques in the Study of Archaeological Materials from the Caribbean*. Edited by Corinne L. Hofman, Menno L. P. Hoogland, and Annelou L. van Gijn, pp. 43-65. Tuscaloosa: University of Alabama Press.). This should be a priority for any future researcher investigating the prehistory of the island.

portions of stone belts and collars used in the Taino ball game), a prehistoric burial[3] with a purposely deformed skull in the manner modified of the high status Taino society members, and an intact Elenan Ostionoid bowl (circa 900-1200 AD). She also recorded a multiplicity of bones and shells giving special insight into the diet of the pre-Columbian settlers on Guana, and possibly recording the easternmost finding of the Puerto Rican hutia. A post-hole was identified, but the type of structure could not be identified as no other post-holes or indications of a structure form were found. Righter believed Guana Island to be a window into the process of change from the late Saladoid to the early Ostionoid societies, providing a glimpse of the reasons for change and the socio-political processes that led to shift in cultural dynamics.

The author has recently been given access to some of Dr. Righter's personal notes and field records, along with artifacts from Guana she had stored at her residence in Bradenton, FL. Among the items in storage are documents with Righter's personal observations, a more complete list of shovel test sites, precise GPS data and identification of the site for Righter's datum point, which is now buried.[4] There are disturbingly records of "dumped" materials without provenience recorded and details of the excavation of the single posthole found during a period of rain on the island, which does not comport with the standards of archaeological practice. Careful review of Righter's documents should be undertaken and notes of these unpublished materials as they might affect interpretation of previously identified cultural materials and burial practices. For the most part, however, Righter's investigations were of a very high standard and her published results were an important clue in the interpretation of the prehistoric use and occupation of Guana and its role the pre-Columbian Virgin Islands region.

Review of Righter's archives and publication of materials is now being undertaken by the author with the permission and cooperation of Robert Pederson. A complete report of the cultural materials and previously unpublished maps and notes of Righter's excavations will follow later this year. The author is grateful for the access to Righter's field notes and stored cultural artifacts as they hold important factual information vital in interpreting Righter's results, understanding her impressions and survey design, and locating with specificity areas she investigated, both with and without evidence of prehistoric activity, previously unpublished. With access to Righter's field notes and other documents, future research for Guana can be narrowly targeted to answer specific questions and explore varying theories without duplication of efforts due to the change of the investigative team.

Purpose

The 2012 archaeological investigations, initially planned as the first year of a multi-year investigation, were undertaken with three specific goals in mind: (1) to develop an understanding of the prehistoric geological environment; (2) to identify with precise GPS location data the areas previously investigated by Righter and others; and, (3) to shovel test likely areas for settlement that have not been previously investigated. A fourth goal was added when Dr. Andrews joined the team. He conducted a pedestrian survey without collection over much of the island providing excellent photographs of the landscape. He

[3] Personal communications with Dr. Righter's husband, Robert Pederson, have shed light on Righter's conclusion that the remains were prehistoric, rather than perhaps an Afro-Caribbean slave as posited by others. In addition to the modified skull, prehistoric potsherds had been placed over the eyes, the position of the burial and other artifacts recovered in the stratigraphic levels of the grave ruled out the possibility of this having been an historic era grave. Unfortunately, Righter mentioned only the skull modification in her 2008 report. Preservation of the skeletal remains should be undertaken as soon as possible as the author understands they are in an extremely fragile state.

[4] Personal communication with Robert Pederson.

also produced, what the author believes is, the first accurate GPS map of the known archaeological sites on Guana Island.[5]

Equipment and Personnel

The author was the lead investigator on the project responsible for the design and management of the 2012 field excavation program. The author provided standard archaeological tools and equipment for the team, and recording forms and a field notebook for the team to organize their findings.[6] Any errors or omissions in the report that follows are the author's and not attributable to the field team.

The field crew consisted of a team from the University of Missouri – Kansas City (UMKC), led by Dr. Tina Niemi, Professor of Geology. The archaeological field crew consisted of UMKC students Theresa Goyette, John Rucker, and Amy Amies. Dr. Niemi is preparing a separate report concerning the prehistoric geology of the island. The author understands the report will identify the equipment used and results and, therefore, will not address the geological findings other than as they are known to the author at this time and as they relate to or otherwise impact the archaeological analysis and interpretation. Joseph Andrews, Ph.D., of KU assisted the field crew with mapping, survey and excavation. He also created the GPS map of Guana in ArcGIS cited herein.

Overview of Daily Activities & Conditions

The field crew arrived on Guana Island in the late afternoon on October 2, 2012. Their time on the island was spent as follows:-

October 3rd – relocation of Righter sections; taking coring samples; shovel test Flat 1
October 4th – coring samples; shovel test of Flats 2
October 5th – shovel test of transect on North Beach, sampling every 30 meters
October 6th – bathymetric profile of salt pond; take coring samples
October 7th – fieldwalk to "Bat Cave" and Sugarloaf summit
October 8th – travel to Norman Island to assist in identification and recording of cannon[7]
October 9th – shovel test Flats 3 and 4; 1x1 section ("Test Unit A"); salinity profile of salt pond
October 10th – continue excavation of Test Unit A; profile beach; complete coring sampling
October 11th – complete excavation of Test Unit A; shovel test Flats 5 through 8; backfill test sites
October 12th – depart Guana Island

[5] A draft of Dr. Andrew's mapping and geological survey of Guana provided to the author in advance of preparation of this report is annexed hereto as "Appendix A". A complete report of the geological survey of Guana from Dr. Niemi and the team from UMKC is anticipated by the author to be received shortly and will follow this report.

[6] As often happens in the field, conditions on the ground necessitate changes to the program and much of the author's prepared reporting forms, instructions for labeling of sites and layers of excavation, and requests for separation of artifacts were not used by the field team. This has resulted in the author's inability to determine with accuracy some of the provenience of the artifacts, and difficulty in determining sites that were labeled with different identification tags. The results should therefore be evaluated and relied on with caution where noted by the author.

[7] See "Appendix C" for John Rucker's drawing and notes concerning the cannon, as well as photos taken by Rucker. The author is not well-versed in military armament and makes no comment apart from agreeing with Rucker's conclusions. The author recommends that, if not already done, immediate preservation efforts be undertaken concerning the cannon as otherwise it is likely to rust and erode in a few years in the Caribbean climate now that it is exposed to the air.

Weather conditions were generally excellent – sunny or partly cloudy with light breezes, approximately 90° F, with light showers occasionally in the afternoon. Much of the time in the field was dedicated to investigation of the geological composition of the island and the salt pond.

Given the previous archaeologists' indications of the complicated stratigraphy of the soils, the author (unable to attend in person due to medical reasons) requested the team excavate in arbitrary 10 cm levels. This was sometimes followed, sometimes not. While the author commends the team on a generally excellent field season with superb efforts by all who participated, it is necessary to reference that the team made certain decisions that may compromise the integrity of the archaeological results that follow. There was a notable lack of consistency in labeling sites and artifact bags. For example, Test Unit A is also labeled as "Flats 4" and referenced as "Flats 5," however there is GPS data in the field notes that will allow the precise location to be accurately mapped.

That is not always the case, however. As often happens, there were potsherds in bags that had no labels indicating provenance, and they have therefore not been included in this report. There are artifact bags referencing three layers identified as "STAA" 1, 2 and 3, respectively, with no field notes to specifically pinpoint origination in the landscape. No modern materials from the surface level were collected, though some were noted. With a few notable exceptions (see below), the team did not collect rocks or other lithic materials. There was some misunderstanding as to the relevance of West Indian topshell (whelk) and whether it was edible or not, therefore a majority of the whelk shells were not collected.[8] As other archaeological sites and previous investigations on Guana have shown, whelk often comprised a major component of the Amerindian diet. Without its collection, the reliability of any inferences drawn from the organic/edible materials that can be inferred from the presence of shells in the soil is dubious. Similarly, without 100% collection of lithic materials, it is possible that some stone tools or other artifacts were lost. The lack of consistency in the identification of sites has made interpretation of the results and analysis difficult, and therefore this report will set out only the factual findings and will point out areas ripe for future archaeological investigations indicated by the results reported herein.

The author asked the field team to investigate several sites along the hiking trails and some areas that have never been subject to any field survey of which the author is aware, but given their location would possibly have been accessed or used by prehistoric groups. Given the steep terrain (many areas with a grade greater than 30% are noted throughout the BVIs) and lack of accessible roads, the team was able to hike to only a few of the sites, such as the "Bat Cave," but did not find any evidence of prehistoric occupation in the higher levels as had been noted by previous researchers.

The author was informed by personal communication with Robert Pederson that Dr. Righter had conducted a pedestrian survey of the "Bat Cave" area as well as shovel tests (for which there is no data known) and found no evidence of prehistoric use. It may be that the area has been disturbed by modern use (there is mention by Righter of the possibility of a "squatter" in the area following the Quaker population). However, the author notes that pedestrian survey is limited only to what can be immediately seen on the surface, and that often changes depending on variable conditions such as the weather, the time of day, and the skill of the investigator in recognizing prehistoric artifacts from ecofacts on the ground.

[8] Personal communication with Dr. Tina Niemi after the team returned to Kansas City.

Additionally, shovel tests are "hit & miss;" unless you dig in the right place, you'll miss finding the evidence you're looking for. The author believes there are areas of the "Bat Cave" and other places on the island that have been tested that should be retested as the reliability of shovel testing is so uncertain. The author has personal experience in finding prehistoric evidence in a similar area to the "Bat Cave" on Little Jost Van Dyke, an area also believed to be sterile by other archaeologists reviewing the historic use of the island. In that case, the author found large prehistoric sherds on the ground which had previously been overlooked. The author also uncovered what appeared on first impression to be a broken ceramic vessel intentionally deposited at the 'mouth' of the 'cave.' The immediate area around the rock shelter can also show evidence of prehistoric occupation. For example, on Little Jost, the author found telltale grooves in nearby batholith boulders that were indicative of prehistoric settlement and tool production on site, as well as a "shelf" which could have held a small oil lamp or fire providing light in the darkness carved high (above 4') into the entrance to the rock shelter. Further investigation of the 'cave' areas on Guana by an experienced archaeologist familiar with the evidence of prehistoric occupation is recommended as it is possible evidence for Amerindian use of the area exists but has not been yet identified.

