PRE-COLUMBIAN REGIONAL COMMUNITY INTEGRATION IN DOMINICA, WEST INDIES

By

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For the Crew: Edward, Garbo, Sandy and Marcus

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
BLI	Broad Line incision
BP	Before Present
CB	Castle Bruce
CL	Clay Lumps
CMBD	Centimeters Below Datum
CMBS	Centimeters Below Surface
DDLS	Dominica Department of Lands and Surveys
DEL	Delices
DEM	Digital Elevation Model
Fe	Ferric minerals
G	Grog
GIS	Geographic Information Systems
HS	Hampstead
INAA	Instrumental Neutron Activation Analysis
LCA	Late Ceramic Age
MURR	University of Missouri Research Reactor
PCA	Principal Component Analysis
PN	Provenience Number
TP	Test Pit
TU	Test Unit
Vol	Volcanic minerals
ZIC	Zone Incised Crosshatched

Abstract of Dissertation Presented to the Graduate School
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This dissertation presents the synthesis of five years of research into the pre-Columbian archaeology of Dominica, one of the most ruggedly mountainous volcanic islands in the eastern Caribbean. The main objective of the project was to investigate settlement patterns and artifact variability in a comparative framework in order to characterize aspects of community organization and regional sociopolitical integration during the Late Ceramic Age (ca. A.D. 600-1500). Following the recognition that the sea functioned more like a highway than a boundary, regional interactivity and inter-island relationships have come to dominate archaeological discourse in the Caribbean. This research considers the corollary that there may have been more apparent differences between communities separated by landmasses than those separated by the sea.

Adopting a multiscalar perspective, three micro-regions along the windward coast of Dominica were chosen for extensive archaeological survey and comparisons were constructed both within and between micro-regions. Three questions structure the research: (1) In what ways were multiple sites within micro-regions functionally differentiated and what does this reveal about community organization? (2) To what extent were communities integrated at larger spatial scales? Were local communities

autonomous, or were they integrated into higher-order/regional polities? (3) What types of hierarchical or heterarchical relationships characterized the organization of communities at both the local and micro-regional scale?

Goals of the fieldwork included: identification of sites; characterization of variability in terms of site size and function; characterization of relations among sites with respect to ecological setting; and collection of artifacts to provide evidence of interaction, including intra- and inter-island exchange. Fifteen months of archaeological field research was conducted over the course of five years to collect the data presented here. Fieldwork was accomplished collaboratively with a crew of four Dominicans, who enhanced the project with practical and intellectual contributions that led to a highly contextual understanding of the landscape ecology in which archaeological sites were identified. In addition, ethnographic homology and ethnohistoric documents provide information that enrich the archaeological analysis of community organization and integration.

CHAPTER 1
INTRODUCTION: DOMINICA IN CARIBBEAN ARCHAEOLOGY

This dissertation presents an archaeological study of three micro-regions of Dominica (Figure 1-1), a volcanic island in the southern Lesser Antilles noted for its intense topographic variability, rugged coastline, high rainfall, dense tropical forests, and fertile volcanic soils. The main objective of the project is to investigate settlement patterns and artifact variability within and between micro-regions in order to characterize the complex organization and degree of regional integration among communities in Dominica during the Late Ceramic Age (LCA) (ca. A.D. 600-1500) (Figure 1-2). Three primary research questions guide the study: (1) In what ways were multiple sites within micro-regions functionally differentiated and what does this reveal about community organization at the local, intra-micro-regional scale? (2) To what extent were communities integrated at larger spatial scales? Were local communities autonomous, or were they integrated into higher-order regional polities? (3) What types of hierarchical and/or heterarchical relationships characterized the organization of communities at both the local and micro-regional scale?

To address these questions, I conducted fieldwork with the following goals: identification of sites; characterization of variability in terms of site size and function; characterization of relations among sites within micro-regions based on distance, intervisibility, and geographic setting; and collection of artifacts to provide evidence of the range of activities carried out at different locales as well as interaction both within and between micro-regions, including intra- and inter-island exchange.

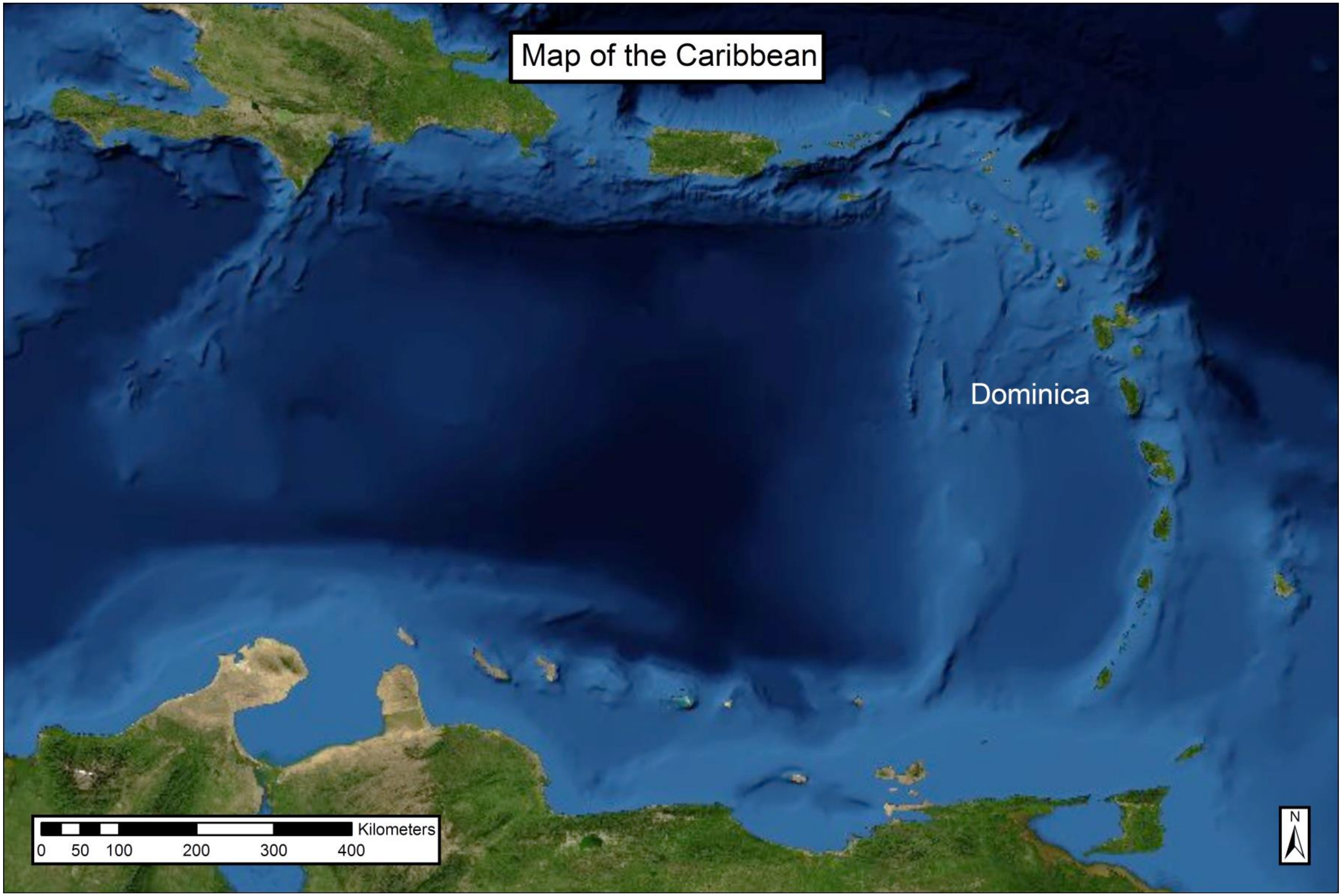

Figure 1-1. Map of Caribbean region.

Windward Islands Ceramic Age Chronology

Time Period	Ceramic Series		Ceramic Description
Early Ceramic Age A 400 BC – AD 400	Saladoid Series (Cedrosan Saladoid subseries) 400 BC – AD 500/600		Saladoid: Bell-shaped bowls. Finely made white-on-red painted wares and zoned-incised crosshatched wares. Some Barrancoid influence after ~AD 300; includes modeled zoomorphic adornos (Rouse 1992).
Early Ceramic Age B AD 400 – 600/800	Troumassoid Series (Troumassan Troumassoid) AD 500/600 - 1000		Troumassoid: "Boat shaped, kidney-shaped, round bottomless, double, and hemispherical and inverted bell-shaped bowls. Cylindrical pot stands, jars, and effigy bowls… [with] polychrome painting… combined with curvilinear incisions" (Hofman et al. 2008b:21). Pottery becomes cruder and plainer through time (Rouse 1992).
Late Ceramic Age A AD 600/800 – 1200/1300	Suazoid Series (Suazan Troumassoid subseries) AD 1000 - 1500		Suazoid: Mostly "thick, coarse, and soft pottery, with scratched or scraped surfaces, inward thickened rims, legged, pedestal or angular bases, legged griddles, and triangular griddle rims… [with] some finer ware exhibiting polished surfaces, often decorated with red paint, linear, or zoned painting" (Hofman et al. 2008b:21).
Late Ceramic Age B AD 1200/1300 – 1492		Cayo Series AD 1250 – 1500	Cayo: "Incision on a flat rim, cone-shaped necks and bodies, and appliqué decoration consisting of small adornos made from clay balls which were perforated… Also typical are the multi-convex vessels with anthropomorphic faces in appliqué" (Hofman et al. 2008b:22).

Figure 1-2. Windward Island chronology and ceramic series (Hofman and Hoogland 2004; Hofman et al. 2008b; Petersen et al. 2004; Rouse 1992).

Presented is the synthesis of fifteen months of archaeological field research I conducted over the course of five years, with the assistance of three part-time undergraduate and graduate student volunteers. I also collaborated in a more full-time capacity with a crew of four Dominican archaeologists, three of whom received their archaeological training through this project. In addition to the insights into Dominican history and ecology that were brought to the project by these collaborators, relevant ethnographic and ethnohistoric data are incorporated to provide contextual information that enrich the archaeological analysis of community organization and integration. Excavations, pedestrian surveys, systematic surface collections, and informal interviews with local land users were conducted in three micro-regions of Dominica, yielding varied yet comparable datasets from multiple sites within each micro-region. The analysis explores the functional and spatial interrelatedness of sites and examines whether communities included hierarchical characteristics, such as centers for specialized sociopolitical, ritual or economic activities or were more heterarchical, involving structurally similar or autonomous local groups.

Despite increased attention in recent years, Dominican archaeology is less developed when compared to its neighboring Windward Islands, where substantial long-term archaeological investigations have developed a high level of understanding about regional social dynamics among communities in Martinique, the Guadeloupe archipelago, St. Lucia, and St. Vincent in the centuries before European Colonization (Allaire 1977, 1991; Allaire and Duval 1995; Bérard 2012; Boomert 1986, 2000, 2011; Bradford 2001; Bright 2011; Callaghan 2007; de Waal 2006; Hofman et al. 2007; Hofman et al. 2010; Hofman et al. 2004a; Hofman et al. 2004b). Bright (2011:93) recently summarized this discrepancy remarking that, “for an island with such a rich Amerindian legacy, the dearth of archaeological research carried out is astonishing.” This project represents a major contribution to the archaeology of Dominica and addresses some fundamental but unresolved questions of culture history and changes in settlement patterns through time.

In developing the research, I strove for a unity among its theoretical, methodological, and practical dimensions, foregrounding community as the central theme. Included are theoretical concepts of “community,” different ways of defining community, and discussion about the ways the community perspective allows us to integrate theoretical perspectives on related topics such as social complexity, the organization of labor, and the entanglement of people and technology. The implications of a community-based approach include specific methodological challenges archaeologists must confront in order to operationalize some theoretical concepts. Chief among these is the issue of scale and like many community-oriented studies in the Caribbean (e.g., Bright 2011; de Waal 2006; Hofman et al. 2010; Hofman and Hoogland 2011; Torres 2012) this project adopts a multiscalar perspective and an approach to regional survey based on the micro-region as a unit of analysis (Kolb and Snead 1997; Yaeger and Canuto 2000). Following Yaeger and Canuto (2000:10), the micro-region is defined as “an area larger than an individual site but smaller than a settlement region, [which] delimits a mid-level scale of analysis that includes both diverse material remains found within an area and intra-site spaces.” The overall design of the project, from the selection of a study area to the survey and sampling strategy, was crafted to permit comparisons at the local-scale, between sites within micro-regions; at the micro-regional scale, between different more or less circumscribed areas of Dominica; and at the macro-regional scale, between communities in Dominica and communities on other islands in the region. The community-based theoretical orientation and methodological approach were complemented with participatory and inclusive strategies designed to engage with local communities and incorporate Dominican perspectives into the practice of conducting field research and interpreting the archaeological past.

The approach integrates multiple perspectives and techniques at all levels of research, including a consideration of a variety of complementary theoretical and methodological perspectives and the incorporation of relevant ethnohistoric and ethnographic literature. In addition, I relate my own ethnographic observations and insight derived from practical engagement with the community and inclusive participation of Dominicans through training, employment, education, and outreach. Often I will highlight aspects of the research that were particularly influenced by the perspectives of Dominican collaborators and informants. Integrating these diverse sources of information with modern archaeological techniques, such as GIS-based modeling, instrumental neutron activation analysis (INAA), and thin section petrography, yields a unique level of contextualization to the research.

The perspectivism and modern analytical techniques just described are balanced with more traditional archaeological approaches, namely technofunctional ceramic attribute analysis. The ceramic and lithic assemblages, and the spatial/ecological context from which they were recovered, constitute the main archaeological materials recoverable in Dominica, an island whose acidic soils limit bone preservation and whose dynamic geology and history of land use tends to obscure structural features. I therefore set out to look at many dimensions of variability in the ceramics by focusing on a number of important morphological attributes and using a variety of analytical techniques and simple inferential statistics to frame comparisons at multiple scales. The ceramic analysis undertaken here represents a departure from common approaches to ceramics in the Caribbean. Decorative style and stylistic analysis are backgrounded in favor of a more holistic view of pottery manufacture and use from the perspective of technological style (Hegmon 1992, 1998; Lechtman 1977; Lemonnier 1986). From this perspective, aspects of pottery manufacture such as clay selection/preparation, forming technique, surface treatment, and morphology of both decorated and undecorated utilitarian vessels are as revealing about membership in a community of practice (Lave and Wenger 1991; Sassaman and Rudolphi 2001) as shared decorative traits (Bishop et al. 1988; Hegmon et al. 2000). This is not intended as a critique of stylistic approaches, it is merely a different way of approaching pottery analysis that works with the community framework that structures the research. It is hoped that this kind of approach can complement and benefit from the well-developed, but often contested stylistic taxonomies in the Caribbean (Allaire 1991; Boomert 1986, 2004; Bullen 1964; Hofman 1995; Hofman et al. 2008b; Petersen et al. 2004; Rouse 1992).

The lithic analysis, although important, takes a minor role in this study and represents a critical direction for future work. The primary features of the lithic assemblages studied here are the general provenance of raw materials, whether local or exotic, and the variable distribution of lithic remains at different locales in the micro-regions. Along with variability in ceramic assemblages, this lithic analysis is used to explore how site function, or more specifically, the range of activities/practices carried out at specific sites or locales, varies within micro-regions. I integrate the spatiality of settlements and patterns of landscape usage with the archaeological analysis through GIS-based modeling.

My understanding of the pre-Columbian environmental and social landscape presented here is enhanced by experiential knowledge developed over the course of fieldwork, which I hope to convey throughout. This includes the collaborative efforts with the Dominican crew, interaction with Dominican and Kalinago craft producers, and informant-based knowledge developed through extensive interaction with land-users, whose engagement with the landscape as subsistence and commercial farmers has important parallels to the pre-Columbian period. In order to develop a better appreciation for the critical role that canoe travel played in integrating communities, the crew and I took boat trips to survey the micro-regions by sea and visited often with a group of Kalinago who were in the process of constructing a 38-foot dugout canoe. Their perspective on pre-Columbian canoe travel and their insights into the processes of manufacturing and voyaging massive canoes fundamentally altered my perspective on community integration and the role canoes played in building communities and connecting them across the region. In the analysis of settlement patterning and community organization, the degree to which communities relied on maritime travel and marine resources is investigated. After presenting the results of the archaeological analyses, I examine in greater detail this aspect of regionality so fundamental to pre-Columbian societies in the Caribbean that it is easily taken for granted (but see Bérard 2012; Callaghan 2001; Cooper 2010; Fitzpatrick 2013; McKusick 1960a).

Although the goal remains to develop a uniquely Dominican archaeology, I hope this project will have broader regional implications and relevance to archaeologists working in other regions with similar concepts and approaches. Specifically, this study articulates with broader anthropological topics by examining the relationship between regional and local community dynamics. Much important Caribbean scholarship takes a regional perspective by synthesizing various local archaeological findings. This study complements such regional perspectives by more closely examining the impact that regionality had on local communities.

In sum, this work aims to take fundamental and widely studied themes in Caribbean archaeology—community, social organization, settlement patterning, mobility, and exchange—and incorporate a variety of strategies and perspectives to investigate them in Dominica, an island that presents both a mystery and a challenge. After outlining the topics covered in the following chapters, the rest of this introduction situates Dominica within the wider arena of circum-Caribbean archaeology. This includes a more detailed discussion of the themes just mentioned, some background into the biogeography of Dominica and an outline of the history of archaeological investigations in Dominica. I also discuss the major figures in Dominican archaeology and show how this research builds upon their contributions.

In Chapter 2, I formally state the specific research questions briefly outlined above, and introduce some of the test implications used to address these questions in the analysis. The remainder of Chapter 2 contains a detailed review of the theoretical orientation that shapes both my own perspective, and the overall design of the research. This includes three sections, the first of which discusses the archaeology of community, and strategies that archaeologists have developed to help orient their research toward this concept. This is followed by an outline of archaeological approaches to social complexity, the theoretical perspectives that shaped them over the last decades, and how these paradigm shifts have influenced Caribbean research. Practice and landscape approaches, along with household perspectives on middle-range societies, contribute considerably to the treatment of social complexity in this study. Finally, the chapter closes with a consideration of theory related to ceramics and to technological systems in general. What has come to be known as the anthropology of technology, and the related concept of "technological style," have a certain resonance with the archaeology of community and directly influenced my approach to the ceramic analysis.

Chapter 3 addresses the methodological implications of a community-based theoretical orientation, or how archaeologists operationalize "community." The chapter begins with a list of methodological challenges associated with community archaeology, and a detailed discussion of the approach I developed to address these issues in Dominica. The most foundational of these is the multiscalar, micro-regional approach, which provided the framework for selecting the study area and constructing comparisons, thereby affecting every other aspect of the research. In this section I introduce the work of Michel-Rolph Trouillot (1988), an anthropologist whose characterization of Dominica as a patchwork of enclaves greatly influenced my thinking about community integration in insular environments and helped to define the scales of analysis. After describing the relevant literature, the remainder of the chapter covers the specific methods and techniques I implemented over the course of the project.

Predictive modelling and the two seasons of preliminary fieldwork undertaken in 2009 and 2010 are described first. This discussion details the diverse factors that influenced my selection of three specific micro-regions for inclusion in the study. In the field methods section, I present my approach to participatory archaeology, which included the collaboration with four Dominican archaeologists, informant-based reconnaissance and exploratory pedestrian surveys, systematic surface collections, and extensive subsurface sampling. This included auger tests, 1-x-1-m excavation units, and the excavation of hundreds of 50-x-50-cm test pits, using perpendicular transects to cover large areas. I also introduce the members of the crew and describe in more detail their various contributions to the project. Their hard work, insight, and ingenuity not only made this project possible, it made the project far more interesting and successful than I could have imagined. Finally I discuss the analytical techniques utilized, including technofunctional ceramic attribute analysis, neutron activation analysis, thin section petrography, and some simple but useful inferential statistics.

In Chapter 4, primary fieldwork conducted in the three micro-regions over the year-long period from August 2012 through August 2013 is discussed. Included are specifics on the local ecology and history of each micro-region, along with maps showing the location of known sites. I present information about the range of areas investigated, also describing areas that were surveyed, but found lacking evidence of Amerindian use. I describe the setting and preservation conditions of each site, along with an account of its discovery and the excavations undertaken. For each site investigated, I provide another map showing the scope of work, including the location of all surface collections and excavations. For many of the sites I also discuss some of the impressions the crew and I developed while in the field. In some cases, these field interpretations are later evaluated in light of the results of the analysis. In the final section of this chapter, I discuss the radiocarbon assays obtained, the context from which samples were drawn to help identify chronological relationships among sites, and some of the issues involved in establishing contemporaneity.

In Chapter 5, I discuss in detail the various analyses I conducted on the recovered materials, and present the results. The chapter begins by reframing the research questions as hypotheses, and outlining some of the assumptions I made in order to derive test implications, including some of the proxies I employ to relate patterning in the assemblages to past practices. Next is an examination of the vessel unit of analysis and my technofunctional approach based on six specific attributes of vessel morphology: rim shape, rim orientation, orifice diameter, wall thickness, surface treatment, and decorative elements. For each attribute, I explore the diversity and distribution within and between micro-regions to look for significant patterning that might be used to characterize relationships among sites. I then move into a discussion of two critical features of technological style: clay selection and preparation. These are investigated with neutron activation analysis and thin section petrography, which also introduce independent lines of evidence to compare to the morphological analysis. The results of the neutron activation analysis contradict some of the expectations the crew and I had developed, and led to a re-evaluation of some basic assumptions, while providing some intriguing directions for future research. The chapter closes on the lithic materials analysis, which is used in conjunction with settlement and ceramic data to investigate site function, and to measure the variable influx of exotic materials as a way to approximate degrees of regionality.

Chapter 6 synthesizes all the diverse lines of evidence to forward some possible interpretations and to draw provisional conclusions. The chapter begins by taking a closer look at some relevant ethnohistoric documents, particularly those pertaining directly to Dominica. It explores several topics as described in these chronicles, including: land use and food procurement; settlement patterns and household structures; social divisions; post-marital residence; pottery manufacture; and dugout canoe building and voyaging. I augment and corroborate certain aspects of these accounts with ethnographic homology from lowland South America. Next, is an individual examination of each micro-region, covering internal connections and relationships, and using the ethnohistoric and ethnographic material to develop more satisfying interpretations of the archaeological patterning. Here, I make the case that in at least two of the micro-regions, multisite configurations represented functionally integrated communities. I then expand the scale outward to discuss relationships between micro-regions. It is here that I evaluate the enclave model and discuss some of the difficulties in identifying direct connections between specific communities. Instead I look for the degree to which regionality is expressed in local communities, and use that as a proxy to evaluate variable levels of regional integration. I then discuss the hierarchical and heterarchical relationships that are evident in the intra- and inter-micro-regional community patterning. Throughout the chapter, I foreground the importance of canoe manufacturing and voyaging processes to both local and regional scales of analysis. In the last section of the chapter, I detail what I see as the important implications that canoe-based mobility had for settlement patterns, labor, economic redistribution, regional community integration, and the social organization of small-scale societies in the southern Caribbean.

At the close of the chapter, I summarize the impact the project has on our understanding of Dominican history and cultural heritage, and how I see this research articulating with broader Caribbean and anthropological scholarship. The rest of the chapter is devoted to proposing directions for future research in Dominica, outlining some of the specific questions raised by this study, and exploring ways to investigate them. Finally, I evaluate the utility of the methods employed and make some suggestions for how to improve upon them in the future. First, however, to provide context for the study, I review how Dominica fits into broader trends in Caribbean archaeology.

Important Topics in Circum-Caribbean Research

Important topics in Caribbean archaeology—which are also central themes of this dissertation—include how we understand pre-Columbian community organization, how this is expressed in regional settlement patterns, and the role that mobility and exchange played in structuring regional integration. How do we best investigate these topics in Dominica, an island that presents a unique and pronounced set of challenges and a limited background of archaeological research? The paragraphs that follow aim to contextualize Dominica within the wider region by first looking more closely at broad trends in Caribbean archaeology relating to the themes just mentioned. I then examine the situation in Dominica specifically, covering its biogeography and geology, followed by an outline of the major archaeological investigations conducted there and the current state of Dominican archaeology.

Before proceeding, a word on terminology and chronology in the Caribbean is necessary. In this study, I have chosen to background the analytical importance of decorative style, which I discuss in detail in Chapter 3. However, the terminology developed by Rouse (1951, 1992) for ceramic series (Figure 1-2), which has come to be used extensively in the Caribbean to also refer to groups of people, is useful heuristically for relating to other work in the Caribbean, and for establishing relative chronological relationships among un-stratified deposits. The taxonomic framework is not used analytically in this study, but some of the terminology, and reference to the scholarship based on it, are included.

Settlement Patterns

The study of settlement patterns in the Caribbean represents one of the strongest pursuits of Caribbean archaeology, particularly with the increasing focus on regional survey (e.g., de Waal 2006). Most studies of settlement patterns take a diachronic perspective, examining changes from the Early Ceramic Age, or Saladoid period, to the Late Ceramic Age in the fairly robust body of regional settlement data. The early Saladoid period is often characterized by functionally undifferentiated permanent villages (Boomert 2001), such as those at Trants on Montserrat and Vive on Martinique. In time, this pattern of nucleated villages gives way to a more dispersed and varied settlement pattern, which has been described as an in-filling of the landscape (de Waal 2006; Hofman et al. 2007). This pattern is also reflected in surveys of Saba (Hoogland 1993), Nevis (Wilson 1989), Anguilla (Crock 2000) and Guadeloupe (de Waal 2006, 2009; Hoogland et al. 2010). During the Late Ceramic Age, it is typical to see not only villages, but also smaller hamlets, single household sites, non-habitation activity areas such as lithic workshops, specific ceremonial sites, and defensive outposts.

Bradford (2001) compiled settlement data from Saladoid, Troumassoid, and Suazoid (Figure 1-2) sites in Dominica, Martinique, St. Lucia, St. Vincent and the Grenadines, Grenada, Barbados, Trinidad, and Tobago in order to look for patterns in settlement locations through time. She identified a leeward preference for Saladoid sites, but a Windward preference for the later Suazoid sites. She also found that 76% of all sites were located within 5 km of reef, and that Troumassoid and Suazoid sites were more likely to be located within 1 km, with the Suazoid association to reefs being the strongest. Finally, Bradford noted a preference for lowland (<50 ft elevation) flat landforms, noting that sites found at higher elevation were less common and perhaps tied to specific functions such as defense or as special-use ceremonial sites. Although 90% of the sites were found within half a mile of the coast, excavation bias against the more difficult to access interior sites likely skewed this figure.

One of the settlement pattern studies most influential to this project is the study of the eastern Guadeloupe micro-region by Maaike de Waal (2006) as part of long-term research conducted by Leiden University in collaboration with André Delpuech (Hofman et al. 2004a). De Waal and the Leiden team conducted an extensive regional survey and site inventory for Pointe des Châteaux, the easternmost edge of Guadeloupe, and La Désirade and Petite Terre, small islands off the eastern coast of Guadeloupe. The goals of the project were to uncover information on social organization and interaction through a study of settlement patterns. The project utilized a primarily systematic surface collection methodology in conjunction with small-scale excavation at some sites, and augmented with the long-term excavation of sites such as Anse à la Gourde. De Waal took a diachronic approach, and outlined a general trend of an infilling of the landscape through time from the Early Ceramic Age to the Late Ceramic Age. This project is notable because it is among the first in the Caribbean to deal with small or single off-site finds, and trying to relate them to household, hamlet and village sites that are more commonly studied. She also made an attempt to define the functional characteristics of sites when possible, drawing the distinction between habitation sites, ceremonial sites, lithic workshops or special activity areas, and defensive outposts. Ultimately, she concluded that although there was some evidence for settlement hierarchy, the evidence for social hierarchy was more limited, and suggested that Late Ceramic Age A (A.D. 600/850-1200/1300) societies be defined as having incipient social stratification before the area was apparently abandoned in Late Ceramic Age B (A.D. 1200/1300-1493) (de Waal 2006).

Social Organization

The investigation of complex social organization has played a major role in the archaeology of both the Greater and Lesser Antilles. Most typically, scholars adopt a diachronic perspective, looking for patterns of change through time from the earliest Saladoid settlers to the later Taino-influenced polities. These have tended to be couched in an evolutionary framework. For example, Siegel (1989, 1991) describes Taino sociopolitical organization as evolving from “complex tribes” lacking centralized political authority during the Saladoid period to complex, stratified chiefdoms during the later post-Saladoid period. Similarly Boomert (2001) suggests that during the Saladoid period, communities were organized around big man collectivities, which are conceived of as primarily egalitarian tribal societies in which individuals competed for status through activities such as elite-financed exchange of prestige goods, specifically the fine lapidary beads and ornaments common to many early (ca. 400 BC-AD 400) and later (ca. AD 400-600/850) Saladoid contexts (Hofman and Hoogland 2004).

The conditions under which more complex social groups appear throughout the Late Ceramic Age (Hofman et al. 2004a; Petersen et al. 2004) have variably been conceived of as evolving out of relatively egalitarian structures (Boomert 2001; Curet 2003; Curet and Oliver 1998; Siegel 1991), or representing an elaboration on already-present social structures that were integrally related to the very process of migration into the Antilles (Crock and Petersen 2004; Heckenberger 2002, 2011; Heckenberger and Petersen 1995; Petersen 1996).

