

## ***THE CHALLENGE IN LOCATING MAROON REFUGE SITES AT MAROON RIDGE, ST. CROIX***

*Holly K. Norton*  
*Department of Anthropology*  
*Syracuse University*  
*209 Maxwell Hall*  
*Syracuse, New York 13244-1090*  
*hknorton@maxwell.syr.edu*

*Christopher T. Espenshade*  
*New South Associates, Inc.*  
*415-A South Edgeworth Street*  
*Greensboro, North Carolina 27401*  
*cespenshade@newsouthassoc.com*

*The hideouts, lookout points, temporary camps, and concealed communities of runaway slaves may be difficult to locate using traditional methods of archaeological survey. These locations were intentionally made inconspicuous, were likely kept clean of surface refuse, and may have been placed in atypical landscape settings. As well, these sites may be small in size and likely contain only a few durable goods. A typical archaeological survey that combines screened shovel tests on a 20 m interval with surface survey for structural features is not well suited to the discovery of Maroon refuge sites. If these important resources are to be discovered, typical methods should be augmented with a GIS-based consideration of locational factors and controlled metal-detector survey.*

---

The Maroon, or runaway slave, plays a large role in defining the cultural identity of many African Caribbean inhabitants of the former Danish West Indies. The modern inhabitants of St. Croix, St. John, and St. Thomas proudly point to their unique history of resistance to slavery, including marronage. They know the landscape of resistance, and many island locations are remembered as important in the Maroon experience. Paradoxically, there is little good evidence for the exact nature of Maroon activities in many areas of the islands. For northwestern St. Croix, the geographical focus of this paper, there are two general schools of thought.

The first holds that the area – known broadly as Maroon Ridge or Maroon Mountain – served simply as a path or conduit for runaways hoping to catch a boat to Puerto Rico. The alternative position is that there was a significant Maroon population living permanently in the area from circa 1650, when the island was occupied by the French, until the 1760s, by which time the extensive development of the Danish sugar economy on St. Croix probably rendered hiding in the bush nearly impossible. A similar trajectory was followed on Barbados, where Handler and Lange (1978:144) note “Although Barbadian slaves escaped and sought refuge in caves

and forested areas, by the second half of the seventeenth century the island was fully occupied, the forests were mostly removed, and there were no opportunities for the establishment of maroon communities.”

How were the Maroons using the landscape of northwestern St. Croix? This seems like a pretty basic question to remain unanswered at this late date, yet it is an important question in understanding slave resistance. As discussed more completely below, the archival record has little to say to resolve this question, and it is time for historical archaeology to step to the forefront. Is archaeology prepared for this task?

The present paper is the result of an evolving proposal to archaeologically study sites of Maroon refuge activity in the Maroon Ridge area of northwestern St. Croix (Figures 1-2). In reviewing the archaeological literature, it became clear that little work has been done on Maroon camp sites, where the Maroons were under persistent threat of

recapture and punishment (i.e., Maroon refuge sites), in contrast with Maroon communities that were tolerated or condoned by the Euro-Caribbeans. Furthermore, in considering the nature of Maroon refuges, it is evident that typical archaeological survey methods may fail to properly find, recognize, and interpret such sites.

We offer a preliminary paper at this juncture, rather than awaiting field results, because Maroon Ridge is under imminent threat. Resort development has begun to squeeze the area from the south and the east. Hoping to counter unchecked development, a local consortium has been pushing for the purchase and development of the area as a territorial park to commemorate the Maroon experience on St. Croix (Maroon landscapes are under threat in many countries. For example, see Price and Price 2002). Under either scenario, it will become necessary to assure that the Maroon sites are discovered, recognized, and properly treated.

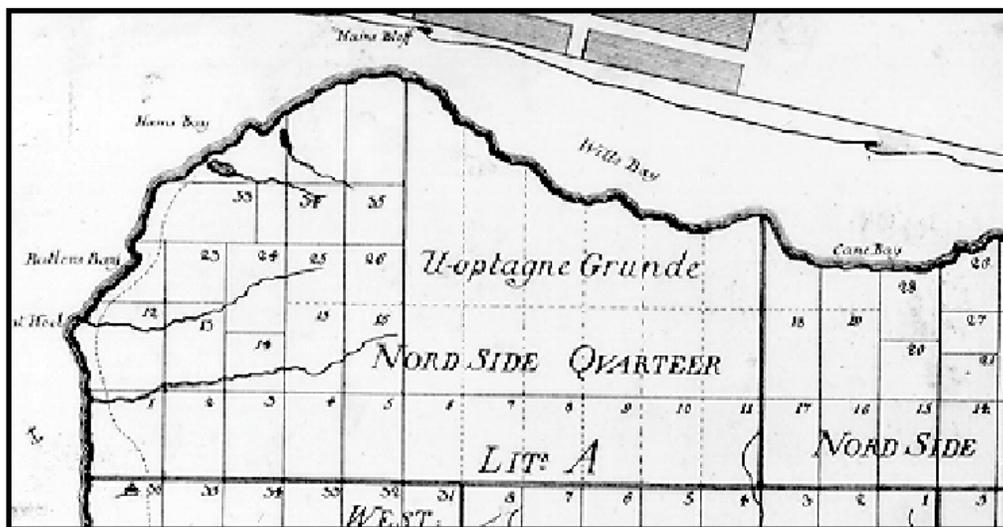


Figure 1. Portion of the 1754 Map of St. Croix (Beck 1754). Note that Maroon Ridge area is labeled as “U-optagne Grunde” or Unrecorded (unclaimed) Ground.