For each shovel test and 1x1 m test section, the team screened the soil to recover cultural and organic materials, noting the "clayey" layers were particularly difficult to screen. Some lithics were also recovered, but total collection of lithics was not undertaken and therefore no analysis of the lithics is undertaken in this report. For the most part, the shape, size, form and visible surfaces were unremarkable and consistent with the geological formations found on the island and naturally occurring rocks found throughout the BVIs. One exception was a possible round flake from debitage of the production of stone collars or belts, as the shape had been rounded but is extremely thin (roughly the diameter of a dime, but about 1/3 the thickness). The disk is covered in calcium carbonate deposits and without their removal it is impossible to see any tool marks or other indicators of worked stone. However, the author has never seen a flake of stone like this occurring naturally in the region and there was one other lithic that was much bigger in size that did bear evidence of having been worked and appeared to be in the process of being deliberately shaped when abandoned.

The team was requested to separate the artifacts by type in the field, but this did not happen. Artifacts were bagged together and brought back to Kansas City unwashed and unsorted. The author conducted a preliminary review of the cultural materials and determined that there was no value in retaining the artifacts unwashed as they had been mixed with other materials. The artifacts were sorted, counted, weighed, measured, and items with diagnostic significance were separated for further review.

The author is in the process of drafting a presentation to deliver the results of the 2012 investigations on Guana at the 25th Congress of the International Association of Caribbean Archaeologists ("IACA") in San Juan, Puerto Rico, in mid-July. A poster session to discuss and review the findings with the top experts in the field of Caribbean archaeology will be attended by the author. As the author will be participating in the conference and presenting findings[9], it will be an ideal opportunity to engage in an exchange of ideas about Guana's role in the prehistoric and to request assistance from experts for analysis of the floral and faunal materials. The paper presented will be subjected to peer review and, unless excluded following peer review, eventually published in the Congress's "Proceedings" to be made available by 2015.

[9] Judith Knight, PhD, who is a co-Director of Guabancex, Inc. (a non-profit organization established by the author and Dr. Knight for the purpose of conducting research in the Caribbean and making their results freely available to the general public and scholars alike), will be reading the presentation as a co-author of the final paper for publication.

While on island, the team also took an informal survey of available equipment, took more than one thousand photos of the island environment, investigated possible archaeological sites suggested by aerial photographs and previous reports, and determined the location and condition of the skeleton recovered by Dr. Elizabeth ("Holly") Righter.[10] Despite the short field season and having agreed to come and work on a variety of tasks on an unfamiliar island on very short notice, the team was very successful in their efforts. They were able to identify many of the areas investigated by Righter and located previously unknown prehistoric sites, including one along the North Beach which previously had been thought to have not included any prehistoric activity.

Review of Findings

Among the total assemblage of artifacts recovered were historical items including a pipe stem, iron nails and other pieces of metal, lithic tools and debitage, a variety of faunal remains to be identified and analyzed separately from this report, shell evidencing both the diet of prehistoric occupants of Guana and possible hand tools, rudimentary cemÍs, coral, mortar, and charcoal samples for possible dating purposes. Among the ceramics recovered were dozens of rim sherds from which pottery size and vessel type can be inferred, White on Red painted wares, sherds with linear incisions, punctations, evidence of burnishing and special adornments not previously recorded. The most unique sherd recovered is an anthropomorphic figure of Guabancex, the hurricane goddess in the Taino mythology, directly linking the prehistoric occupants on Guana with the Taino culture. The importance of this singular sherd is discussed further below.

Figure 2. Anthropomorphic sherd fragment of the Taino goddess, Guabancex. Photo by Deborah Davis. © 2013 Guabancex, Inc.

[10] The author will be on Guana Island from July 27-31, 2013, to record and preserve the human remains as best as possible given their fragile condition. A report of the findings will follow.

Also recovered were two sherds with lugs, one perhaps with a small face and partial figure that has been badly damaged.

Figure 3. Lug in Test Unit A. Photo by Deborah Davis. © 2013 Guabancex, Inc.

Figure 4. Interior of rim sherd with lug with incised patterned decoration. Photo by Deborah Davis. © 2013 Guabancex, Inc.

The North Beach area was previously thought to have been unused in prehistoric times provided two large potsherds (one a rim sherd) hinting at other evidence of prehistoric use of the North Beach area.

Figure 5. North Beach potsherds found at NB5. Photo by Deborah Davis. © 2013 Guabancex, Inc.

Most intriguing to the author were coral artifacts recovered that may be tools used by a pre-ceramic society on Guana. Based on review of recent studies identifying these types of coral pieces as tools, rather than merely bits of natural coral, it is possible that Guana was the site of a small pre-ceramic, late Archaic age settlement. If so, it would be the earliest evidence of occupation of Guana and could potentially push date of the first settlement of the island back by hundreds of years, perhaps more. The late Peter Drewett, Ph.D., found evidence of an archaic settlement on Tortola at Belmont that parallels similar lithic tools found at the Krum Bay site in the U.S. Virgin Islands dated c. 1000-200 BC, though the lithic tools could have been part of a ritual deposit by a later societal group. Recovery of a layer of coral pieces that are visibly different from coral found at other shovel test units and in the above layers triggered a closer inspection of the assemblage as a whole and each individual piece. On preliminary review by eye, the coral appears to be shaped for use as hand tools with corresponding evidence of wear and shaping. Further examination of the deep coral deposits should be undertaken with a view to determining whether there was an active archaic presence on Guana.

Figure 6. Coral with shape and indications of modification, possible pre-ceramic tool? [Color not displayed correctly. Coral is much lighter than appears in photo.] Photo by Deborah Davis. © 2013 Guabancex, Inc.

Figure 7. Examples of possible coral tools. Photos by Deborah Davis. © 2013 Guabancex, Inc.

The author is compiling a database of Guana artifacts at the request of Lianna Jarecki, PhD, using Past Perfect 5.0, with optional images included, which will serve as the "virtual museum" for the general public and researchers interested in Guana archaeology. It will also fill a need to consolidate the efforts of various archaeologists who have worked on Guana to avoid duplicative efforts and to assist in developing a more focused and productive archaeological program of investigation. For now, the

Survey tests ("shovel tests" – literally excavating a square, to differentiate from possible post hole features, the size of a standard shovel to test whether there are cultural deposits in the subject area) undertaken by the team revealed a largely similar geophysical composition of the site. The topsoil was usually sod, with humic, sandy loam underneath. Below that, clay or clayey sandy layers pervaded, underlain with clean beach sand believed to be a sterile "natural" horizon. In some areas, the team found a layer of heavy coral deposits with clean sand, indicative of a major meteorological weather event such as a massive hurricane. This could potentially explain the clear breaks between the late Saladoid and Elenan/Chican Ostionoid (Taino) societies as noted by Dr. Righter in her reports. It is assumed that further information about the ecofacts in these layers can be found in the report from Dr. Niemi, *et al.,* to follow and therefore will not be addressed further in this report.

Figure 8. Example of the type of stratigraphic layers found on Guana. Photo by John Rucker. © 2013 Guabancex, Inc.

The team spent the majority of their time investigating the area known as the "Flats," being the flat area between the salt pond and White Bay beach. A summary of their shovel test results is set out below with the complete transcription of the team's notes set out in "Appendix C."

Figure 9. Scenic overlook of the "Flats" area. Photo by John Rucker. © 2013 Guabancex, Inc.

Shovel tests

"Flats" area (including the Orchard/Garden, old Donkey
Pen and area between the salt pond and White Bay beach

Flats 1 – Sod, loam and sandy silt. Likely disturbed. Cultural and organic materials recovered 10-130 cmbs.

Flats 2 – Sod, loam and silty sand. Charcoal horizon below surface level starting at approximately 10cmbs.

Flats 3 – Likely historic mortar found. Cultural deposit (pottery) at 70-80 cmbs. Coral and shell deposits to 120 cmbs.

Flats 4 – Likely disturbed. Historic and prehistoric pottery recovered. Darker beach sand below 50 cmbs. Location of trash burn one year previously.

Flats 5 – Located in old donkey pen. Two potsherds recovered just below the surface. Likely disturbed by animal activity.

Flats 6 – Mixed historic and prehistoric cultural materials indicating area of disturbance. Tree root at 20 cmbs prevented further excavation.

Flats 7 – Pottery and shells recovered from surface to 20 cmbs. Tree root prevented deeper excavation.

North Beach

A transect was established and shovel tests were conducted at 30 m intervals. A possible "hammerstone" was recovered, but no provenience was recorded. The author notes the hammerstone resembles the common large beach pebbles found on Jost Van Dyke and Little Jost Van Dyke. Review of the stone by eyesight and at 1.5 times magnification revealed no evidence of wear or use, and the author therefore believes the stone is simply just a beach stone and therefore not of archaeological significance.[11]

North Beach 5 – Pottery and charcoal recovered from 10-75 cmbs.

North Beach 1, 2, 3, 4 6, 7, 8, and 9 – Modern materials on surface not collected. Shells and coral present, not collected.

Test Unit A

The team spent two days excavating a 1x1 meter square north of the fence of the "Orchard" in the southwest corner of the "Garden" as identified by Righter. The section was placed either in the area of Flats 4 or Flats 5 (field notes reference both, but in all instances but one the test unit is referenced as

[11] The stone has been removed from the collection and will not be archived as it has no archaeological significance.

being in Flats 4) which they identified as "Test Unit A." The site was chosen as there was a small depression in that area of the flats and previous areas had been on higher locales. The top layer (surface to 10 cmbs) contained abundant charcoal and one historic sherd (blue on white transfer print white ware). As the team was excavating the section, a gardener advised them the depression was a result of a fire they'd burned the previous year to dispose of trash, and the effects of the bulldozer pushing soil and materials toward that area.