In the northern Lesser Antilles, Crock and Petersen (2004) argue for a multi-island chiefly polity centralized in Anguilla during the Late Ceramic Age. The work in Anguilla was geared toward identifying the origins of sociopolitical complexity in the Lesser Antilles, evaluating models of elite or chiefly control, and found evidence for an inter-island polity characterized by a distinct settlement hierarchy (Crock 2000). Four models of chiefly control were proposed to account for social hierarchies in Anguilla. Each model considered the possibility that hierarchies were characterized by elite control over a different domain of experience, including domestic production, regional exchange, and religious symbolism and ceremonialism. The models were evaluated by comparing the distribution of artifacts related to these different domains. The more restricted the distribution of one or another class of artifact, the more likely it was controlled by a restricted segment of society. The work revealed correlations between control over different domains of experience among a weak settlement hierarchy, and model four, “enhanced” control—which accounted for the possibility that chiefly control incorporated two or more domains of experience, minimally containing both an internal and an external dimension—was ultimately supported. The hypothesized multi-island polity in the Northern Lesser Antilles has found further support from work in St. Martin, Saba, and Antigua, although some still debate the degree of influence that chiefdoms in the Greater Antilles had on these developments (Hoogland and Hofman 1999). Regardless, it is clear that communities in the northern Lesser Antilles were more aligned with similar communities in the Greater Antilles to the northwest (Crock and Petersen 2004; Hofman et al. 2008b), and somewhat distinct from the more mainland-oriented spheres of influence in the southern Windward Islands (Wilson 2007).

This influenced the present study to investigate the degree to which certain communities exhibit evidence for greater control of, or access to, external inter-island interaction. This follows from the likelihood that certain communities would have had a greater maritime focus than others, which may have been more focused on inland horticultural activities. Furthermore, I develop the hypothesis that control over the manufacture of canoes and the act of captaining inter-island voyages are processes that promote both community integration, and sociopolitical hierarchies. This is based on the assumption that canoe ownership and captaincy brought benefits from broader regional interactions, but only to some restricted segment of society.

Archaeologists in the Windward Islands have tried to build a consensus about several aspects of social organization in the region. De Waal (2006), Bright (2011), and Hofman et al.(2004a) propose that social organization was limited to incipient social hierarchy, although there was evidently more regional diversity in later periods. This still represents an arena for fruitful research, although the focus can be seen to be shifting from the evolutionary question of how complex the societies were to a more historical approach. As more archaeological sites are investigated, the differences between tribes and chiefdoms proposed by evolutionary theorists (e.g., Johnson and Earle 1987; Sahlins et al. 1960) that once seemed clear begin to appear fuzzy and archaeologically ambiguous (Curet 2003). Increasingly, archaeologists are investigating the various and diverse ways groups complexly organized in networks of communities that were highly interactive across different micro-regions (Boomert and Bright 2007; Bright 2007, 2011; Hofman and Bright 2010; Hofman and Hoogland 2011; Keegan 2004). Different localized expressions of complex sociopolitical formations are now thought to vary in scale through time, and archaeologists are finding better ways to approach them than the checklist approach to identifying features supposedly characteristic of one evolutionary stage or another. This research approaches the topic of social complexity from this more historical perspective, considering diverse pathways to power, and alternate configurations of complex organization (Crumley 1995; Heckenberger 2002; McIntosh 1999; Pauketat 2007).

Regional Interaction

Regional interaction studies take the premise that networks of communities were highly interactive across different regions and integrated to varying degrees through time. Such studies attempt to identify specific interaction spheres and often use stylistic affinity in pottery decorations to draw connections among islands (Bright 2011; Hofman 1995; Petersen et al. 2004; Rouse 1986). Regional interaction in the Caribbean has been framed from the perspective of material/economic transactions (exchange), social interactions (ethnicity/kinship), and/or ideological interactions (diffusion). From a material perspective, studies on the distribution of lithic materials (Cody 1991, 1993; Knippenberg 2006; Murphy et al. 2000), the provenance of pottery manufacturing materials (Crock et al. 2008; Daan Isendoorn et al. 2008), and strontium isotope studies (Booden et al. 2008) have been used to identify patterns in regional mobility and interaction. From a social perspective, regionality has been described as a web of social relationships (Hofman et al. 2007), as dynamic and chaotic (Keegan 2004), and as a matrix of plural identities (Whitehead 1995a, 1995b). That regional interaction was a key element in the formation and functioning of social groups in the Caribbean is now widely, if not universally accepted. Caribbean archaeology seems now to be moving from a general theoretical acceptance of the region-oriented perspective to the more specific and historical delineation of actual spheres of interaction within the "complex mosaic of ethnic groups which had considerable interaction with each other, the mainland and the Greater Antilles" (Wilson 1993:56).

These three topics, which contribute so fundamentally to Caribbean Archaeology, are integrated into the research design of the present study. I explore how political power is manifest in hierarchical and heterarchical relationships among sites in the overall settlement system and in the control over mobility and regional interaction. These kinds of relationships must be interpreted from the archaeological patterning of artifact assemblages, how assemblages are variably distributed across sites and settlements, and in the relationship of these settlements to the landscape in which communities resided and made a living. In Dominica, to develop a model for how communities interacted with the landscape and how their practices contributed to the built environment, it is critical to understand the island's unique ecology and extreme geography.

Dominica in the Windward Island Context

Dominica is positioned on the younger of two volcanic arcs that constitute the Lesser Antilles (Roobol and Smith 2014). Whereas all other volcanic islands on these chains have one active volcano, Dominica has nine (Figure 1-3). This unique geology contributes to what is the most extremely varied and mountainous topography in the Lesser Antilles. Trouillot (1988:28) remarks that in Dominica, "nature seems to have provided us with a wonder and a challenge: for centuries, human beings have had to accommodate themselves within the marginal areas left between and around the steeps." Likewise, a passage written by Lennox Honychurch (1995:1), the premier figure in Dominican archaeology, poetically describes the terrain:

> The island rises in places sheer out of the sea, towering in a series of jumbled peaks to a height of almost 5,000 feet. This rugged landscape of blue-green slopes, rushing streams and cloud drenched mountain peaks has given the island a legendary beauty, a fatal gift some call it, which has created both major problems and great advantages for those who have lived here. More than most islands, the environment has guided the course of Dominica's history.

The majestic images these beloved passages conjure belie the awesome power—and danger—this extreme place presents. It can be difficult to describe, but the best way I have heard it was, "the island eats itself" (Jem Winston, personal communication 2012). While there, I witnessed countless violent storms and landslides, causing fatalities and severe property damage, brought on by the torrential rains (Dominica News Online 2013).

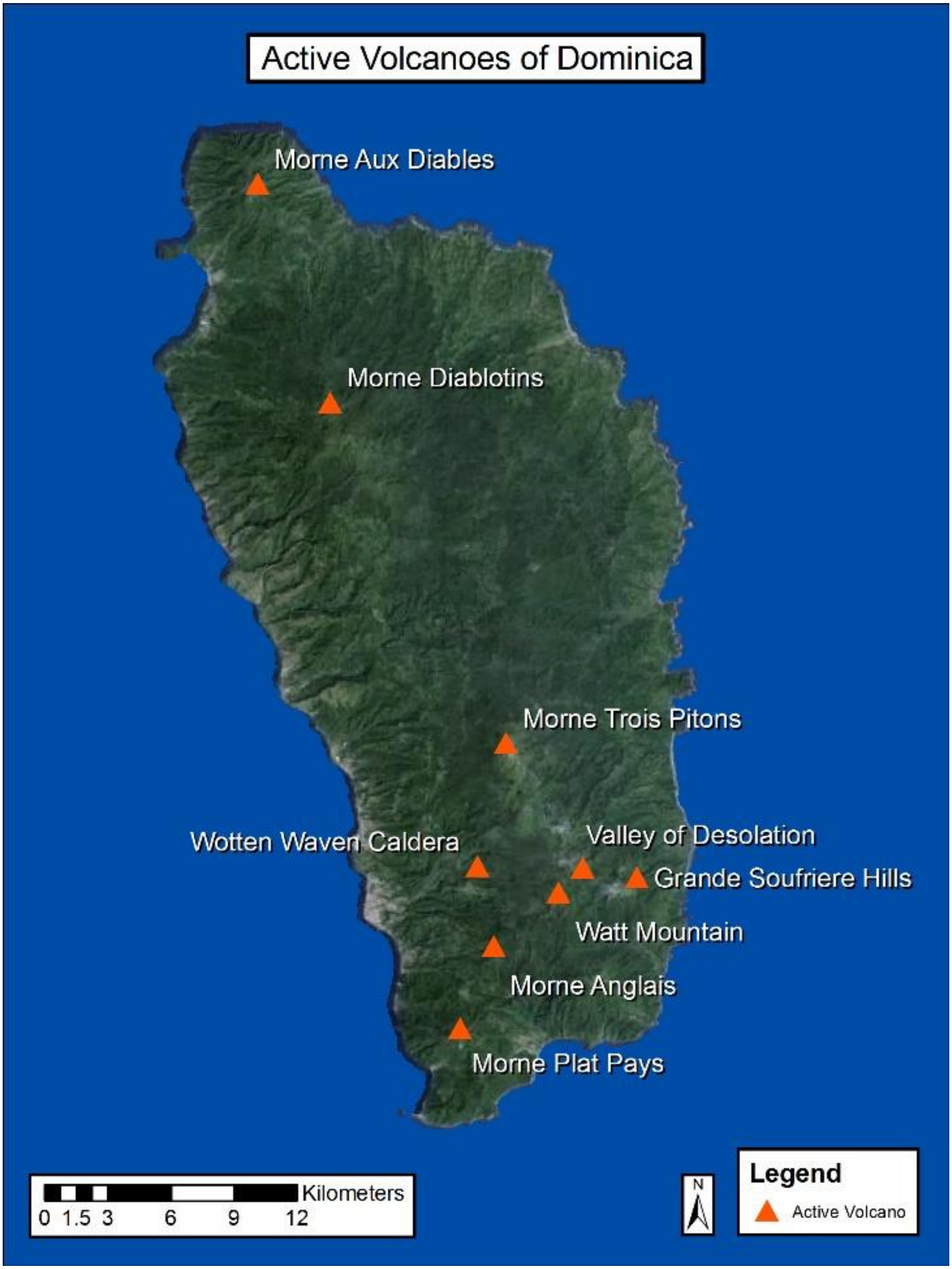

Figure 1-3. Active Volcanoes of Dominica (adapted from Roobol and Smith 2014).

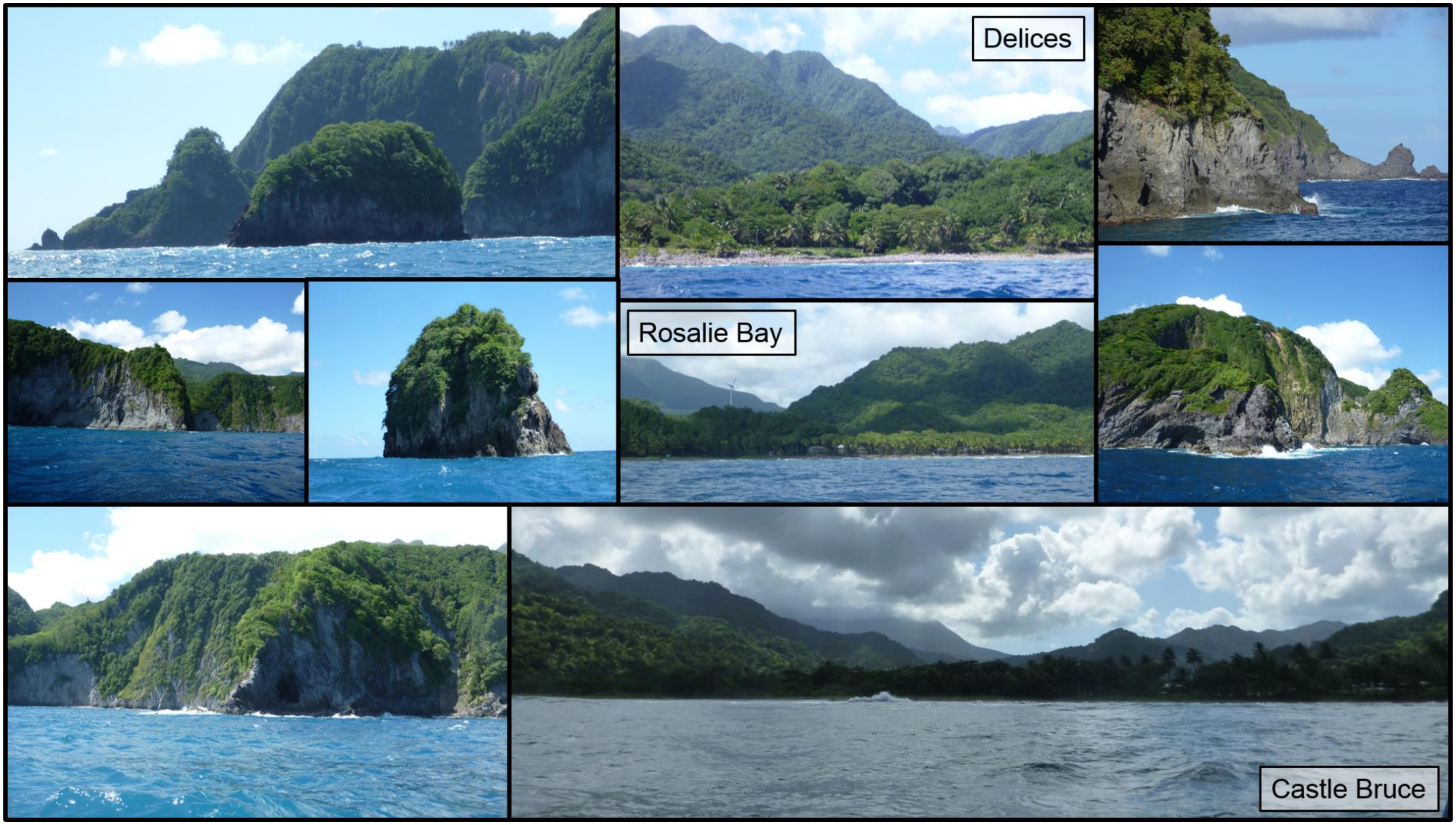

Figure 1-4. Some images of the windward (eastern) coast of Dominica taken from the sea. Notice the drastic contrast between low coastal zones and the long stretches of coastal cliffs.

The varied terrain contributes to the patchiness of Dominica’s multiple and highly varied micro-climates (Drigo 2001). The extreme changes in altitude affect temperature and precipitation, which in turn affect flora and fauna distributions. Owing to the sheer cliffs that constitute most of the windward coastline, archaeological settlements and modern villages along this eastern coast are primarily found in a small number of lowland areas with protected bays (Figure 1-4). Further, the very steep mountains that bound such areas suggest that, in pre-Columbian times, travel into and between these valleys was often by sea, and such areas would have provided hubs for canoe-based interactions and exchanges. Because the geology of Dominica places considerable constraints on mobility relative to other Caribbean islands, it brings into focus mobility and control over regional interaction as avenues through which social relationships were negotiated and legitimized.

As to more region-oriented considerations, Windward Island archaeology has recently been a focus for growing interest with many notable studies coming from Leiden University, such as Hofman et al. (2004a), Boomert (2000), de Waal (2006) and Bright (2011), and others in the region such as Bérard (2008), Bradford (2001), and Callaghan (2007). These studies have investigated social organization, settlement patterns, regional interaction, and the ways these relate to the distribution of sites and ceramic styles. These studies have promoted our understanding of local and regional dynamics throughout the Early and Late Ceramic Age for many parts of the Windward Islands. However, it has remained unclear exactly how Dominica should be understood within this context. One source of ambiguity comes from Dominica’s intermediary position between two well defined spheres of influence, the Windward Islands which typically encompass Grenada through Martinique/Dominica, and the northern Lesser Antilles or Leeward islands which typically range from Guadeloupe/Antigua to Anguilla. Wilson (2007:148) notes that “the island of Guadeloupe seems to be a sort of threshold in the political geography of the archipelago in later prehistory.” Guadeloupe, which shows affinities to the north and south (Hofman et al. 2004a), is generally grouped as the southernmost of the northern Lesser Antilles, and is directly north of Dominica. If there is a threshold between these areas, it may be evident in Dominica as well.

The recent dissertation by Alistair Bright (2011), provides an extensive overview and re-analysis of previous archaeological and ethnographic research in the Windward Islands. This study represents a giant leap forward in terms of integrating data from many different sources and makes solid inferences using analytical techniques such as the graph-theoretical approach to look at the distribution of certain ceramic traits. This was used to reconstruct networks of interactivity as represented by varying degrees of stylistic affinity. Furthermore, he looks at different approaches to the study of social organization, reviewing various archaeological proxies that have been used to understand social complexity, such as settlement structure, settlement hierarchy, exchange of prestige goods and craft specialization. Although he is forthright that his analysis is biased against Dominica because of a lack of extensive archaeological investigations, the detailed analysis of settlement patterns and ceramic assemblages on the neighboring islands form a background against which aspects of this study can be compared.

Bright’s study is also notable for its multiscalar approach, in which he analyzed settlement patterns and ceramic assemblages at the site level, the micro-regional level, and the regional level, to identify trends that would yield insight into the degree of social interaction and sociopolitical integration among various communities in the Early and Late Ceramic Age. This approach is inherent in his “islandscape” view of the Caribbean and from an archaeological standpoint, it is appropriate for the study of groups known to have been interacting at these different spatial scales (Bright 2011). The current study adopts a similar multiscalar analytical framework for studying the relationships between sites across Dominica, but whereas Bright’s multiscalar approach made inferences about the larger end of the scalar spectrum (i.e., the regional level), my approach is geared more toward understanding the impact of regional scale interaction on small-scale patterning (i.e., individual sites or multisite clusters in micro-regions).

The “Carib” Question

The “Carib” question, in simplest form, refers to the relationship between Arawak and Carib ethnic groups in the Caribbean during the LCA. The dichotomy derives from contact-period narratives that contrast the peaceful Arawak with the fierce and cannibalistic Island Carib (Honychurch 1997; Hulme and Whitehead 1992; Whitehead 1995b). Scholarship has cast doubt on many aspects of this narrative, but many still debate how much of it reflects reality, how much reflects misunderstandings or misinterpretations by the chroniclers, and how much was fabricated by European colonizers who used the stories of savagery to legitimize their conquest (Whitehead 1995b). It is a complex and multidimensional issue that has wide-ranging implications for both the circum-Caribbean and wider Amazonia. The problem has been studied by several archaeologists, many of whom incorporate ethnohistoric and linguistic data into their inferences (Allaire 1977, 1980, 1997; Boomert 2004, 2009; Bullen and Bullen 1976; Davis and Goodwin 1990; Whitehead 1995a). Major topics in this debate include:

claims for a relatively late migration of Carib speakers into the insular Caribbean from South America (Boomert 1995; Davis and Goodwin 1990); the timing of this migration (Allaire 1980; Boomert 2004); the nature of the interactions between Arawaks and Caribs (Allaire 1980, 1997; Rouse 1948; Whitehead 1995b); Rouse 1948; Whitehead 1995b); the association of these ethnic groups with specific pottery styles (Allaire 1977, 1991; Boomert 1986, 1995, 2000; Bullen and Bullen 1976; McKusick 1960b); and the appropriateness of framing Caribbean population dynamics from the perspective of Arawakan Diaspora (Heckenberger 2002; Whitehead 1995a, 1995b).

Three basic models have been proposed to explain the relationship of the Arawak and the Island Carib in the years before European colonization (Holdren 1998; Wilson 1993): the Carib invasion model (e.g., Boomert 1986); the Arawak continuity model (e.g., Davis and Goodwin 1990); and the reticulate model (Holdren 1998). The invasion model follows closely the narrative developed during European conquest of the Arawak/Carib dichotomy, suggesting that Island Caribs moved into the Caribbean relatively late and did so by conquering the resident Arawak populations and marrying their women. The Arawak continuity model suggests that the Island Carib were really descended from the same Arawak population that the Taino were, and that perceived differences between the Greater and Lesser Antilles had more to do with interaction between mainland and Island groups, leading to the intrusion of mainland Carib language and features of material culture into the Antilles. The reticulate model, proposed by Holdren (1998) abandons the “family-tree” style explanation that characterizes both previous models in favor of a more complex picture of Island Carib origins. This model suggests that the historically documented Island Carib had multiple origins and various resulting groups emerged from the reticulate interaction of these different groups.

This debate has prompted archaeologists to attempt to link various ceramic stylistic series to specific ethnic groups. Allaire (1977) argues that the Suazey ceramic series is an (de-)evolution of post Saladoid ceramic series, representing an *in situ* economic transformation from agriculturally focused to maritime focused adaptations that took place in the Windward Islands around A.D. 1100. The Suazey ceramic series however is not associated with Island Caribs. Differences between Suazey ceramics and ethnohistorically documented Island Carib, or Kalina ceramics led Allaire (1977) to hypothesize that the Island Caribs documented by the Europeans represented either a very late (ca. ~A.D. 1450) migration into the Antilles by mainland Carib-speaking Amerindians, or the rapid acculturation of Antilleans to mainland Carib culture following increased contact through trade. It is argued that either explanation accounts for the linguistic dimorphism documented ethnohistorically in which males apparently spoke a Cariban pidgin language while females spoke an Arawakan language (Allaire 1977; Boomert 1995, 2011; Hoff 1995; Taylor and Hoff 1980).

Boomert (1986) agrees with Allaire that Suazey ceramics should not be associated with the Island Caribs. He argues that Caribs migrated into the Windward Islands by at least A.D. 1250, but perhaps as early as A.D. 900, and produced a unique ceramic style known as Cayo, which he argues can be linked, through shared ancestry, to a mainland ceramic style known as Koriabo from northwest Guyana (Boomert 1986). This does not presuppose an invasion scenario however, and the question of whether peaceful human migration or ideological diffusion could account for the archaeological pattern is left open. Recently Boomert (2011) has argued that Cayo features were introduced gradually over a long period of time and were incorporated with, rather than replaced Suazey ceramics.

Davis and Goodwin (1990) draw primarily on linguistic evidence to argue that the Island Carib were really an Arawakan group—much closer in relation to the Taino than to the mainland Carib—that either moved into the Windward Islands ca. A.D. 1100 or developed *in situ* there. Island Carib pottery was Suazey and they only self-identified with the mainland Carib in the seventeenth century because they had increased interaction with them in the proto-historic and historic periods, the men adopting a pidgin language with Cariban loan words to facilitate exchange (Davis and Goodwin 1990).

Dominica has been called the "island most steeped in lore of the island Carib" (Myers 1978:325). It is home to the Kalinago, one of the last communities of Amerindian descent in the Caribbean. The rich ethnohistoric accounts of Carib Amerindians living in Dominica during the colonial period make this research highly relevant to both the Carib question and larger questions related to pre-Columbian population dynamics (Heckenberger 2002), even if addressing these questions is not the primary objective of this project. The hypothesis that regional interaction in the Windward Islands was directed toward South America whereas regional interaction in the Leeward Islands was directed toward the Greater Antilles is accepted among many regional specialists (Boomert 1986; Hofman et al. 2008b; Hoogland and Hofman 1999; Wilson 2007), even if the question of migration (Boomert 1995) or diffusion (Davis and Goodwin 1990) is still debated. Whitehead (1995b:12) proposed that Arawaks and Caribs "were not opposed or exclusive populations but aspects of a Caribbean and South American ethnic matrix in which a plurality of identities were represented at different times." With regard to the Island Carib, however, he argues that their "origins from, and continuing participation in, Arawakan regional culture and polity seems undeniable" (Whitehead 1995a:97). This argument could be seen to combine elements of the Arawak continuity model and Holdren's (1998) reticulate model. If Whitehead is right, then communities were likely integrated at spatial scales orders of magnitude greater than the area studied for this project. Evidence of this integration should however be visible at both local and micro-regional scales through, for example, increased evidence for regional interaction such as nonlocal ceramics and lithics at certain sites.

This research will not answer the Carib question, but it is informed by much scholarship that addresses it, and will have relevance to those who pursue such studies. However, based on the preceding arguments, I assume that pre-Columbian communities in Dominica, particularly those producing ceramics more like Troumassoid and Suazoid, were descendent from Arawakan diasporic communities, and that only later was the external influence of Carib ethnic groups from the mainland—as opposed to a wholesale population replacement—apparent in the Windward Islands. In Chapter 6, this will be used to justify the application of ethnographic homologies from ancestrally related Arawakan groups in South America. Analytical strategies are designed specifically to address the multiscalar dimensions of community integration typical of Arawakan societies and incorporate both ethnohistoric accounts from the colonial period in Dominica (e.g., Breton 1958a), and the growing literature on the socio-spatial dimensions of Arawakan communities (e.g., Eriksen 2011; Heckenberger 2002, 2005; Santos-Granero 2002).

History of Archaeological Investigations in Dominica

Many archaeologists who have made regional surveys of the Lesser Antilles or the Windward Islands have remarked on the paucity of information about Dominica (e.g., Bradford 2001; Bright 2011). Honychurch (2011:34) points out that "up to 1997, only seven brief papers had been published on the archaeology of Dominica…, [and] only McKusick (1960b) and Petitjean-Roget (1978) had done any excavation of sites on the island." Before Bérard and Petersen began the *Mission Sud-Dominique* in 2005, the archaeology that had been done in Dominica was either limited in scope (e.g., Evans 1968; McKusick 1960b), or was more extensive, but concerned chiefly with developing an inventory of sites (e.g., Petitjean-Roget 1978). In this section, I present each of the different archaeologists who have worked in Dominica and contextualize their studies in the history of archaeological thought. Then I summarize the state of Dominican archaeology and how my research builds on these contributions.

Marshall McKusick

McKusick was one of the first archaeologists to work in Dominica, although the scope of his investigations was extremely limited. Working during the heyday of Culture-Historical approaches to archaeology, his research followed Rouse in using ceramic styles to trace the distributions of people through time. His dissertation work (McKusick 1960b) is based on more extensive archaeological investigations he conducted in St. Lucia, where he identified many localized styles of pottery dating to what is now referred to as the Late Ceramic Age. He is attributed by Honychurch (2011) with finding four sites in the northeastern portion of Dominica near the village of Vielle Casse, although specific excavation results were not published and the work does not figure prominently in his dissertation on the distribution of ceramic styles in the Lesser Antilles. In that work, he mentions his excavations at the Vielle Casse site and how ceramics were slightly at odds with his findings in St. Lucia. He attributes the ceramics from Vielle Casse to the Troumasee phase of the Troumassoid Series (Figure 1-2), but points out differences with the pottery from St. Lucia, such as the absence of griddle legs, the rarity of bichrome painting, and the association of fine-line crosshatching with flanged rims (McKusick 1960b:136). He also correlates some post-Troumasee pottery from the Vielle Casse site to the Choc style based on the "simplicity of shape and relative crudity of surface finish" (McKusick 1960b:143), but comments on the lack of vessel legs in the collection.

Robert Evans and Betty Meggers

Although Evans alone authored their only publication on the research, together he and Meggers conducted a three week archaeological survey of Dominica in 1966 (Figure 1-5A), which resulted in the 1968 article "The Lack of Archaeology in Dominica." As one of the first treatments of the subject, this article asked several important questions: Were there permanent settlements in Dominica? What ecological conditions would have affected the setting and arrangement of those settlements? And what was the relationship of sites in Dominica to other nearby islands? However, Evans wrongly concluded that the ecology of Dominica limited the potential for long-term, permanent habitation, and that settlements in Dominica would have been small and transient. The imagery presented by Evans, and held for some time after, portrays Dominica as merely a stepping stone to more desirable nearby islands such as Guadeloupe or Martinique.

Working from a fairly narrow environmental determinist approach that was more widely accepted at the time, Evans and Meggers had already made their mark on South America, proposing the now contested view that protein was a limiting factor that restricted the potential for large scale and complex societies in the Amazon (Meggers 1971, 1991; Meggers and Evans 1957). They forward an analogous argument for Dominica, but here the focus is on shellfish. The fact that Dominica's offshore bank is so steep means that it does not have very rich shellfish resources like Anguilla for example, where the flat offshore bank provides an ideal shellfish habitat (Carder and Crock 2012; Carder et al. 2007). However, nearby St. Vincent features little evidence of shellfish exploitation, but research has uncovered a long record of permanent settlement (Allaire and Duval 1995; Callaghan 2007). Indeed, in all of our excavations, we did not find any subsistence shell or fish bones, although I will present other explanations for this besides the restrictions imposed by habitat.

In addition to the supposed lack of marine resources, Evans (1968:96) concludes that the forests of Dominica produce "superb flora for botanists, but nothing of use to aboriginal man." From this description, we can see that Evans conceives of the Amerindians in Dominica as having been primarily gatherers, rather than cultivators. It is also clear that he has not considered the historical ecology of the island. Much of the area that was once inhabited by Amerindians was used for commercial cultivation during the colonial period, meaning that vast areas of land were clear cut. Despite the appearance of Dominica's rainforest as being virgin or pristine, along much of the coast these forests are in fact much younger secondary forests. As Honychurch (2011) has shown, there are many reasons to believe that Evans (1968) greatly overstated the ecological limitations of Dominica.