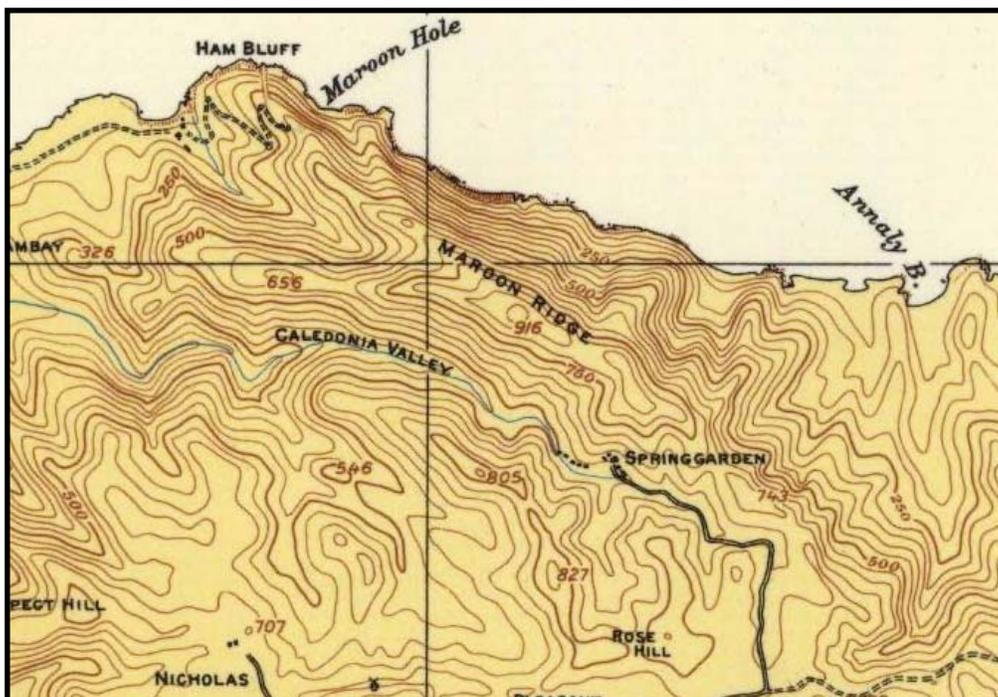


Figure 2. Portion of a 1942 Navigation Chart (U.S. Department of Commerce 1942) Showing Topography and Place Names, “Maroon Ridge” and “Maroon Hole.”

### *Historic Context*

Marronage existed, in various forms, in every slave-holding society in the Western Hemisphere. Although Marronage is classically associated with runaway African slaves, Indians were often the earliest Maroons in the Caribbean (e.g., Yaremko 2006). Generally the acts of these self-liberating individuals, commonly referred to as “Maroons,” is categorized in one of two ways: petite marronage, also referred to as truancy or absenteeism, where an individual left their plantation or other place of enslavement for a short period of time, tending to return on their own; or grand marronage, an act of permanent escape (Price 1979). In the case of grand marronage, ethnohistoric evidence suggests that

individuals banded together, sometimes with Native American groups, to form permanent settlements. Arguably, the most famous of these is Palmares, in northwestern Brazil, which existed for nearly 100 years before finally being crushed by British mercenaries and Native Americans, after persistent Portuguese attacks (Allen 2001; Orser and Funari 2001). Accompong and Nannytown, both located in Jamaica, were also highly successful Maroon communities. The Maroons of these communities were so successful that they were able to negotiate treaties with the British government to ensure their continued existence (Agorsah 1993, 1994, 2003; Bilby 1997; Kopytoff 1978, 1979; Schuler 1970). Despite these examples, most Maroon communities were ephemeral and short lived, under constant

pressure from the militarily dominant European societies in which they existed.

Marronage within the Danish West Indies was similarly varied. Although the historic documentary evidence hints at these semi-permanent internal settlements on St. Croix and St. Thomas, most of the activity centered around escape from the islands, along what Hall has identified as the “marine underground” to Puerto Rico, Vieques and Tortola (Hall 1985: 482. See also Chinae [1997] for an evaluation of the archival record on marronage to Puerto Rico.), islands held by European powers that were often hostile to Danish policy. The Maroons that were able to eke out an existence on the small Danish holdings (the islands of St. Croix, St. Thomas and St. John fall short of 200 square miles combined, the bulk of that retained by St. Croix) did so at a place identified as “Maroon Mountain” or “Maroon Ridge” on St. Croix (Pope 1972).

Maroons of northwest St. Croix were discussed by Oldendorp, a Moravian Missionary and visitor to the Danish West Indies in 1767-68. Oldendorp left a detailed account of island culture, including a brief description of “Maroon Hill”, which he describes as “almost impassable” (Highfield and Barac 1987:51). He further notes that the Maroons on St. Croix rely on rainwater caught in rock crevices or basins for their drinking water (Highfield and Barac 1987:53). Oldendorp (Highfield and Barac 1987:106) reports that the fruit of the susack tree was a major subsistence item of the Maroons, who “often live exclusively on them” (Susack trees, *Annona murciata*, grow to 25 to 30 feet in height, and produce fruits up to 15 pounds in weight. The fruit has an inedible skin with stubby spines, but the flesh

of the fruit is sweet and acidic in taste.) A resident of St. Croix, writing a decade before Oldendorp’s visit, noted that “...planter families were being ruined by the running away of slaves in groups of as many as twenty to twenty-five in a single night” (Hall 1985: 485).

Oldendorp provides details on the Maroon Hill people:

For a long time now, a large number of these Negroes have established themselves on lofty Maroon Hill in the mountains toward the west end of the island. In addition to the lay of the land, they are there protected by impenetrable bush and by their own wariness. They keep every approach safe by attempting carefully to conceal small, pointed stakes of poisoned wood so that the unwary pursuer might wound his foot on them and therefore be prevented from continuing the chase as a result of the unbearable pain. . . . For those foods that they cannot obtain in the wild, they must search at sea at night, exposing themselves to life-threatening dangers in the process; or they can steal them from plantations. On St. Croix, they are so bold that they often venture down from their hills during the day and go into the Negro markets in order to procure the necessities. It is not at all easy to identify them among the great numbers of Negroes in the market [Highfield and Barac 1987:233].

This passage is interesting in suggesting an economic relationship between plantation/market Afro-Cruzans and the Maroons. The Maroons must have been offering something – possibly wild foodstuffs – in exchange at

the market. The market contacts also suggest that kin ties may have been important in supplying Maroons.

Oldendorp (Highfield and Barac 1987:234) notes that the Maroon problem was often addressed through organized hunts for the runaways, yet states “hunts such as these, however, are not organized to track down those who remain in the high Maroon Hills of St. Croix.” Noting “a large number of these Negroes” on Maroon Ridge, Oldendorp is the best champion of the permanent population school of thought.

Dookhan (1994) offers a somewhat different interpretation of Maroon Mountain:

Runaways never comprised a permanent body in the Virgin Islands such as the maroons in Jamaica, for when the slave-hunt became too successful, the slaves escaped to Puerto Rico. That island had not yet developed a plantation economy and the treatment of slaves there was relatively mild. Besides, runaways were usually employed on works of fortification on the island for one year, after which they were pronounced free and given a plot of land to cultivate. Slaves escaping to Puerto Rico became lost to the Virgin Islands slave-owners, a loss which was more strongly felt since only the most robust slaves were prepared to hazard the dangers of the 40-odd miles of ocean separating the Danish islands from the much larger Spanish island. The numbers of runaways were apparently large since for 1745 alone it was estimated that about 300 slaves from St. Thomas and St. Croix had escaped to Puerto Rico. The traffic became highly organized by the

runaways themselves, and in St. Croix there was a mountain-hideout called ‘Maroons’ Hole’ just east of Hamm’s Bluff, where hideaways were safely hidden in a cave whose entrance was protected by poles of poisonous wood, until they could be transferred to Puerto Rico [Dookhan 1994:164].