A shovel test (identified as "Flats 5") had found a large deposit of cultural materials (potsherds) at 30-40 cmbs, so it was decided to expand the shovel test to a 1x1 m unit. At approximately 20 cmbs, the team encountered a very hard compacted layer. No color or texture change was noted. With each successive layer, the team encountered sandier soil. The water table (fresh water[12]) was discovered at approximately 100 cmbs.

The majority of the ceramics were collected from "Flats 4" also known as "Test Unit A." Analysis of the pottery is ongoing, with a complete dataset and interpretation to be included in the paper for presentation in July at the IACA Congress. In this report, I will summarize the characteristics of the assemblage and point out notable artifacts of special significance.

The 2012 field team recovered 381 ceramic sherds with no intact vessels among the assemblage. The total weight of the ceramics was 2,230 grams. The majority of the ceramics were recovered in Flats 4, Test Unit A being 234 sherds (61.4% of the total collection) weighing 1,389 grams (62.3% of the total weight of the assemblage). Eight sherds (2% of the ceramics) lacked provenance and had to be disregarded. Thirty-two sherds (8.4% of the assemblage) weighing 33 grams (1.5% of the total weight) were identified as being from "STAA" (for which no site location was recorded) and therefore it is unclear as to how to interpret these materials until such time as their provenience can be identified.

Caribbean ceramics are not uniform; vessel proportions and equivalents cannot be reliably estimated as sections are often inconsistent in the same vessel. Thus, no estimation of vessel equivalents can be postulated. Additionally, many rim sherds were simply too small to infer vessel shape or size, though they are capable of providing some limited information about the vessel form.

Figure 10. A small sample of the variety of pottery that can be found in one level of a section. There are various reasons, but in this case it is likely due to later disturbance of the soil by animal activity and modern farming. 2013 Guabancex, Inc.

The collected assemblage of ceramics, excluding discussion of the historic sherds for the moment, included bases, rims/lips, body sherds, and appendages, including lugs and handles. Pastes were often tempered with organic materials and sand. Textures ranged from smooth/polished pastes with fine sand temper[13] to very rough paste with large, visible organic and inorganic inclusions. Inclusions appeared to be of locally-sourced materials. Vessel

[12] Ph 6.44. Temp 27.96° C. Salinity 6039 rysiemes/per cm3.

[13] Given the source of the clay used to manufacture the vessels and the presence of fine sand throughout nearly all levels of the islands stratigraphy, it is doubtful that any of the clay used would be found without at least temper of fine sand thus whether that was the intent of the potter or not cannot be inferred.

sizes estimated from rim sherds ranged consistently between the 10-20cm range with few outliers. Soil disturbance from animal activity and farming practices resulted in potsherds possibly being shifted from their original place of deposition and contributed to their destruction in the soil, thus estimation of friability and strength of the original vessel is made more difficult to ascertain.

Overall forms include small outcurving bowls with concave bases, shallow plates/platters with flat bases, an unknown vessel form with a ring base, and a small vessel with a stump base. Stylistic attributes included red and white slips, white on red paint, polished and unpolished exterior and interior surfaces, plain and decorated sherds, and variations of color from white to bright reddish orange, orange red, brick red, dark red and black, along with an array of gray and brown shades. Pottery colors are recorded in the database of artifacts using the Panetone Color Chart available on the internet.[14]

Decoration attributes include incised lines, grooves, and patterns, anthropomorphic figures, lugs, punctation marks and possible drilled holes, impressed patters, finger marks, manufacture lines/wheelmarks, coil junctures, plain and articulated rims, flattened and pushed rims, a smoothed flattened handle sherd with red slip, possible stamp or paddle patterning, and perforated fragments. Function of the vessels represented by the assemblage is difficult to ascertain except where evidence of use as a griddle or cooking vessel is apparent. There may be sherds with black smudging, although the effect could have been created by later historical burning in the area.

Potsherds in the collected assemblage range from extremely friable, soft pastes to very hard (Mohs scale 3-4, approximately) ceramics more common in the higher levels. It is highly likely there are Afro-Caribbean wares included in the total assemblage due to soil disturbances, and review under intensified magnification levels will provide more information but many of these sherds are apparent to the naked eye. There is one piece of painted white on red ware (approximately 2x2 cm) that has a very heavy coat of white paint but no other decoration. No similar sherds were found among the assemblage but this singular piece indicates there may be other well-preserved painted sherds yet to be recovered.

The majority of the sherds can be attributed to the late Saladoid through to the Elenan and Chican Ostionoid (Taino) socio-political groups, although there is a wide variety of earthenwares present in the collection. The dates of occupation largely correspond with previous findings by Dr. Righter with ample evidence for use and occupation of Guana by a small group or settlement being established circa 900-1200 AD followed by a later, possibly overlapping or changing cultural group, circa 1100-1400 AD, with depopulation of the island by the time of the arrival of Columbus in 1492.

Faunal Remains

The faunal assemblage includes claws, crab shells, bird bones, jawbones with teeth, fish vertebrae and many other bones which the author has not yet been able to identify. Given that many of the fragile bones were included with heavier artifacts in the recovery and transportation process, the author is pleased to note that many fragile bones survived intact. The author is not sufficiently knowledgeable to identify the faunal remains with specificity and strongly suggests that an expert should be employed to ascertain the species and quantify the minimum number of animals represented. Expert analysis should be able to identify the both the species and minimum number of species represented the precision

[14] A hard copy of the Panetone Color Chart should be used for precise color identification as the variation of monitors and their ability to precisely display colors and thousands of settings available for display makes exact color identification difficult, although the general color family can reasonably be predicted from the chart publicly available on the internet .

necessary to draw inferences of the nutritional value and volume of caloric energy by the number and type of edible species present and usage/preferential diet of the prehistoric settlement. From this information the population size can be extrapolated by use of parallels and comparisons with previous studies of similar small settlements on nearby islands.

Dr. Righter had previously engaged Samuel Turvey in the UK to analyze a dozen or so bones.[15] The author contacted Turvey in early 2011 and he was pleased to know someone had picked up the reins of the archaeological program, although he was not aware Dr. Righter had passed away. He provided the author with a list of bones reported to Righter from her 2008 field season. Turvey indicated that there are bird bones in archival storage he would be happy to retrieve along with the jawbone of the hutia referenced in Righter's 2008 report, but he could not determine whether this was the Puerto Rican hutia (*Hutia puertoricensis)* or not. The prehistoric floral and faunal remains from Guana Island archived in various institutions where they were sent for study by Righter should be returned for permanent archiving with the Guana prehistoric collection, wherever it is decided to store the archaeological findings.

The author will continue to review the artifact collection and separate the faunal remains from the shell, coral and lithics. Initial separations have been made, but there are two levels where the artifacts are so minute (averaging 2-3 cm each) and the volume of recovery is so high that it will take additional time to sort through. The entire assemblage has been separated by type: pottery, shell/coral, lithics, bone, and metal, with the exception of the artifacts recovered from Flats 1 and 2 (which are the small bits referred to) although all ceramics have been removed from those levels.

Floral Artifacts/Ecofacts

Due to the limited time and space for transporting equipment and artifacts for analysis, the team did not take any soil samples. Charcoal samples were taken, but none have yet been sent for laboratory testing for dating evidence. The author does not believe at this time there would be any value in the expense of doing so as there is ample evidence among the ceramic assemblage for inferring dates and assigning stylistic attributes of the earthenware to known and well-established societal groups. The author will continue to review the ceramic assemblage, however, as Righter (and others) believe evidence of the changing society from the late Saladoid to the early Ostionoid may be found among the archaeological evidence on Guana. The author will present initial analysis of the ceramic assemblage at the IACA Congress and, if consultation with the experts there so indicate, will follow up this report with an update on the analysis of the ceramic assemblage and its importance in demonstrating the changing preferences of the distinct societal groups to create possibly a unique style found only on Guana Island to date.

There are possibly phytolithic remnants and other organic materials present among the earthenware as both temper in the clay and adhering to the unwashed ceramics. Given that the ceramics were mixed in with other artifacts rather than separated by type in the field, the author would suggest sending only a few sherds for analysis to avoid unnecessary expense. There is one sherd in particular from Flats 8 that is quite literally coated in organic material. The author recommends sending at least this one sherd for analysis of the organic materials embedded in the surface of the sherd. Whether the organics are food

[15] The exact number and type of bones sent is not known. There are general references in Righter's notes, but the author has not yet found any type of inventory sent to Turvey other than that provided in his report back to Righter.

residue or were present in the soil is unclear, however this is the only sherd displaying this volume of organic material adhering to the surface and thus appears to be a viable and distinct artifact for further expert analysis and identification of organic matter.

Shell & Coral

Figure 11. An example of the shell types recovered. © 2013 Guabancex, Inc.

The artifact assemblage contains a broad array of shells found in the West Indies. The collection included claims, oyster, scallops, limpets, topshells, possible wormshells, pheasant shells, periwinkles, rissoids, and conch, to name the major classifications. A separate report with more particular recording of the shell assemblage will follow with the paper to be presented at the IACA Congress in July. Many shells included evidence of modification and wear or use without modification as tools. No shells were recovered that were not native to the region.

Of particular note is a large (17x9 cm, with a lip nearly 1.5 cm thick conch shell found in Level 9 of Test Unit A that shows signs of use as some sort of tool. The shell is heavier than every other artifact weighing more than 350 grams. It appears to have been encrusted with some type of mortar, which has hardened it and changed its strength to make it harder and much less friable. A piece of the shell was recovered with a lithic object (6x4x1.5 cm) similar encrusted with mortar. There is one small area of

percussion effect on the stone indicating it may have been crudely shaped, however as the shape is not one that would serve any apparent use (roughly a trapezoidal 'dagger' curving to one side near the 'dagger's' tip). It may be that the artifacts were included in later building during the historic period and the soils have been disturbed in that area. As noted by the field team, that site had been the subject of trash burning and a bulldozer pushing soils and debris into that area.

Figure 12. An example of the damage a bulldozer can do to the stratigraphy of a section when pushing soils. © 2013 Guabancex, Inc.