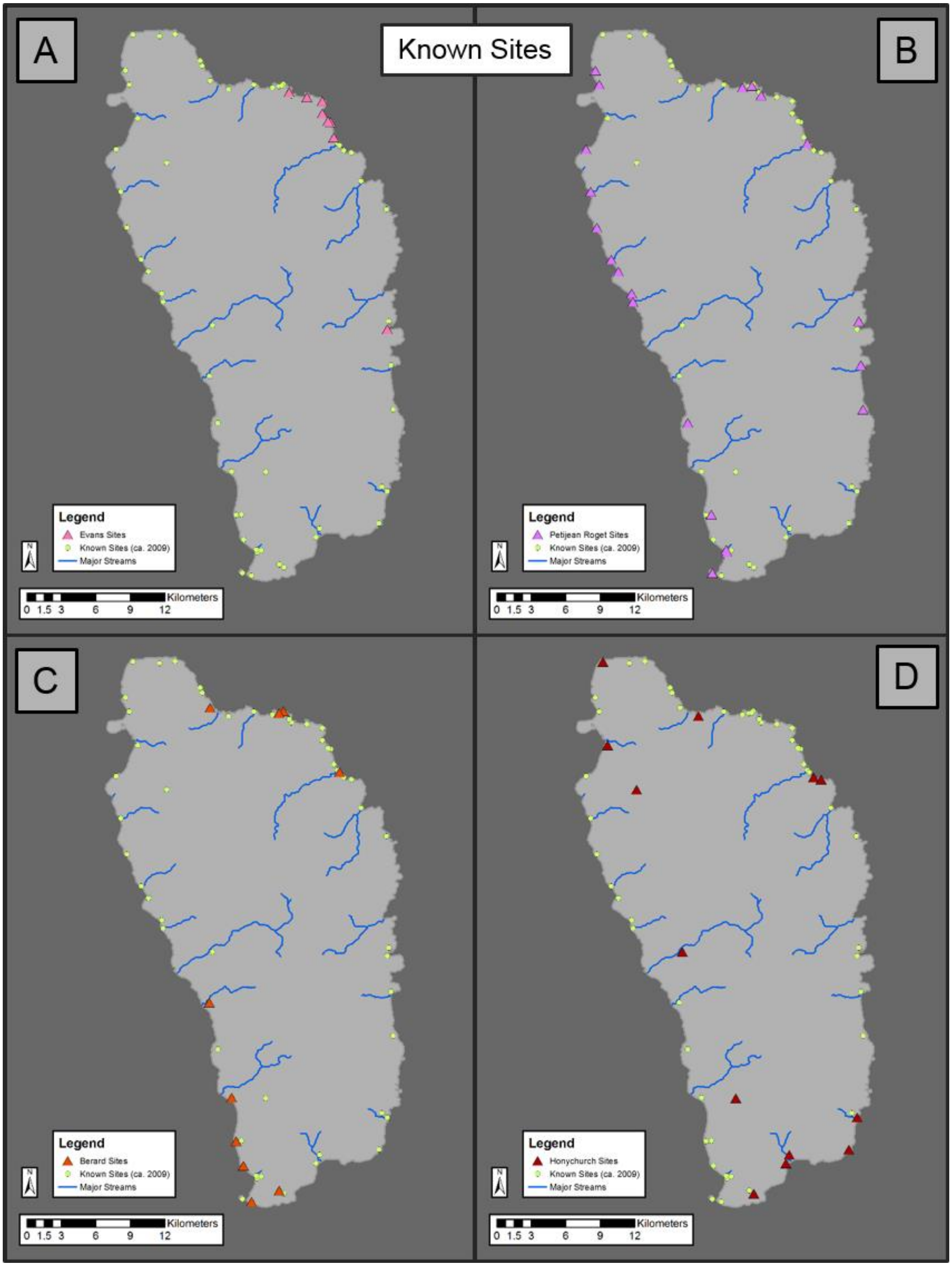

Figure 1-5. Maps of known sites. Sites identified by: A) Evans; B) Petitjean-Roget; C) Bérard; D) Honychurch (2011).

Another serious problem with Evans' approach was the lack of excavation. Evans (1968:97) did mostly surface inspections, claiming that in many places "excavation was neither possible nor worthwhile." They did not factor in taphonomy, or the possibility that sites have been deflated or buried. Also they made no attempt to differentiate between different site types, instead only identifying sites as Carib, Arawak, or Colonial, depending on the presence of diagnostic surface finds, which he does describe in some detail. In sum, despite the authoritative tone and the fact that his work is widely cited, Evans (1968) was wrong about the lack of archaeology in Dominica, which has been proven by the work that followed (Bérard 2007, 2008; Honychurch 2011; Petitjean-Roget 1978), including the direct response from Myers (1978) that is discussed next.

Robert Myers

In 1978, Robert Myers wrote a reply to Evans in which he considered the arguments proposed and weighed them against a collection of ethnohistoric documents that comment on the aboriginal communities in Dominica post-1493. It is likely that Myers was influenced by the New Archaeology and the increased usage of ethnographic and ethnohistoric sources to develop inferences about the archaeological record. He suggests that the focus on gardening in Dominica mitigated the lack of shellfish resources, thereby facilitating permanent settlement. Furthermore, Myers (1978:355) concludes that "if Dominica is ever investigated archaeologically to the extent (and intensity) to which it has been studied biologically. . . the results will reveal a picture of the past which contrasts sharply with that presented in 'The Lack of Archaeology on Dominica.'" To arrive at this conclusion, Myers makes six main points.

(1) “There is considerable ethnohistorical evidence to suggest that Dominica was a permanent home for Amerindians from prior to 1493 up to the present” (Myers 1978:335). To make this point, Myers compiled a diverse collection of ethnohistoric accounts from French, British, and Spanish sources dating back to Columbus’s second voyage in 1493, during which Dr. Chanca, the expedition’s physician, reported spotting both people and dwellings on the coast of Dominica. Most of the accounts that Myers reports on are brief mentions of the inhabitants of Dominica, although more extensive accounts add greater detail about Amerindian life, such as the dictionary penned by Father Raymond Breton (1958a) during his residence in the French West Indies between 1635 and 1654 (Hulme and Whitehead 1992). A striking aspect of Myers’ compilation is the agreement between diverse sources on the presence of permanent settlements in Dominica post-1493. The fact that most accounts simply take for granted the presence of such settlements is more revealing than the troubling lack of census data or population estimates.

(2) “Amerindians lived along both coasts, had gardens in the interior of the island, and deposited refuse away from the settlements” (Myers 1978:335). This point is the most consequential for archaeology and therefore the most relevant to the present study. For instance, the 1596 account by Doctor Layfield mentions the exchange of garden produce, but also the size of a Carib village being roughly 20 cottages and ruled over by a “king.” The observations made by Father Breton (1958a)—that villages were positioned near rivers, that defensibility factored into the planning of communities, that refuse was deposited far from settlements, and that gardens were sometimes located far away from villages—are extremely useful for an archaeological study of settlement patterns and community organization, and were directly influential on the predictive model used in this study (outlined in Chapter 3).

(3) "Evidence on the location of the settlements and the number of inhabitants are imprecise" (Myers 1978:335). This underscores the value but also the limitations of the ethnohistoric accounts. They can be used to reveal certain key points about the Amerindian occupation of the island, but they should not be relied upon to provide precise locations of villages or estimates of population.

(4) "There may have been Amerindian settlements under present-day towns along the leeward coast; and other sites which have not been identified probably exist along this coast" (Myers 1978:335). This supposition has been confirmed by the extensive survey work of Petitjean-Roget (1978), Petersen and Bérard (2007, 2008), and Honychurch (1997, 2011). Our work has shown similar distributions for the east coast (Shearn 2010; Shearn and Toney 2009).

(5) "Absence of mangroves and associated shellfish did not prevent permanent Amerindian settlement in Dominica" (Myers 1978:335). This point underscores the fact that Evans (1968) misunderstood both the subsistence practices of Amerindians living in Dominica, and the ecological constraints the island presents, making his conclusion wrong on two accounts; the ecology was not limiting in the way he thought it was, and even if it were, it would not have limited the population on Dominica because subsistence practices were more advanced and diverse than Evans realized. For example, Evans talks about the lack of shellfish, but does not discuss the advanced fishing practices of the island Carib (Price 1966) or the abundance of other riverine and marine food sources such as crab, crayfish, and sea turtle, which thrive in

Dominica but leave a diminished archaeological signature (Honychurch 2011). There is no mention of the agouti (*Dasyprocta*), a South American land mammal introduced to Dominica by early settlers and known to have been a food source for later occupants. He did not appreciate the sophisticated and productive agricultural practices now known to be associated with Arawakan diasporic communities (Heckenberger 2002), for example, their use of manioc and other root crops as staples. These crops flourish in most parts of Dominica and are still used as staples today (Honychurch 1995, 2011; Taylor 1935, 1938).

(6) "Detailed analysis of several collections of artifacts may help to shed light on Dominica's Indian past" (Myers 1978:335). Myers saw the need for a much more extensive and intensive study of the archaeology of Dominica, one that avoided the overly environmentally determinist approach of Evans in favor of a more historical and comparative approach, and consisting of more than just three weeks of "intensive" survey. Myers' use of the ethnohistoric texts raises intriguing possibilities about the potential for identifying undiscovered sites and interpreting the archaeological past in Dominica with the aid of these historical, contextual insights.

Although one could point out the anachronism inherent to any analysis that applies post-colonial accounts to pre-colonial times, there are undoubtedly valuable insights to be gleaned from this approach as long as the method of applying the accounts is sensitive to the historical contexts in which the documents were written and to the cultural changes that may have occurred in the interim. Of course there is a similar anachronism in attacking Evans (1968) approach to the archaeology and his simplistic view of Amerindian subsistence practices, but because so few other early treatments of Dominican archaeology exist, the work is still relevant. Furthermore, some of the impressions Evans and Meggers had of Dominica are valid and an ecological approach is still critical, even if their impression of Dominican ecology in relation to archaeology was underdeveloped (Honychurch 2011). It is therefore wise to examine these works very closely, even if the conclusions drawn from the early archaeology have proven false.

Henry Petitjean-Roget

In 1976 Henry Petitjean-Roget, a student of Claude Lévi-Strauss, made a research trip to Dominica in which he identified 21 sites (Honychurch 2011; Petitjean-Roget 1978) (Figure 1-5B). At the time, this was one of the most notable contributions to the archaeology of Dominica, although the efforts could be described as more extensive than intensive. Petitjean-Roget's work was focused on the west coast, although he did identify sites on the more rugged east coast as well. His method was primarily surface inspections, along with small-scale excavations in Soufrière in the southwest, where house construction had revealed Amerindian deposits first identified by Carl Winston (Honychurch 2011). Petitjean-Roget reports that he limited his survey to those areas easily accessible by vehicle due to time constraints. However, his survey of the west coast is impressive for scope. He found pottery in several locales that could be attributed to different time periods, but was hesitant to assign very specific dates because of the limited nature of the survey. However, specific diagnostic sherds led Petitjean-Roget to conclude that at least terminal Saladoid deposits were present in Dominica, as well as some sherds evocative of the Cayoid style identified in St. Vincent. He concludes that almost all the bays on the west coast were occupied at different times by Amerindians.

Lennox Honychurch

Lennox Honychurch is without question the most important and accomplished archaeologist and historian of Dominica and he has worked closely with me throughout the course of the project. In 1975, Honychurch first published his general history of Dominica, *The Dominica Story: A History of the Island*. After completing his doctorate in Anthropology at Oxford, he revised the history in 1995 to include more recent advances in archaeology. In his most recent book, *The Archaeology of Dominica*, Honychurch (2011) summarizes more directly the state of archaeology in Dominica. His (2011:36) synthesis reveals the naiveté of Evans' (1968) conclusions about Dominica, suggesting that the notion of ecological constraints limiting settlement viability "calls into question the extent of his botanical and zoological assessment of the locality."

Based on his lifetime of work in Dominica and his insider emic perspective on life in Dominica, Honychurch has developed intimate knowledge of every archaeological site in Dominica. When locals uncover artifacts in their gardens or when digging foundations, they often bring those finds to him. He is the only archaeologist to have located sites far in the interior, and this was because artifacts recovered by construction projects were brought to his attention (Honychurch, personal communication 2012) (Figure 1-5D). Interior sites are severely underrepresented in Dominica, in large part due to the difficulty of surveying the extremely rugged and heavily forested mountains.

Honychurch further refutes the claim made by Evans and supported by Versteeg (1995, cited in Honychurch 2011) that, based on the shallow deposits at sites they identified—without excavating—Dominica did not have substantial archaeological deposits. Honychurch (2011) reports that many sites have been deeply buried by the erosion of soils and by forest growth, with some deposits being recovered from depths up to 14 feet. This shows that archaeological investigations in Dominica cannot be based on surface inspections alone. Furthermore, he aligns with Myers (1978) to argue in favor of using ethnohistoric accounts to guide and enhance our interpretation of the pre-Columbian history of the Island.

Benoît Bérard and James Petersen

In 2005, Benoît Bérard and James Petersen began a collaborative project, the *Mission Sud-Dominique*, whose initial goal was to document connections between northern Martinique and southern Dominica. The efforts in 2005 and 2006, when I volunteered with the project, were directed toward the site in Soufrière that had been identified by Carl Winston and later investigated by Petitjean-Roget. At Soufrière, the team uncovered evidence of a deeply buried, early Saladoid village that had been partially demolished by volcanic activity in the southern part of the island. However, the remains of the village were sufficient to identify strong similarities in pottery styles between southern Dominica and northern Martinique, including pieces with near-identical decorative motifs. The site at Soufrière is now one of the best-studied Saladoid sites in Dominica. It is near the location where a large three-pointed *zemi* idol was recovered in 1878 in a cave near the Roman Catholic Church (Honychurch 2011). Honychurch (2011:40) also points out that Soufrière has a special place in the pre-contact narrative of the Caribs, who regarded it as “a gathering place for regional ‘kings’ and as the village of their descendants, the abouyou, ‘the carriers of the kings.’” In addition to the excavations at Soufrière, Bérard and the team also conducted regional survey through surface inspection over much of southern Dominica and parts of the north, identifying 12 undiscovered sites (Figure 1-5C).

Arie Boomert

In 2008, Arie Boomert expanded his research on Trinidad and Tobago and St. Vincent (Boomert 1986, 2000) to Dominica, where he led a team of archaeologists from Leiden University in a survey of sites on the northeast coast. They conducted excavations and surface inspections at five sites, all of which contained multicomponent deposits, and three of which yielded Cayo pottery (Boomert 2009, 2011). Boomert notes that Cayo pottery co-occurred with traits more diagnostic of the Suazan Troumassoid, such as scratched surface treatment, which suggests that Cayo ceramics did not replace Suazan Troumassoid, but rather were gradually integrated. This research also suggests more direct links between Dominica and nearby islands such as St. Vincent, Guadeloupe, Martinique, Grenada and the Grenadines, and Trinidad, where Cayo style ceramics have also been recovered.

Boomert also makes an important contribution by synthesizing ethnohistoric accounts directly related to Dominica, such as those written by the Anonymous of Carpentras, Breton, du Tertre, Rochefort, and Labat (Boomert 1995, 2009, 2011). These invaluable insights into Kalinago house and village structure yield important clues for the study of settlement patterns and the relationship between sociality and spatiality in Dominica.

Steve Lenik and Mark Hauser

Steve Lenik’s work is primarily concerned with the historical period in Dominica, including his dissertation research into the early Jesuit missionaries in Grand Bay, on the southeast coast of Dominica (Lenik 2010). However, he has also surveyed Dominica extensively for contact-period sites (Lenik 2012). One of his most important contributions to pre-Columbian archaeology was the discovery of the only known petroglyph site in Dominica, located far on the northern tip of the island. He has also identified pre-Columbian components at a number of historic sites.

Mark Hauser is another historic archaeologist working in Dominica, whose work employs an approach that is similar to this study, using the notion of enclaves to frame archaeological interpretations about the organization of labor and communities during the Colonial Period (Hauser 2011). His work is notable for adopting a nuanced approach to the relationship between Europeans, enslaved Africans, and the indigenous Kalinago, identifying continuities of practice that link pre- and post-colonial Dominica, particularly with reference to land use and regional interaction. These refute aspects of the traditional colonization narrative, "which treats incorporation into empire as an abrupt 'event', representing a radical digression in earlier patterns of trade, power and everyday life, rather than as part of a long-term process" (Shearn and Hauser 2014:8).

Concluding Remarks on the State of Archaeology in Dominica

Although the archaeology of Dominica has progressed considerably in some ways since Evans (1968), there remain countless unanswered questions. The work of Honychurch (1995, 1997, 2011), Evans (1968), and Petitjean-Roget (1978), forms the basis for the number of known sites on the island. However, our knowledge about many of those sites is scarcely above the level of dots on a map (Figure 1-5). Importantly, Honychurch's work demonstrates the importance of long-term belonging and community relations to site survey and the investigation of the archeological record. The work of Bérard (2007, 2008) and Boomert (2009, 2011) has furthered our understanding of the archaeological relationship between Dominica and its neighboring islands, where studies by de Waal (2006) and Bright (2011) predict what might be expected from more extensive research in Dominica. From such works, I borrow some aspects of Caribbean classificatory ceramic typologies, the use of ethnohistory to facilitate a broader understanding of the archaeology, a focus on site survey, and Honychurch's emic perspective on Dominican communities, but reject outright Evans' narrow environmental-determinism and his conclusion that settlements in Dominica were mostly transient. What is still lacking is an understanding of what the known sites in Dominica, the dots on the map, really represent. For instance, what is the range of variation in site function for sites across Dominica? How were communities organized as settlements on the landscape? How did ecological and social factors play a role in these settlement patterns? How should we interpret clusters of sites with respect to chronology, interactivity, and functional integration? By focusing on these questions, and by incorporating contemporary archaeological theory and methods, along with Dominican perspectives, this research represents an important step forward for the archaeology of Dominica and, I hope, a valuable contribution to the archaeology of the region.

CHAPTER 2
PROBLEM ORIENTATION: THEORIZING COMMUNITY

In developing research questions for this study, I had to balance three main concerns. The first was anthropological, concerning the concept community, and how different ways of thinking about and defining it affect the investigation and interpretation of archaeological communities. The second was more region-specific. To investigate how communities were organized in Dominica and how they were regionally integrated, the research had to address the baseline level of resolution that Dominica was still lacking in issues of culture history, social organization and changes in settlement patterns. In doing so, the questions had to articulate with current trends in regional Caribbean archaeology. The third was practical, for I had to develop research questions that were feasible within the constraints of the archaeological record of Dominica, which is limited to mostly ceramic and lithic remains distributed across an extremely dynamic and varied landscape. My solution to these concerns was to take standard archaeological techniques, regional survey of settlement patterns and technofunctional ceramic attribute analysis, and augment them with more advanced analytical techniques such as neutron activation analysis and GIS-based analysis. I construct these analyses with a multiscalar framework in which the units of analysis are chosen very carefully so as to be sensitive to patterning at local, micro-regional, and regional scales. To this end, three primary questions structured the research.

(1) In what ways were multiple sites within micro-regions functionally differentiated and what does this reveal about community organization at the local level? Here, functional differentiation refers to the degree of specialization exhibited by certain sites in a multisite settlement pattern. Higher degrees of functional differentiation imply a division of labor and an interdependence that might be characteristic of socioeconomic integration. The degree to which groups that resided at particular sites were dependent on their relationships with other groups to ensure social reproduction can be addressed by proxy through the investigation of site function and settlement hierarchy. Site function is conceived of as the range of activities or practices evident at a site by the diversity and variable distribution of certain artifact types. For example, the presence of griddles at a site might indicate a domestic/residential function. The presence of microlithics used to make graters might indicate a domestic/food-processing function, whereas the presence of ornate serving vessels might indicate a ceremonial or ritual feasting site. If all sites are more or less the same size and exhibit the same range of activities, it would indicate very little functional differentiation.

The settlement data are framed with reference to micro-scale ecological variation, positioning with respect to other settlements and important landscape features, and to patterned variability in the artifact assemblages within micro-regions. Based on findings from neighboring Guadeloupe, settlements were expected to range from large, elaborated villages to small hamlets or outposts (de Waal 2006). Important ecological variables with implications for community organization include size and slope of inhabited landform (i.e., scale of occupation), access to marine resources and to suitable agricultural areas (i.e., functional variability and division of labor), relationship to ocean currents (i.e., access to canoe landings), prominence on the landscape (i.e., visibility, defensibility) and relationship to floodplain (i.e., seasonality). Comparisons based on the size and age of sites, the functional composition of assemblages, and the setting of sites with respect to these ecological variables, are used to determine the likelihood that multisite clusters represented any of the following: integrated communities (i.e., corporate production and redistribution); dispersed communities with little functional interdependence (i.e., household production); small autonomous neighboring groups; or non-contemporaneous shifting or sequentially occupied settlements. This question will be addressed individually for each of the micro-regions by evaluating patterned relationships between sites within micro-regions.

(2) To what extent were communities integrated at larger spatial scales? Were local communities autonomous, or were they integrated into higher-order/regional polities? Were settlements, including multisite communities, autonomous within micro-regions or were they regionally integrated, transcending physical boundaries? Although it has long been understood that the sea served to connect people, rather than divide them (Boomert and Bright 2007; Bright 2007; Hofman and Bright 2010; Hofman et al. 2007; Hofman et al. 2010; Hofman and Hoogland 2011; Rouse 1951; Watters 1982), this research considers the corollary that there may have been important differences between communities on the same island—particularly those on a topographically diverse island such as Dominica—depending on the nature and intensity of interactions between them (Bérard 2012). It is important to remember that, despite the fact that there was extensive trade and interaction between the islands, and while islands did not necessarily represent bounded entities, boundaries, as well as specific interaction spheres, did exist, which increasingly detailed archaeological surveys in the Windward Islands continue to reveal (e.g., Bright 2011; de Waal 2006; Hoogland et al. 2010).

This question requires that the data be reframed to a broader regional (between-micro-region) scale of analysis to address the possibility that communities were integrated between islands and that interaction was more intense across bodies of water than across the landmass of Dominica. Because this question demands that the settlements studied should be those most likely to contain evidence of regional interaction, including between islands, the micro-regions selected for investigation all feature access to the coast. The focus expands from functional interdependence to investigate the intensity of interaction and practices related to boundary maintenance. This study considers three types of boundaries: physical boundaries expressed in the relationship of settlement patterns to landscape features; social boundaries expressed in differential pottery production techniques; and symbolic boundaries expressed in differential pottery style. The intensity of interaction among communities is inferred by identifying exotic goods and measuring the degree of external influence on assemblages. A suite of inter-micro-regional comparisons is drawn among a number of variables related to pottery manufacture technique and use, including: paste and temper selection; morphology and forming technique; surface finishing and the application of decorative elements; and the technofunctional composition of assemblages.

(3) What types of hierarchical and/or heterarchical relationships characterized the organization of communities at both the local and regional scale? This study focuses on hierarchy and heterarchy as organizing principles in the functioning of social, political, and economic processes within and between communities. In settlement systems this can manifest in a pattern of centers and peripheries, which will be investigated through analysis of site characteristics and the composition of assemblages reflecting variable practices at different sites. Sites can be characterized according to variables such as size, functional diversity of assemblages, ratio of prestige goods to utilitarian objects, and ratio of exotic to local materials. An analysis of these variables can be used to determine whether settlement patterns contain clear centers and if so, which practices were centralized (e.g., food production, craft production, ceremonial practices). If centers are found, they can be compared across micro-regions to determine the extent of their influence and if centers were ranked equivalently or hierarchically. This should help to determine if: (1) there were several local centers whose influence was limited, with little variation in the ranking of these centers between micro-regions; (2) there were higher-ranked regional centers that served to integrate non-co-resident communities from multiple micro-regions; or (3) there were no clear centers.

Some of these questions can be more satisfactorily addressed than others with the available archaeological data. As I move from the first to the third question, I incorporate more varied evidence, such as ethnohistoric accounts and ethnographic homologies, to draw more satisfying conclusions. In the following sections of this chapter, I discuss the theoretical orientation that shaped the conceptual framework of the research questions, and in the following chapter, I discuss the specific methodological approach undertaken to gather evidence to addresses these questions.

Theoretical Overview

There are three main bodies of theory that inform this research and structure the methodological approach. First is the theoretical concept of community in archaeology, a topic that has come to achieve some prominence in archaeological theory over the last 15 years (Harris 2012). Before we can study communities, we have to define the term and consider the implications of our definition of community to the methods utilized and the interpretation of the results. The critical attention paid to the concept of community implicates related archaeological concepts such as practice/agency approaches and household perspectives, which are incorporated into Caribbean research with growing acceptance (Morsink 2009; Samson 2009, 2010).

Second is the theoretical perspective on social complexity, which has been a topic of importance in archaeological theory for over 40 years and remains critically important in the Caribbean. The shift from an evolutionary view of social complexity to a practice-oriented approach allows for a more nuanced analysis of the way power and social complexity arise and are constantly negotiated through hierarchical and heterarchical relationships at multiple scales within and between communities.

Finally is the anthropology of technology, or how we understand the role of things in the relationships that structure communities. For this research, the focus is primarily on ceramic technology and how the distribution of ceramic assemblages can be seen as an aspect of community organization and reflects specific types of activities and interactions at different scales more or less suggestive of community identity and integration. I discuss the literature on ceramics, including early attempts to link ceramics to sociality such as socio-ceramics, information-exchange theory, and more recent approaches based on practice and situated learning. Theory focusing on pottery manufacturing technique, particularly the idea of technological style, forms a critical role in this research because I assume that similarities in technological style are more indicative of social integration than similarities in decorative style. In addition to ceramics, I consider lithic technology as well as aspects of technology not immediately apparent in the archaeological record such as fishing technology, architecture, basketry, and perhaps most critically, the manufacture and use of dugout canoes.

Archaeology of Communities

In the Caribbean, the definition of social units has been dominated by a cultural historical approach pioneered by Rouse (1951, 1986, 1992). When new sites are identified, they tend to be grouped into social categories using the style of their diagnostic pottery sherds (Figure 1-2). This practice became increasingly untenable in light of the heterogeneity of artifact assemblages previously grouped within series by Rouse's method (Curet 2003; Keegan 2004, 2009, 2010a; Ramos 2010). A reaction can be seen in the development of more "chaotic" models (Keegan 2004), which see the Caribbean as "a pluriform set of mutually influencing and interactive culture traits and languages, shared to a varying degree in multiple configurations across a mosaic of communities" (Hofman et al. 2008b:18). Despite this growing understanding, the ceramic-based terminology developed by Rouse (1951, 1986, 1992) continues to be used universally in the Caribbean to refer to both ceramic series and to groups of people.

To explore more meaningful social units, and to transcend the normative association of stylistic series to social groups, contemporary researchers have variably foregrounded kinship and post-marital residence (Ensor 2003, 2011; Keegan 2009; Keegan and Maclachlan 1989), sociopolitical units/polities (Crock 2000; Crock and Petersen 2004; Curet 2003), ethnic groups (Allaire 1977; Boomert 2009; Whitehead 1995a, 1995b), or social networks (Bright 2011; Hofman et al. 2007). Some of these units, particularly kin groups and ethnic groups, can present more challenges than they resolve as these contested anthropological constructs do not always translate well to the analysis of archaeological patterning (Pauketat 2007). The focus on community as a unit of analysis was implemented to sidestep some of the archaeological and intellectual pitfalls that accompany the search for ethnicity in the past.

In a recent reassessment of the concept of community, and the way archaeologists engage with it, Harris (2012) points out that although meaningful advances have occurred over the last 15 years, beginning with Canuto and Yaeger's (2000) edited volume, *The Archaeology of Communities*, it is still an emerging and problematic topic requiring explicit attention from archaeologists who study past communities. One major problem Harris identifies is that archaeologists who employ the term often fail to define it adequately, an issue that is complicated by the fact that many different definitions of the term exist. Hilary (1955), for example, identified 94 different definitions of community and the only feature common to all of them was that they involve people. It is interesting that even this basic feature of community is now being challenged by post-humanist arguments for an expanded definition of community that includes non-human agents such as things, animals, plants and architectural/landscape features (Harris 2012).

In a review of how the concept of community has been used by archaeologists, Yaeger and Canuto (2000) identify four schools of thought from which the concept has been variously conceived: structural functionalist, historical-developmental, ideational, and interactional. Following Murdock (1949), the structural-functionalist definition of community is a "co-residential collection of individuals or households characterized by day-to-day interaction, shared experiences, and common culture. . . that serves as a society's principal unit of biological and cultural reproduction" (Yaeger and Canuto

2000:2). Here the focus is on the function a community serves in the overall social organization of a particular group. This approach, similar to Isbell's (2000) natural community, is criticized for presupposing that communities represent an unproblematic pre-existing social category that evolves naturally out of the social structure (Yaeger and Canuto 2000).

Rather than looking inward at the social structure for the origins of community, the historical-developmental approach led by Eric Wolf stresses "the roles of external and historical forces in conditioning a community's internal structure, arguing that distinct conditions would create different kinds of communities" (Yaeger and Canuto 2000:2). As a response to structural-functionalism, this approach perhaps swings too far in the opposite direction, failing to consider the way communities are generated locally, and more importantly, that different communities will respond to similar external forces in perhaps highly varied ways.

Ideational approaches bring identity to the forefront; how individual perceptions of self and one's place in a community combined to form a sense of shared and self-ascribed group identity (Yaeger and Canuto 2000:2). Unfortunately, by locating community in the sphere of individual attitudes, we can lose track of the structural and external forces that also affect communities. Furthermore, it can be very difficult to bring archaeological evidence to bear on the evaluation of one or another emic perception of community belonging.

Finally, interactional approaches investigate how communities are constituted, created, and maintained through the relationships among individual agents and the relationship between agents and structure (Yaeger and Canuto 2000). Interactional approaches often draw from practice and agency theory to understand how communities are produced and reproduced as the community is perhaps the most obvious locus for the intersection of agency and structure (Varien and Potter 2008). An agent's identity, status, and aspirations are at the same time shaped by and constantly shaping the nature of the community to which he belongs. In order to achieve one's interests, one must marshal the support of the community or work through the community. Likewise, the nature and organization of the community structures the manner and medium through which actors negotiate their social relationships and achieve their goals.

Natural vs. Imagined Communities

Isbell (2000) draws a sharp distinction between the "natural community" and the "imagined community," arguing that archaeologists have for too long implicitly used the natural community definition to guide our research. A natural community is "traditionally defined in terms of the solidarity produced by two things: (1) shared residence or space, and (2) shared life experiences, knowledge, goals, and sentiments" (2000:243). A natural community definition is essentialist, perceiving a community as a "real and bounded entity, a static, natural unit of comparative social science" (Isbell 2000:245), the formation of which comes as a natural outgrowth or byproduct of co-presence and face-to-face daily interactivity or interdependence.