An 1828 reference does little to resolve the nature of the use of Maroon Mountain. The Church Missionary Society (1828:619) reports “among them lies the so-called Maroon Mountain, where a few run-away Negroes still hide themselves.”

Maroon Ridge remains a historically significant location to St. Cruzans. It has generally remained a rugged, remote place from the seventeenth century through today. It is mentioned on heritage tours of the island, retains key place names, and is a source of local pride (e.g., Voight 2006).

The archaeological study of Maroon sites is important for scholars of the African Diaspora (Weik 1997, 2004). Not only would it provide information regarding the internal social structure of maroon communities themselves, but archaeology may also shed light on questions concerning identity, agency, creolization, and internal economies, to name just a few arenas of scholarly focus.

Because the archival record is surprisingly quiet (and conflicting) on the nature of Maroon activity in northwestern St. Croix, and because paradoxically that activity is important to the cultural identity of African Cruzans, it falls to archaeology to address the nature of the Maroon existence.

### ***Previous Archaeological Research on Maroon Sites***

Although there has been much progress in the historical, anthropological and archaeological study of Maroon culture over the past decade (Agorsah 1993, 1994, 2003, 2006, 2007; Allen 2001; Bilby 1997; Camp 2002; Forbes 1992; Hall 1985; Kopytoff 1978, 1979; La Rosa Corzo 2006; Lokken 2004; Orser and Funari 2001; Price 1979; Weik 1997, 2004) the literature is generally devoid of archaeologically examined Maroon refuge camps (c.f., Vega 1979; Garcia Arevalo 1986; Maris-Wolf 2002, La Rosa Corzo 2003, 2005, 2006). Instead, archaeologists have generally investigated stable communities that were established by Maroon groups, and that were tolerated by the dominant Euro-Caribbean culture (Agorsah 1993, 1994; Allen 2001; Orser and Funari 2001). Such Maroon villages can often be discovered and examined by typical methods of historical archaeology because the villages are typical residential sites. These villages often had a rich material culture including permanent structures, refuse middens, and cleared horticultural plots.

In contrast, refuge camps occupied by small numbers of Maroons living under threat of recapture and punishment are expected to have different characteristics (see La Rosa Corzo 2005 and 2006 for examples of this type of site in western Cuba). It is reported that the Maroon Ridge area of northwest St. Croix harbored Maroons from 1670 through at least 1767. The limited archival record suggests that these Maroons would have been recaptured and severely punished if their recapture was easy. To make their capture difficult to impossible, the Maroon Ridge

groups used the rugged, minimally accessible landscape of Maroon Ridge for their refuge.

It is anticipated that refuge camps in areas such as Maroon Ridge on St. Croix will have the following traits:

1. *Site locations will have been selected with concealment in mind.* Rather than settling on a broad, open ridge top, the Maroons would have selected an obscure, secluded cove. Rather than settling near a major trail, road, or landing, the Maroons would have chosen locations with difficult access. In this regard, Maroon camp locations might be considered analogous to illicit whiskey stills in the southeastern United States.
2. *Site locations would have been chosen with defensibility in mind.* The site itself or the access to the site would have been selected to provide strategic advantage to the Maroons. The superior weaponry of slave-hunters would mean little if the Maroons were pelting them with rocks from concealed locations 50-100 ft above the trail. Military considerations would have played a key role in selecting site locations.
3. Due to 1 and 2, *Maroon refuge sites would not have been located on the landforms targeted by normal archaeological survey.* If such sites are sought by an archaeologist used to searching for plantations, slave villages, and similar historic sites, the survey could easily miss many or all slave refuge sites.
4. Related to 1 and 2, *Maroons would have made a concerted effort to reduce their signatures on the landscape.* Refuse would have been policed and buried or dumped into the sea. A general residen-

tial midden would not be created. Useful items would be cached out of view. Substantial houses would not have been constructed.

5. *Depending on the amount of interaction between the refuge Maroons, enslaved African Caribbeans, freedmen, and others (e.g., pirates), the Maroons may have had limited material possessions.* Maroons may have preferred to have limited material goods, to allow their rapid abandonment of sites. Artifact counts may be relatively low at refuge sites.
6. *Due to lack of building materials and risk of loss to slave hunters, the Maroons likely utilized indestructible, ready-made rock shelters or caves for many of their sites.* Even if the domestic site was discovered and the Maroons were forced to flee, the slave hunters could not burn down or raze a natural overhang. In western Cuba, La Rosa Corzo (2005:165) reports that “within these elevations, all the sites consist of overhangs and caves that served as temporary shelters to isolated groups of cimarrones.” Vega (1979) also addressed the use of rock outcrops, and Barnet (1993) provides an account of a Cuban Maroon who lived for years in a cave.

### ***Implications for Archaeological Survey***

The anticipated traits of Maroon refuge sites have implications for the selection of archaeological survey methods. A typical compliance survey (within the U.S. Section 106 process) utilizes shovel testing on a 20-meter interval. Shovel tests are generally not excavated where the landforms are sloped more than 20-30 percent, and these slope determinations are often made on the basis of

rather coarse, U.S.G.S. topographic maps. Shovel testing is typically augmented by a surface search for structural features (e.g., stone or brick foundations).

The method of shovel testing on 20-meter intervals is premised on the targeted sites being greater than 20 meters in diameter. This may not be the case for Maroon refuge sites. Five Maroon sites documented in western Cuba by La Rosa Corzo (2005:166) measured 3 x 4 meters, 14 x 5 meters, 1 x 1 meter, 13 x 5 meters, and 4 x 3 meters, respectively. Arrom and García Arévalo (1986) also comment on the small size of Maroon refuge sites.

The method of shovel testing at 20-meter intervals is also premised on there being a sufficiently dense midden deposit to assure discovery of the site in shovel tests spaced at 20-meter intervals. As argued above, Maroon refuge sites probably did not have sheet middens and may not have had sufficient artifact density (Figure 3). Furthermore, the vast majority of artifacts at such sites will be concentrated either in caches or refuse pits. Shovel testing is especially ineffective in discovering relatively small features.