Additionally, the area of Flats 3, Levels 4, 5, and 6 held a large quantity of strikingly white[16] coral in shapes, colors, and forms that to the naked eye appear to have been modified into primitive tools. The author will conduct a separate analysis of coral artifacts from that location for wear/use indications and, if found, parallels with other forms of pre-ceramic coral tools found in the Antillean archipelago.

Guabancex – Presence of the Goddess of the Hurricane

The word "hurricane" is from the Taino language. In Taino mythology, the goddess "Guabancex" (gwah-bahn-say), meaning "Lady of Winds," controls the wind and the storms. When angered, she comes to remove corruption and decay from the islands, sweeping away everything in her path with the combined forces of the wind and water in order to renew the islands. It is believed she brings the hurricanes with the assistance of the gods of the rains and thunderstorms, who must do her bidding when called upon. Her visitation of the hurricanes on the islands is usually attributed to the straying of the population from worship of the deity or failure to make a proper offering. She is powerful and has the ability to force the other gods to assist her in her work.

[16] Most of the coral mixed with prehistoric cultural materials was a light grey or greyish brown color and showed few or no signs of possible modification.

A ceramic rim sherd among the assemblage from the Flats 6 area bears an anthropomorphic depiction of Guabancex, or at least a part of her with her head and one complete outstretched, upward curving arm. It is believed to be the first finding of her icon on anywhere in the British Virgin Islands, and is a very significant find. Images of the Taino gods found on ceramics are not common among the smaller, less important societal groups. Finding an image of Guabancex, such a powerful goddess, on Guana Island is a distinctive mark of the importance of the island and the status of its residents among the Taino society. While it cannot be inferred with certainty without further study and comparative review, the finding of higher-status items, such as the Guabancex sherd and the ball belt fragments, indicate that the island may have played a very important, if smaller, role in the apex of the Taino society in the northern Antillean archipelago. The author strongly urges that a rigorous program of study be undertaken to thoroughly and systematically investigate and review again the areas of occupation on the island. As it is in pristine condition, undisturbed by modern construction and activity over much of the island's landscape, Guana represents a unique opportunity to learn about the role of a small, yet possibly highly important part, of the pre-Columbian activities in the Virgin Islands.

Future Work

At the end of July, the author and her colleague, Dr. Judith Knight,[17] will be traveling to Guana Island for a few days to accomplish three specific goals: (1) to record and preserve the human remains now stored, and to determine whether further analysis of the bones should be undertaken; (2) to inventory the archaeological equipment and storage space, and to measure the space for creation of museum-quality archaeological exhibits for guests of the island; and, (3) to view firsthand the landscape of Guana Island and locate the datum buried by Righter and Pederson identifying precise GPS coordinates. A detailed report of the forensic findings and recommendations regarding the skeletal remains will follow. In the role of professional consultants to Guana, the author and Knight will design museum-quality exhibits that provide both an informative and interactive experience for guests of the island. Finally, location of Righter's datum will allow the author to locate with reasonable accuracy the GPS coordinates of the sites Righter investigated for more accurate mapping. The foregoing items are all recommended actions that should be done sooner rather than later, and certainly before any further archaeological programs commence.

[17] The author and Knight have created a non-profit named "Guabancex, Inc." for the goddess of the hurricane found on Guana Island with the hopeful intention of continuing their prehistoric archaeological investigations on Guana Island in future. The creation of the non-profit organization is designed, in part, to fund and supply the equipment needed for a rigorous archaeological program conducted in strict accordance with the professional standards of archaeological methods in order to make a meaningful contribution to the knowledge of the island and the role of the BVIs in prehistory. The author and Dr. Knight, along with a third colleague in the United Kingdom, are also working on a book project together investigating the bioarchaeology of care in the prehistoric, specifically designed to explore the evidence of an ephemeral emotion – compassion – that would otherwise have left no mark on the landscape or in the cultural deposits. In doing so, the author is reviewing evidence of every recorded burial in the prehistoric Caribbean and other selected sites around the globe for contrast and comparison. The author is building a database of skeletal remains with evidence of injury or disease with onset at least one year ante-mortem that would have required assistance for the affected individual's survival. The author's specialized knowledge base of skeletal remains lends itself to a thorough forensic field assessment of any burials found on Guana and the ability to determine the age, sex, date of burial, etc. for any other burials that may be found as well as initial recording and preservation of the skeleton currently stored on Guana. The author believes this will be the first database of this kind with strict scientific parameters for inclusion of the recording of skeletal remains to find evidence of the intangible – a human emotional motivation such as compassion - although databases of burials related diseases, injuries, disorders, etc. do exist. Anticipated completion date for the book is Dec. 2014. The author hopes the recording of the skeletal remains on Guana will qualify for inclusion in the study.

Based on the 2012 field season findings and review of previous work done on Guana, the author recommends that extensive excavation of certain areas where prehistoric cultural materials have been found or are likely to be found be undertaken. Intensive excavation efforts over a committed period of years, such as that successfully accomplished on Tortola by Peter Drewett, be undertaken to thoroughly identify the Amerindian populations that were present on Guana and their use of the island and socio-political affiliations. A similar program on Guana would be an unparalleled opportunity to investigate where modern society has not yet destroyed fragile beach and shoreline occupational evidence. Important questions that have hung like shadows clouding archaeologists' understanding of the prehistoric inhabitants may be resolved, at least in part, by evidence that might be found on Guana. For example, Columbus noted the islands were uninhabited as he passed. No evidence of occupation has been found for the period around the mid-15th century, yet there is ample evidence for settlement in the BVIs during the early years, height of Taino society and into its eventual decline. As of yet, however, there is no definitive explanation as to *why* the islands were depopulated by 1491. It could be that *Guabancex* visited and wiped out the existing population in her wrath. Or disease could have taken its toll with survivors relocating to other islands. An answer could be found in the undisturbed stratigraphic layers of Guana's landscape where similar evidence has already been destroyed by modern development on other islands.

Figure 13. Field crew member Theresa Goyette taking samples of the fresh water from the water table. Photo by John Rucker. © 2013 Guabancex, Inc.

Additionally, and previously unbeknownst to the author, Guana has a ready source of fresh water not far beneath the soil surface.[18] In prehistoric times, where the horizon level was lower than present day, fresh water would have been extremely close to the surface if not visibly apparent on the surface. Certainly the presence of fresh water in the local vegetation growth would've been apparent. This would have been a very attractive and special feature to all who passed the island and those who chose to settle there from the Archaic period through the Ostionoid groups. It may have elevated the island's inhabitants to a higher social status or indicated the island was a sacred place of the gods, a place for special ceremonial rituals. Or it may have been that the presence of fresh water so readily available simply facilitated the island's ability to support a small population group. Only further archaeological investigation on a broader scale with a detailed program of study specifically focused to explore these questions can provide answers.

[18] Apparently the presence of the fresh water table is well known locally on the island as is very extensive. It's found in many areas approximately 1 meter below the present day surface.

To properly understand Guana's role in prehistory, the author suggests a multiple-year program of research be implemented to accomplish the following:-

Initial goals for a Phase I survey

- pedestrian survey of all the beach (sand and rock) areas of Guana and the adjacent areas in so far as they are accessible be done by an archaeologist who is familiar with such prehistoric sites and aware of identifying factors so that they are not overlooked and lost;

- a systematic fieldwalking exercise in the North Beach, Orchard/Garden, Donkey Pen, and "Flats" areas be done with total collection of all cultural materials, noting their location by GPS identification;

- a complete map of the island be created using ArcGIS with all known archaeological sites and sites investigated identified;

- the area in and around the "Bat Cave" and other rock shelters be explored by a fieldwalking team with experience in recognizing prehistoric materials and marks on the landscape;

- soil samples from undisturbed areas where prehistoric cultural materials have been recovered (such as NB5) be taken with floatation conducted on the island and results carefully preserved and sent for phytolithic and organic identification and analysis;

- an attempt to investigate the possible sources of chert rumored to be on Tortola and Great Thatch with the requested cooperation of the BVIs government, Department of Natural Resources/Parks or the relevant governmental agency

- identification of any rock art features be made, and detailed photographs of rock shelters, standing stones, stones with evidence of grinding or other use by human hands, and measurements of the inside of rock shelters for 3D modeling in ArcGIS be taken; and,

- a consistent methodology for the identification of sites, levels, and methodology for sampling with standard forms and means of recording should be established and applied in all field work.

Phase 2 and Long-term Goals

After a thorough and potentially exhaustive pedestrian survey of the accessible areas of the island has been conducted with potential prehistoric sites identified, smaller test units rather than shovel test pits should be utilized to ensure a more complete sampling of the landscape for cultural remains.

Underwater sampling of the salt pond for possible cultural materials should be considered, especially if investigation could take place during a period when the salt pond has dried up or is more shallow.

The area of settlement identified by Righter should be as well-defined as possible, beginning with the "hearth" feature she described. The area near the posthole should be carefully scraped by hand by experienced archaeologists who can espy the soil changes that would mark the presence of a posthole in the soil or a floor surface.

A multi-year program of planned extensive excavations of areas for study on Guana that have evidence of prehistoric use and/or occupation of the island should be carefully drafted allowing some flexibility for adding or pursuing new lines of inquiry and sufficient flexibility to adapt to changeable circumstances in the field. The goal of the archaeological program would be, among other things, to fully define the settlement and use of Guana Island, the societal structures and socio-political groups occupying the

island for each distinct population, evidence of trade and temporary use of the island as a resource by people from other islands, and to add to the growing body of knowledge about the settlement of the pre-Columbian Caribbean inhabitants.

It would be ideal to establish a space for the processing of artifacts on the island. This would allow the field team the ability to quickly identify sites of possible significance and investigate such sites as time permits. Artifacts that would remain on display in an interactive "museum" exhibit could be quickly identified, recorded, preservation efforts undertaken, and be made part of the collection of cultural materials in the "museum" without removal from the island. Guests could be advised how to deal with cultural materials they might find while hiking around the island or in the flats or beach areas, thus preserving their scientific integrity of location.[19] Additionally, storage of equipment and materials necessary for archaeological research could be organized and kept on the island to eliminate the burden on the field team of incurring expensive shipping costs and/or laboring with extra baggage when traveling to/from Guana Island.