In a discussion of modern archaeological approaches to community that are based on this notion of a natural community, Isbell criticizes Kolb and Snead (1997:611), who define community as a "minimal, spatially defined locus of human activity that incorporates social reproduction, subsistence production, and self-identification." Isbell sees this as a problematic because the essentialism that views communities as naturally occurring units represents an artifact of anthropological methodology rather than some universal characteristic of human sociality.

Isbell (2000) contrasts the natural community with “imagined communities,” communities that are formed through purposive action within some structure, a particular cultural system or social order. Communities only exist because we build them through action and it is in repetitive practices that communities reproduce society. A critical concept forwarded by Isbell (2000) is that imagined communities are constructed relative to other communities, and that competition and contestation between rivals both within and between co-resident groups is as important for understanding communities as pro-social attitudes, kinship, and cooperative labor.

This theoretical perspective resonates well with scholarship on the social and political organization of indigenous Carib polities. Dreyfus (1983:54), for example, argues that pre-Columbian polities were more complex than modern sociopolitical systems, and were based on extensive regional inter-group relations that ranged along a spectrum including open hostilities, ambiguous friendships, institutionalized partnerships, and formalized exchange networks in which both people and goods circulated. He proposes the hypothesis that it was warfare that supported this structure, providing the means for war chiefs to accumulate prestige and support. Further, Dreyfus (1983) suggests that the disappearance of this ritualized system of warfare may account for the transformation into the autonomous and egalitarian units that characterize modern Carib polities (but see Duin 2009).

I would agree with Harris (2012) that the distinction between natural and imagined communities is perhaps drawn too starkly to be operational for archaeologists, but we can still take lessons from Isbell (2000). We should be sensitive to the role that the alterity and competition associated with imagined communities played in the contexts we study, and look for factors affecting the organization and relationships among communities beyond the boundaries of co-resident groups. The study of community is a localized and historical pursuit, recognizing that communities are not a “pre-given entity” (Yaeger and Canuto 2000), but that they emerge in different forms through the interactions of people, practice, environment and technology in a particular place and time (Harris 2012). For example, you could not study communities in the present day without considering the impact of technology like the Internet. In the Caribbean, we cannot consider the concept of community without considering the impact of canoe-based mobility and exchange.

In a very broad way, communities can be seen to be organized around the means of transportation that connect them. For instance, in Dominica today, communities are organized around a system of roads. In Guyana, along the Berbice River, the communities are organized along the river, as river canoes are the main means of transportation and larger ships transport goods to be exchanged. Whereas communicative technologies like the Internet keep us connected to various distributed, or cyber-communities (Axel 2006; Porter 2004; Wilson and Leighton 2002), the canoe had a similar function in the Caribbean.

Mobility, including the movement of both people and objects, is the critical feature underlying the multiscalar nature of regionally interacting insular communities (Hofman and Hoogland 2011). It permits the coexistence and integration of communities at regional, inter-island scales. It is therefore unsurprising that archaeologists have found evidence that control over regional mobility, including elite spheres of exchange, provided the power base for elaborated systems of social ranking in the Antilles (Crock 2000). In this study, interpretations of settlement patterns and artifact assemblages are made with reference to this critical feature of community organization.

The "Enclave" Model

In his 1988 *Peasants and Capital: Dominica in the World Economy,* Trouillot makes an analysis that captures the historical, multiscalar, and contested nature of community organization and integration. In his central thesis, he characterized the Dominica of the 1980s as a nation composed of a patchwork of enclaves. Enclaves were defined as geographically circumscribed villages or village clusters (Figure 2-1) separated by both social and physical boundaries that strengthened this decentralized pattern of social integration. These enclaves exhibited a high level of local socioeconomic integration with a high degree of social distance between regions. He argued that the "Nation" was a social construct reflecting a particular colonial history more than a level of social integration uniting people from across Dominica.

Enclave is a term that embodies the spatial dimensions of community integration. Taken from geography for a nation or territory completely surrounded by another nation or territory, it carries with it a sense of boundedness by outside forces. Unlike community, when we talk about an enclave it is tied to a specific place, the boundaries of which can be investigated. There will be many different relationships that connect people within an enclave, including shared occupation, family relations, political allegiances, et cetera. In different historical and cultural contexts we can expect that enclaves will be more or less integrated and along different lines.

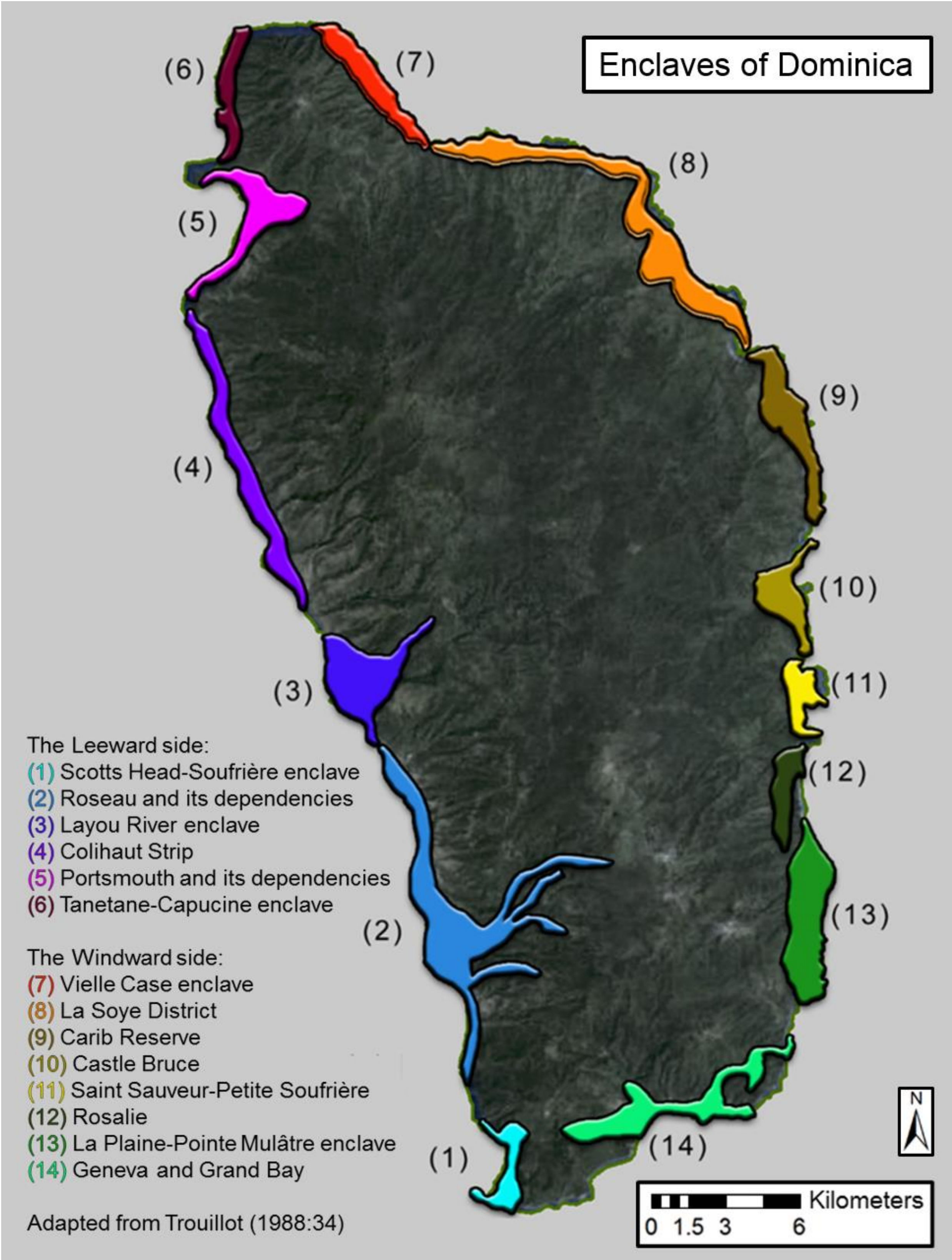

Figure 2-1. Enclaves of Dominica adapted from Trouillot (1988:34).

We can approach regional interaction from the large-scale, looking at the greater circum-Caribbean as the assemblage of variably related communities interacting in different ways. In contrast, we can investigate the effect that such regionality had on community organization at smaller scales of analysis. How were local communities organized with respect to their participation in local socioeconomic processes and how did these relate to region-wide sociopolitical dynamics? This is what Trouillot calls mediation. The articulation between the global and local occurs through elements of mediation that legitimize regional processes at the local-scale. These can be fixed in the environment, things such as public architecture and roads, or mobile. "Mobile elements of mediation can be, in turn, material (instruments of mediation) or human (agents of mediation)" (Trouillot 1988:199). Although this theoretical paradigm grew out of dependency theory, itself a specifically post-colonial theory designed to explain social and economic relations in modern Latin America and the Caribbean in the wake of colonialism (Chilcote 1974, 1978), I believe its relational approach to the articulation between global and local phenomena has applicability to pre-colonial times. For example, we can conceive of canoes as instruments of mediation and the elites who sponsored their manufacture and captained their voyages as agents of mediation, controlling the avenues through which communities interacted. This can be seen as a means by which community integration occurs, permitting regional systems of exchange, intermarriage, and warfare.

Trouillot's work has been very influential on my thinking about the prehistory of Dominica, leading me to investigate whether this phenomenon of social segmentation was characteristic of pre-Columbian communities in Dominica. Were social relations similarly embedded in the physical boundaries that so dominate one's experience of Dominica, or did a region-oriented sociality and a mastery of sea voyaging enable them to transcend these boundaries? This study was inspired by the enclave model, but takes the notion of enclaves as a question to be investigated, rather than as a given. This is important because Amerindians would have had different ways of relating to each other and their environment from Europeans and Africans, upon whom the enclave model is based. That Amerindians also segmented their society in Dominica into enclaves is one possibility, but it is also possible that they were more regionally integrated. Some critical features of these societies that would have played a role in how integrated groups were across Dominica include modes and relations of transportation as well as relations of production, distribution, and exchange, where exchange includes at least ideas, commodities, and marriage alliances but also violence and hostilities. The difficulty lies in finding ways to infer these social features from the archaeological record.

I found Dominica to be an ideal place for a community-oriented research strategy. In a region where mobility and interaction defy characterization because of their extreme ubiquity, Dominica has to be the island in the Caribbean that provides the most extreme challenges to human movement as a consequence of both its rugged topography and the rough seas surrounding it. It therefore presents an interesting case for exploring the relationship between local and regional dynamics in the organization and integration of communities and how this relates to other topics of interest, such as hierarchy, heterarchy, and the role of mobility in supporting complex social organizations.

Approaches to Social Complexity

Evolutionary Approaches

As mentioned, the study of social complexity has been foregrounded by many Caribbean archaeologists, many of whom approach the problem from radically different theoretical perspectives. The first body of theory to address is the umbrella category of evolutionary approaches, as they form the entry point for complexity discussions in the Caribbean. In general, evolutionary approaches to the study of complexity more or less follow the ideas presented by Sahlins and Service (1960), and later developed by Johnson and Earle (1987). In the Caribbean, this approach is seen in what could be called the pristine chiefdom model (e.g., Boomert 2001; Curet 1992, 1996; Curet and Oliver 1998; Siegel 1991, 1992, 2004, 2010).

Aside from a shared neo-evolutionary paradigm, three main points characterizing the pristine chiefdom model are presented here. First, evolution from egalitarian tribes to chiefdoms is argued to have occurred indigenously in the Caribbean and only in the Greater Antilles, thus constructing Lesser Antilleans as passive recipients of cultural innovation. Second, although there is a vague notion that “demography, economic and social organization, technology, and ideology are intimately linked” (Siegel 1996:329) in an explanation for this evolution, there is no well-developed or widely accepted theory to explain how or why this occurred. Ethnohistoric accounts have been cited in reference to Taino chiefdoms (e.g., Wilson 1990), and archaeologists working in the Greater Antilles regularly encounter ceremonial centers with ball courts and stone-lined plazas that are then associated with hierarchical social organizations (Curet 2003). Third, it is argued that Saladoid people originate from South America and ethnographic analogy is frequently and explicitly, but unsystematically applied, drawing either on Pacific Island cultures such as the Lapita (Boomert 2008; Kirch 2000; Watters 1982) or on various Amazonian horticultural groups that have been defined as *tropical forest cultures* (Lowie 1948; Meggers and Evans 1957; Steward 1948). The latter becomes increasingly problematic in light of emerging archaeological evidence from the Amazon that suggests that these tropical forest cultures shared little in common with actual Saladoid ancestors, the Arawakan agriculturalists that made Saladoid/Barrancoid pottery in the central Amazon ca. ~3000 BP (Heckenberger 2005; Heckenberger et al. 1999, 2001; Heckenberger et al. 2008; Heckenberger and Neves 2009). An outcome of this, presupposed by the first point, is that Saladoid sociopolitical organization is conceived of as largely egalitarian.

Finely crafted lapidary goods were exchanged among Saladoid-period communities that participated in far-reaching networks of exchange (Cody 1991, 1993; Crock and Bartone 1998; Murphy et al. 2000). Although these objects are generally thought of as prestige goods, this is often interpreted as part of a “big man” model of sociopolitical organization, an evolutionary stage that precedes chiefdoms in which status can be achieved but is specifically non-enduring (Boomert 2001; Curet 2003). This evolutionary model of social complexity is built with the instability of initial communities in mind, and sees competitive self-aggrandizement as an adaptive response to economic and demographic pressures, serving to attract followers and stabilize communities (Boomert 2001, 2008). If this were true we would expect that certain Saladoid villages would expand through time, whereas others would go extinct as their competing leaders were more or less successful. But the archaeological evidence suggests that early Saladoid villages were relatively large, stable, and permanent (Heckenberger and Petersen 1995; Petersen 1996; Petersen and Watters 1991; Siegel 1992; Versteeg and Schinkel 1992). Furthermore, the lapidary production and distribution networks were highly formalized, regionally specialized, temporally enduring, and controlled by a restricted (elite) segment of the population (Cody 1991, 1993; Crock 2000; Crock and Bartone 1998). If we re-analyze the Saladoid period from a multiscalar perspective and incorporate the theory of heterarchy, Saladoid social complexity can be understood in a very different light.

Heterarchy and Hierarchy

Heterarchy is a conception of social complexity that eschews some problematic assumptions underlying evolutionary perspectives, and has been applied to the archaeology of communities (Mehrer 2000). Following the now classic formulation by Crumley (1995), “heterarchy may be defined as the relation of elements to one another when they are unranked or when they possess the potential for being ranked in a number of different ways. For example, power can be counterpoised rather than ranked.” Although some people see heterarchy as an alternative to social hierarchy, others see it as a different kind of complex organization (Mehrer 2000; Pauketat 2007) based on regional or horizontal integration. Heterarchy and hierarchy are not mutually exclusive. The theory of heterarchy lets us understand how sites that display only limited evidence of status or rank stratification—very common in the Caribbean—can still be part of a complex social organization when that site is contextualized into a lateral network with other integrated sites. The realization that heterarchy and hierarchy coexist and are mutually operational in many societies implies a multiscalar approach as we investigate the different spatial dimensions of hierarchical and heterarchical social relationships. Joyce and Hendon (2000:143) describe their use of a multiscalar approach to examine heterarchy in the relationship between identity and community through routine, or habitus. “By continually reframing the archaeological data at different scales of analysis, [they] take as a question for investigation the degree to which congruence is evident at different scales and in different material media.” The relationship in the material domain between place making (settlement hierarchy/heterarchy) and material culture patterning (variable labor investment/variable practices) can be used to infer intra- and inter-community-based social relationships.

From this perspective, the archaeological patterning in the Saladoid period that conflicts with some expectations of the “big man” model of sociopolitical organization can be explained. An argument could be made that social hierarchies existed at one scale, but that the overall regional sociopolitical organization was characterized more by heterarchical relations. I propose that this heterarchical organization has been misinterpreted as egalitarian. At the local-scale, participation in the lapidary exchange was restricted and reinforced a sense of hierarchy, which is assumed by some to be characteristic of Arawakan diasporic communities (Hardy 2008; Heckenberger 2002, 2011; Santos-Granero 2002). However, by reframing the same data on a larger scale, we see that this hierarchy only works as part of a regionally integrated system. Without equal trading partners, the restricted access to the elite exchange could not exist. This explains why early Saladoid villages have the quality of enduring often into much later time periods, and the formal, specialized nature of the exchanges themselves.

The important point is that, by looking at the same process at different scales, we can see that the same practices promote hierarchy at one scale and heterarchy at another. From this perspective, what appears in the Late Ceramic Age to some as the *in* *situ* evolution of social complexity can really be seen as elaboration on a pattern that already existed (Petersen 1996).

Practice and Landscape Approaches

If evolutionary approaches to social complexity (e.g., Johnson and Earle 1987; Sahlins et al. 1960; Service 1962, 1975), are designed to determine how complex a particular society is, practice- and community-based approaches are more apt to ask, in what ways are particular societies complex (Bright 2011). Complexity can be found in every society to be sure, and often societies with the least complex social systems have complexity in other dimensions of experience, such as cosmology or ideology (Dwyer 1996). The particular kind of complexity that archaeologists often find themselves examining is organizational complexity in the functioning of society (e.g., Kramer 1981) or social complexity in the delineation of rank and status (e.g., Randsborg 1981). It is more common with practice and landscape approaches to embrace the diverse and potentially infinite ways that complexity can manifest, rather than attempt to pigeon-hole disparate social groups into evolutionary categories for the purpose of finding cross-cultural universals—particularly because such cross-cultural universals have proven rather difficult to identify archaeologically (Yoffee 1993).

Perhaps the evolutionary framework for understanding social complexity has been used and abused in Caribbean archaeology, but the critique is not new, and many regional specialists have attempted to overcome the problem in recent decades (e.g., Bright 2011; Hardy 2008; Heckenberger and Petersen 1995; Keegan 2004; Mol 2007; Morsink 2009; Torres 2012; Whitehead 1995a; Wilson 2001). As archaeological theorists are rejecting the checklist approach to identifying complex social organizations through characteristics such as monumental architecture (Crumley 1995; Heckenberger

2002; McIntosh 1999; Pauketat 2007), findings in the Lesser Antilles (Crock 2000) and the Amazon (Heckenberger et al. 2008) that reveal alternate forms of complex organizations become increasingly relevant to broader archaeological issues.

Bright (2011) argues that Caribbean archaeologists should move away from the evolutionary framework for social complexity and the present study aims to do so. Instead, I investigate hierarchy and heterarchy in the organizing principles that structure communities and inter-community relations. However, the approach is grounded in practice by focusing on issues like ceramic manufacturing techniques, the range of activities practiced at different sites in a settlement pattern, and the positioning of sites with respect to each other and the landscape. It will seek to identify hierarchical relationships in the functional interdependence of settlements, in differential labor investment and redistribution, and in practices related to boundary maintenance (Kolb and Snead 1997). The analysis should help determine the degree to which settlement patterns included regional centers and the scale at which these centers served to integrate communities. By comparing settlement patterns and archaeological assemblage composition at multiple scales, it should be possible to identify patterns related to a variety of sociopolitical configurations ranging potentially from “balkanized” independent communities (i.e., enclaves) to more regionally integrated macro-polities.

The Household Perspective

Social complexity theorists often seek material correlates to social organization in the patterning of settlements with respect to the landscape. Mehrer (2000:45, emphasis in original) points out that the built environment reflects in a generalized way the prevailing social order, but that “the built environment also *acted* as a constant reinforcement of that social order, so that it was a powerful guiding metaphor, in prehistoric times, emphasizing the specific beliefs and behaviors that governed daily life." This is often framed from the perspective of "the house," which often represents the smallest archaeologically identifiable social unit, and can be seen as a corporate entity governing aspects of production and social relationships. For middle-range societies—a formulation that has found growing acceptance for the communities that inhabited most parts of the Caribbean (Boomert 2001; Curet 2003)—it has been argued that the house, or the household, depending on one's definition, is the proper unit from which to approach social inequality.

Moorsink (2009), following Levi-Strauss (1983) and Gillespie (2000), argues that we should adopt a *maison* perspective on Caribbean prehistory, embracing the relational perspective adopted by that approach. "The individual is never dislocated from the web of social relations and his or her agency always involves the identity through which it interacts. The agency, therefore, is located in the relations and not the individual" (Morsink 2009:4). In small-scale societies, it is often at the level of the household that such corporate interests are realized.

For a more detailed discussion of how I incorporate a household perspective into my analysis, I turn to Blanton's (1995) theory on "household social reproductive strategy." He focuses on the household as the unit of analysis, noting that the size, complexity, and centralization of political authority characterizing households will vary cross-culturally. The focus on the household is argued to facilitate a better understanding of the interplay between kinship, post-marital residence, religion/ideology, and communal labor or "voluntary collectivization" (Blanton 1995) in the development of complex societies.

Blanton (1995) draws the distinction between different models of household organization based on patterns of post-marital residence, economic mobilization, and control of marriage. Household reproductive strategies can be described on a continuum between the processes of incorporation and centralization, the difference being the degree to which the choices of junior members of households are constrained. The household continuity model promotes the longevity of the household by keeping junior married couples under the authority of senior members of a household, whereas the neolocal strategy encourages junior members to establish their own households. Blanton's method uses this distinction as a proxy for household inequality. The neolocal strategy promotes egalitarian structures through incorporation of junior members as equals who are granted more freedom and autonomy within the community. Collective action results from the incorporation of these more or less equal individual interests. The household continuity model promotes centralization and a greater potential for intra- and inter-household conflict by restricting the choices and autonomy of junior members, and centralizing their post-marital residence under the authority of existing household corporate units. He argues that the process of centralization is critical to understanding how social hierarchy is institutionalized through household behavior. The institutionalization of hierarchical social organization occurs through the sanctification of ideologies that legitimize hierarchical structures. Sanctification refers to the way that aspects of the social order become manifest materially through ritualization of daily behavior and habitus. In this case, the more a household exhibits centralizing behavior, the more likely that a highly structured and ritualized, or symbolically charged ordering of space will be seen in things like houses and village plans.

This is useful for the present study because it provides a link between community organization expressed in the relationship between settlement patterns and the landscape (i.e., the built environment), and community integration as a function of mobility and regionality. Regional interactivity, when controlled by elites through the exchange of goods and people (i.e., arranging marriages), and war chiefs through systems of ritualized warfare that serve to strengthen bonds between allies (Dreyfus 1983), can have the effect of centralizing political authority on successful households. It also suggests the kinds of things we might look for in the archaeological record to identify such processes, including a highly structured or ritualized delineation of space, or what Blanton (1995) refers to as an elaboration of habitus. In this study, I approach these issues with settlement pattern data and with a ceramic analysis designed around the concept of technological style.

The Anthropology of Technology

In a passage that echoes closely Mehrer's (2000) reflection on the built environment, Miller (1987:105) highlights the critical importance that objects play in society, concluding that "artifacts are simultaneously a form of natural materials whose nature we experience through practice and the form through which we continually experience the very particular nature of our cultural order." Technology functions as a medium through which community ties are forged, negotiated, and reinforced, as we have seen with the internet and with canoes.

In the 1980s and 1990s, there emerged two new approaches to the relationship between technology and style. In North America, the anthropology of technology, advocated by Lemmonier (1986) and Pfaffenberger (1992) began to adopt a more holistic perspective on material culture variability (Stark 1998), recognizing that both the technical and stylistic attributes of an artifact are attributable to culturally specific techniques. In France, a method for studying material culture developed known as *chaînes opératoires*, or operational sequence (Stark 1998). This method included reconstructing the entire life cycle of an artifact step by step, from the selection and processing of raw materials, to the techniques of manufacture and distribution. This includes all aspects of a society's technology, from the simplest tools to the organization of space. The benefit of these approaches is that they bring the study of mundane, or utilitarian artifacts into the forefront as being as important, if not more important than the highly ornate and decorated artifacts that, while often comprising the minority of most assemblages, often comprise the major focus in archaeological analyses.

Technology vs. Style

The earliest treatments of style in ceramics come from the culture history approach which used style to delineate time-space systematics. This includes two operations: associating a particular style or suite of stylistic traits to a particular social group, and tracing the geographical range of that social group through time based on the variable appearance of those stylistic traits. Although this is an over-simplification, and more detailed analysis can be used to identify the influences of trade, diffusion, and migration on these patterns to identify social dynamics, in general, style has been treated this way in many regions of the world, including the Caribbean. One problem with this essentialist logic is that it results in archaeological narratives that take for granted the assumption that pottery style can be equated to a group of people in a straightforward way. Theoretically, this approach must justify how it associates style to particular social groups while methodologically it must determine how to measure and interpret variation in the distribution of stylistic traits across sites in the region. One problem with this generally top-down approach to style is that it tends to treat style as a passive trait that merely reflects membership in a particular social group in a normative and straightforward manner. Style is treated separately from technology and the social contexts in which it was produced and used.

Anthropological and archaeological theorists have grown increasingly uncomfortable with this rather restricted and passive conception of style. Michelle Hegmon (1998:264), an archaeologist who has studied the relationship between technology and style extensively, has summarized the major developments in material culture studies since the culture history period in two phrases: “style has function” (Wobst 1977) and “technology has style” (Lechtman 1977).

Information-Exchange Theory

The first big leap forward from the culture history perspective on style came from Martin Wobst, who in 1977 outlined his information-exchange theory of style. Focusing on the functional characteristics of style, what style does in a social context, he proposed that style functions to communicate information. The manner in which this information is communicated will reveal aspects of the social context in which these messages were derived and expressed. Wobst (1977) observed that style was often functional in its ability to transmit information and signify boundaries, but this function cannot be assumed *a priori*. The intensity with which information is exchanged stylistically will vary depending on the type of information, who the information is supposed to be about, and the people for whom the message is intended. For example, private material may tend to have a ritual or religious importance whereas public material may tend toward group social, political or ethnic associations (Hegmon 1992). In a theocracy the opposite may be true. One problem with this approach is that, although group identity and boundary maintenance can be expressed in material culture, any relationship between material culture and sociality is an empirical rather than a theoretical question. Material culture can be used to assert differences and similarities in ways that do not necessarily reflect boundaries that ethnographers would identify as meaningful. Hodder (1979) promoted the idea that material culture does not merely reflect a social organization, but is used and manipulated actively by agents in society to express identity and negotiate social roles.

Sackett (1977) was one of the first theorists to bridge the gap between technology and style. He recognized that in archaeology, we tend to separate artifacts into distinct spheres of experience. A utilitarian object is relegated to the realm of economics or functional adaptation whereas non-utilitarian objects belongs in the realm of the social or religious (e.g., Binford 1962), distinctions that might not be universally meaningful to all cultures in all times. He argues that both technology and style result from a series of choices that the producer makes, which are particular to a specific historical and social context. The important corollary to this for an archaeology of communities is that “because these choices (like all cultural behaviors) are socially transmitted, the degree of similarity among the choices that are made in two historically related loci depends upon the intensity of social interaction shared by their occupants” (Sackett 1977:371). This idea is also echoed by Bishop et al. (1988:325), who postulates that “features that indicate shared technical skills, such as clay selection and preparation, are more likely to be affected by close interaction between potters than by exchange or alliance considerations."

Taken together, these ideas shaped the design of this project by encouraging me to background decorative style in favor of an approach to technofunctional ceramic analysis based on technological style. If identifying instances of community integration is the goal, then a focus on shared technological style may be more indicative of potters integrated in a community of practice than decorative style alone. In the next chapter, I will discuss in more detail these and other methodological approaches that were implemented to address the questions outlined at the beginning of the chapter.

CHAPTER 3
METHODOLOGY: TOWARD A DOMINICAN ARCHAEOLOGY

Yaeger and Canuto (2000:9) outline four methodological challenges facing community-oriented archaeologists: “(1) the correlation of spatial and social units; (2) problems of scale and sampling; (3) the recognition of interaction; and (4) the question of palimpsests.” Although these may be issues virtually any archaeologist must address, in the explicit study of communities, they are thought to be among the most sensitive, and therefore most critical issues. The ways in which different archaeologists approach these issues will be entirely context-dependent. Therefore I found it useful to explicitly address how I see my research in Dominica confronting these issues.

(1) The correlation of spatial and social units. This issue derives from the potential lack of fit between indigenous conceptions and archaeological models of community (i.e., community ≠ site). Yaeger and Canuto (2000:9) make a salient point when they conclude that “the community is not a spatial cluster of material remains to be observed, but rather a social process to be inferred,” but it is through spatial clusters of material remains that we must infer such social processes. For this study, I use *site* as a term to describe a discrete cluster of artifacts on a particular landform or locale, but I make no assumption about the relationship of any site to any particular community. I choose instead to make this relationship a matter for investigation. In fact, all indications point to the likelihood that communities in the Windward Islands during the LCA were multisited (de Waal 2006; Shearn 2010; Shearn and Toney 2009). This study is geared toward identifying which sites were related and how their relationships reflect the organization of communities in the past. The social unit under investigation is not the ethnic group or the archaeological culture, which have been commonly used in the

Caribbean. The unit I prefer is the community of practice (Harris 2013; Lave and Wenger 1991; Sassaman and Rudolphi 2001), as this makes no assumption about ethnic or cultural affiliation, but shifts the focus toward identifying those groups of people whose practices appear similar to the point that social integration and a shared learning context become viable explanations.