Maroon refuge camps will be small, have low artifact density, and have severe artifact clustering. These attributes represent three strikes against the applicability of shovel test survey (termed “TPS” or “Test Pit Survey” by Nance and Ball 1986. See also Orser and Funari 1992 and Weik 2004 for discussions of shovel testing on Maroon sites). Following a thorough review of the mathematical premises of such survey, Nance and Ball (1986:479, emphasis in original) conclude “The net effect is that TPS is biased against



Figure 3. Maroon in Suriname (from Benoit 1839). Note limited material goods and simple abode.

discovery of small, low density sites, especially when these sites exhibit marked spatial clustering of artifacts. TPS is also unreliable in such contexts.”

There is little gained at Maroon refuge sites by the surface search for structural features. The Maroons would have avoided the very types of features sought by the archaeologists. A rock cistern or a brick hearth would have drawn attention to the refuge during occupation and would have been a prime target for destruction by the slave-hunters.

Furthermore, it appears that the Maroon strategy was often to abandon a settlement whenever there were incursions by slave hunters. La Rosa Corzo reviewed extensive slave-hunter records for Cuba, and concluded

“the tactic of falling back before slave hunting militia arrived prevailed throughout the area” (La Rosa Corzo 2003:104) and “it was a setback when slave hunters discovered a settlement, destroyed their crops, and burned down their huts, but the runaways were able to recover quickly and easily” (La Rosa Corzo 2003:236). This strategy of dealing with the omnipresent risk would have included the use of expedient (*sensu* Binford 1979) structures. In the absence of suitable rock overhangs or caves, La Rosa Corzo (2003:245-246) reports that “dwellings of the first type – that is, low, thatched-roof huts with dirt floors – seem to have been more commonly used and more convenient in places where the conditions did not facilitate the development of a long-lasting, safe settlement.” Such structures would have left an

extremely light archaeological signature, probably with no surface features (but possibly with sub-surface post holes).

It is difficult to know what percentage of Maroon refuge sites would be missed by a standard archaeological survey. However, if our expectations about such sites are correct, the potential loss of information is significant.

### ***An Improved Approach***

In addressing Civil War and other military sites, Espenshade et al. (2002) noted that traditional survey methods were poorly suited for finding camps, picket posts, and skirmish locations, for many of the same reasons delineated above (see also Connor and Scott 1998; Fox 1993; Scott et al. 1989; Sterling and Slaughter 2001). Espenshade et al. (2002) argued that survey methodology should be changed in areas likely to contain military resources, and that controlled metal detector survey should be an important element of such research. Controlled metal-detector survey is especially effective for military sites because a large portion of the surviving material culture is metallic, and because artifacts are likely to be sparsely distributed, except for a few refuse features.

Clearly, the same applies to Maroon refuge sites. Survey in areas of known or suspected Maroon refuge sites should include intensive metal-detector survey. These areas, at least on St. Croix, generally lack deep soils and have not undergone extensive disturbance by plowing, logging, or relic-hunting. This means that metallic artifacts, even if buried in refuse pits, should be within the operating depth range of a metal-detector. Intensive metal-detecting of all suitable landforms

should be completed by archaeologists with extensive experience in metal-detecting.

Survival in the Caribbean forests and shoreline depended heavily on metal objects. La Rosa Corzo (2005) found machetes, a hoe, a shackle, and buttons in his test excavations in Cuba. Slave-hunters from Cuba (La Rosa Corzo 2003:104) reported Maroons “armed with machetes, knives, and five “nearly useless” shotguns.” An account from Martinique in 1667 (Baptiste Dutertre 2004 [1667]; English translation by Espenshade) emphasizes the importance of metal items:

Los segundos al estar más acostumbrados al país, no se convierten jamás en cimarrones más que cuando han puesto orden en sus asuntos; es para ello que se proveen de herrajes, tales como sierras, hachas, y cuchillos; se llevan sus harapos, hacen provision de mijo y se retiran a los lugares más elevados de las montañas que son casi inaccesibles donde abaten árboles, hacen un huerto y plantan mandioca y ñames, y a la espera de que lleguen a madurar, vienen por la noche a los límites de bosque donde los otros negros no faltan de llevarles de comer lo que tengan. Cuando no están seguros, van osadamante en el noche a robar a las haciendas y toman todo lo que encuentran; ha ocurrido que han llegado a robar hasta la espada y el fusil de su amos [Baptiste Dutertre 2004 (1667)].

(The second group, being more accustomed to the country, never become runaways before they have put their affairs in order; they gathered implements such as saws, axes, and machetes; they clean their clothes, make provision of millet and retire to the most elevated places in

the mountains that are almost inaccessible, where they fold over the trees, make an orchard, and plant manioc and yams, and while they await the ripening, they come at night to the limits of the forest where the other negroes never fail to give them whatever food they have. When they are not safe, they go daringly in the night to rob the haciendas and they take everything they encounter; it has happened that they have stolen even the sword and the gun of their masters.)

In their call for better approaches to finding military sites, Espenshade et al. (2002) also called for archaeologists to apply the concept of Inherent Military Probability (as defined by Hans Delbrück and Alfred Burne. See Keegan 1976). This basically requires the archaeologist to think like a soldier. Is this location defensible? How high up the ridge should the rifle trenches be placed? What are the best observation points?

Similarly, the archaeologist searching for ephemeral Maroon sites must put themselves in the mindset of the Maroon, to the degree possible. The archaeologist must let go of the typical parameters of site location – level ground, access to a good water source, exposure to cooling breezes, proximity to transportation corridors, nice view -- and think like a Maroon. The archaeologist must keep in mind concealment, defensibility, and escape routes. The archaeologist must abandon their concept of what a house will look like, and which support features (an oven, a cistern) ‘must’ be present at a residence. The archaeologist must abandon the typical expectation for midden.

In his work in Cuba, La Rosa Corzo (2003, 2005) embraced the concept of Inherent Mili-

tary Probability, although without using that term. La Rosa Corzo (2003:223) reports:

In fieldwork, both archaeological and ethnographic aspects were helpful, but in this phase of the work, obtaining on-the-spot knowledge of geographic conditions that favored the founding of runaway slave settlements as a form of active slave resistance was most important, since, in order to understand and explain this phenomenon, it was necessary to make direct contact with the environment in which the incidents took place [La Rosa Corzo 2003:223].