Figure 14. An example of the pressing need for a dedicated space for the proper processing, recording and storage of excavated finds. The objects wrapped in foil and plastic to the left depict the current storage space for the human remains unearthed by Elizabeth Righter in 2008, exactly as they were left by Righter in 2008. Already extremely fragile and in a state of rapid deterioration, the skeletal bones have continued to suffer from lack of proper preservation. The author will attempt to record and preserve what remains of the skeleton in July, and the bones should then either be reburied or placed in an archival space sufficient to prevent further deterioration. Photo by John Rucker. © 2013 Guabancex, Inc.

The establishment of a well-designed, well-defined archaeological program of investigation on Guana would be a significant contribution to the understanding of the role of the BVIs in prehistory allowing Guana a unique role in the archaeological work in the Caribbean today. As an added benefit, as finds are made and conclusions can be inferred with some certainty or finds of significance, such as the finding of the Guabancex sherd, can be the subject of positive press coverage, reinforcing Guana's special and unique place with the 'power of the gods' and one of only a handful of islands with undisturbed

[19] Essentially, it's OK to pick up an artifact off the ground and look at it, but rather than bring it back with them to the hotel to put it back where they found it so that archaeological surveys of the area can pinpoint the site where it was found. Perhaps a map could be given to interested guests that they could use to explore and mark areas where they see cultural materials and indication as to type, making them part of the archaeological survey (and, if desired, including their name as the discoverer of those artifacts in future reports).

Amerindian or “pre-[European]contact” settlements. An online presence regularly updated as new discoveries are made would generate excitement and enthusiasm for the prehistory project as well as providing a forum for providing access to results for the general public and scholarly research.

The author posits that, although comparatively a small island by size, Guana played an active role in the prehistory of the region. If proof of an Archaic settlement and a seriation of shell and coral tools could be created it would be a significant contribution to the knowledge of the pre-ceramic settlers in the Lesser Antilles. As Righter postulated, it may be determined that the cultural materials on Guana having a mix of several styles (although identified thus far generally as Elenan or Chican) may shed light on the reason why one population group appears to disappear only to be replaced with another group not long after. If it can be shown the earlier people simply crafted a new style of their own, a deeper understanding of the processes of change from late Saladoid settlements through to Ostionoid cultures would be directly attributable to Guana’s contribution. There are strong, albeit smaller in scale, possibilities of bringing new ideas and fresh theories of the cultural processes of societal reorganization involving the Amerindian use and occupation of the islands present on Guana. If the theories are proven correct, it would forever establish the island’s role as an important and unique landscape in the pre-Columbian settlement of the Virgin Islands.

Appendix A

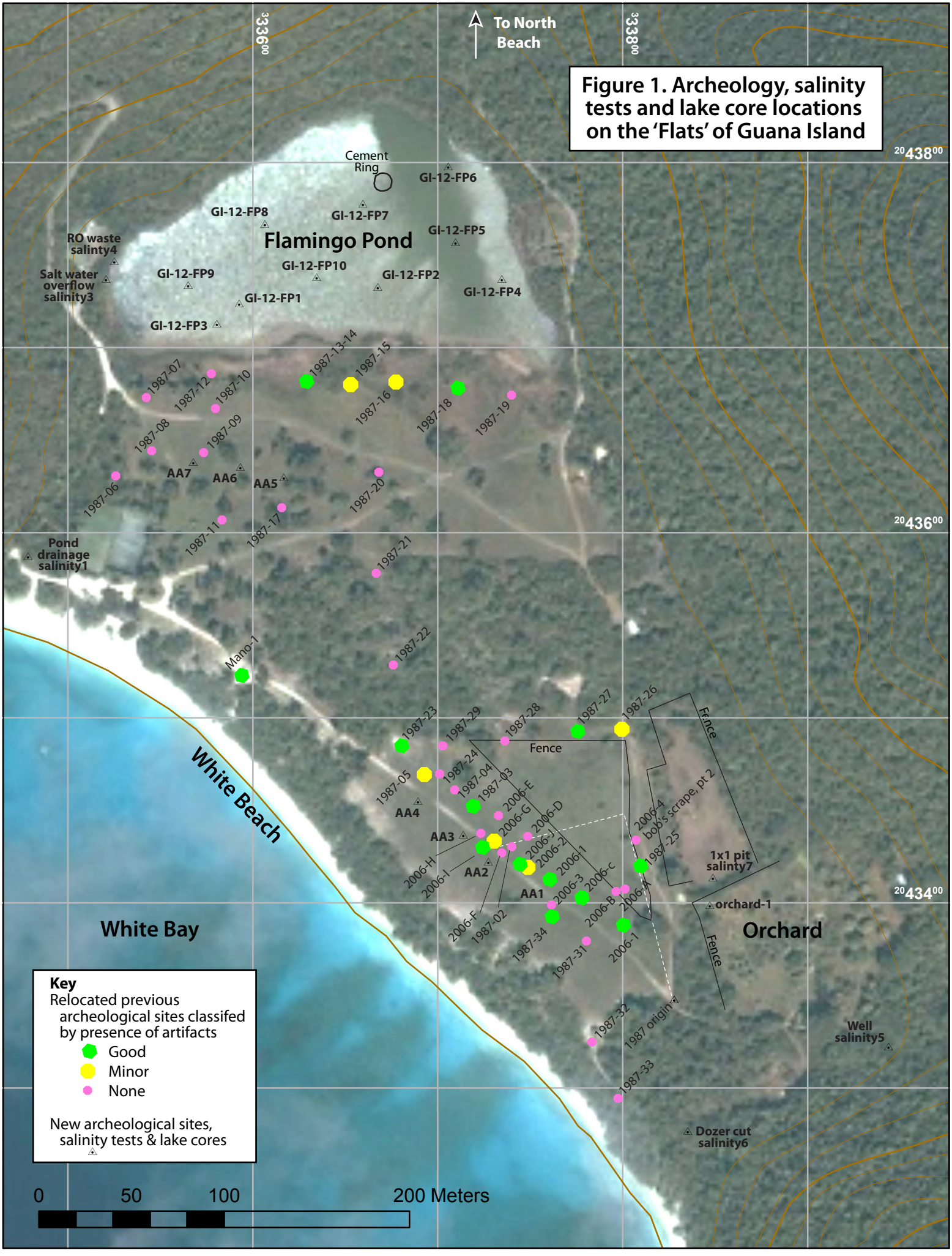
Figure 1. Archeology, salinity tests and lake core locations on the 'Flats' of Guana Island
To North Beach
333600
333800
20438 00
20436 00
20434 00
Cement Ring
GI-12-FP6
GI-12-FP8
GI-12-FP7
GI-12-FP5
Flamingo Pond
RO waste salinty4
Salt water overflow salinity3
GI-12-FP9
GI-12-FP10
GI-12-FP2
GI-12-FP4
GI-12-FP1
GI-12-FP3
1987-07
1987-12
1987-10
1987-13-14
1987-15
1987-16
1987-18
1987-19
1987-08
1987-09
AA7
AA6
AA5
1987-06
1987-20
1987-11
1987-17
Pond drainage salinity1
1987-21
1987-22
Mano-1
1987-23
1987-29
1987-28
1987-27
1987-26
Fence
Fence
1987-24
1987-05
1987-04
1987-03
2006-E
2006-G
2006-D
AA4
AA3
2006-J
2006-2
2006-1
2006-H
2006-I
AA2
2006-3
2006-c
AA1
2006-B
2006-A
2006-4
bobs scrape, pt 2
1987-25
1x1 pit salinty7
orchard-1
2006-F
1987-02
1987-34
1987-31
2006-1
Orchard
Fence
White Beach
White Bay
1987-32
1987 origin
Well salinity5
1987-33
Dozer cut salinity6
Key
Relocated previous archeological sites classifed by presence of artifacts
Good
Minor
None
New archeological sites, salinity tests & lake cores
0
50
100
200 Meters

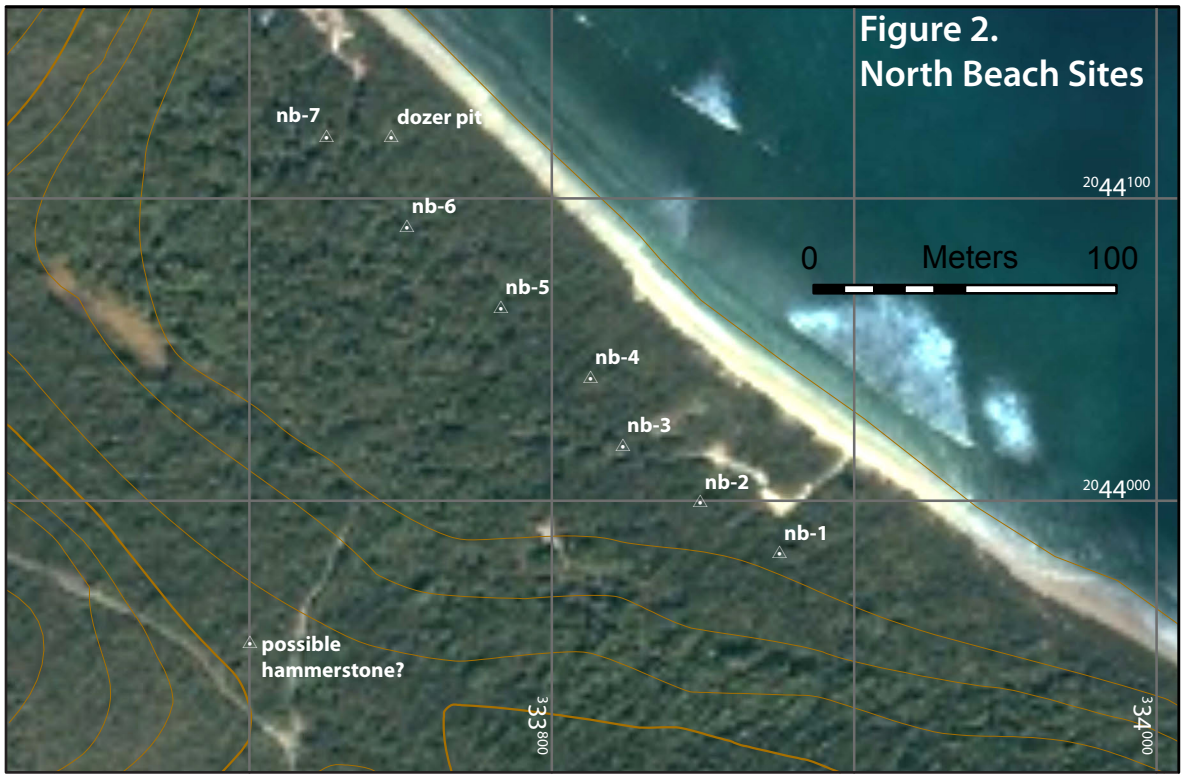
Figure 2.
North Beach Sites
nb-7
dozer pit
nb-6
nb-5
nb-4
nb-3
nb-2
nb-1
possible
hammerstone?
0
Meters
100
2044100
2044000
33800
34000