(2) Problems of scale and sampling. Scale is an important problem in community studies, particularly if the subject of inquiry includes questions about scales of regional integration. At what distances are individuals and communities interacting frequently, intermarrying, and moving between settlements? At what scale do communities express their boundaries? The problem then is that the scale at which we execute our research methodology will have a direct impact on our results, and limit the scales of interaction we can observe. Is the assumption that distance is the most critical factor affecting these possibilities correct? Or should we consider alternate scales, such as degrees of sociopolitical autonomy (Keegan 2010b)? In tackling these issues of scale, many have advocated the use of the micro-region as the appropriate sampling universe to study communities (Kolb and Snead 1997; Yaeger and Canuto 2000). Furthermore, because the social processes involved in community production and reproduction can operate at different scales simultaneously, most analysts utilize a multiscalar perspective that articulates inter- and intra-micro-regional relationships.

(3) The recognition of interaction. This problem deals with the difficulty in recognizing that interaction occurred in the material record, and assessing the nature and intensity of that interaction. Following Varien and Potter (2008:3), “the spatial propinquity of settlement does not produce any set type of interaction; it does not in itself produce community. Instead, the nature of that interaction and how it leads to the social production of communities is the empirical problem archaeologists should be trying to solve." Three methodological approaches that address this issue are

> (1) spatial analysis that looks at intra/inter-unit spacing, access patterns, and boundary maintenance; (2) techno-material studies that include analysis of artifact styles, exotic goods, resource scarcity, and labor investment; and (3) demographic studies of settlement patterning, ecological adaptation, site number and nucleation/dispersion (Yaeger and Canuto 2000:11)

This study utilizes all three of these approaches to some degree. It looks at the spacing of sites relative to resources and the activities likely conducted at those sites; the composition of artifact assemblages and the distribution of exotic goods; as well as the patterning of sites with respect to nucleation/dispersion. Although recognizing instances of precise individual interactions is often impossible in archaeology, there are ways to employ proxies for interactivity. For example, rather than trying to trace exact boundaries, we can measure how cosmopolitan different communities were, or to what degree a community was regionally vs. locally oriented. Ratios of imported/exotic goods to locally produced goods, or locally available raw materials, provide some indication of this characteristic. Other indications include diversity of decorative motifs and diversity of manufacturing techniques.

(4) The question of palimpsests. The palimpsest nature of the archaeological record poses serious problems for all archaeologists, but community-oriented strategies that explore the interactivity of individuals and groups over a particular period of time might experience more pressure to establish contemporaneity. This is problematic given that the tools at our disposal (e.g., stratigraphic relationships, ceramic sequences, radiocarbon dating) do not always provide the temporal resolution necessary to prove contemporaneity. Yaeger and Canuto (2000:11) suggest that:

> We can address this issue by recognizing the important roles of structuring forces and attempting to identify the more consistent meaningful social interactions, many of which might not have been strictly contemporaneous. . . . The effects of a sequence of consistent practices within a circumscribed space creates salient and archaeologically recognizable patterns that structure and reflect the interaction therein.

Given the scope of this study and the limited budget for radiocarbon assays, the contemporaneity of sites is often difficult to establish. I sometimes make inferences about site relationships and interactivity, however, by assuming that certain sites were contemporaneously occupied/utilized. We do not need to assume absolute contemporaneity, but we have to assume that if there is patterning in the comparison, this reflects on some level patterning in the structure of these practices, whatever those practices may be. We can add that in a general sense, the more varied the practices through time, the less likely structured patterning will emerge. The degree to which practices appear varied vs. structured can be seen as another characteristic of community organization. Whenever we are forced to assume contemporaneity to draw a comparison, I offer alternate interpretations and/or a rationale for assuming contemporaneity. It is important to remember that this stage of the research is exploratory in nature, and the interpretations based on unrefined chronological associations can be reevaluated in later stages of research with a more robust sample of radiocarbon assays.

Operationalizing Community

Archaeologists who study communities have developed useful methodological approaches and strategies to address some of the issues discussed. Kolb and Snead

(1997:613) offer three ways to characterize community organization, including "examination of differential labor investment, spatial relationships between elements of the community, and boundary maintenance." These are very broad analytical strategies, helpful because they give us flexibility to iterate on these concepts to better interrogate the archaeological data.

In discussing labor, Kolb and Snead (1997) draw a distinction between family labor, festive labor and corvée (compelled) labor. Markers of these different kinds of labor "represent a starting place for the analysis of human labor organization and must be adjusted for specific social contexts" (Kolb and Snead 1997:613). I find that this distinction, although useful, may be too restrictive by over-simplifying the differences between the three types of labor. Each of the three represents a particular type of coercion, played out at a different scale and through various media and types of social relationships. Anyone who has ever worked for their family knows that when we do, we often feel compelled to do so. However, when one feels equally compelled to work for non-kin members, such as chiefs, it implies a different type of social relationship, the nature of which reveals something about the organization of community labor. The ability of chiefs to marshal labor from non-co-resident groups is an indication of the sociopolitical integration among communities (Arnold 1992). When people participate in festive labor, there is also a compulsion factor. I find it difficult to imagine that the food or drink served at a feast, for example at a work party, serves as an actual payment for labor in the sense that in a capitalist society, we perceive our labor as a commodity for sale. Participation occurs because of social factors underlying the relations between people in communities; the feast merely serves to normalize, or in some circumstances, institutionalize this participation through ritual. The feast serves to cement the relationship perhaps, but does not serve as payment. This type of detail about the organization of labor is going to vary cross-culturally, but it helps to remember that even within these categories, there is potential for great variation in what community labor relations imply about, for example, social complexity.

The differences between family, festive, and corvée labor tell us information about organizational properties of communities but they all include elements of coercion and an arena in which power relationships are acted out, reinforced and contested. Like membership in overlapping or nested communities, these labor classifications are not mutually exclusive. I find it impossible to imagine a scenario in which only one type of labor relation would have been observable in any community. Their value is not as a ranking, but as a characterization, or a heuristic to penetrate the social relations constituted in the patterned activities involving community labor. At this point we may find the term labor to be constricting, because our true topics of interest are practices or activities, some of which are more characteristic of what is traditionally thought of as labor than others. It helps to be aware of this point and adopt an expanded view of labor when if we try to characterize labor relations archaeologically.

Torres et al. (2014) recently conducted a study on the organization of labor involved in constructing stone lined batays in Puerto Rico employing these concepts from Kolb and Snead (1997). They concluded that the labor investment in batays probably represented festive labor, and that the practices surrounding this construction acted to reinforce a sense of community, rather than to reinforce social stratification, even though social organization at the time is characterized by stratification. This use of labor to characterize relationships within the community around Tibes, and how certain activities involving communal labor served to integrate other nearby communities, represents a noteworthy advance in how we understand community integration in the Caribbean. In Dominica, we can easily hypothesize which activities or practices contributed most to the archaeological patterning and then compare the assemblages to evaluate ways they indicate different types of labor arrangements. Some major activities involving labor we might consider include ceramic manufacture, gardening, agricultural processing and distribution, fishing, canoe building and over-sea voyaging. The focus here is less on quantifying labor investment, which was appropriate for Torres et al. (2014), as it is in identifying the spatial patterns of where labor is invested, how practices were specialized, and at what intensity. We can then characterize these practices and labor relations to describe the organization and degree of integration among various communities.

In relation to Kolb and Snead's (1997) other two strategies, the consideration of spatial relations pervades every aspect of the analysis, and is somewhat formalized in the micro-regional framework I have constructed. Boundary maintenance is a somewhat trickier concept to operationalize in certain archaeological contexts. The goal is not to uncover boundaries *per se*, but by accumulating evidence of difference as well as lack of difference in several characteristics of compared sites and micro-regions, it may be possible to determine the point at which the difference is so great that some type of boundary becomes a viable explanation. We can do this through ceramic analysis by measuring variability in those attributes that, when similar, are most likely to be reflective of close interaction, such as forming/finishing technique, clay selection and preparation, and other morphological characteristics. Another way to approach boundaries is to consider a related characteristic of communities: the degree to which they are regionally oriented. When a community is highly regionally oriented, it is not exactly the inverse of expressing clear boundaries, but it is related, and lends itself well to the archaeological data available in insular environments, particularly the provenance of raw materials.

In a methodological discussion about different ways that archaeologists study community, Marcus (2000:232-233) divides them into two types: those who approach it from the "top-down," and those who approach it from the "bottom-up." Although she uses a very architecture-specific example, Marcus makes the point that the perspective from which we conduct our research has an effect on the view of community we will come away with. Her recommendation is to combine top-down and bottom-up perspectives, which influences the approach taken here. Throughout, the scale of analysis tacks back and forth between inter- and intra-micro-regional comparisons. The various methods employed in this study were developed specifically to bridge the gap between the research questions outlined above, and the logistic and practical realities of working in Dominica, while staying sensitive to these different scales. Over the course of the project, new approaches had to be implemented, old methods had to be adjusted or discarded, and improvised methods had to be developed to suit the very real challenges that Dominica presents.

Micro-Regional Approach

A micro-regional approach was used in order to study society on the scale of communities. As previously mentioned, issues of scale are critical in community-oriented approaches to archaeology because of the quality that communities have of being overlapping and multiscalar. On the issue of scale in the Caribbean, Heckenberger (2011:499) offers the following:

> In the final analysis, scale is perspective dependent, a question of visibility, and scales from sub-local to global, short to long, micro-macro are all legitimate points of entry and bespeak different relations, networks, and organizations. What is critical is not the idea that things are multi-scalar, and multi-sited, which is accepted by virtually all today, but what features, relations, or change in cultural groups is revealed at one or another scale and how do we articulate analyses across scales.

It is impossible to fully comprehend this multiscalarity; we cannot focus on everything at once. I employ a micro-regional approach so as to be clear about exactly which scales are considered in the analysis, which ones are not, and how the scales analyzed relate to each other.

Caribbean archaeologists deal with islands that are highly variable in size and ecology. However, the scale of social organization does not necessarily mirror the size of islands, as Keegan et al. (2008) and Crock (2000) have shown. Research on exchange and migration in the region has promoted the now-ubiquitous view of the sea as a connector, not an isolator (Boomert and Bright 2007; Bright 2007; Hofman et al. 2007; Hofman and Hoogland 2011), an idea first presented by Rouse (1951) in the concept of passage areas and further developed by Watters (1982) who used comparisons with Oceania to help characterize inter-island linkages in the Caribbean. Social units, such as polities, may have operated on scales that do not necessarily reflect the geographic scales used to measure islands or island groups (Keegan 2010b). Integrated communities residing on different islands, connected to one another by the sea, are difficult to identify archaeologically, although efforts have been made to do so (Bérard 2007, 2008; Bright 2007, 2011; Rouse 1951, 1986). Bérard (2007, 2008) for example, used direct similarities in pottery decorations from northern Martinique and southern Dominica to argue that some kind of community integration existed across the channel. Bright (2011) expanded this concept to the entire Windward Island macro-region by showing that the distribution of certain pottery traits indicated integration among multiple communities on different islands. Although relying heavily on ceramic style to draw inter-island connections, studies such as these attempt to overcome the problematic assumption—implicit in an island-scale of analysis—that pre-Columbian communities can be grouped together based on modern political boundaries (Honychurch 1995, 1997; Hulme 1986; Trouillot 1988; Whitehead 1995b).

In an effort to mitigate the difficulties of utilizing site- or island-level scales of analysis, Caribbean archaeologists increasingly employ a micro-regional approach such as that used here. For example, Torres (2012) used river valley watersheds as the scale of analysis to explore the relationship between place, identity, and community in Puerto Rico during the LCA. Similarly, Curet (1992) studied a single valley watershed in order to investigate changes in political organization in Puerto Rico. In the Lesser Antilles, micro-regional interactions have been assessed by Crock (2000), who looked at Anguillian and near-island settlement hierarchies; Hoogland (1993), who used the micro-regional scale of analysis to investigate settlement patterns in Saba; and de Waal (2006) and Hoogland et al. (2010), who investigated human mobility and social organization in micro-regions of Guadeloupe. More region-focused settlement pattern studies have been conducted for the Windward Islands (Bradford 2001) and the broader Caribbean region between Puerto Rico and Trinidad (Haviser 1997) in order to identify temporal trends in settlement selection. In St. Vincent, an island similar to Dominica in terms of geography and ecology, Callaghan (2007) discovered that archaeological patterns were sensitive to local conditions and did not necessarily reflect broader Caribbean trends. Taken together, these studies suggest that to investigate pre-Columbian communities, researchers must consider the relationship between local and regional social dynamics, along with ecology and local environmental variation.

The micro-regional approach is the most influential method employed in this study and many have promoted such an approach for the archaeological investigation of communities (Kolb and Snead 1997; Peterson and Drennan 2005; Yaeger and Canuto 2000). It provided the framework for choosing the study area, conducting the surveys, and framing comparisons in the analysis. The micro-region is particularly well suited for the Dominican case because preliminary research (Shearn 2010) indicated that the archaeological record is composed of clusters of small sites in many areas, rather than large centralized or singular settlements. The success of surveys that utilize some formulation of the micro-region (e.g., Bright 2011; de Waal 2006; Hoogland 1993; Torres 2012) reflects the critical importance of the relationship between local, micro-regional, and regional scales of analysis in Caribbean archaeology (Hofman and Hoogland 2011).

The micro-regional approach allows for comparisons among sites within micro-regions, between any two micro-regions, and among multiple micro-regions. My application of the micro-regional approach is strongly influenced again by Trouillot's "enclave" model. Each of the micro-regions chosen for investigation represent either an entire enclave or a major portion of an enclave delineated by Trouillot (1988). The actual size of the micro-regions, like the size of Trouillot's enclaves, are variable depending on the local geographic conditions, but are mostly watersheds, or groups of watersheds that are circumscribed by difficult-to-traverse mountainous zones. Comparisons between micro-regions will serve to evaluate the appropriateness of the enclave model for characterizing pre-Columbian communities. In this study, I define enclaves as communities that are highly bounded sociopolitically, or at least socioeconomically autonomous. The opposite of enclaves would be communities so thoroughly integrated that there are few appreciable differences between them in terms of settlement patterns, activities conducted at sites in multisite configurations, and the archaeological materials recovered from those sites. We can think of this scenario, in which all the micro-regions are more or less the same, as the null hypothesis for our second research question regarding the extent of regional integration. The more we reject the null hypothesis in our tests, the more differences we have to explain between the micro-regions. Further, the more that a micro-region stands out in these comparisons, the more we might characterize the community residing in that micro-region as enclave-like. If we fail to reject the null hypothesis, it might support the hypothesis that interaction, or perhaps integration characterizes relations between micro-regions.

A term that some use for the highly connected networks of interaction and exchange in Amerindian culture is *regionality*, which, in the context of Arawakan societies, has been described as:

> sociopolitical integration based on formalized (institutionalized) patterns of exchange (e.g., exchange, intermarriage, visitation, and intercommunity ceremonialism) and regional sociality rooted in shared substance or heritage (kinship), geography (territory), and an ideology of 'in-ness' in a regional moral community (Heckenberger 2002:111).

Regionality in this sense can be seen as a social force opposed to forces that promote autonomy and the "balkanized" distribution of enclaves. Of course balkanization is also a response to regional forces, but is perhaps closer to territoriality. In this study I attempt to measure regionality as a variable of integration, reflecting the degree of influence that regional interaction had on certain communities. By making some provisional assumptions, we can develop a basis from which to assess the archaeological patterning. For example, communities that most resemble enclaves are likely to feature higher ratios of local to exotic materials, have relatively less technological variability in ceramic manufacturing processes, and less need to signal information in the decorative elements of pottery relative to more regionally oriented communities. More cosmopolitan communities, those with increased regional orientation, might exhibit elevated ratios of exotic to local materials, greater variability in the material assemblages at certain sites resulting from increased exchange of both people and ideas, and perhaps a greater need to signal information to outsiders, resulting in elevated ratios of decorated wares.

Having summarized some of the methodological challenges associated with operationalizing a community-oriented approach, I next outline the specific methods and techniques we implemented over the course of planning and executing this research.

Pre-Planning Methods and Preliminary Research

Fieldwork for this project was undertaken over a five-year period, with two preliminary research trips in 2009 and 2010, and a major year-long research trip spanning 2012 to 2013. After each stage of preliminary analysis, I refined the approach, developing ideas for the next season's fieldwork and analysis. Likewise, over the course of the year of fieldwork, the approach was adjusted by what we were learning in the field. Much of this change came from input and knowledge developed not by me, but by my Dominican collaborators.

The main goal of pre-planning was to develop an appropriate study area for the research. This meant deciding which areas to investigate, how many sites to include, whether to utilize known sites or to look for yet unidentified sites, and so forth. Once the micro-regional approach was formulated, I had to decide which micro-regions to investigate and for that I would eventually incorporate a GIS-based predictive model. But before that, I conducted preliminary fieldwork in 2009, three years after first working in Dominica with Benoît Bérard.

2009 Fieldwork

In 2009 I conducted a four-week exploratory study, assisted by U.S. student volunteers Joshua Toney and Warren Rich. In addition to addressing logistical concerns about living and working in Dominica, the study sought to locate several previously identified sites, evaluate the potential for finding previously unknown sites, and assess the condition of sites in relation to size, accessibility and preservation. The general strategy was reconnaissance pedestrian survey of surface deposits. All spot finds were mapped with a handheld GPS. In some cases, more extensive systematic surface collection was conducted using a long tape and pocket transit to map finds. Subjectively placed 50-x-50-cm test pits were excavated at certain sites in order to determine the density, depth, and integrity of subsurface deposits. All test pits were excavated in arbitrary 10-cm levels within natural strata, screened through ¼-inch mesh, and mapped with a handheld GPS. Reconnaissance survey and suitability assessments were conducted at approximately 20 locales.

It became clear as a result of the exploratory study in 2009 that, contra Evans (1968), there is no shortage of pre-Columbian sites in Dominica. In fact, we were struck by how frequently we encountered Amerindian artifacts in locations we expected to find them. This understanding of the under-represented archaeological potential of Dominica had been growing thanks to the survey efforts of Petitjean-Roget (1978), Honychurch (1997, 2011), Lenik (2012) and Bérard (2007, 2008), and is reflected in the map of sites that was compiled by Honychurch (2011) (adapted in Figure 1-5). However, the majority of sites on the map, like the sites we identified in 2009, were only known from a handful of spot finds and non-systematic surface collections. There was little understanding of what they contained, the kinds of settlements they represented, their relationships to one another or their relationship to the landscape.

GIS-Based Modeling

After the 2009 field season, I made the first efforts to build a GIS model of Dominica (Figure 3-1). This model would serve a number of purposes. First, it allowed for a digital geographic compilation of all known sites in Dominica. Second, it modeled features of the landscape that were assumed to be relevant to the location of Amerindian settlements, such as flat land, access to fresh water, and access to protected bays for fishing and canoe launching and landing. Having access to canoe-friendly harbors is not only assumed to be an important characteristic of insular maritime-focused communities—it is also a critical feature for addressing research questions related to inter-micro-regional interaction. Further, this step provided a way to integrate landscape affordances with archaeological data to help contextualize the dots on the map that represented the then-current understanding of Amerindian settlement patterns. Third, it served a predictive function. Once the location of known sites was considered with respect to recurring landscape features, future survey efforts could be directed toward those high-ranked areas where multiple variables considered important for Amerindian settlement co-occurred. Later, it served as an analytical tool, allowing me to objectively assess variability across Dominica's micro-regions and the spatial relationships among sites at various scales. Finally, it served as a tool for easily displaying the spatiality of artifact variability in attributes that are not themselves measured in spatial scales. Throughout the analysis presented in Chapter 5, I include a series of map figures created with GIS that display such proportional data with scaled pie charts, which can be compared to help discern patterns that would have otherwise been very difficult to comprehend, much less visualize.

To capture the variation in communities and settlements across Dominica, I selected areas that were spaced out across the island, but that were similar to one another ecologically. The predictive model identified micro-regions that were structurally similar so that when compared, differences in the assemblages could be more confidently attributed to social, political, or cultural differences among communities occupying those regions, rather than ecological variability constraining settlement choices.

There are four main assumptions in the predictive model that structured the settlement survey. First, Amerindian settlements are likely to be situated on or near relatively flat land suitable for agriculture, defined here as between zero and five degrees of slope (Figure 3-1A). Second, settlements are likely to be located near important marine resources such as coral reef and other habitats productive for fishing. In Dominica, these are found in a patchy distribution around the coast because of the very steep off-shore bank (Figure 3-1C). Third, settlements are likely to be found close to large and relatively stable fresh water rivers (Breton 1958a; Myers 1978).

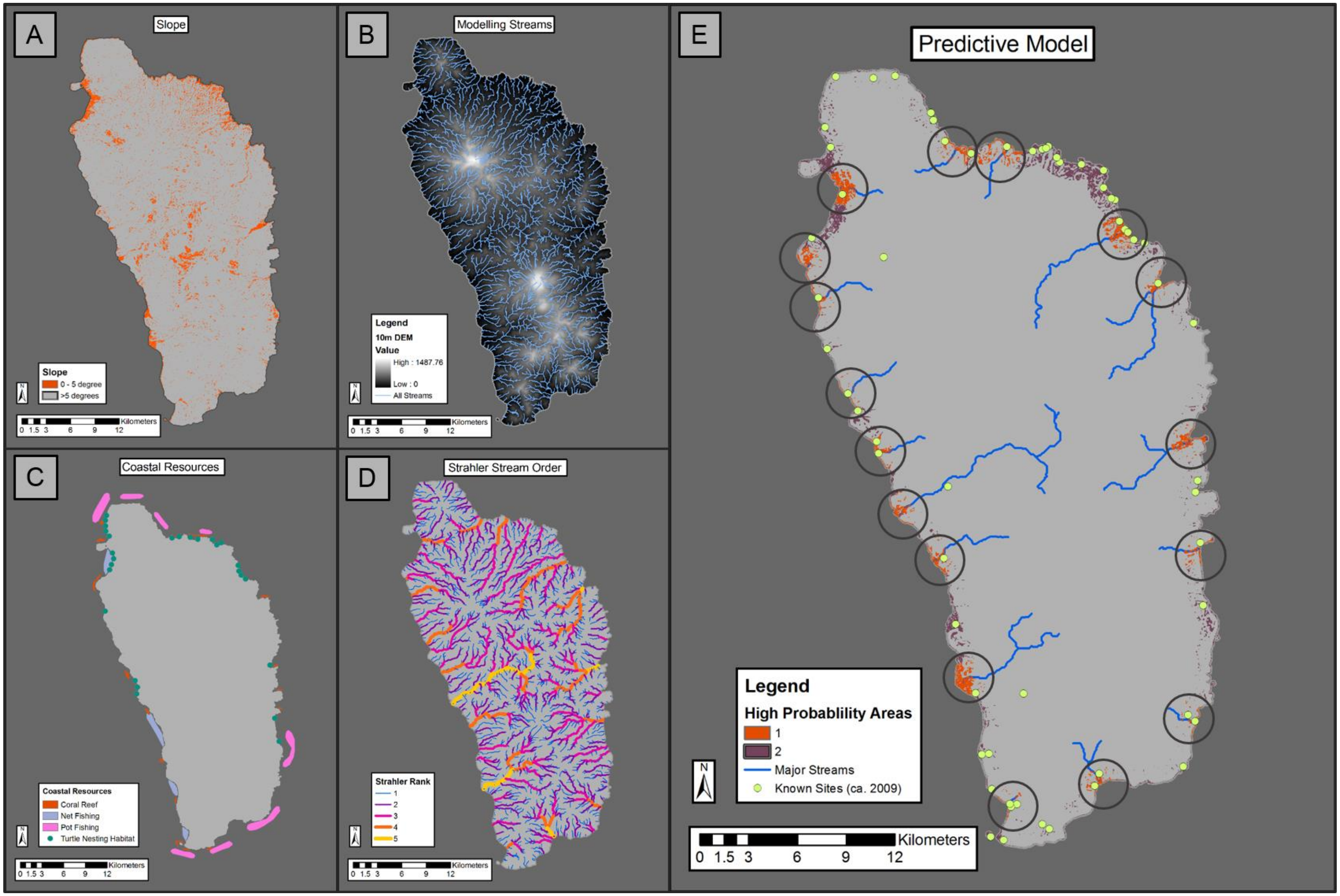

Figure 3-1. Some processes involved in developing the GIS model. A) Land in Dominica with 5° slope or less. B) DEM and location of all streams. C) Modern fisheries data, living reef, and turtle nesting habitats (Lynch 1979; Shanks and Putney 1979). D) Streams ranked with Strahler (1957) stream order. E) High-probability areas.

Despite featuring high annual rainfall averages and abundant sources of fresh water (Drigo 2001), Breton (1958a) noted that settlements were often positioned near large rivers, suitable for bathing and exploiting riverine resources. Fourth, settlements most likely to engage in inter-micro-regional and inter-island interaction are likely to be found near protected bays, suitable for canoe landing and launching. Although most of the west coast would qualify under this criterion, the east coast contains far fewer bays with calm, protected waters.

The model was developed in ArcGIS by performing a series of operations on a 10-m-resolution digital elevation model (DEM) acquired from the Dominica Department of Land and Survey (DDLS). This DEM replaced the 30-m-resolution DEM obtained from ASTER GDEM (a product of METI and NASA) that was used initially. First, spatial analyst was used to model slope and aspect. With these, models of flow direction and flow accumulation were constructed to identify streams, of which Dominica contains many (Figure 3-1B). Flow accumulation and flow speed affect the potability of water as well as the potentially destructive force that flooding played in the setting (and preservation) of sites. Most streams are quick-flowing, low-volume, and found in deep cuts, known locally as “wavins” or ravines. It was assumed that larger and more stable rivers would have been more attractive for settlements so streams were ranked using Strahler stream order (Strahler 1957), a method for analyzing hydrological systems by separating stream networks into nodes (Figure 3-1D). A node that is not fed by any other node is ranked as first-order. When two first-order nodes join, they form a second-order stream. When two second-order streams join, they form a third-order stream and so forth. Rank is only elevated when two streams of similar rank join, so if a third-order stream is fed by a second-order stream, it remains a third-order stream. By limiting the predictive model to only fourth- and fifth-order streams, it put the focus on a more limited number of watersheds, and those watersheds more likely to contain large tracts of flat land and to feed into protected bays good for both fishing and canoe launching.

Figure 3-2. Net fishing in Womabati Bay, Hampstead.

After performing these operations, buffers of varying size were constructed around the coastline, fourth-order and fifth-order streams, areas with known living coral reef (Lynch 1979), areas currently used for pot and net fishing (Shanks and Putney 1979) (Figure 3-2), and known turtle nesting areas (Shanks and Putney 1979). Following Bradford (2001), who showed a strong correlation between marine resources, such as coral reef, and settlement locations, these data were useful for linking good river systems and flat land to important offshore resources. Using these criteria, two sets of buffers were made, one around coastal resources and fourth- and fifth-order streams and another around just coastal resources for comparison. Places where either of these two buffer zones intersected with areas of land with less than five degrees of slope were identified. A relatively high proportion (~85%) of known sites fell within these buffer zones, and high-probability areas were defined by the first set of buffers.

The model revealed seventeen high-probability areas (Figure 3-1E), with nine on the west coast and eight on the east coast. I assume these micro-regions would be more attractive for settlement and should be considered optimal settings in the sense that Crock (2000) used in his investigation of pre-Columbian settlement patterns in Anguilla. These areas can be considered structurally similar in that they contained relatively large tracts of flat land—although some have considerably more than others—high-stability river systems, and good access to protected bays and marine resources. Despite these similarities, there were many notable differences between these areas as a consequence of Dominica's high degree of ecological variation and the impact of modern development. The biggest topographic and climatological differences exist between the leeward and windward coast. There is less variability between the northern and southern areas of the island in terms of climate, but in terms of geology, there are considerable differences as a result of the volcanic history of the island. For example, portions of the northeastern coast of the island are decidedly flatter than the southeastern coast. These factors would play a role in deciding which areas to study during primary fieldwork in 2012-2013.

2010 Fieldwork

In 2010, I conducted a six-week pilot study, assisted by U.S. student volunteers Warren Rich and Allie Clark, and Dominican volunteers David Prince, and Junior Felix. The goal of the pilot study was to further evaluate the micro-region as a viable scale of analysis by selecting one micro-region for archaeological survey. The Castle Bruce locale was selected because it was ranked highly in the predictive model and because there had been no previous archaeological investigations in the area (Honychurch, personal communication 2010). Extensive pedestrian survey was conducted throughout the valley, and six discrete sites were identified, varying greatly in size and ecological setting. At one of these sites, CB-Tronto, systematic surface collections were conducted, but informal surface collections were conducted at all sites and finds were mapped with a handheld GPS. To assess the density of subsurface deposits, at certain sites a small number of 50-x-50-cm test pits were subjectively placed, excavated in 10-cm arbitrary levels within natural strata, and screened through ¼-inch mesh. Long tapes and a Brunton pocket transit were used in conjunction with GPS data, high-resolution aerial photography, and topographic maps acquired from the DDLS in order to map all finds and test pits. As in 2009, a letter report outlining the fieldwork and preliminary results was submitted to the Dominica Museum for the public record (Shearn 2010; Shearn and Toney 2009). All collected materials from all phases of fieldwork are currently curated by the Dominica Museum.

The pilot study revealed that archaeological materials in the Castle Bruce watershed are distributed in discrete clusters throughout the valley, varying in size and density. More importantly, the study demonstrated the presence of sites in a variety of settings within the watershed, including a high bluff overlooking the bay on the southern valley margin, the valley bottom 1.5 km from the coast at the confluence of two rivers, and on small flat bluffs overlooking the floodplain along the northern valley margin. An interesting observation made during this survey was that many sites featured views of other sites in the valley. We began to question if intervisibility between sites may have been an important factor in their location. A viewshed analysis revealed that every site in the valley was visible from CB-Tronto, one of the larger sites identified in 2010.