### *The Other Half of the Equation*

Although it would be great to intensively metal detect every square meter of Maroon Mountain, this would be cost and time prohibitive (Figure 4). Luckily, Geographic Information Systems (GIS) provide a means of defining those areas with the highest probability of containing Maroon sites, while also defining areas that will not require survey. The challenge is to translate expected parameters of Maroon site selection into variables that can be derived from available geographic data sets.

There are consistencies in descriptions of Maroon refuge camps. Price (1996:5-6) notes “to be viable, Maroon communities had to be almost inaccessible, and villages were typically located in inhospitable, out-of-the-way areas. . . . Successful maroon communities learned quickly to turn the harshness of their immediate surroundings to their advantage for purposes of concealment and defense.” La Rosa Corzo (2003:225) offers this in agreement with Price:

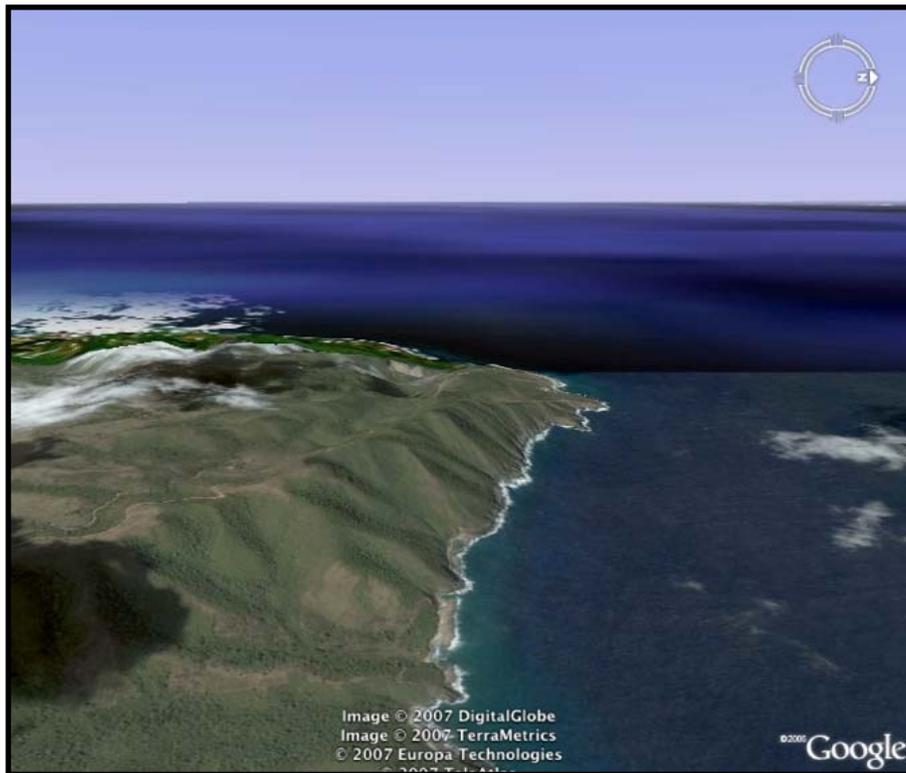


Figure 4. Image of Maroon Ridge from Google Earth, Showing Ruggedness of the Terrain.

As already stated, the places in which runaway slaves chose to settle had to meet the most basic requirements for living under attack: **distance** (as far as possible from colonial population centers and from means of communication), **inaccessibility** (that is, they had to be in locations that were difficult to reach by passersby, farmers, and cowhands and that had few probabilities of being stumbled upon), and **natural concealment** (a place whose topography and vegetation offered its protection). These three conditions, which often overlapped, corresponded to three different – though related – spatial levels [La Rosa Corzo 2003:225, emphasis in original].

For an example of these consistencies in the US Virgin Islands, the reader can compare the Oldendorp description of Maroon Mountain (see above) with an early eighteenth century description from St. Thomas:

J.L. Carstens, who was born in St. Thomas in 1705 and died in Denmark in 1747, noted in his memoirs that in those early years runaways occupied the island's coastal cliffs, where they sheltered in almost inaccessible caves. Those first maroons chose well, with a keen strategic eye, for the cliffs could not be scaled from the seaward side and vegetation obstructed the landward approaches. Such refugees went naked and subsisted on fish, fruit, small game such

as land turtles, or stolen provender. Slave hunts, organized three times a year, could neither loosen their grip on freedom nor dislodge them from the cliffs [Hall 1992:127].

How does one model inaccessibility? How does one model a condition described in Cuba in 1828 as “there was no way for beasts to get through. We went down to it along a stony stream. The descent was very difficult and we had to hang on vines” (La Rosa Corzo (2003:124)? Perhaps by scoring the landscape by travel labor, derived from distance and slope relief. How does one account for a desire to remain hidden? The tools of viewshed analysis, as widely applied in cell tower studies, can be used to map which locations are visible from key points (Bruce Larson [personal communication 2007] reports that suspected Maroon sites on Vieques were located in the rear portions of caves that were hidden at least 100 m back from the beach. See Sanders et al. 2001, 2003). Where are potential rock outcrops on Maroon Mountain? Local ecologist Olasee Davis knows of one cave with two compartments on the high slope and additional caves close to the beach. Oral history interviews, the soil survey, and Digital Elevation Models can create a signature for potential shelters and caves. Upon survey, potential shelters and caves may reveal signs of past use, such as sooting of the ceiling.

The benefits of incorporating a GIS component into an archaeological survey of Maroon Ridge would be two-fold. First, GIS can be used to create a predictive model, allowing the researcher to narrow the focus of intensive metal-detector and other remote-sensing survey. GIS allows for a targeted landscape survey. Although we recognize that suggest-

ing the use of a predictive GIS model places us squarely within a particular camp (i.e., embracing some variety of environmental determinism), it is not the intention of the authors to argue the theoretical implications within this paper. A substantial literature exists highlighting the controversy (Brandt et al. 1992; Ebert 2004; Llobera 1996; Wheatley and Gillings 2002; Gaffney and Van Leusen 1995; Kvamme, 1997; Kuna 2000, Wheatley 1998). Instead, our intention is to suggest the use of GIS predictive model as an atheoretical tool, a methodology that can hopefully be applied to a number of theoretically derived research questions.