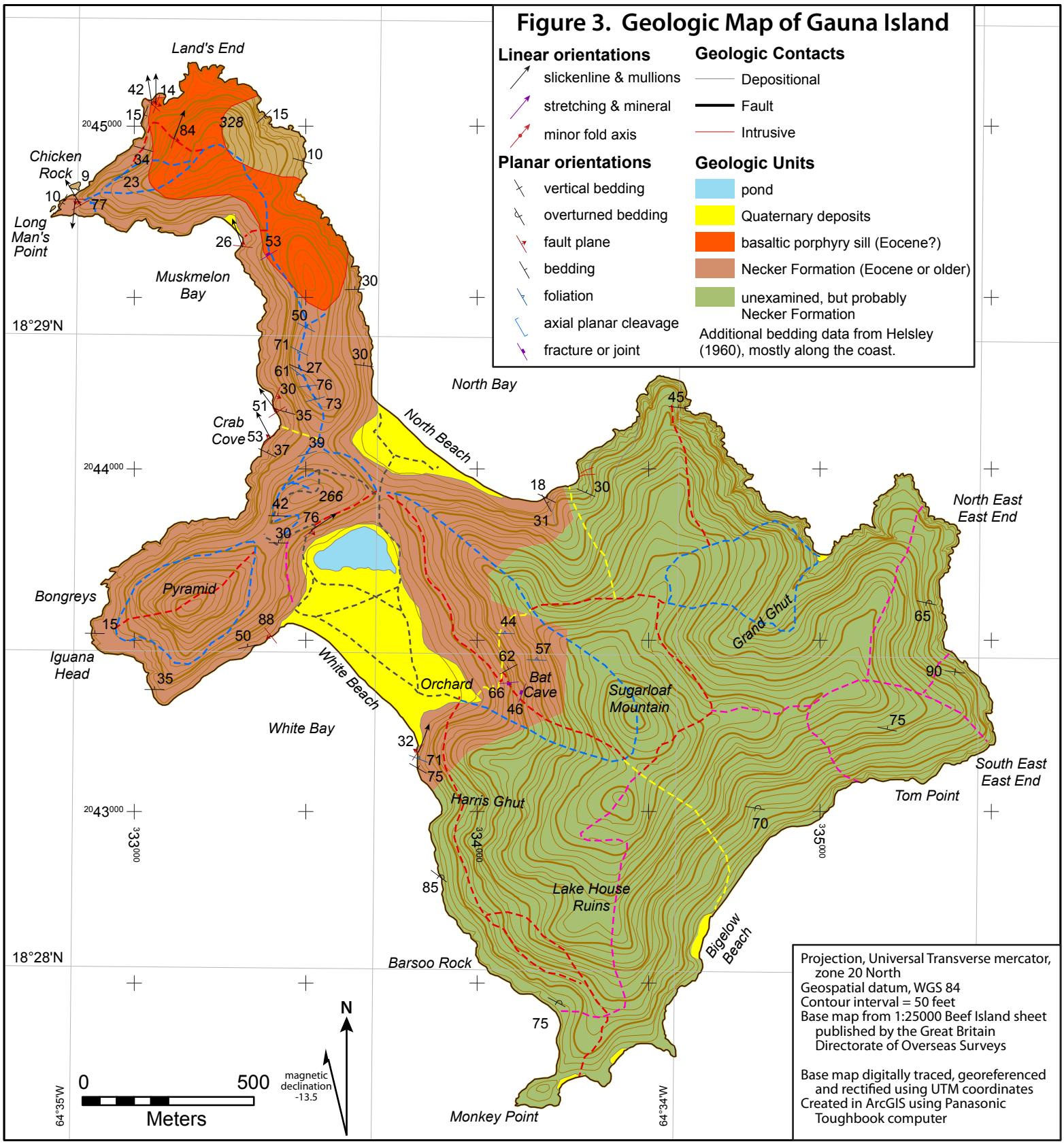
Figure 3. Geologic Map of Gauna Island
Linear orientations
slickenline & mullions
stretching & mineral
minor fold axis
Planar orientations
vertical bedding
overturned bedding
fault plane
bedding
foliation
axial planar cleavage
fracture or joint
Geologic Contacts
Depositional
Fault
Intrusive
Geologic Units
pond
Quaternary deposits
basaltic porphyry sill (Eocene?)
Necker Formation (Eocene or older)
unexamined, but probably Necker Formation
Additional bedding data from Helsley (1960), mostly along the coast.
Land's End
Chicken Rock
Long Man's Point
Muskmelon Bay
North Bay
North Beach
Crab Cove
Bongreys
Pyramid
Iguana Head
White Beach
White Bay
Orchard
Bat Cave
Sugarloaf Mountain
Grand Ghut
North East East End
South East East End
Tom Point
Harris Ghut
Lake House Ruins
Bigelow Beach
Barsoo Rock
Monkey Point
18°29'N
18°28'N
64°35'W
64°34'W
20 45 000
20 44 000
20 43 000
333 000
334 000
335 000
0
500
Meters
magnetic declination -13.5
N
Projection, Universal Transverse mercator, zone 20 North
Geospatial datum, WGS 84
Contour interval = 50 feet
Base map from 1:25000 Beef Island sheet published by the Great Britain Directorate of Overseas Surveys
Base map digitally traced, georeferenced and rectified using UTM coordinates
Created in ArcGIS using Panasonic Toughbook computer

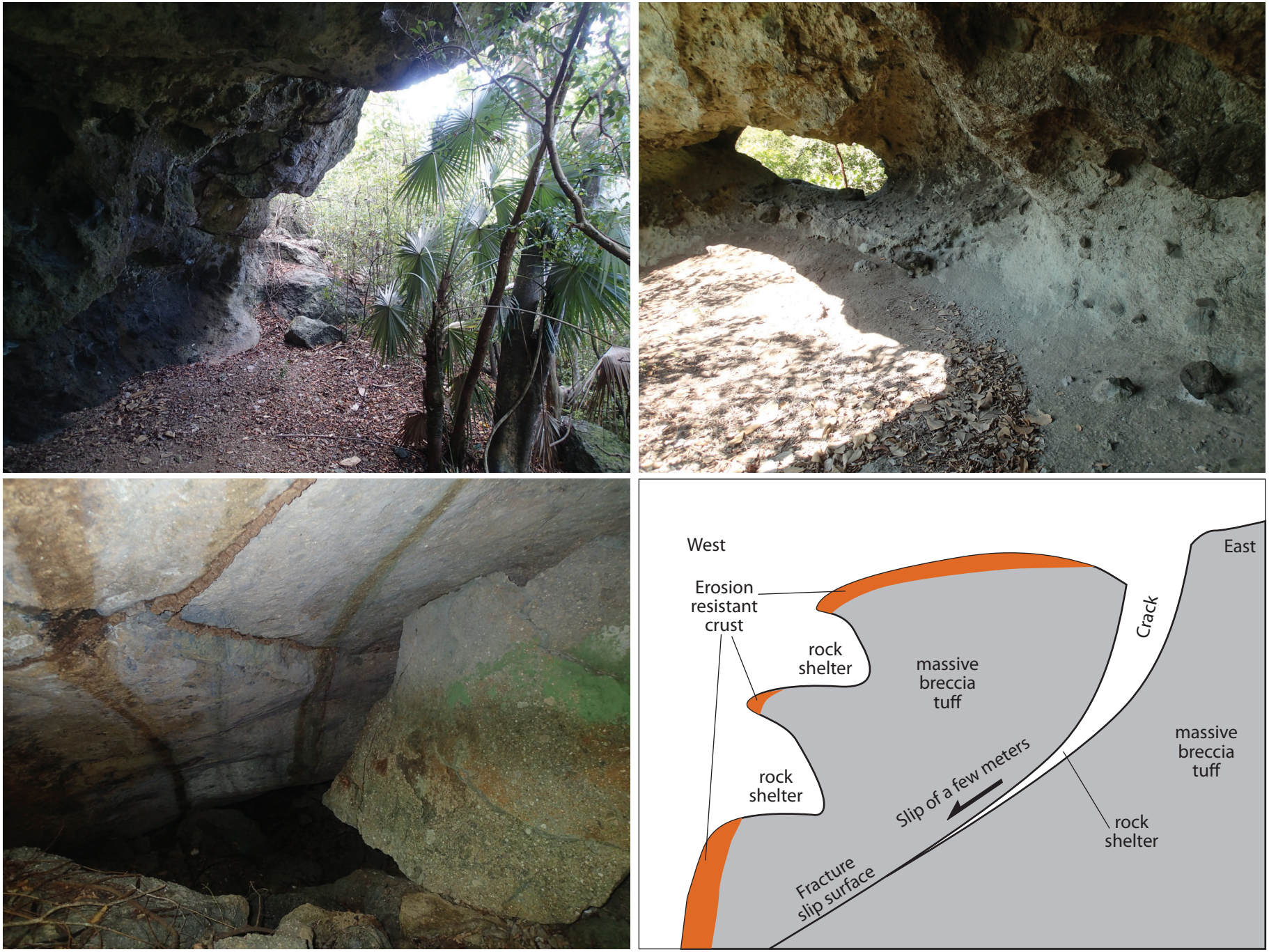

Figure 4. A. Large rock shlter (lower shelter) near yellow and red trails. B. Rock shelter adn window above lower rock shelter. View into rock shelt along rock slide surface, looking toward west and downward. D. Simple rock slide model of crack-like rock shelter.