The Study Area: Selection of Three Micro-Regions

The selection of appropriate study areas was a critical aspect of this project. The study areas had to balance the needs of addressing the research questions with the practical and logistical realities of ground conditions in Dominica. Also, in selecting three different areas for investigation and comparison, there was a risk that the findings would be automatically biased because of ecological variation between the areas. It was therefore a central goal to select areas that were structurally similar, thereby reducing the chance that variability in the assemblages could be attributable to ecological differences, and increasing the likelihood that social, cultural, and political factors contributed to variation among micro-regions. This was achieved by integrating the GIS model with the groundtruthing, reconnaissance survey, and excavation efforts over the 2009 and 2010 field seasons.

The first major decision that should be justified is the exclusive focus on the windward (eastern) coast. Many who have worked in the Lesser Antilles have noted a distinction in settlement patterns between the windward and leeward coasts, often attributing this variation to ecological differences (Bradford 2001; Callaghan 2007; Haviser 1997). In Dominica, the ecological differences between the east and west coast are extremely pronounced, owing in large part to the *orographic effect*, or what is commonly known as a rain shadow. Dominica is home to the second highest point in the Lesser Antilles, and the interior mountain range stretches nearly the entire length of the island. As the prevailing winds bring clouds and moisture to the east coast, the mountains force those clouds upwards where they cool in the atmosphere, causing them to drop their moisture on the eastern slopes of the mountains. This results in a scenario in which it can be cold and raining on the east coast and in the mountains, while at the same time it will be sunny, dry, and hot on the west coast. The published annual rainfall average for the interior is ~7,500 mm, on the east coast it is ~4,000 mm, whereas the average on the west coast is closer to ~1,250 mm (Drigo 2001), “but the yearly averages conceal the specificity of miniature ecological niches. . . . Altitude or even mere proximity to the highlands determines actual variation within any small enclave” (Trouillot 1988:29). This also means that the flora and fauna of the two coasts are quite distinct from one another as well as from the interior mountainous areas. This variability would have had a definite effect on horticultural groups occupying Dominica, as it continues to today. In modern times, the east coast is more rural and under more extensive cultivation, whereas the west coast is more urban, home to both the former and current capitols, Portsmouth and Roseau.

The terrain and coastal dynamics are very different on the two coasts as well. The east coast is more rugged, featuring dynamic terrain and rapid elevation changes, whereas the west coast is given to gently sloping hills and larger, flat headlands. The Caribbean Sea is much calmer than the Atlantic, so more areas along the west coast are safe for canoe landing. In contrast, along the east coast, large portions of the coast are rocky and in many places sheer cliffs rise abruptly from the sea as heavy waves crash against them. This suggests that protected or sheltered bays with calm waters would have acted as gathering locations for canoe-based travel. The harshness and ruggedness of the east coast serves to limit the areas suitable for habitation, suggesting that substantial settlements would be located with respect to the relatively small number of protected bays that also had large, contiguous tracts of flat land (Figure 1-4).

In addition to these differences, I also had to take into account the impact of modern development. In general, the west coast is far more developed than the more rural and agriculturally focused east coast. Of the seventeen high-probability areas, four of the most enticing had to be eliminated because of modern disturbance. These included Roseau, the modern capitol and the largest city on the island; Portsmouth, the historic capitol, and second largest city on the island; Grand Bay, the third largest city on the island; and Melville Hall, the site of the airport, where construction required a substantial amount of landscaping and terraforming that severely impacted the archaeological remains.

After the development of the predictive model and the completion of two preliminary field seasons, the decision was made to focus research efforts on three micro-regions spaced evenly along the east coast (Figure 3-3). Following the theory that visibility between islands could play a large role in social relations between islands (Cooper 2010; Torres and Rodríguez Ramos 2008), I decided that the northern micro-region should have a view of Guadeloupe or Marie-Galante, and that the southern micro-region should have a view of Martinique.

With this in mind, I chose first to include Delices, located south of Castle Bruce by approximately 17 km, and featuring a clear view of Martinique (Figure 3-3). Delices is located in a large valley with a fourth-order river. The bay in Delices is not as well protected as the bay in Castle Bruce, but was still suitable for canoe launching and landing. Delices had been investigated in 2005 by Petersen, Bérard and Honychurch and one 50-x-50-cm test pit was excavated along with some surface collected artifacts. In 2009, during preliminary fieldwork, we identified a second site with abundant Amerindian remains.

The next micro-region selected was Hampstead, located approximately 21 km north of Castle Bruce with views of both Guadeloupe and Marie-Galante (Figure 3-3). As with Delices, Hampstead contains a fourth-order river. However, the northeast part of Dominica is quite different from the southeast. Rather than being one large valley, Hampstead is made up of several smaller valley watersheds, each bounded by steep ridges that are not as tall as the mountains surrounding Castle Bruce or Delices.

In selecting Hampstead, there were some other factors affecting the decision beyond pure ecology, specifically post-depositional disturbance and modern impact. For example, Pagua Bay, Melville Hall and Calibishi would have been suitable selections in the northeast that would have been perhaps more similar to Castle Bruce and Delices, but substantial tracts of prime settlement zones have been impacted in each of those areas. Calibishi is home to a large village covering the prime settlement zone there, but in Trouillot's (1988) delineation of enclaves, Hampstead and Calibishi were grouped together in the enclave with the greatest geographic range (Figure 2-1). In contrast, Hampstead has been the site of almost no modern development and approximately 450 acres are owned by the Douglas family. Although historically it functioned as an estate producing and exporting sugar, and later limes and cocoa, since then, only small portions have been under part-time cultivation.

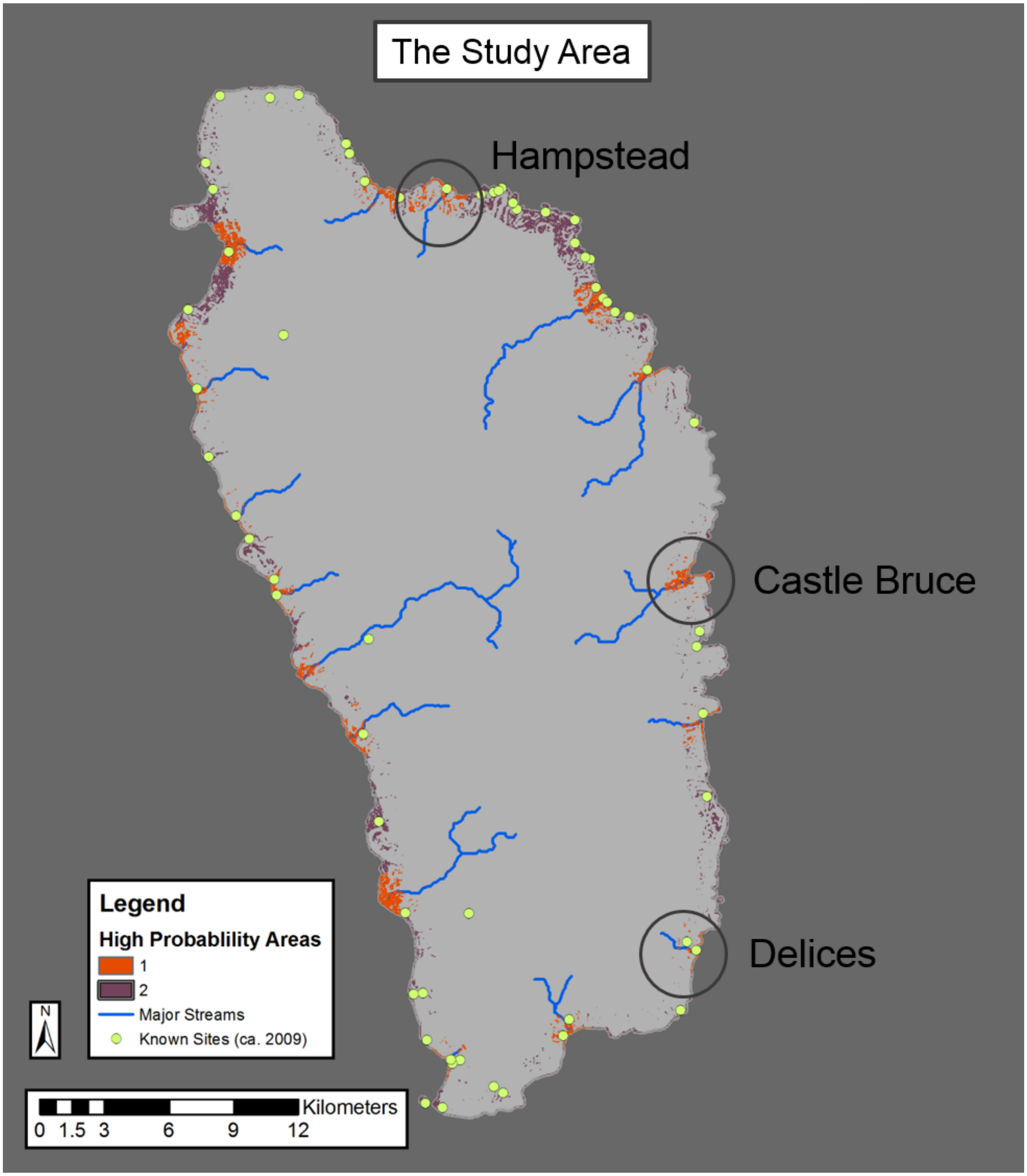

Figure 3-3. Map showing the three micro-regions included in this study.

Finally, I decided that these two micro-regions would augment further study of Castle Bruce, which had been initially investigated in 2010. Castle Bruce is located around the midpoint of Dominica's east coast and contains a fifth-order river cutting through one of the largest contiguous tracts of flat land on the coast (Figure 3-1A). This "central" location represents some interesting possibilities. If social relationships that promote community integration were oriented more toward visible nearby islands than other communities residing across the same island, then Castle Bruce is not a central location at all. Perhaps this location was peripheral, being as far as one can get from the spheres of interaction oriented north or south.

Field Methods

Participatory Archaeology

I find a particular kind of unity in the theoretical, methodological and practical dimensions of my approach to this project. At all levels, community is the theme, including a theoretical treatment of concepts surrounding community, contextualized methods designed specifically to explore these concepts in Dominica, and the incorporation of the local community into the archaeological practice of fieldwork, analysis, and interpretation of results. This approach—what I call *participatory archaeology*—includes collaborative efforts with Dominicans in all aspects of the research; educational activities designed to orient young students to the goals and techniques of archaeology; and outreach designed to engage with local communities to raise awareness about archaeology and the island's cultural heritage (for a similar approach in Monsterrat, see Ryzewski and Cherry 2012). For archaeology, more than most sciences, it is through fieldwork and engagement with the community that history comes to mean something more than knowledge for knowledge's sake. Local attitudes toward the island's history and heritage are shaped in the palm of the hand when someone holds an ancient artifact for the first time, tying their land to the history of the island. The overwhelmingly positive response was not difficult to gauge and we engaged with many people in different communities to promote understanding and involvement. As their island is home to the modern Kalinago community, Dominicans have a high level of awareness and knowledge about the island's Amerindian heritage. This is also thanks to the efforts of Lennox Honychurch, who travels around the island year-round presenting historical and archaeological lectures at various schools and village centers. My efforts in Dominica included strategies to allow students to experience archaeology hands-on; to present our research at several community centers across the island; and to foster participation in the research in a more professional, collaborative manner.

The fieldwork methodology was a mix of standard and improvised archaeological methods and informal field interviews, developed in collaboration with a group of four Dominicans who worked with me over the course of the year (Figure 3-4 and Figure 3-5). Throughout the dissertation, I refer to them collectively as "the crew," but the designation "crewmember" obscures the many roles they assumed in the research, including as friends, assistants, collaborators, cultural ambassadors, guides, students, teachers, promoters, informants, and translators. I think it is extremely important that their practical and intellectual contributions to this project are not overlooked so I will take the time to introduce them and talk about their participation in the project. Object 3-1 provides a link to a short video I compiled of clips we recorded regularly throughout the year. In this video, recorded early in the project, all the members of the crew introduce themselves, and two vignettes capture moments from our exploratory pedestrian survey.

Object 3-1. Short video "Meet the Crew" (.mp4 file 359 MB).

Edward Thomas

Edward was the member of the crew who had the most archaeological experience, and was also most involved with the lab work and analytical aspects of the project. Edward has been doing archaeology in Dominica for seven years, working closely with Lennox Honychurch. He also worked with many of the historical archaeologists who work on the island, including Steve Lenik, Zachary Bier, and Marc Hauser. This was the first pre-Columbian project he had worked on, and he lived with me for almost the entire year. Edward was the only one of the crew who worked extensively in the lab with me, conducting the lithic and ceramic analysis. He was also instrumental in locating clay samples for the neutron activation analysis. He is an extremely experienced and knowledgeable archaeologist and his insight had an impact on this research that cannot be overstated.

Figure 3-4. The crew. See Object 3-1 for a short video introducing the crew.

Junior Felix (Garbo)

Junior Felix (or Garbo as he prefers to be called) is my oldest friend in Dominica. I met him through some colleagues who had visited Dominica in 2005, and we became fast friends. I always stayed in touch with him but he never really knew the extent of my work in Dominica until 2010, when I first lived in his home village of Grand Fond, where I would also reside between 2012 and 2013. Garbo is a gardener, builder, and craftsman by trade, but has an interest in history and culture. When he saw the artifacts we were finding and talked about the project with us more extensively, he expressed interest in visiting the site to see what we were doing first hand. In 2010, he volunteered with us a number of times and discovered an immediate affinity for archaeology, and developing a very keen eye for finding artifacts on the surface. In addition, as one of the most charming and personable individuals I have ever met, he had an ability to act as a liaison with the different landowners whose property we would visit and explain to them our mission, in Patois more frequently than English. This resulted in a much better relationship with landowners, who might have been distrustful of me or any outsider working alone. Garbo has a real passion for fieldwork, and in our various activities with school groups he was an enthusiastic and charismatic teacher.

David Prince (Sandy)

David Prince (or Sandy, as he is sometimes called) is a very close friend and cousin to Garbo. I became acquainted with him through his mother, Martha Prince, who rented her house to me and my volunteers in 2010. Sandy and I became fast friends and in 2010, he also volunteered with us alongside Garbo. During our pedestrian survey of Castle Bruce, Sandy was instrumental in helping us to find pathways to some of the various locales we wanted to investigate, but did not know how to access. Sandy had great landscape intuition, leading us to discover sites in several areas based on his suggestions. Later, during the 2012-2013 fieldwork, Sandy and Garbo developed a friendly competition to see who had the best eye for spotting pottery in surface collections. Sandy can be quiet at times, but like Garbo, he has a passion for archaeology, and when he speaks, he always says something wise.

Marcus Cuffy

Marcus Cuffy is an artist and gardener. We have been friends since 2010, and although Marcus was always interested in what we were doing, he did not actually participate in the fieldwork until a few months after the project started in 2012. However, Marcus ended up being integral to many aspects of the project, and once he joined the field crew, he quickly became a very skilled archaeologist and an intellectual asset to the project. He has a remarkable gift for articulating the essence of the project to Dominicans, and has worked for years to mentor the youth of Dominica. We teamed up to design a collaborative educational activity with Mr. Martinez, a local potter. For these activities, we would visit primary schools around Dominica and give a 30-minute talk about archaeology and the island's pre-Columbian history, focusing on ancient technology. Then we would have an arts and crafts lesson in which either Mr. Martinez, or Marcus and I would teach the students to make coil constructed pottery with local clays that we would later analyze through neutron activation analysis. We incorporated theory, history, heritage, practice and fun into one activity, and then took it to several schools around Dominica. Object 3-2 provides a link to another video I compiled of footage from when Marcus and I were harvesting clay with Mr. Martinez. It also includes a montage of photographs taken during the activities at the various primary schools.

Object 3-2. Short video "Clay Harvest and Pottery Day Activity" (.mp4 file 218 MB).

Figure 3-5. Images of fieldwork and labwork with the crew. A) The Brunton pocket transit used to lay in test pits and transects. B) The crew excavating 50-x-50-cm test pits along a transect at HS-2. C) Crewmembers (from left) Edward Thomas, Junior Felix, and David Prince recording elevations from a datum for 1-x-1-m test unit at DEL-3. D) Garbo and Edward cataloging artifacts. E) Edward analyzing temper in our field lab. F) All the pottery from a 5 m^2 area of a site. Vessel lots are organized on trays that each represent a single provenience. Before each vessel lot was analyzed, Edward and I would compare it to each other tray to identify vessel lots that crossed provenience.

Informant-Based Reconnaissance Survey

Although GIS-based methods of remote survey were used to identify likely areas for pre-Columbian settlements, generating rough guidelines for the survey and drawing attention to important micro-regions, the GIS model did not capture the kinds of real world conditions that affect human settlement, lacking the fine-grained resolution required to identify small flat landforms that could potentially support sites. Therefore, in conducting our search for unidentified sites, we employed a more experiential technique that involved extensive pedestrian survey, incorporating input from the crew, and from landowners, farmers, and other local people who had intimate knowledge of the landscape. This gave us the opportunity to engage directly with local communities, to incorporate their ideas and perspectives, and to share our own. Knowing that we would be interacting with the public extensively, we tried to structure our research goals and our approach in a way that would be meaningful to other Dominicans.

Evans (1968) remarked that “never had [he] been in any place in the world where local inhabitants, making their basic living by agriculture and hence constantly observing the ground, had seen so little on or in the soil.” I found this to be a completely unfounded characterization and contrary to my experience. For example, many people we spoke with had seen potsherds in their gardens, and even though many land owners have an interest in local history, the importance such seemingly mundane artifacts might have is not always immediately apparent. The more important point is that even if a landowner is uninterested in potsherds, interaction with local farmers exposed an intimate and expert understanding of the landscape ecology, which they have at the forefront of their minds as an integral aspect of daily practice. When we talked to farmers we covered topics such as the range of suitable conditions for agriculture, what changes they had seen in the landscape in their lives, how rivers may have changed course over time, where ideal locations for settlements might be and how these things relate to history and archaeology. These interactions were invaluable for developing an understanding of the local ecology in each micro-region, provided deeper levels of contextualization to the sites identified, and further helped to raise awareness about Amerindian cultural heritage and the value of archaeological sites

This approach made the research considerably more relatable, and many shared details with us that greatly informed our survey of the micro-regions. It did not take long for the crew to take over this aspect of the project, and soon they were conducting the inquiries when we were working with community members, allowing them to engage with their community in the shared pursuit of studying the archaeological past. Surely every archaeologist who works in the Caribbean has similar experiences of developing contextual knowledge about the place they work by interacting with the people who live in these places now, which can help to better understand the archaeology. We simply chose to make this aspect of fieldwork a more integral part of the research strategy.

Working together with the crew over the course of the year, we developed a uniquely Dominican survey style that incorporated ethnography, archaeology, public outreach, and education. This style made it really feel like we were all learning collaboratively about the past. A typical survey day would start with a strategy session in the morning. We would drive to one of the three micro-regions, look at the area and talk about the landscape and how it may have affected settlement. We would discuss places that looked good for farming, assess how things may have changed over time and then we would go out and talk about these same things with the farmers working these areas. Anywhere we wanted to investigate had to be somewhere we could walk to. We tried consciously to avoid too much roadside surveying. Dominica's forests are highly domesticated, despite their virgin appearance to an outsider. Each watershed is riddled with footpaths that connect different ecological zones, footpaths down the steepest slopes to the sea, to places where people fish from the rocks. We had the time to look for these and use them as a surveying device, as these same or similar paths would likely have been used by Amerindians first, and some are widely known to have been.

In addition to the information we collected from local informants, another criterion we utilized in our pedestrian survey was intervisibility. During our preliminary work in 2010, we discovered that many of the sites in Castle Bruce were visible across the valley, even when they were separated by kilometers. This was something we tried to stay conscious of when surveying the regions. If we could see an area from a known site that looked habitable, we would investigate there. This was not the only method used, but it was useful at the beginning of a survey to focus on intervisible landforms and radiate out from those to other potential habitable zones. In addition, we took boat trips around the east coast of the island to view the setting of known sites from the water. This gave us the opportunity to talk to fishermen about currents and landing considerations and offered a unique perspective on diverse factors affecting the setting of sites.

We also had the opportunity to interview a group of Kalinago that were constructing a 38-foot ocean-going dugout canoe. Dugout canoes are made from gommier trees (*Dacryodes excelsa*), which grow to stunning heights of approximately 35 m (Lugo and Wadsworth 1990) in the interior forest strongholds of Dominica. We learned a lot about various aspects of canoe travel from the Kalinago, such as the time and labor involved in making and moving a canoe, the number of rowers required to paddle a large canoe, and the techniques involved in open-sea canoe travel, which I will discuss in greater detail in Chapter 6. This kind of knowledge is critical to understanding the pre-Columbian occupation of the Caribbean, where regional interaction is so well documented that it is easily taken for granted. We must not forget that, in order for people to interact in the Caribbean, they must concern themselves with building and voyaging often massive canoes, processes that involve a substantial investment of community labor. These canoes were a focus for community building activities. The building and voyaging requires a tremendous investment of time and labor, the marshalling of which could be carried out successfully only by certain individuals, corporate groups, or households, and only with the support of the communities involved (Arnold 1992).

Canoe-based mobility permitted the integration of communities across the Caribbean, and the social organization surrounding the manufacture and voyaging of canoes created the framework for how interaction was experienced in regionally-oriented communities. Although mostly invisible in the archaeological record in a direct way (we are unlikely to recover canoes archaeologically in Dominica), these processes cannot be ignored when interpreting archaeological patterns as the need to access large gommier trees in the interior and bring them to the coast, along with other practical realities associated with canoe building and voyaging, would have affected settlement decisions.

Surface Collection

Although surface collection is regarded as one of the primary tools for regional survey, and has been used extensively in the Caribbean, it is not a reliable method in Dominica, where the combination of dynamic geological processes that cover archaeological sites and dense forest cover limit the ability to see deposits on the surface (Honychurch 2011). Certainly there were some exceptions, and surface inspections were made throughout our study, but we could never rely on there being sufficient ground visibility for systematic collections in the majority of areas investigated.

Surface collections were primarily conducted in agricultural fields when the fields had been recently plowed and were not planted. Therefore, we were often restricted in the areas that we could conduct such collections. Often only a small plot would have been recently tilled whereas the other plots in the area were fallow or covered in plants. Over a given site, we may have only been able to conduct surface collection in a small number of fields, arrayed patchwork over the entire site. There was no site that we investigated that would have allowed for a full surface collection. In forested areas, there was virtually no visibility, and many times our subsurface sampling would return cultural materials in places where no artifacts were visible on the surface. As a result of this, our surface collection strategy turned into a method for rapidly identifying the presence of cultural materials at a particular locale, rather than as a data collection strategy. After assessing a particular locale by surface inspection, we would move to subsurface sampling.

Subsurface Sampling

With an increased reliance on subsurface sampling, our strategy had to balance many different needs to achieve coverage of the survey area within the time constraints of the project. During our survey, we were always conscious of trying to sample the sites as evenly as possible so that assemblages would be comparable. We also had to balance the desire to excavate in the densest portions of sites with the need to test site boundaries, which often required excavating in low-density areas. Finally, we needed to achieve a certain level of coverage of the landforms we tested to make sure we did not falsely identify non-site areas. We therefore took a three-tiered approach to subsurface sampling, including the use of auger tests, test pits, and test units (Figure 3-6).

Figure 3-6. Examples of subsurface sampling strategies. A) A 50-x-50-cm test pit. B) Shearn working in a 1-x-1-m test unit. C) An example of an auger test. D) Stratigraphy in a 1-x-1-m test unit at DEL-2.

Auger testing

It was often the case that we inspected the surface of an area and failed to find cultural material, particularly when visibility was limited because of vegetation. In this event, our method to rapidly identify the presence or absence of cultural materials was to dig informal, and subjectively placed, circular auger holes that were approximately 15-25 cm in diameter (Figure 3-6C). Soil from auger tests was inspected thoroughly by hand and not screened. Auger testing would cease with the first identification of cultural materials, at which point we moved to the next phase of subsurface sampling.

Test pits

Once we had established that a particular locale contained cultural materials, we moved to the next tier of subsurface sampling, which was the excavation of (n = 217) 50-x-50-cm test pits. We excavated test pits in arbitrary 10-cm levels within natural strata, starting at the ground surface and excavating until we found at least 10, but more often 20 cm of sterile soil below cultural deposits. All soil from test pits was screened with ¼-inch mesh. Test pits were often arrayed along transects at 10-, 20- or 40-m intervals depending on the size of the landform we were testing (Figure 3-5B). We began by laying in a transect across the middle of the landform along the longest axis using a Brunton pocket transit (Figure 3-5A). We then put in a perpendicular transect to create a cruciform pattern according to the landform and the materials recovered from the initial transect. We then expanded the grid around test pits we found interesting, whether that meant high artifact density, unique artifacts, or well-defined stratigraphy. The laying in of test pit transects varied from site to site depending on several conditions such as the size and shape of the landform, the permission of landowners, and the presence of crops. In some cases, where plantings or other factors prevented us from establishing transects, we would place test pits subjectively and map them with a handheld GPS. Schematic drawings of stratigraphy were made for all test pits, including the depth of stratigraphy and the color and texture of soils according to a Munsell color chart.

Given that the bulk of the collection was recovered from test pits, it is worth seriously considering the implications of this strategy. Excavations can be characterized as phase I and phase II, in accordance with Cultural Resource Management (CRM) terms. The test pit strategy was designed as much to look for boundaries of sites as to examine denser portions of sites. For these reasons, some of the smaller sites are represented by very small assemblages. Also, because we used a systematic, rather than random sampling strategy, samples used in the analysis might not be representative of the sites from which they were drawn and violate the assumptions of certain statistical procedures (Drennan 2009).

Test units

Additionally, we excavated 1-x-1-m test units at sites where the test pits revealed substantial or dense deposits, particularly when these were well preserved or in stratified contexts. Only six of these 1-x-1-m test units were excavated because the objectives of the project were oriented more toward large-scale, rather than fine-grained data. Test units were excavated in 50-x-50-cm quads and 10-cm arbitrary levels from a vertical datum. All soil from test units was screened with ¼-inch mesh. Precise drawings were made of profile walls for all test units, which included the color and texture of soils according to a Munsell color chart.

Materials Recovered

Pottery, lithic debitage, and tools made from stone, shell, and coral, constituted the only artifact classes recovered from the excavated sites. Ceramic remains constitute the overwhelming majority of the archaeological record in Dominica. Lithics are also ubiquitous, although there is considerable variation in the distribution of both flaked and groundstone objects. Shell and coral tools, although present, were only recovered in a very limited quantity. As a consequence of the acidic soils of Dominica's primarily rain-forest ecology, bones and other organic materials almost never preserve, leaving ceramic and lithic artifacts as the predominate recoverable materials at most archaeological sites. No faunal bone or subsistence shell was recovered, even from deposits that were likely middens.

The lack of shellfish could result from a combination of factors, including the lower reliance on shellfish in the diet, shellfish disposal practices, or to taphonomic phenomena. A passage in Breton (1958a:15) suggests that it was common practice during this period to dump domestic refuse, such as shell and bone, off site. He attributes this to the insects that would otherwise breed in the midden heaps, but we should also remember that, when added to soil, shell can alter pH levels and may have affected growing conditions. This suggests that the rivers carried away most of the direct evidence of subsistence practices. I suspect that shellfish did play a role in the diet, even if in relatively lower proportion than in other parts of the Lesser Antilles (e.g., Carder and Crock 2012).

Following its dominance of the recovered materials, ceramic analysis constitutes the most important analytical role in this study. Throughout the planning and execution of fieldwork, from the earliest pedestrian surveys to the final days of pottery analysis, I have been very conscious of the role that ceramic analysis would play in this study. Ceramic analysis is of critical importance in Caribbean archaeology, particularly in Dominica, where so often the ceramic remains compose the majority, and sometimes the sole artifact class recovered from pre-Columbian contexts. The goal then is to use a suite of different analytical techniques—including formal attribute analysis, instrumental neutron activation analysis, and thin section petrography—on the same assemblages to produce independent bodies of evidence for comparison.

Analytical Methods

Trends in Caribbean Ceramic Studies

Before detailing the analytical strategy, I review some trends in Caribbean ceramic studies to demonstrate how this approach articulates with other approaches in the region. Caribbean ceramic studies have come a very long way both theoretically and methodologically in recent years. Yet despite all of the great advances in ceramic studies, we still seem trapped in a normative framework for linking pottery styles to social groups that feels increasingly restricting. There is tension between the narrative we have developed about dynamic/chaotic social relationships and the straightforward association between style and ethnicity. I do not say this as a critique, because I myself find it unavoidable to use terms like Saladoid, Troumassoid, Cayo, and Suazoid, even though these labels tend to gloss over the same variability much research tends to highlight. Ceramic series terminology emphasizes regional similarities, but when the research focus is on local and regional variability, these terms become constraining. In this study, although I may refer to ceramic series terminology such as Saladoid or Suazoid heuristically, my intention is to leave these terms behind analytically in favor of a more ground-up approach to ceramic variability that eschews some of the normative assumptions that associate style and culture.

Style has been analyzed in many ways in the Caribbean, but is often used to define regional time-space systematics and to establish cultural or ethnic affinity between different archaeological sites and regions. We may ask, at what geographic scale is stylistic variation meaningful and what are the most meaningful types of variation? Bright (2011) for example looked at variation at three different scales and measured variability based on the frequency distribution of a suite of 12 varyingly shared stylistic traits in pottery assemblages. Hofman (1995) used the concept of style areas in much the same way Rouse did to establish regional culture-historical relationships. Roe (1989) has studied style in a more detailed manner by employing a grammatical approach to organize and classify different design motifs and characterize their structured use in pottery assemblages. In Dominica specifically, both Bérard (2007, 2008) for Saladoid, and Boomert (2009, 2011) for Cayo, used stylistic similarities between local and regional assemblages to identify interconnectivity among islands.