Viewshed analysis requires establishing which points on the physical landscape are visible from a particular viewpoint on that landscape (Conolly and Lake 2006; Wheatley and Gillings 2002). It has been used primarily to identify the visual landscape of monumental structures (Bevan and Conolly 2002-2004; Wheatley 1995). However, as discussed by Llobera (2006), all landscapes are inherently visually structured. This is probably most true for societies such as Maroon communities or refuge sites where concealment is central to their survival. Not only would Maroons have been concerned with their own visibility to outsiders, but the ability to actively scrutinize activities around them, to anticipate their detection by authorities would have been a requirement for site placement as well. The use of cumulative viewshed analysis for the entire area of Maroon Ridge and surrounding locales may therefore be an effective tool in establishing areas of priority; locations on Maroon Mountain that are masked from below, but that allow views from the ridge-top should be given highest priority, those sites with no intervisibility second priority, and those with full in-

tervisibility lowest priority. Other factors should be considered along with viewshed data, both environmental and cultural, such as proximities or paths to markets, to sea and land escape routes, availability of natural shelters such as rock overhangs, presence of economic trees and bushes, etc. Although not utilizing GIS software and mapping capabilities, Gabino La Rosa Corzo had great success in identifying Maroon refuge sites on Cuba looking at a variety of environmental conditions as predictors that he wrought from historic documentary sources (La Rosa Corzo 2003, 2006). One the most compelling environmental consistencies that La Rosa identified was the near absence of water sources at refuge sites; only 3 of 30 had springs/water sources, and of those two were seasonal sources, which fits with accounts of refuge sites on other islands, such as St. Croix (La Rosa Corzo 2006: 9). Maroons may well have avoided settling close to springs because water sources were the first place a slave hunter might look. Testing this hypothesis may fit well with an agent-based model of the type created by Lake and Woodman to test the importance of hazel-nut collecting to ancient foragers (Conolly and Lake 2006; Lake 2000a, 2000b; Lake and Woodman 2000). This model provided agents with "...a set of goals, decision-making abilities and risk-taking parameters..." along with information on the environment and known archaeological site and artifact patterns (Conolly and Lake 2006: 49). A compelling hypothesis, and one that may be incorporated into an agent-based model, is that self-liberating slaves may have purposely avoided known water sources as these would have had the potential to be high traffic areas of the general populace of the island.

One of the greatest advantages of GIS to constructing predictive models for Maroon refuge sites would be in the ability to constantly assess and modify the model throughout the duration of field work as GIS software "...enables the visualization of data patterns at or soon after their collection... facilitating a 'reflexive' approach to data collection..." (Conolly and Lake 2006: 37). Because we are unsure of the exact nature of Maroon use of Maroon Ridge, it will be especially important to adjust and refine the GIS model as initial survey data become available. By creating a GIS model, the scope of the metal detector survey can be reduced to a feasible level, and the key locations can be examined intensively.

The second benefit to a GIS based approach would come after the field data are in, when we can begin analyzing and explaining the relationships of Maroon sites across the physical and social landscape of St. Croix. For instance, was there a change through time, say between when the French held the island versus when the Danish occupied, in the character of maroon sites? Did multiple sites exist simultaneously? The creation and testing of the model provides an interpretive tool for better understanding Maroon strategies. Once a GIS model has been developed and tested, the key variables can be used to assess the potential for Maroon refuge sites on St. John and St. Thomas, as well as questions concerning the spatial relationships between Maroon sites and plantation or other institutional sites across the island, and the spatial and temporal relationship between Maroon sites themselves.

A number of GIS layers already exist for St. Croix. The United State Geological Sur-

vey offers digital elevation models (DEMs), the Environmental Protection Agency of layers for hydrology and land cover, and the Virgin Islands Conservation Data Center can provide access to soil survey, hypsography, LANDSAT enhanced thematic mapper mosaics, and NWI wetlands.

### Conclusion

Little is known about the lifeways of Maroons in refuge areas such as Maroon Ridge in St. Croix. At least in the former Danish Virgin Islands, there is not a good archival record to guide reconstructions, and archaeology is the most promising avenue to interpreting the Maroon refuge existence. However, archaeology may fail to properly locate, evaluate, and interpret Maroon refuge sites if only traditional survey methods are used. It is argued here that we should apply a two-step approach that begins with GIS modeling of desirable (in a Maroon mindset) locations and ends with the intensive metal detector and landscape survey of those locations. By using this different approach, archaeology can find key sites that ultimately will provide valuable information on Maroon lifeways in the former Danish Virgin Islands.

*Acknowledgements.* The writing of this paper was supported by New South Associates, Inc. The paper's genesis was a series of conversations with individuals concerned with preserving Maroon Mountain, including Mr. Onaje Jackson and Dr. George Tyson. Dr. J.W. Joseph at New South Associates and Dr. Theresa Singleton at the Department of Anthropology, University of Syracuse provided in-house peer review. Dr. Lynne Guitar, Dr. Gabino La Rosa Corzo, Ms. Sue Sanders, and Bruce Larson assisted us by providing source material, and Mr. Olasee Davis provided information about caves on Maroon Ridge. An abbreviated version of this paper was presented at the 2007 meetings of the International Association for Caribbean Archaeology in Jamaica. Dr. Chris Clement and two

anonymous peers reviewed the article for the *Journal of Caribbean Archaeology*.

### References Cited

- Agorsah, K.  
1993 Archaeology and Resistance History in the Caribbean. *The African Archaeological Review* 11:175-195.
- 1994 *Maroon Heritage: Archaeological, Ethnographic, and Historical Perspectives*. University of West Indies, Barbados.
- 1999 Ethnoarchaeological Consideration of Social Relationship and Settlement Patterning among Africans in the Caribbean Diaspora. In *African Sites Archaeology in the Caribbean*, edited by J.B. Havisser, pp. 38-64, Ian Randle Publishers, Kingston, Jamaica.
- 2003 Tracking Down the Maroons: Archaeogeography of Marronage in the Caribbean. Paper presented at the International Congress for Caribbean Archaeology, Santo Domingo, Dominican Republic.
- 2005 New Trends in Maroon Archaeology in Suriname – Transformation Processes. Paper presented at the 21<sup>st</sup> meeting, International Association of Caribbean Archaeologists, St. Augustine, Trinidad and Tobago.
- 2006 The Other Side of Freedom: The Maroon Trail in Suriname. In *African Re-Genesis: Confronting Social Issues in the Diaspora*, edited by J.B. Havisser and K.C. MacDonald, pp. 191-203. UCL
- 2007 Predicting and Reconstructing the Formation and Nature of Maroon Settlements in Suriname. Paper presented at 22<sup>nd</sup> Conference of the International Association for Caribbean Archaeology, Kingston, Jamaica.
- Allen, S.  
2001 *"Zumbi Nunca Vai Morrer": History, The Practice of Archaeology and Race Politics in Brazil*. Unpublished PhD Dissertation, Department of History, Brown University.
- Armstrong, D.V.  
2003 *Creole Transformation from Slavery to Freedom: Historical Archaeology of the East End Community, St. John, Virgin Islands*. University Press of Florida, Gainesville.
- Arrom, J.J., and M.A. García Arévalo  
1986 *Cimarrón*. Fundación García Arévalo, Santo Domingo.
- Baptiste Dutertre, Padre Jean  
2004 (1667) *De Los Esclavos de Martinica*, Guada-