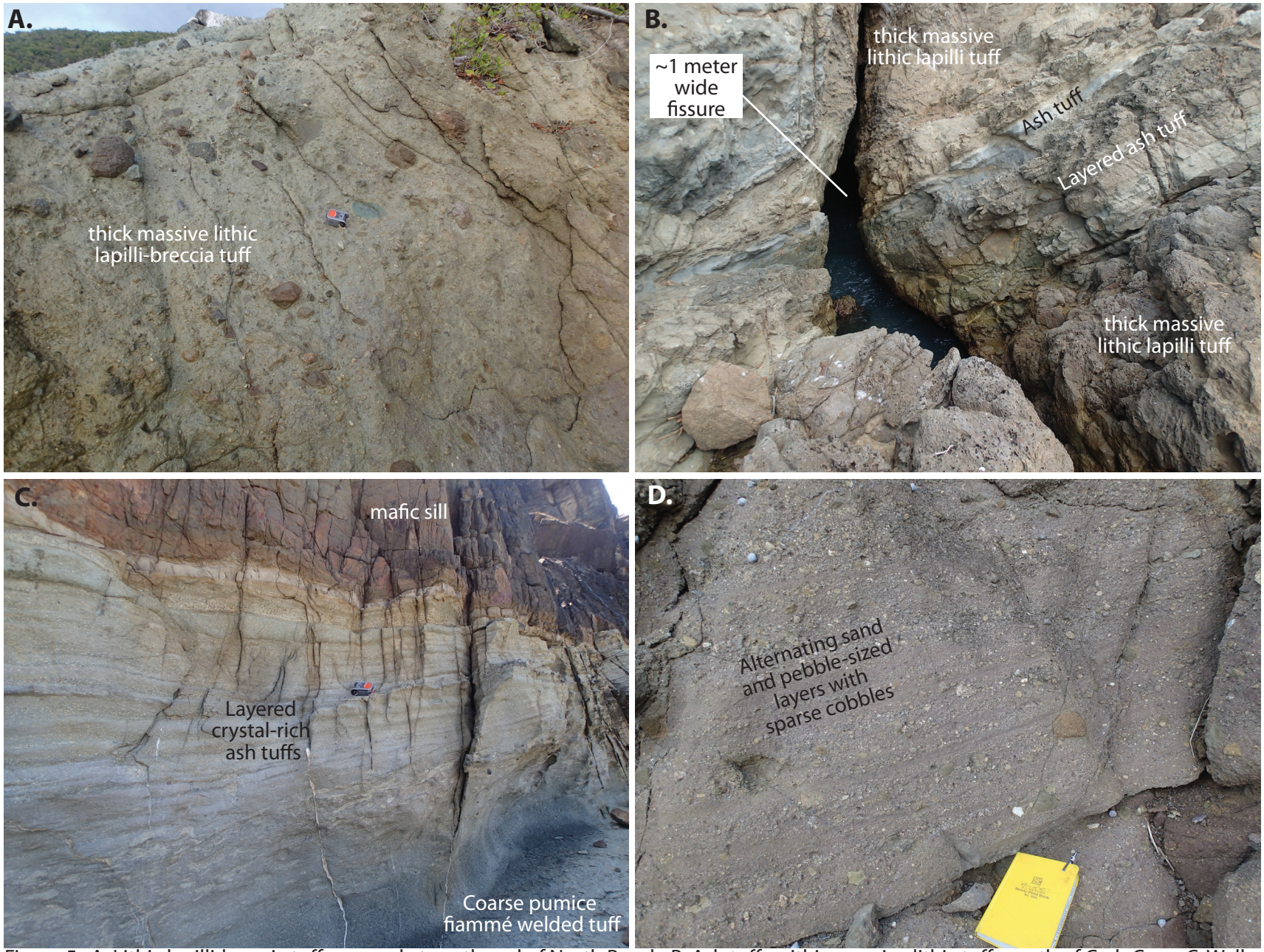

Figure 5. A. Lithic lapilli-breccia tuff exposed at south end of North Beach. B. Ash tuffs within massive lithic tuffs south of Crab Cove. C. Well layered ash tuffs over welded tuff and intruded by mafic sills at north end of the island. D. Epiclastic sediments exposed southeast of North Beach.

Figure 6. View of rocks at south end of North Beach, intruded by dikes.

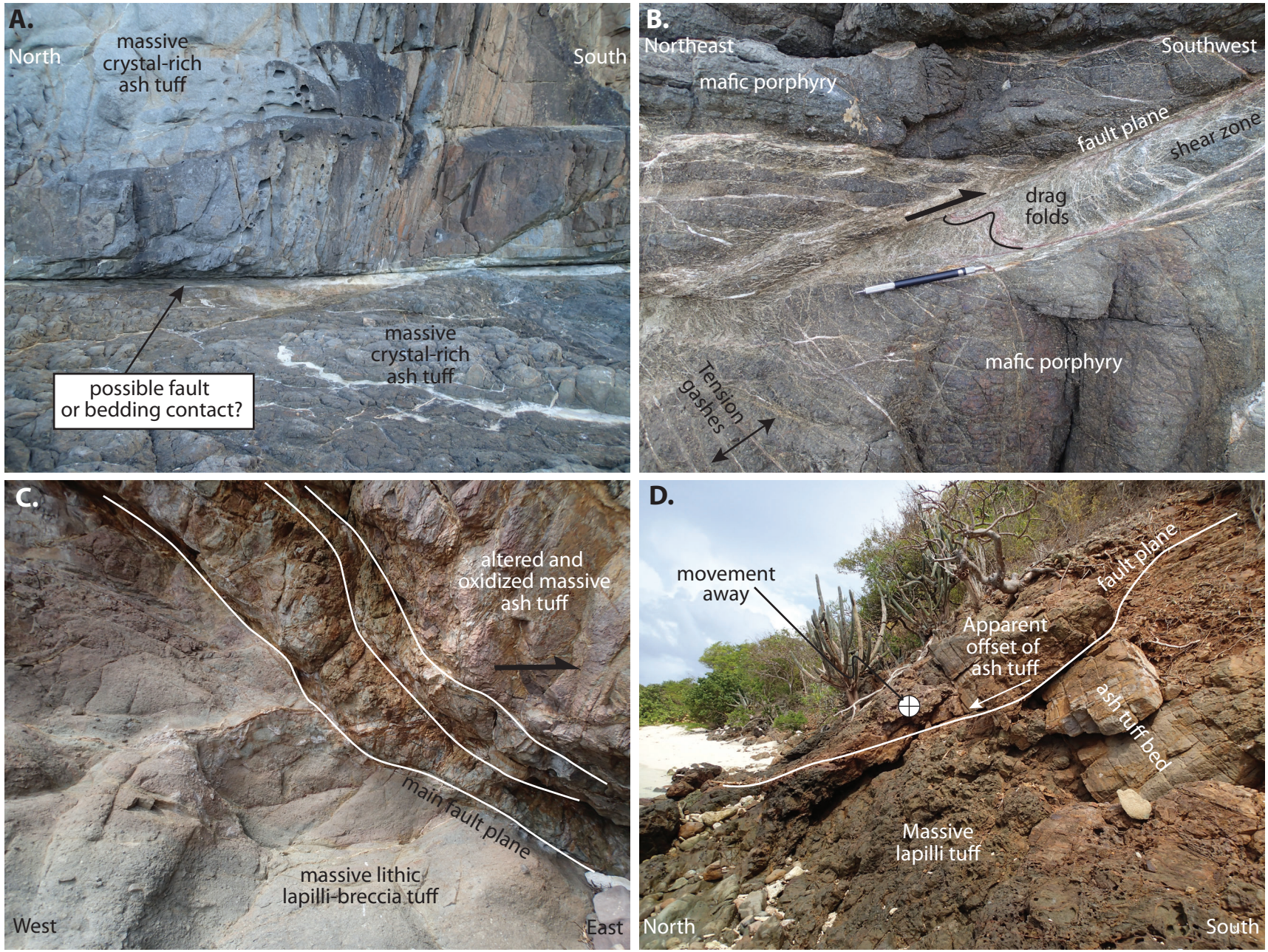

Figure 7. A. Possible low-angle fault plane along top of wave cut terrace at Long Man's Point. B. Thrust fault exposed in mafic porphyry along northern edge of Gauna Island. C. Fault exposed jsut north of Crab Cove with top to east relative movement. D. Fault exposed at the southern end of White Beach with top to the east movement.