In the Caribbean, we have learned a lot by studying style. But if you start from the dual premise that “no one relationship between ceramics and ethnicity can be assumed, *a priori*” (Whitehead 1995a:104), and that “physical proximity and potential or actual social interaction are not determinative of stylistic similarity” (Rice 2005:254), then the reliance on style to find similarities and differences between groups can be problematic. This is especially true of the Caribbean, where sociopolitical and ethnic boundaries are blurred as a consequence of the poly-cultural mosaic of varyingly related and interacting groups. This is not to say that an analysis of style should be avoided. Style has been used successfully to link people across the Caribbean. However, in this study I explore other dimensions of variability in the pottery assemblages in the hope that it might bring different perspectives to the regional trends already established through stylistic analyses (e.g., Hofman et al. 2004a; Petersen et al. 2004).

Insight into the way pottery was made and used, and the terminology for various vessel shapes and functions can be drawn from ethnohistoric accounts, including Breton's (1958a) dictionary, and ethnographic studies among related Arawakan groups in northern South America. Boomert (1986), for example, synthesized archaeological findings on St. Vincent with contact period accounts and ethnographic material to link mainland Kalina groups to the Kalinago of the Windward Islands. Several aspects of LCA pottery are discussed, including the names for different types of vessels, manufacturing and decoration techniques, and the dimorphism between male and female pottery manufacturing. Women, he argues, were responsible for manufacturing large, plain, or utilitarian vessels, whereas men produced smaller ceremonial drinking vessels that were more frequently decorated (Boomert 1986). It is unclear how widespread or how enduring this trend was, and there was some indication that there were changes through time.

Technofunctional Analysis of Technological Style

In this study, I am choosing to background the importance of stylistic variability in order to foreground the importance of technofunctional variability in the assemblages, and adopt an approach to the ceramic analysis based on technological style. The application of decorative elements is considered just one of many morphological variables or manufacturing techniques contributing to the technological style of the pottery assemblages. Technofunctional variability encompasses a wide range of attributes in the ceramic assemblages including rim/vessel shape, orientation, orifice diameter, wall thickness and surface treatment. Manufacturing technique includes clay selection and preparation, surface treatment, and integration of decorative elements. Certain attributes, such as surface treatment and wall thickness, tell as much about manufacturing technique as they do about intended use-function. Manufacturing patterns and usage patterns are likely to vary independently across sites because pottery is produced by a restricted segment of society, whereas it is used by all or most members of society. Multiple different sites within a region might contain pottery indicating similar manufacturing techniques, but usage might vary independently depending on the activities carried out at a particular site. Thus, manufacturing technique, morphological variation, and spatial usage/discard patterns can be used to study different aspects of site function, community organization, and local/regional integration.

The technofunctional approach to the ceramic assemblage has many advantages over a strictly stylistic approach (Braun 1983; Curet 1997; Espenshade 2000; Hally 1986; Hegmon 1992; Rice 1996; Stark 1998). First of all, only a small percentage of pottery is actually decorated, so this approach allows us to study the whole assemblage. Secondly, by studying pots as tools, we can understand better how pottery was used at different sites and what this suggests about community organization. From this perspective, variable patterns in vessel usage are reflective of the range of practices associated with different locales in a micro-region. A primary goal of the analysis is to determine whether pottery users at different sites used a similar suite of vessel types, or if vessel types varied among sites. This will yield insight into the functional variability and the degree of functional interdependence expressed in the settlement patterns of different micro-regions. Importantly, although I intend to make a functional argument about the various sites and settlements, I am not making a strictly functional argument about the actual use of individual vessels. Rather, I take diversity in the assemblages as a proxy for the range of activities or practices carried out at different locations, provided that diversity occurs in an attribute that affects function. Then I make characterizations of possible use functions for different vessel types based on their morphology and distribution in different ecological zones within the micro-regions.

Another goal of the technofunctional attribute analysis is to make general inferences about pottery manufacturing practices to determine how likely it is that potters were learning their craft in similar contexts. In the case of manufacturing technique, the practices involved minimally include technical choices such as clay selection, clay preparation, wall forming, surface finishing, firing, and optionally decorating the vessels. For the potters, they are also anticipating future practices by producing vessels that members of their community will use. Therefore the formal variation between assemblages can be seen to reflect difference in both manufacturing technique and the range of intended uses (Braun 1983; Hally 1986), both of which speak to practice. Thus, when the suite of vessels represented at two different sites is very similar, it can be taken to mean the potters had a similar range of practices in mind that their vessels would be used for, as well as practicing a similar set of technical choices to achieve suitable vessels—similarities characteristic of shared belonging in a community of practice. Alternatively, if two sites feature a different suite of vessels, but both are made with similar techniques, it might be indicative of the same community of potters producing vessels for different sets of activities. Lastly, different vessel shapes made with different techniques would be the most likely to represent distinctive communities of practice.

In selecting attributes for analysis, I selected those attributes that related most directly to these considerations. To capture the range of formal variation and vessel morphology in assemblages too fragmentary for complete vessel reconstructions, I selected rim shape, rim orientation, orifice diameter, and wall thickness (Hally 1986). The other two attributes analyzed are surface treatment, or how the vessel wall was formed and finished, and the application of decorative elements. Surface treatment is an interesting attribute because it speaks to both the social context in which the potters learned their technique, and to anticipated uses, as surface treatments can alter performance characteristics such as porosity (Skibo et al. 1997). The application of decorative elements might not affect performance characteristics in the same way, but it certainly relates to intended use or function for the vessel, whereas the range of decorative techniques employed speaks more to the context in which the potter learned. In the analysis, these six attributes, all of which speak to practice on one level or another, are evaluated.

In this study I avoid using the density or abundance of materials recovered from different sites to make inferences about their relationships or to make estimates about demography because too many sites were disturbed for such measurements to be realistic. I explicitly use a number of proxies to establish links between the archaeological materials and the practices involved in the manufacture and use of those materials. For example, I often use the presence of griddles to help delineate domestic/residential contexts. This derives from the simple observation that griddles represent one of the least portable forms of ceramic technology. They are very large (~30-60 cm in diameter) and flat and often vary in thickness from very thick (11.2-36 mm) at the rim to very thin (5.5-22.8 mm) in portions of the center (Figure 3-7A). Here, both the function of the vessel as a cooking device and its material characteristics (e.g., fragility) support the domestic/residential correlation. Although we did not recover postmolds indicating house structures, I use the presence of griddles as a proxy to differentiate residential sites from non-residential activity areas. I also draw distinctions between vessels more likely to serve a domestic or utilitarian function from those vessels more likely to act as serving vessels for food and drink, likely in ceremonial or ritual contexts. Here the distribution of thin-walled, small-orifice, decorated vessels that likely functioned for serving food or drink is used as a proxy for locating ritualized or feast-based public ceremonialism. This will further assist with determining site function from variability in the assemblages.

By framing comparisons at multiples scales and between varying sets of attributes from different groups of sites, patterning emerges that can then be described and evaluated statistically. Characterizing this variability at different scales can reveal patterns relating to community integration both within and between micro-regions. When contextualized with ethnohistoric details and our localized understanding of the landscape, even basic patterns can become revealing. There may be no limit to the number of comparisons and tests we could do, so it is critical to select data relevant to our questions, construct meaningful comparisons, and be aware of the assumptions and complicating factors when drawing inferences from these analyses.

Statistical analyses were calculated using the software package Minitab 17. For a detailed discussion of how we carried out the ceramic analysis, more information about the data we collected on specific attributes and our coding of the data, along with our rationale for making vessel lots and constructing categories, see Appendix A.

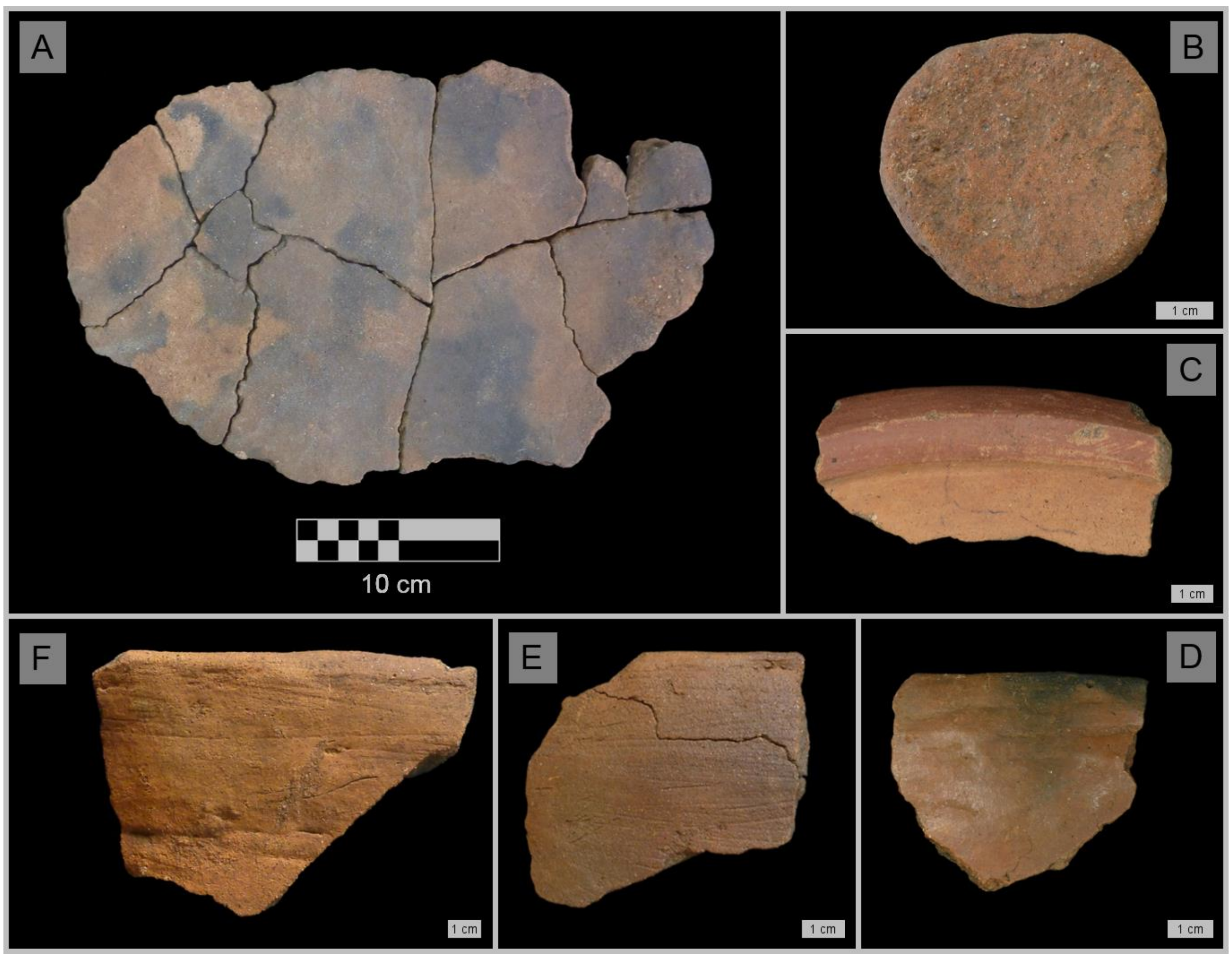

Figure 3-7. Examples of various pottery types and attributes. A) Fragments of a griddle with small portion of rim preserved on the right side (HS-2). B) Rounded ceramic that may be a tool used for finishing and polishing pottery vessels (Van Gijn and Hofman 2008) (DEL-3). C) Example of a well smoothed/finished surface treatment (CB-1). D) Example of a burnished surface treatment (HS-2). E) Example of a brushed/burnished surface treatment (HS-2). F) Example of a brushed surface treatment (HS-2).

Quantifying Diversity

Evolutionary archaeologists have been using diversity indexes, a method adapted from biology, for quite some time and have developed some very specific methods derived from a Darwinian perspective on the evolution of societies. For this study, I utilize some basic diversity statistics even if I do not necessarily embrace the neo-evolutionary framework from which they are drawn. The diversity indexes are supposed to help make a functional analysis of site patterns even when a strictly functional argument cannot be made directly on individual ceramic vessels. They are useful to help characterize the range of activities represented at a particular site.

Diversity indexes capture two dimensions of variability, richness and evenness (Dickens 1980; Rindos 1989). Richness refers to the number of categories represented in a particular assemblage. For example, a site yielding ten different rim shapes can be considered richer than a site yielding just four. Evenness refers to the distribution of individual specimens into these categories. A site yielding an equal number of specimens in 10 rim shape categories is more diverse than a site dominated by one or two rim shapes, even if all 10 are represented. A dominance index, the inverse of a diversity index, captures the degree to which an assemblage is dominated by any one category relative to the number of categories represented and can be used to explore the degree of activity specialization characterizing the assemblages. By characterizing the diversity of the assemblages in different micro-regions, and then looking at the nature of that diversity with the various methods and approaches utilized, I make basic interpretations of site function and regional interactivity.

Diversity indexes were calculated using a software package called PAST 3.0, which stands for Paleontological Statistics. This software provides the option of performing a bootstrapping procedure to calculate a 95% confidence interval for the diversity index, which can offset the sensitivity that such statistics can have to small sample size. Then a diversity *t*-test can be performed to determine the probability that there are statistically significant differences between two diversity indexes (see Appendix B).

Chemical Characterization of Paste

The technofunctional analysis is augmented by the addition of two other analyses to characterize paste selection and preparation, key components in the manufacture of pottery that contribute to the overall technical system for a community of pottery producers. Ceramic paste was analyzed chemically with instrumental neutron activation analysis (INAA), and aplastic inclusions were characterized microscopically with thin section petrography. For these analyses, a subsample of the total assemblage was selected.

The Lesser Antilles has a growing database of pre-Columbian ceramic paste recipes and clays thanks to the research compiled in the 2008 special volume in the *Journal of Caribbean Archaeology* (Descantes et al. 2008), compiling compositional paste studies from Anguilla and St. Croix (Crock et al. 2008), St. Lucia (but XRF) (Daan Isendoorn et al. 2008), Puerto Rico (Siegel et al. 2008), Dominican Republic (Conrad et al. 2008) and Carriacou (Fitzpatrick et al. 2008). These studies helped refine our understanding of regional pottery manufacturing patterns by revealing the degree to which pottery manufacture occurs locally in different settings and how that relates to other archaeological data (Hofman et al. 2008a), but some of the results have been characterized as ‘equivocal’ (Conrad et al. 2008).

One-hundred-fifty sherds and thirteen clays were analyzed at the University of Missouri Research Reactor (MURR) by neutron activation analysis and composition groups were identified by Ferguson and Glascock. Just as I characterize the variability in the morphology of the vessels, I characterize the variability in the chemical signature of their pastes. Neutron activation data allow us to identify composition groups, or groups of pottery that are composed of similar proportions of elements. We can compare these groups to locally collected clays to determine the degree to which ceramics were produced locally, or the possibility that ceramics or raw materials were imported from other regions. In addition to attempting to locate potential clay sources and production zones, I also compare the different assemblages based on the diversity of composition groups represented and relate this to patterns observed in the technofunctional analysis.

Petrographic Analysis of Aplastic Inclusions

The third and final ceramic analysis was a temper study by petrographic methods conducted by Ann Cordell at the Florida Natural History Museum. The temper added to vessels can affect vessel performance characteristics, but also reflects variable manufacturing and resource collecting practices. Here, I investigate how the tempering of ceramic vessels varies and if it varies in relation to any of the other characteristics of the pottery assemblages. Being such a geologically dynamic area, Dominica presents an intriguing, if challenging case for using petrography in concert with neutron activation analysis to develop deeper insights into the manufacture and intended function of ceramic assemblages. This is particularly true here, as this is the first research to implement these techniques on pre-Columbian assemblages from Dominica. With no archaeological or geological baseline for comparing temper materials and paste recipes, these analyses take on an exploratory character.

Lithic Materials Analysis

Lithic analysis plays a small but important role in the overall analysis, and represents one of the more fruitful avenues for future research in Dominica. There are two dimensions of the lithic assemblage that are used in the present study. The distribution of lithic materials in relation to pottery is used to aid in the interpretation of the range and relative importance of activities represented at particular sites. The ratio of raw material categories is used as a proxy measurement for the intensity of regional interaction represented at different sites in the overall settlement system and is compared both within and between micro-regions. The provenance assignation of raw materials is very basic and a more rigorous study of local lithic sources could greatly refine our current understanding. For this study I simply grouped raw materials into three categories, local, exotic, and unknown. Local was restricted only to those stone types that I know could have been harvested locally, such as red jasper. The exotic category was restricted to materials known to have an off-island provenance, such as Antigua chert. The unknown category includes materials such as white chert and basalt that could be local or exotic. Even with this simplistic breakdown, interesting patterns emerged in the distribution of raw materials at different sites.

In addition, the relationship between lithic technology and site function is considered, but only by making some assumptions. Microlithics, specifically those in the range of 2-10 mm (Walker 1980, 1983), are considered likely to have been used in composite tools associated with domestic production, such as grater boards. This is sometimes referred to as the Manioc Grater Hypothesis, and it has been argued that we should not automatically assume a direct relationship between microlithics, griddles, and manioc horticulture (Berman et al. 1999; Crock and Bartone 1998; DeBoer 1975). Here, I make no assumption that microlithics automatically indicate manioc horticulture, or that they were used in grater boards exclusively. However the preponderance of evidence, including ethnohistoric documentation (Breton 1958a) and Kalinago ethnography from Dominica (Taylor 1938), leaves me confident in the assumption that such lithic artifacts can be associated with domestic production, whether that specifically involved manioc processing or not.

Concluding Remarks on Theory and Methodology

In these chapters I have summarized some of the theoretical positions that influenced the direction of this research, discussed the specific research questions, and outlined my particular methodological approach to addressing those questions. Hopefully the context in which the fieldwork took place is now clear, including my own theoretical orientation and my practical and incorporative approach to the fieldwork. The Dominican crew and I conducted regional survey, taking time to talk to people, engaging with communities to develop insights into the landscape and factors affecting settlement, voyaging, farming, and fishing in various ecological zones. Working together, we used our combined knowledge of history, ecology, and archaeology to expand our knowledge of the Dominica that was. In the next chapter, I examine each of the micro-regions in turn and outline the work we accomplished at each site, relating some of the impressions we developed during fieldwork.

CHAPTER 4
FIELDWORK: CASE STUDIES FROM THREE MICRO-REGIONS OF DOMINICA

In this chapter I summarize the primary fieldwork investigations conducted over a one year period between 2012 and 2013 (Figure 4-1). For each micro-region, I discuss the ecology and landscape features of the area, in addition to some local history for context, and an outline of the survey strategy for the region. For each site I discuss the setting and preservation conditions, how it was initially identified, the scope of work conducted there, and point to some basic interpretations that will be more fully developed in later chapters. For each micro-region there is a map showing the location of sites with boundaries interpreted from the distribution of finds. For each site there is also a map showing the location of surface collections and all excavations. Finally, the chapter concludes with a discussion of the chronological relationships among sites based on the limited AMS radiocarbon assays obtained.

Castle Bruce

Natural Setting

Castle Bruce is located around the midpoint of Dominica's east coast and contains one of the most extensive tracts of flat land on the coast. The large valley bottom in Castle Bruce features the confluence of two fourth-order streams, creating the fifth-order Castle Bruce River, which is prone to flooding during the wet season and known to meander, naturally shifting course through time. The rivers feeds into the sea at a large protected bay, known as Anse Quanery, or St. David Bay, which is flanked on both sides by massive ridges. The hilly area to the north is where the modern village of Castle Bruce is situated. To the south is the much smaller village of Tronto. Mountains surround the entire valley, but as they descend toward the bottom, they give way to smooth, but undulating foothills that overlook the floodplain of the valley.

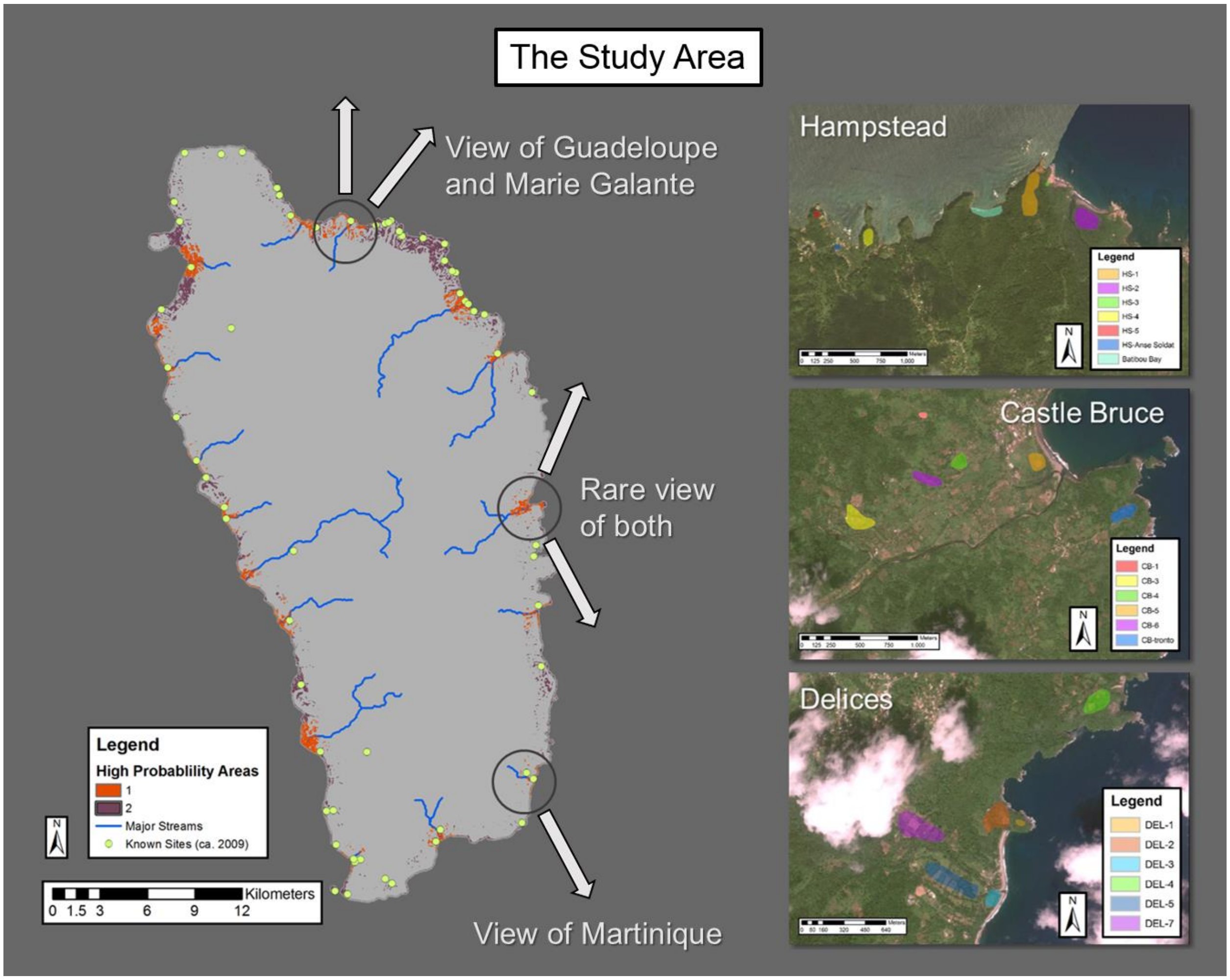

Figure 4-1. Map showing the three micro-regions studied. Insets show site locations within micro-regions.

Castle Bruce has a highly varied topography with many different ecological zones in a relatively circumscribed area (~600 hectares). The river system is dynamic and known to have altered course in living memory because of both natural and human intervention, altering the floodplain landscape through time. St. David Bay is one of largest bays on the east coast, and features a wide, mostly sandy beach along the inner portion of the bay that gives way to rocky outcroppings along both the northern and southern edges (Figure 4-2). Today, people frequently fish off the large rocks on the southern edge of the bay, and boats can be launched from the calmer waters near the southern corner, where the river meets the sea.

Figure 4-2. St. David Bay in Castle Bruce, as seen from the sea.

Local History

Castle Bruce gets its name from Royal Engineer Captain James Bruce, who purchased the whole valley (approximately 1,485 acres) from the British Crown in the 1760s. The Kalinago name for the region is Kouanari (Couanary in European maps of Dominica) (Honychurch 2011). Bruce established one of the largest plantations in Dominica, cultivating sugar cane throughout the valley to produce sugar, rum, and molasses for export. This is relevant because it affected both the condition of archaeological sites in the region and the organization of the modern community. The clear-cutting of the valley resulted in substantial erosion of the rolling hills that constitute the edges of the valley, which seems to have caused the deflation of several sites in the area. Furthermore, activities at the estate factory and mill near the river likely impacted the coastal site CB-5.

Figure 4-3. Pictures from Castle Bruce. A) Taken from the bay looking north at the modern village of Castle Bruce. B) Taken from CB-Tronto looking south at the adjacent bays. C) Heavy erosion on the point north of Castle Bruce.

The northern part of the bay and the steep hills to the north and east house the modern village (Figure 4-3A), which impacts the area as far south as the playing field at the approximate midpoint of the bay’s arc. South, across the river and up the hill are the villages of Tronto, Good Hope, San Souvier (Evans 1968), and Petit Soufrière. This enclave of villages is located on a dead-end spur of the main road resulting from a rare case in Dominica in which the circumferential road does not follow the coast, but turns inland from Rosalie to Emerald Pool before descending to Castle Bruce. This area is characterized by very steep hills that descend down to fairly narrow valleys and bays (Figure 4-3B), with the possible exception of San Souvier, a fishing village on a protected bay that houses a substantial fishery. Between Petit Soufrière and Rosalie is the section of coast too rugged for the road to pass, although it has been under construction for years. The foot path connecting the villages receives daily use by people who live in Petit Soufrière but work in Rosalie.

Scope of Work and Sites Investigated

In 2012, we continued our previous efforts by surveying additional regions of the valley as well as further investigating sites that we had previously identified. The range and size of habitable areas in Castle Bruce made total coverage survey an unrealistic goal. Our survey strategy was to investigate as wide a variety of habitable zones within the region as possible, and to prioritize those areas least affected by modern disturbance. In total, we found seven sites in the Castle Bruce watershed (Figure 4-4), although only six sites are included in the analysis. Site CB-2, which is located in the floodplain, contains only a more recent historic component. Although our survey was extensive, the valley encompasses a very large area and the potential exists for finding additional sites. It remains ambiguous whether certain areas in the valley, particularly in the dynamic floodplain, contained sites in the past not detected by our investigations. There may have been sites in the floodplain that are now so deeply buried that they cannot be accessed by our auger/test pit strategy. Likewise, sites on the floodplain, such as CB-5, may have been scoured away by the meandering action of the river. In addition, the location of the modern village obscures our picture of pre-Columbian settlements. Although we did investigate certain areas within the village, considerable terraforming hindered the thoroughness of our exploration. Other large areas, such as the southern bank of the river, were inspected but de-prioritized because of the very steep and abrupt slopes rising directly from the river bank (Figure 4-4), although it remains possible that there are areas worth investigating in these hills. The promontory north of the bay was investigated but the area was heavily eroded and no cultural materials were recovered (Figure 4-3C). We halted our survey approximately 2.5 km inland, west of where the valley splits into two much narrower valleys, although there are habitable zones farther up both rivers, and additional survey would be worthwhile.

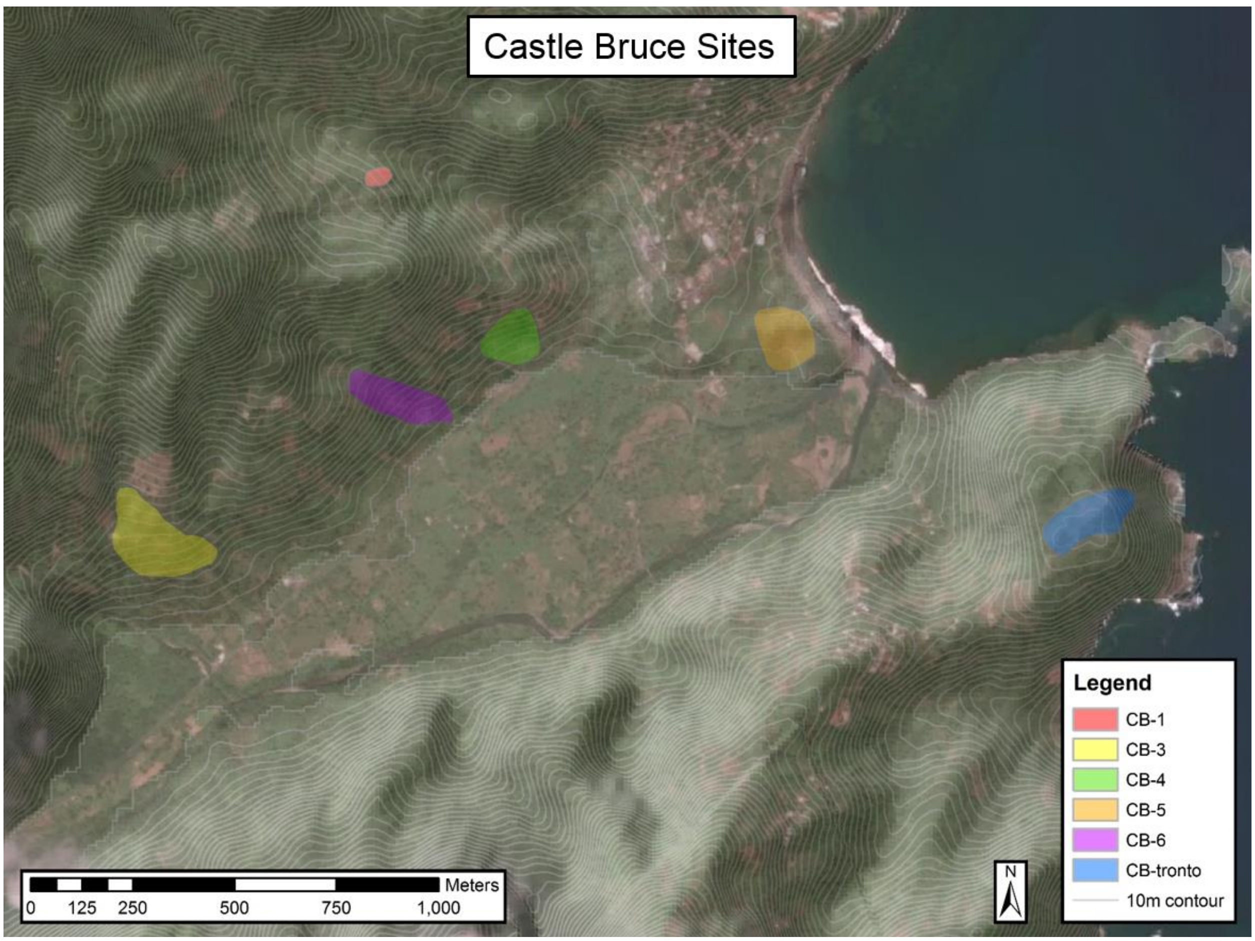

Figure 4-4. Map showing the location of sites in Castle Bruce.