- lupe y Antillas Francesas; Del Marcado de Negros en Africa; de lo que hacen; de su Familia; de sus Comidas y sus Casas; de sus Vestidos y Adornos; de sus Fiestas y Danzas; de los Castigos y de los Cimarrones; de otras Curiosas Costumbres. In *Crónicas de las Poblaciones Negras en el Caribe Francés*, Second Edition, edited and translated into Spanish by Eugenio Fernández Méndez, pp. 101-130. Centro de Estudios Avanzados de Puerto Rico y El Caribe, San Juan, Puerto Rico.
- Barnet, M.  
1993 *The Autobiography of a Runaway Slave*. English Translation by J. Innes. Macmillan Caribbean, Oxford, England.
- Beck, J.M.  
1754 (Map) Kort Over Eylande St. Croix udi America. Image available on-line at <http://cas.umkc.edu/StCroix/mapping/beck.htm>. Accessed February 27, 2007.
- Benoit, P.J.  
1839 *Voyage a Surinam*. Societe des Beaux-Arts, Brussels.
- Bevan, A. and J. Conolly  
2002-2004 GIS, Archaeological Survey and Landscape Archaeology in the Island of Kythera, Greece. *Journal of Field Archaeology* 29 (1/2):123-138.
- Bilby, K.  
1997 Swearing by the Past, Swearing by the Future: Sacred Oaths, Alliances and Treaties Among the Guianese and Jamaican Maroons. *Ethnohistory* 44 (4):655-689.
- Binford, L.R.  
1979 Organization and Formation Processes: Looking at Curated Technologies. *Journal of Anthropological Research* 35(3):255-273.
- Brandt, R., B. Groenewoudt and K. Kvamme  
1992 An Experiment in Archaeological Site Location: Modeling in the Netherlands using GIS Techniques. *World Archaeology* 24(2, Analytical Field Survey):268-282.
- Camp, S.  
2002 'I Could Not Stay There': Enslaved Women, Truancy and the Geography of Everyday Forms of Resistance in the Antebellum Plantation South. *Slavery and Abolition* 23(3):1-20.
- Campbell, M.C.  
1988 *The Maroons of Jamaica 1655-1796: A History of Resistance, Collaboration & Betrayal*. Bergin & Garvey, Granby, Massachusetts.
- Chinae, J.L.  
1997 A Quest for Freedom: The Immigration of Maritime Maroons into Puerto Rico, 1656-1800. *The Journal of Caribbean History* 31(1-2):51-87.
- Church Missionary Society  
1828 *The Missionary Register for MDCCC XXVIII*. L.B. Seeley & Sons, London.
- Conolly, J. and M. Lake  
2006 *Geographical Information Systems in Archaeology*. Cambridge University Press, Cambridge.
- Connor, M., and D.D. Scott  
1998 Metal Detector Use in Archaeology: An Introduction. *Historical Archaeology* 32(4):73-82.
- Dookhan, I.  
1994 *A History of the Virgin Islands of the United States*. Canoe Press, Kingston, Jamaica.
- Ebert, D.  
2004 Applications of Archaeological GIS. *Canadian Journal of Archaeology* 28(2):319-342.
- Espenshade, C.T., R.L. Jolley, and J.B. Legg  
2002 The Value and Treatment of Civil War Military Sites. *North American Archaeologist* 23 (1):39-68.
- Fernández Méndez, E.  
2004 *Crónicas de las Poblaciones Negras en la Caribe Francés*. Centro de Estudios Avanzados de Puerto Rico y El Caribe, San Juan, Puerto Rico.
- Forbes, E.  
1992 African Resistance to Enslavement: The Nature and the Evidentiary Record. *Journal of Black Studies* 23(1):39-59.
- Fox, R.A., Jr.  
*Archaeology, History, and Custer's Last Stand*. University of Oklahoma Press, Norman.
- Garcia Arevalo, M.A.  
1986 El Maniel de Jose Leta: Evidencias Arqueológicas de un Possible Asentimiento Cimarrón en El Región Sud-Oriental de la Isla de Santo Domingo. *Cimarrón Serie Monografica* No. 18, Fundación Garcia-Arevalo, Santo Domingo.
- Hall, N.A.T.  
1985 Maritime Maroons: "Grand Marronage" from the Danish West Indies. *The William and Mary Quarterly, 3rd Series* 42(4):476-498.  
1992 *Slave Society in the Danish West Indies: St. Thomas, St. John, and St. Croix*. The Johns Hopkins University Press, Baltimore.
- Handler, J.S., and F.W. Lange  
1978 *Plantation Slavery in Barbados: An Archaeological and Historical Investigation*. Harvard University Press, Cambridge, Massachusetts.
- Highfield, A.R., and V. Barac  
1987 *A Caribbean Mission*. English Translation of *A History of the Mission of the Evangelical Brethren*