Appendix B: Shovel Test Log

Flats 1	0-10 cmbs	Sod	Small mound, open area on flat around 30 meters southwest of the "donkey pen" fence
	10-20	Humic topsoil, loam (75YR 4/2)	Pottery and shell
	20-45	Sandy silt (10YR 6/2, light brown)	Pottery, shell, and coral
	45-130	Sand (10YR 7/2)	Pottery (likely contamination), shell
Flats 2	0-10	Sod	Small mound, open area on flat
	10-30	Humic topsoil, loam (10YR 3/2)	Abundant charcoal (collected) near top layer. Charcoal horizon just below sod.
	30-80	Silty sand (10YR 6/2)	Sterile layer.
	80-100	Sand (10YR 8/2)	Reached 1 meter depth believed to be natural with no cultural deposits.
Flats 3	Level 1: 0-10	Sod	
	Level 2: 10-20	Silty sand (10YR 5/3)	Four meters west of road, southwest of lone tree. Some mortar.
	Level 3: 20-70	Silty sand (10YR 6/32)	Mortar and shells present. Small pieces of wood and coral found.
	Level 4: 70-80	Sand (10YR 7/3)	Pottery and coral
	Level 5: 80-120	Sand (2.5Y 8/2)	Coral and shells
Flats 4	0-30	Humic sandy loam (7.5YR 4/2)	Open, small depression in flat. Very abundant charcoal.
	30-50	Silty sand (10YR 4/3)	Probably disturbed, mixed with topsoil (but not charcoal) above. Recovered blue and white transfer paint body sherd (historic).
	50-100	Sand (10YR 6/3)	Beach sand, but darker than above. The gardener said the location had been used to burn trash one year previously.
Flats 5	0-20	Humic, sandy loam (10YR 2/2)	Within old donkey pen ("garden" on map) in corner near orchard. Two potsherds recovered immediately below sod.
Flats 6	0-20	Sandy, humic loam (7.5YR 3/2)	On flats around 40 meters south of salt pond. Mowed open area with intermittent large trees. Recovered historic and prehistoric pottery. Stopped at 20cm as reached an impermeable tree root (<4" diameter).
Flats 7	0-20	Sandy, humic loam (7.5YR 3/2)	On flats around 40 meters south of salt pond, 70 meters northwest of Flats 6. Mowed, open area with scattered trees. Recovered pottery and shell. Stopped at 20 cm as reached impermeable (<3" diameter) tree root.
Flats 8	0-30	Sandy, humic loam (7.5YR 3/2)	On flats around 4 meters south of salt pond, approximately 30 meters northwest of Flats 7. Mowed, open area with scattered trees. Recovered pottery and shell.
	30-80	Clayey sand (10YR 6/2)	Pottery and shell.
	80-100	Sand (10YR 8/2)	Pottery and shell.
	100-120	Beach sand (10YR 7/2)	As deep as team could reach. Two coconuts and a plastic bag placed at bottom.
Flats 9	0-20	Humic loam (7.5YR 3/2)	Pottery, shell and bone.
	20-35	Sandy clay (7.5YR 4/3)	Pottery and shell.
	35-45	Carbonate loam (7.5YR 3/2)	Bone, shell, and pottery.
	45-50	Clayey sand (7.5YR 3/2)	No data recorded.
	50-60	Moist sand (7.5YR 4/2)	Sand difficult to sieve due to higher moisture content.
NB1	0-25	Humic, sandy loam (7.5YR 2.5/3)	Wash covered flat inland from North Beach.
	25-50	Sand (10YR 7/3)	Beach sand.
	50-70	Sand (10YR 7/3)	Beach sand. Charcoal collected. More large [illegible] coral, rock, and shell chunks.

	70-95	Sand (10YR 7/3)	Beach sand but with less big chunks. Impenetrable rocks at approximately 95 cmbs.
NB2	Level 1: 0-10	Humic sand (10YR 4/4)	Thirty meters north northwest of NB1. Next to bulldozer scrape, west of trail. Recovered coral. Roots.
	Level 2: 10-30	Humic sand (10YR 4/3)	Coral and organics.
	Level 3: 30-40	Humic sand (10YR 4/4)	Coral and organics.
	Level 4: 40-50	Sand (10YR 6/4)	Coral, organics, and small shells.
	Level 5: 50-60	Sand (10YR 6/4)	Large pieces of coral. Roots.
	Level 6: 60-90	Sand (10YR 6/4)	Large coral, small organics, shells.
NB3	0-30	Humic, sandy loam (10YR 4/3)	Brush covered flat inland from north beach. Topsoil contains modern material. (not collected)
	40-50	Sandy loam (10YR 4/3)	Topsoil disturbed, mixed beach sand and topsoil above. Impenetrable rocks at 50cmbs.
NB4	0-30	Humic, sandy loam (7.5YR 5/3)	Brushy woods inland of North Beach.
	30-70	Sand (10YR 7/3)	Beach sand.
	70-80	Sand (10YR 7/3)	Beach sand with larger weathered chunks of coral, shell, and beach rock.
NB5	Level 1: 0-10	Humic loam topsoil (10YR 4/3)	Thirty-five meters north northwest of NB4. Concrete brick and roots.
	Level 2: 10-30	Humic sand (10YR 5/4)	One piece of pottery found approximately 30cmbs.
	Level 3: 30-75	Sand, coral (10YR 6/3)	Charcoal found approximately 40-50cmbs.
	Level 4: 75-90	Sand (10YR 8/4)	Start of layer under coral layer. Rock and coral with soft sand underneath.
NB6	0-20	Humic, sandy loam	Brushy woods inland of North Beach
	20-60	Sand	Beach sand
	60-70	Sand	Layer of coral chunks
	70-80	Sand	Beach sand. Reached impenetrable rock at approximately 80cmbs.
NB7	Level 1: 0-10	Surface	Thirty meters north northwest of NB6 off side of the road by dump.
	10-50	Humic loam (10YR 4/3)	Coral, rocks and roots.
	50-80	Humic sand (10YR 6/3)	Large pieces of coral, rocks, bedrock and pebbles.

Appendix C: Review of the Cannon Discovered on Norman Island by John Rucker

Figure 15. Cannon discovered on Norman Island. All photos by John Rucker. © 2013 Guabancex, Inc.

NORMAN ISLAND CANNON

Oct. 8 2012

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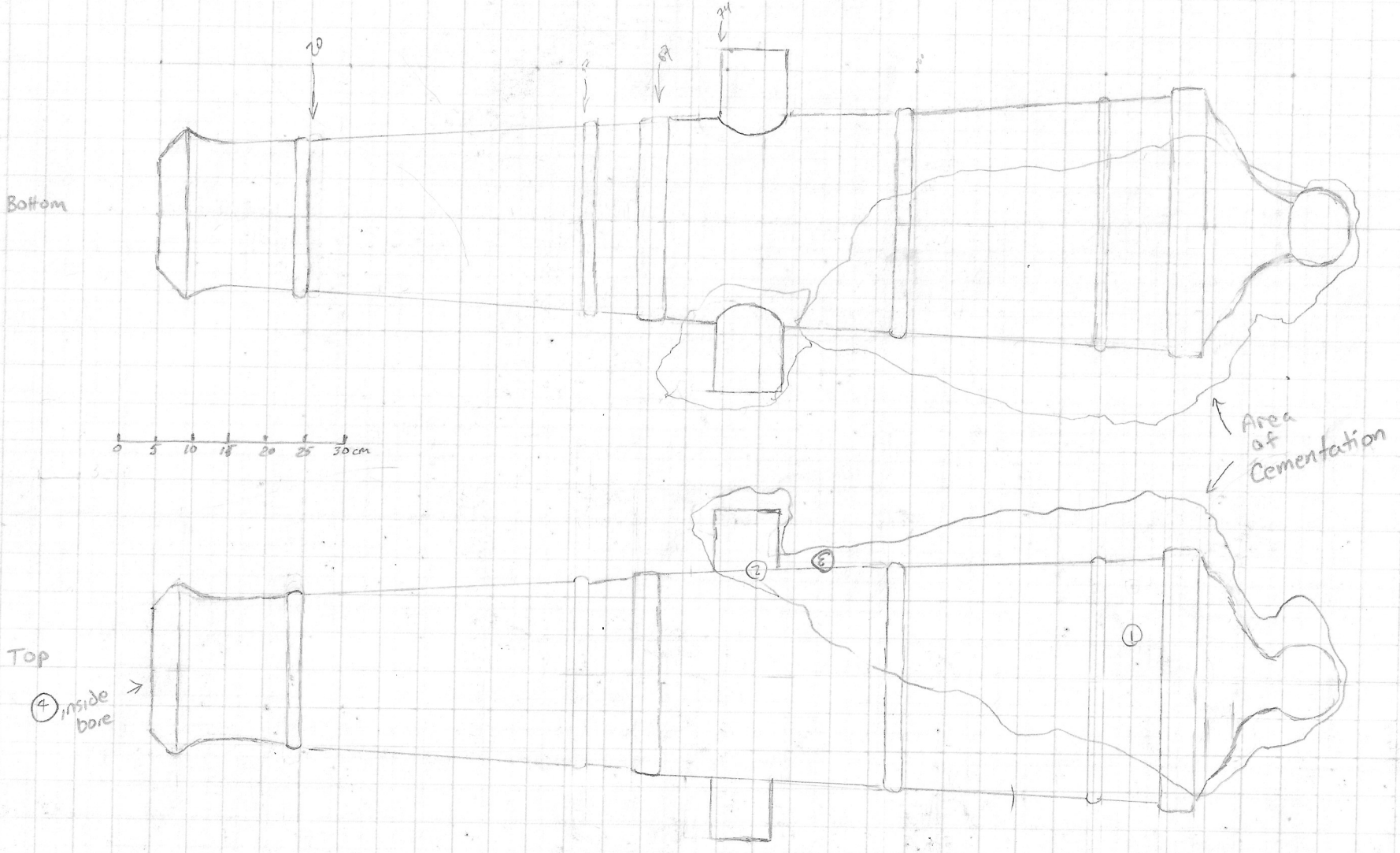

Overall length: 157cm

Bore: ≈95mm

Cascabel diameter: ≈10cm

Length across Trunnions: ≈46cm

Trunnion diameter: ≈9cm

④ cementation sample locations

JDR

circumferential ridges/bands are roughly triangular over the surface of the cannon. caskabell completely encrusted; the shape of the breach leading to the caskabell is unclear due to the encrustation; possibly multiple Ogees (2); touchhole not evident. no apparent inscription on gun tube, but most likely location of inscription covered by cementation. corroded metal exterior to the cannon surface appears to indicate close proximity of supplementary metal object near the breach on the starboard side of the cannon. trunnions are mounted below the midline and are approx 9cm in diameter extend approx 9cm from the side of the gun tube. Possible indistinct marking on the end of the port trunnion. Starboard trunnion to cemented to view any possible markings. Bore approx 95 mm in diameter and only loosely filled with unlemented with sandy gravel with coral/seashells. No apparent rifling. Spalling down 3-4mm on the underside of the port trunnion. Cannon buried inverted no active/apparent marine encrustation, indicating a non-subtidal. No evidence of elevating mechanism on caskabell, but, it is DO cemented it may not be visible if it existed.