- ren on the Caribbean Islands of St. Thomas, St. Croix, and St. John, written in 1777 by C.G.A. Oldendorp. Karoma Publishers, Ann Arbor, Michigan.
- Keegan, J.  
1976 *The Face of Battle*. Viking Press, New York.
- Kopytoff, B. K.  
1978 The Early Political Development of Jamaican Maroon Societies. *The William and Mary Quarterly* 3rd Series; 35(2):287-307.  
1979 Colonial Treaty as Sacred Charter of the Jamaican Maroons. *Ethnohistory* 26(1):45-64.
- La Rosa Corzo, G.  
2003 *Runaway Slave Settlements in Cuba: Resistance and Repression*, translated by Mary Todd. English translation of 1998 Spanish edition. The University of North Carolina Press, Chapel Hill.  
2005 Subsistence of Cimarrones: An Archaeological Study. In *Dialogues in Cuban Archaeology*, edited by L.A. Curet, S.L. Dawdy, and G. La Rosa Corzo, pp. 163-180. University of Alabama Press, Tuscaloosa.  
2006 Arqueología del Cimarronaje: Útiles Para la Resistencia. Paper presented at the 71st Annual Meeting, Society for American Archaeology, San Juan, Puerto Rico.
- Lake, M.  
2000a MAGICAL Computer Simulation of Mesolithic Foraging on Islay. In *Hunter-Gatherer Landscape Archaeology: The Southern Hebrides Mesolithic Project 1988-98* edited by S. J. Mithen, pp. 465-495. Volume 2, Archaeological Fieldwork on Colonsay, Computer Modeling, Experimental Archaeology, and Final Interpretations. The McDonald Institute for Archaeological Research, Cambridge.  
2000b MAGICAL Computer Simulation of Mesolithic Foraging. In *Dynamics in Human and Primate Societies: Agent-Based Modelling of Social and Spatial Processes*, edited by T. A. Kohler and G. J. Gummerman, pp. 107-143. Oxford University Press, New York.
- Lake, M. and P. E. Woodman  
2000 Viewshed Analysis of Site Location on Islay. In *Hunter-Gatherer Landscape Archaeology: The Southern Hebrides Mesolithic Project 1988-98*, edited by S. J. Mithen, pp. 497-503. Volume 2, Archaeological Fieldwork on Colonsay, Computer Modeling, Experimental Archaeology, and Final Interpretations. The McDonald Institute for Archaeological Research, Cambridge.
- Llobera, M.  
1996 Exploring the Topography of Mind: GIS, social space and archaeology. *Antiquity* 70:612-622.  
2006 What You See is What You Get?: Visualscapes, visual genesis and hierarchy. In *Digital Archaeology: Bridging method and theory*, edited by T. Evans and P. Daly, pp. 148-167. Routledge, London.
- Lokken, P.  
2004 A Maroon Moment: Rebel Slaves in Early Seventeenth-Century Guatemala. *Slavery and Abolition* 25(3):44-58.
- Maris-Wolf, E.  
2002 Between Slavery and Freedom: African Americans in the Great Dismal Swamp 1763-1863. Unpublished Masters thesis, Department of Anthropology, College of William and Mary, Williamsburg, Virginia.
- Nance, J.D., and B.F. Ball  
1986 No Surprises? The Reliability and Validity of Test Pit Sampling. *American Antiquity* 51(3):457-483.
- Orser, C. and P. Funari  
1992 Pesquia Arqueológica Inicial en Palmares. *Estudios Ibero-Americanos* 18:53-69.  
2001 Archaeology and Slave Resistance and Rebellion. *World Archaeology* 33(1):61-72.
- Pope, P.  
1972 A Maroon Settlement on St. Croix. *Negro History Bulletin* 35(7):153-154.
- Price, R.  
1996 *Maroon Societies: Rebel Slave Communities in the Americas* (third edition). The Johns Hopkins University Press, Baltimore.
- Price, R., and S. Rice  
2002 Maroons Under Assault in Suriname and French Guiana. *Cultural Survival Quarterly* 25(4).
- Sanders, S.L., M.A. Simons, C. Goodwin, D. Davis, F. Vento, and K. Anderson Cordova  
2001 *Patterns & Transformations in the Prehistory and History of Vieques, Volume I: Archeological Survey and Inventory of the VNR*. R. Christopher Goodwin Associates, Frederick, Maryland.
- Sanders, S.L., J. Brown, R.C. Goodwin, D. Davis, F. Vento, and K. Anderson Cordova  
2003 *Patterns and transformations in the Prehistory and History of Vieques, Volume II; Archeological Survey and Evaluation of Historic Period Sites*. R. Christopher Goodwin Associates, Frederick, Maryland.
- Sayers, D.O.  
2006 Diaspora Exiles in the Great Dismal Swamp,

- 1630-1860. *Transforming Anthropology* 14 (1):10-20.
- Scott, D.D., R.A. Fox, Jr., M. Connor, and D. Harmon  
1989 *Archaeological Perspectives on the Battle of the Little Bighorn*. University of Oklahoma Press, Norman.
- Schuler, M.  
1970 Ethnic Slave Rebellions in the Caribbean and the Guianas. *Journal of Social History* 3(4):374-385.
- Schwartz, S.B.  
1996 *Slaves, Peasants, and Rebels: Reconsidering Brazilian Slavery*. University of Illinois Press, Chicago.
- Sterling, B.B., and B.W. Slaughter  
2001 Surveying the Civil War: Methodological Approaches to the Antietam Battlefield. In *Archaeological Perspectives on the American Civil War*, edited by C.R. Geier and S.R. Potter, pp. 305-322. University of Florida Press, Gainesville.
- United States Department of Commerce  
1942 (Map) Chart 3242, West Indies, Virgin Islands, St. Croix. Image available on-line at the Historic Map & Chart Project web page of the National Oceanic and Atmospheric Administration at <http://historicals.ncd.noaa.gov/historical/histmap.asp>. Accessed February 27, 2007.
- Vega, B.  
1979 Arqueología de los Cimarrones del Maniel del Bahoruco. *Boletín, Museo del Hombre Dominicano* 12:11-48.
- Voight, C.  
2006 Northwest St. Croix: Our Spiritual Legacy. *St. Croix This Week*, edition of July/August 2006. Published in Christiansted, St. Croix, U.S.V.I.
- Weik, T.  
1997 The Archaeology of Maroon Societies in the Americas: Resistance, Cultural Continuity, and Transformation in the African Diaspora. *Historical Archaeology* 31(2):81-92.  
2004 Archaeology of the African Diaspora in Latin America. *Historical Archaeology* 38(1):32-49.
- Wheatley, D.  
1995 Cumulative Viewshed Analysis: a GIS-based method for investigating intervisibility, and in archaeological application. In *Archaeology and Geographic Information Systems: A European Perspective*, edited by G. Lock and Z. Stancic, pp. 171-185. Taylor & Francis, London.
- Wheatley, D. and M. Gillings  
2002 *Spatial Technology and Archaeology*. Taylor and Francis, London.
- White, C.  
2005 Report on the 2004 Archaeological Investigation of a Maroon Settlement in Suriname, South America. Paper presented at the 21<sup>st</sup> meeting, International Association of Caribbean Archaeologists, St. Augustine, Trinidad and Tobago.
- Yaremko, J.M.  
“Gente Bárbara”: Indigenous Rebellion, Resistance and Persistence in Colonial Cuba, c. 1500-1800. *KACIKE: The Journal of Caribbean Amerindian History and Anthropology* [On-line Journal]. Available at: <http://www.kacike.org/Yaremko.html>. Accessed February 15, 2007.