CB-1

Setting and condition of site

Site CB-1 is located on a small promontory point on the northern ridge overlooking the Castle Bruce Valley, approximately 1.1 km inland. The CB-1 locale and the immediate surrounding areas are under part-time and small-scale cultivation. The site itself is located on a plot of land that was fallow at the time of excavation, but there were many fully grown fruit trees on the land. CB-1 is located in the hills, at an elevation of ~85 m. Fresh water is available from a nearby ravine that contains a second-order stream but it is likely that this ravine would have been dry for parts of the year. In the immediate area of the archaeological findings, there is very little flat land. The terrain slopes down dramatically around the small promontory on three sides, to the north, east, and south. To the west, across a dirt farm road, there is a larger tract of flat land. Unfortunately, when the road was constructed, some digging occurred, and it is very likely that the road cut truncated the western edge of the site. No archaeological materials were recovered west of the road.

Preservation conditions at CB-1 cannot be considered ideal. Aside from the fact that the western edge of the site was impacted by road construction, it is likely that the site has suffered deflation. Because this site is located on a promontory, with steep slopes on three sides, and because it has been under cultivation, it seems likely that the heavy rainfall common to Castle Bruce washed cultural materials downhill, particularly if inhabitants dumped refuse on the slopes as has been documented ethnohistorically (Boomert 2011; Myers 1978). We located one test pit (test pit 8) on the eastern slope, but this test pit was negative for cultural materials.

Initial discovery

Site CB-1 was initially identified in 2010 during our pedestrian survey of the northern foothills of the Castle Bruce Valley. Although the fallow field groundcover provided extremely limited visibility, the crew spotted a single potsherd on the surface through the vegetation, which prompted a more thorough ground inspection. Once two more sherds were found on the surface, the site was given the designation CB-1 and the crew moved forward with subsurface sampling.

Scope of work

In 2010, fieldwork at CB-1 was limited to the non-systematic surface collections of four pieces of pottery, the excavation of one 50-x-50-cm test pit (test pit 1), and the excavation of one 1-x-1-m test unit (test unit 1) (Figure 4-5). The test pit was located in close proximity to the initial surface finds, and aligned to magnetic north. It was excavated to a depth of 70 cm with all cultural material being recovered from the top 30 cm. However, during the excavation of the test pit, a circular stain was uncovered that was thought at the time to be a possible postmold (Figure 4-6). It was for this reason that we proceeded with the excavation of a 1-x-1-m test unit adjacent to the test pit, rather than with the excavation of more test pits. Unfortunately, the test unit did not confirm or discount the possibility that the stain in test pit 1 was a postmold. In the subsoil of test unit 1, there were many stains and general evidence that multiple plow or soil digging events had occurred in the area, as expected in agricultural fields.

In 2012-2013, nine additional test pits were excavated at CB-1 in order to locate site boundaries, and to assess the density of artifacts in the immediate vicinity of test pit 1 and test unit 1. Work proceeded by re-establishing the grid based on the northeast corner of test unit 1. Test pit 2 was placed across the dirt road 40 m west of test unit 1, which was the distance required to clear the disturbance caused by road construction. Test pit 2 was located on a small slope. When it returned no cultural material, another test pit (test pit 3) was placed 10 m north, at the top of the landform. When test pit 3 recovered no cultural material, test pit 4 was placed another 40 m west, at the western edge of the flat area of the landform. Test pits 5 through 10 were located at 5-m intervals in the immediate area of test pit 1 and test unit 1.

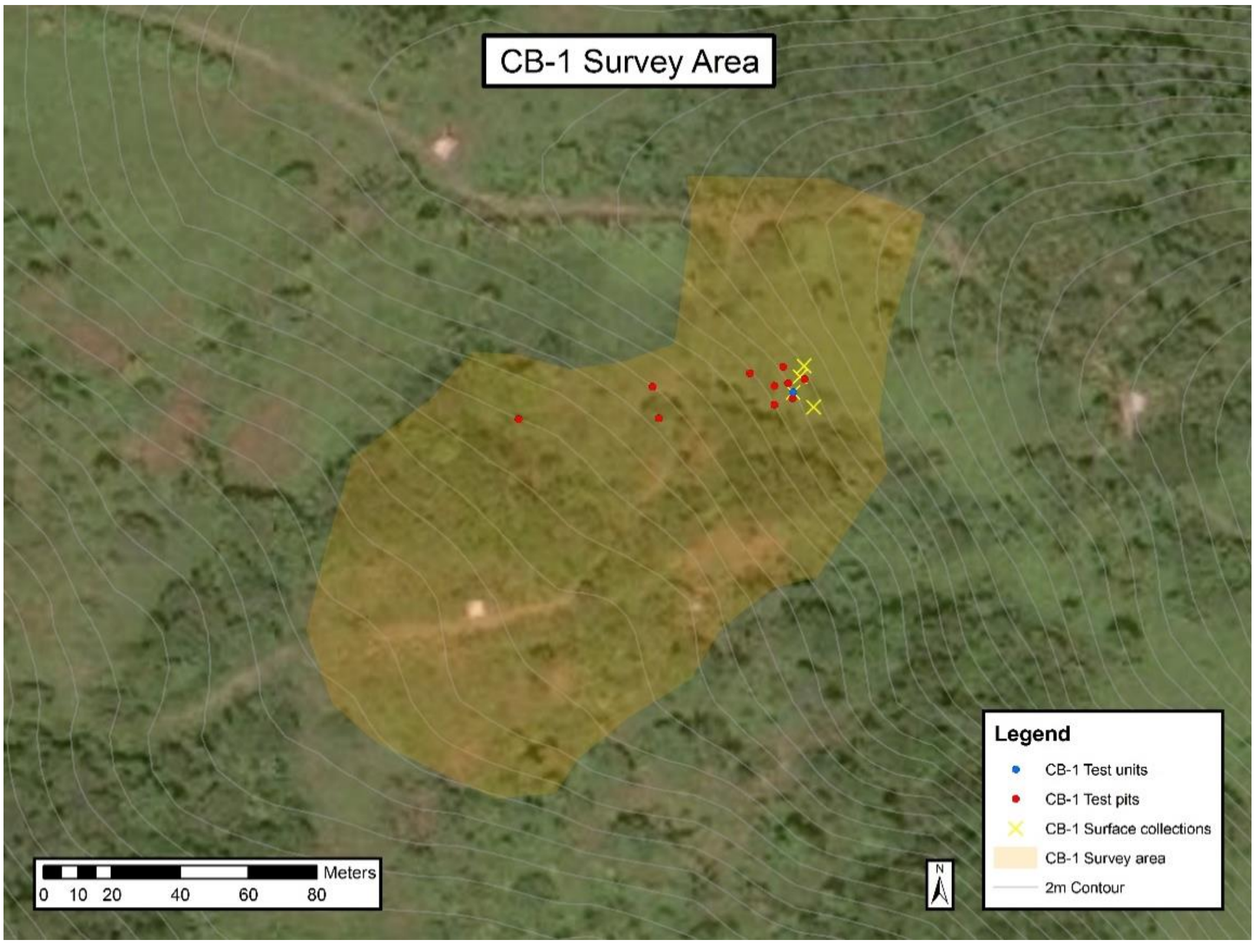

Figure 4-5. Map showing scope of work at CB-1.

Of the ten test pits and one test unit excavated at CB-1, only the test unit and four of the test pits (1, 5, 6, and 9) yielded cultural material. Of these, the densest concentration of artifacts comes from test pit 1 and test unit 1, but even in these pits, artifacts were not abundant. The distribution of lithic materials at CB-1 is also uneven, with the majority of lithic material coming from test pit 9. It is notable that test pit 9 had only lithics and was devoid of pottery. Although inconclusive, this pattern is suggestive of a differentiation of task areas at the site. We conducted additional pedestrian survey in adjacent and nearby agricultural fields but none of these returned further archaeological deposits.

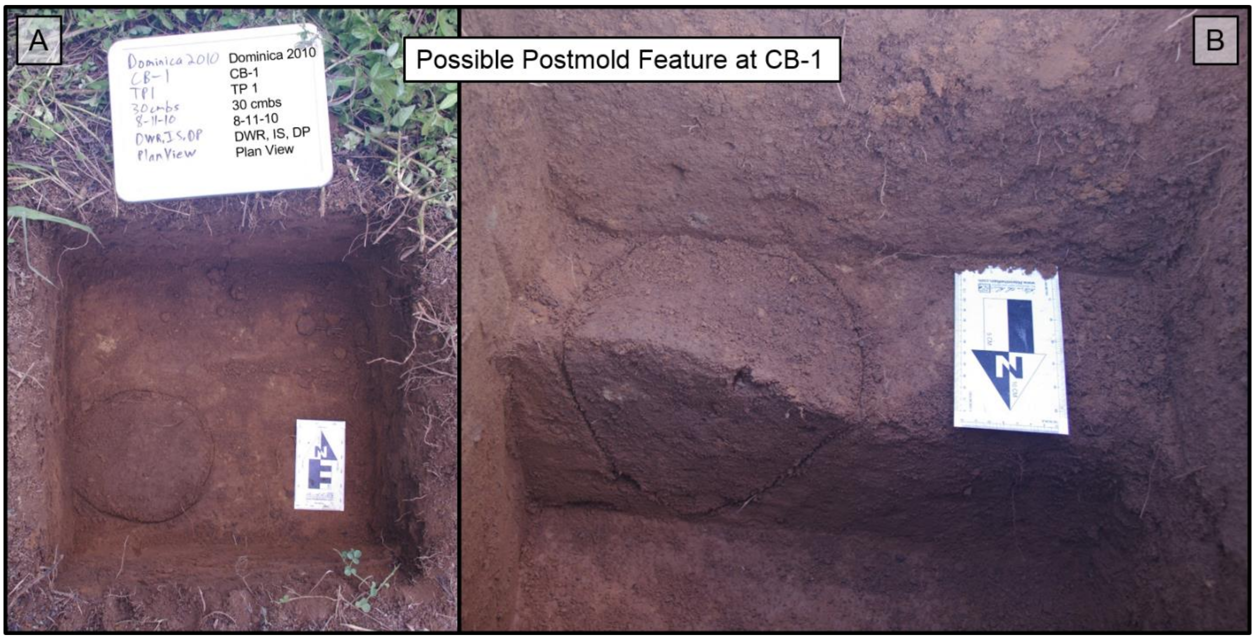

Figure 4-6. Test Pit 1 at CB-1. A) At the base of the plowzone, we encountered this stain, which had the appearance of a postmold, but which could not yet be confirmed with other postmolds. DWR is Warren Rich, IS Isaac Shearn, and DP is David Prince. B) After bisecting the feature, it was still difficult to say with certainty that this was a postmold.

Discussion

Given the very small ($5m^2$) distribution of artifacts and the relatively low density of deposits, CB-1 was likely a very small site, with a limited length of occupation. This makes sense when we consider that it is located in a relatively marginal zone of the valley. It seems likely that CB-1 represents the single occupation of a single household. Although the pottery assemblage is small, it displays a range of vessel forms, including flanged storage vessels, serving bowls, and griddles. This suggests that it is not merely an activity area associated with another site, but an actual domestic or habitation site. The lithic evidence suggests that tools were either manufactured or maintained at this site and that a specific area of the house or domestic area was utilized for this purpose.

From CB-1, the viewshed provides visibility to the bay and to coastal sites CB-5 and CB-Tronto. This particular viewshed seems important as there are other, more substantial landforms in the immediate vicinity that are devoid of cultural materials. These adjacent landforms feature a much more restricted viewshed as they are obscured by the contours of the landscape. Settlement was apparently focused on the one landform in the area that maximized visibility. This intriguing possibility merits further investigation.

CB-3

Setting and condition of site

Site CB-3 is the farthest inland of the Castle Bruce sites, located roughly 1.5 km from the coast toward the western edge of the valley. It is located on a set of rolling hills overlooking the Castle Bruce River. An informant told us that the river course had been purposefully diverted away from CB-3 so it is likely that when CB-3 was occupied, it was closer to the river than it appears today. Being so far inland, CB-3 represents a unique type of site in the overall settlement pattern for Dominica. This site is on prime agricultural real estate and conveniently located near the confluence of two rivers, providing abundant fresh water. However, in the absence of a contemporaneous presence on the coast, the interior location toward the back of the valley would have restricted access to sea-based regional interactions and coastal/marine resources. This is reflected in the lithic assemblages at CB-3, which are overwhelmingly comprised of local materials, specifically red jasper.

Initial discovery

Site CB-3 was initially identified in 2010 during our extensive pedestrian survey of the western and northern margins of the valley. Although no excavations were conducted in 2010, we recovered surface finds scattered over a fairly extensive area. The crew and I returned in 2012 to conduct subsurface testing and more extensive surface collections.

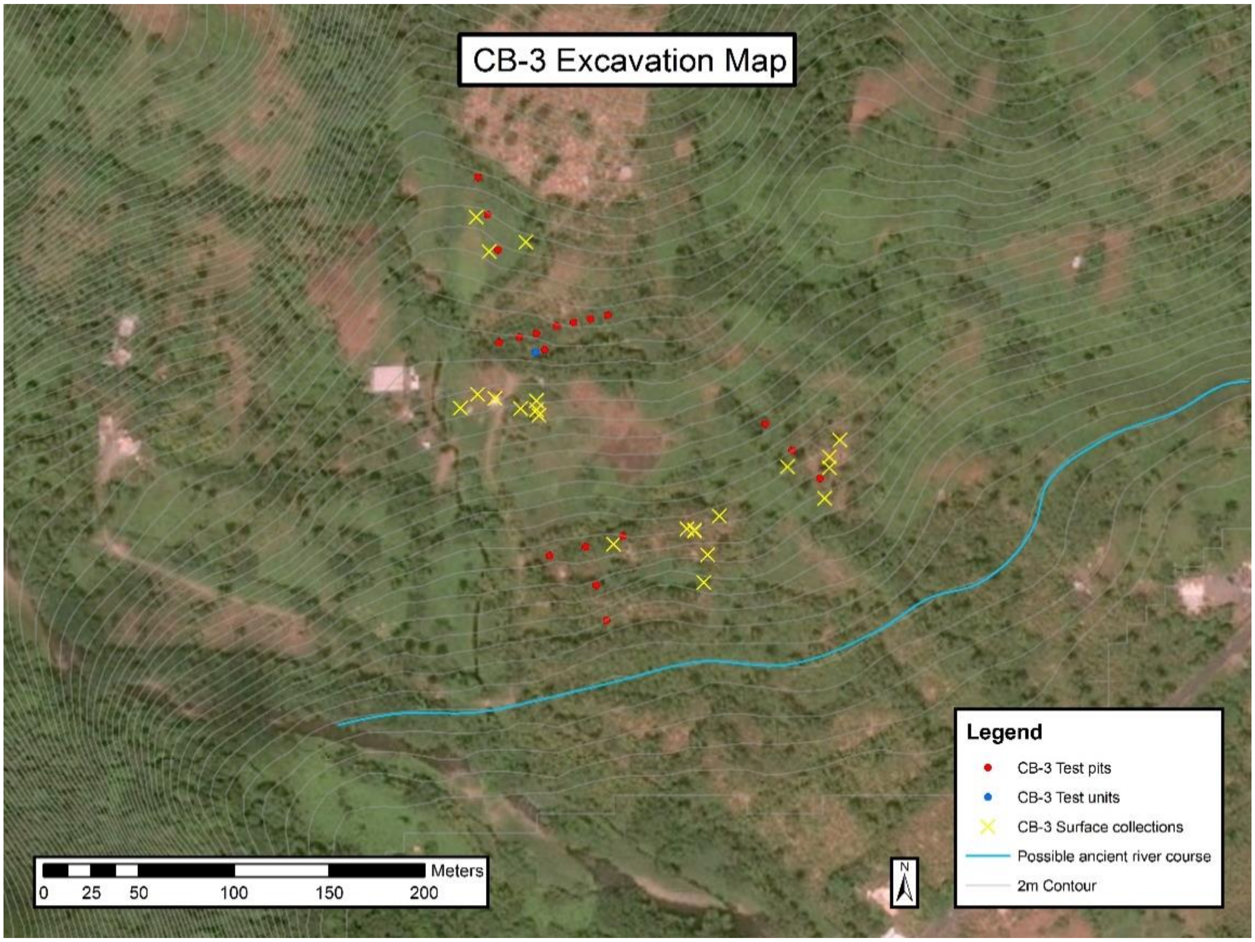

Figure 4-7. Map showing scope of work at CB-3.

Scope of work

Unfortunately the landowner of a major portion of the property was absent during our year of fieldwork and we could not reach him, limiting the areas we could investigate. However, areas adjacent to this plot of land were available for investigation and we found that deposits were distributed over a fairly extensive range in this area, and were not limited to any specific landform. The area of CB-3 has rolling hills connecting the river to the adjacent highlands. Artifacts were recovered from both the low and high areas of the site. In total, we excavated three 50-x-50-cm test pits on the highland portions where surface finds were recovered (Figure 4-7). We excavated eight 50-x-50-cm test pits and one 1-x-1-m test unit on the lowland portion directly below the highland area and adjacent to where the majority of the 2010 surface collections were made (i.e., the area we could not get permission to investigate in 2012). This area had the densest deposits. South of this central area of the site we also excavated five 50-x-50-cm test pits which we believe reveal the southern boundary of the site, as the two most southern test pits were devoid of cultural materials. Along the eastern edge of the site, we collected some scattered surface finds and excavated three 50-x-50-cm test pits but deposits were minimal, indicating the eastern boundary of the site. A large area on the western edge had been disturbed by the construction of several farm buildings and just west of there, the valley becomes very narrow with a swiftly running stream occupying the bulk of the valley floor. Our pedestrian survey of this narrow portion of the valley returned no artifacts and no subsurface sampling was conducted. Across the river and south of the site, the area had been obviously affected by the alteration of the river course in modern history. Our surface inspections in these areas returned no cultural materials.

Discussion

The lithic assemblage recovered from CB-3 is particularly intriguing. This site yielded the highest density of lithic artifacts as well as the most homogenous composition of locally available lithic materials with one notable exception. CB-3 yielded a relatively large sample of stone that looked like a type of greenstone, but this assignation was not confirmed. However, even if this sample is removed, CB-3 still yielded more lithics than any other site by a wide margin. The high incidence of lithic materials found at the site suggests that domestic horticultural activities, such as plant processing, were prevalent at CB-3. Furthermore, the pottery assemblage is entirely undecorated with the exception of one vessel with a red painted interior, which may have been a functional rather than decorative application. The presence of griddles and the relatively high density of artifacts, as well as the areal extent of the site, suggest this was a multihousehold residential site, potentially a small village. The location at the back of the valley at the confluence of two streams, along with the utilitarian/domestic nature of the assemblage, all point toward agricultural production as a major function for the site. Although the lowland portions of the site have restricted views, there were deposits at the top of the adjacent hills from which the coastal site of CB-Tronto is visible.

CB-4 and CB-6

Setting and condition of sites

Sites CB-4 and CB-6 are located on the low hills just above the floodplain on the northern valley margin. They are somewhat lower in elevation than CB-1, but in the same approximate location in the valley. Before the diversion of the river, it is likely that these sites were closer to the river than they appear today. Both sites have suffered from deflation and erosion, likely resulting from the historic clear cutting of the hills for the Bruce sugar plantation.

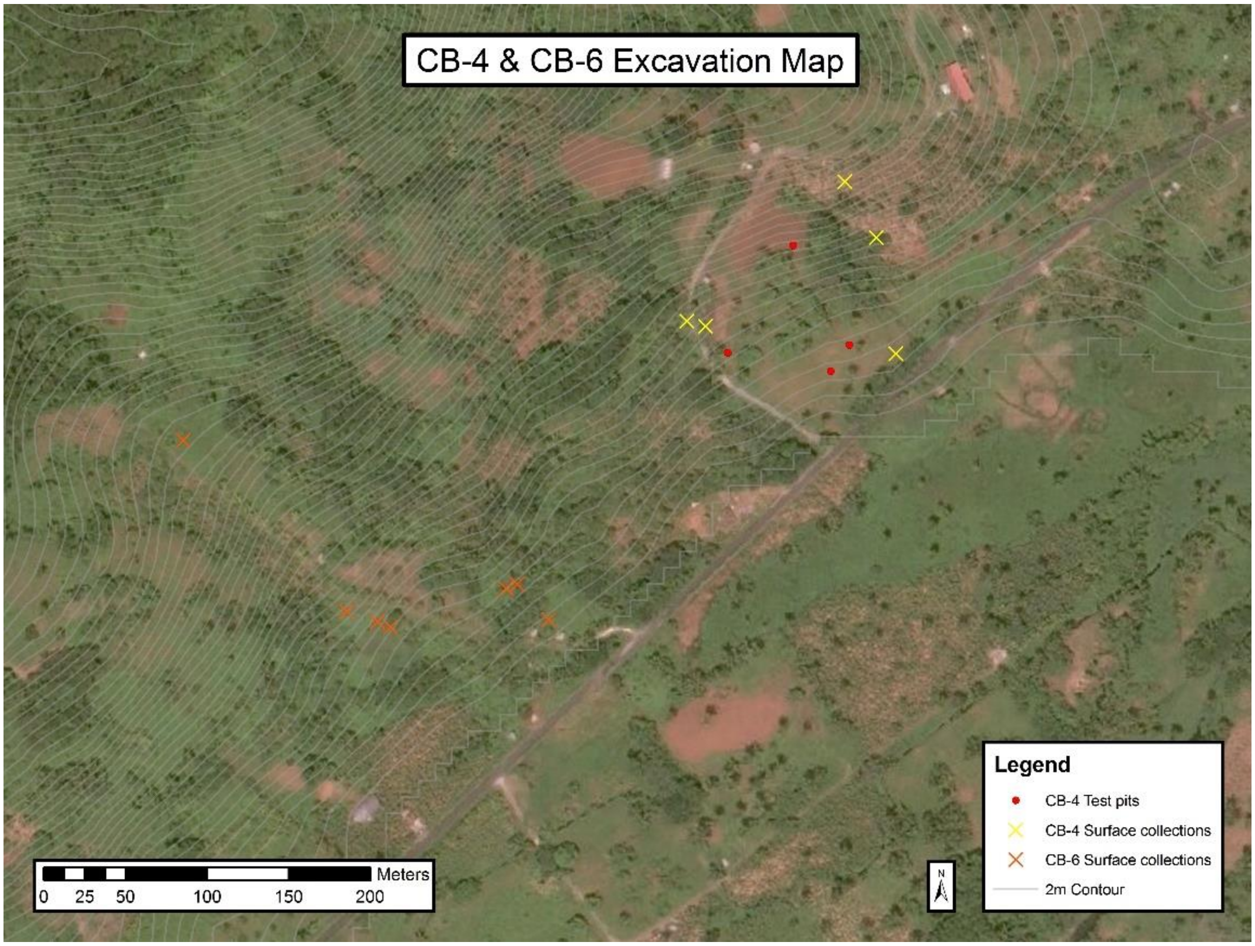

Figure 4-8. Map showing scope of work at CB-4 and CB-6.

Initial discovery and scope of work

Site CB-4 was identified in 2010 as part of the pedestrian survey of the northern edge of the valley. We identified a light scattering of pottery and lithic materials in and around the area, which was partially planted with banana and cassava, but was mostly fallow and extremely overgrown. The lack of visibility prevented a systematic walkover collection, but spot finds were collected and their position recorded with a handheld GPS. We returned to CB-4 in 2012 to conduct further investigations, but the area was still extremely overgrown, preventing any further surface collections. Furthermore, the landform was highly irregular, with three small promontories overlooking the steep decline to the floodplain. We wanted to test the flats, so we subjectively placed 50-x-50-cm test pits on each of the promontories, rather than running a transect across the area (Figure 4-8). We confirmed that concentrations in the area are very sparse, and limited to the surface and plow zone.

The crew and I identified CB-6 in 2012 by the presence of pottery and lithics on the surface. The area was entirely under cultivation and the owner did not want us to excavate, but she allowed us to walk the area and collect spot finds, which were mapped with a handheld GPS.

Discussion

It is very difficult to interpret CB-4 and CB-6 because the investigations were limited and the likelihood that the sites were impacted by erosion and the deposits deflated. Anecdotally, CB-6 seemed richer in its deposits than CB-4, but it is difficult to know if this was because of preservation or the limited nature of our investigations. Their setting at the midpoint of the valley, surrounded by sites CB-1 north and above, CB-3 west, and CB-5 and CB-Tronto east, is revealing. It attests to the distributed nature of activity areas throughout the valley, the potential preference for settings above the floodplain, and the importance of intervisibility, particularly visibility of the coastal sites. From CB-4 and CB-6, both CB-5 and CB-Tronto are visible, but the sites farther inland (CB-3 and CB-1) are obscured. If indeed intervisibility was a critical feature of interrelated sites, this pattern suggests that the coastal sites were the anchors, or centers for this pattern and that satellite sites, hamlets or activity areas throughout the valley were situated primarily with reference to those locales. This remains speculative, as we have no way at the moment to demonstrate the contemporaneity of CB-4 or CB-6 to the other sites in the region. However, like CB-1, the landforms are too small to have supported self-sustaining settlements without being integrated in some way with other settlements in the region. CB-6 did yield one griddle sherd, indicating that as with CB-1, it likely represented a small residential site or hamlet. Because we were not able to fully investigate the area, this site will be a priority for future investigations.

CB-5

Setting and condition of site

Site CB-5 is located in the valley bottom on the coast, near the mouth of the Castle Bruce River (Figure 4-9). This can be considered a prime location for exploitation of the river and coastal areas, but is vulnerable to flood and inundation during the wet season. In addition, CB-5 represents the site with the least reliable distributional data because of a number of factors. CB-5 is located directly adjacent to the Castle Bruce playing field, which, when constructed, required substantial terraforming including the grading of a substantial tract of land. It is very likely that this large tract of disturbed land was once a part of the site. In addition to the playing field, which is located north and west of the site, CB-5 is situated on the northern bank of the Castle Bruce River. The course of the Castle Bruce River is known to meander, so it is possible that it has eaten away at part of the site. Furthermore, the estate mill and factory were sited on the western edge of the site, south of the playing field. Activities related to the construction and use of these facilities may have further impacted the site, particularly adjacent to the river. Although some remains were identified on the surface, CB-5 yielded very little in terms of subsurface remains. However, it is my contention that CB-5 was a much more extensive settlement than the present condition of the site reveals.

Figure 4-9. Photograph taken from below CB-Tronto, looking at CB-5.

Initial discovery

In 2010, as part of the extensive pedestrian survey, the crew and I identified a small number of pottery sherds on Castle Bruce beach at the northern and southern edges of the beach. However, it was unclear at the time whether they had been re-deposited by the sea. Sherds were not recovered in any abundance and some of them were highly waterworn. The location of several sherds on the southern edge of the beach, just below the cliff that rises up to CB-Tronto led the crew to investigate the higher coastal elevations above the floodplain. In 2010, surface inspections were made in some of the fields along the coastal plain with limited success. Two test pits excavated at CB-2 to a depth of 120 cm below surface, indicated very deep alluvial deposits devoid of cultural materials. It was assumed at this time that if there had been a site in the floodplain, it was either so deeply buried as to be impractical to excavate, or that the river had scoured it away during its regular seasonal flooding.

In 2012, with more time available, we returned to the coastal floodplain to make a more exhaustive survey of the areas that had not been obviously impacted by either the river or the construction of the playing field. Surface inspections and auger tests were conducted in agricultural fields adjacent to the beach. The area now designated as CB-5 was identified during these surface inspections. It was identified initially by the presence of red jasper flakes and pottery on the surface.

Scope of work

Once an area with intact deposits was identified between the playing field and the river, we acquired permission to conduct excavations and lay in two perpendicular transects to cover the landform, excavating eleven 50-x-50-cm test pits at 20-m intervals (Figure 4-10). Although most of the test pits yielded cultural materials, the deposits were not very dense and we got the impression that the area had been affected by flooding. The landowner informed us that during the rainy season, the area would become inundated and that during storms, the ocean would sometimes flood the area. However, we were fairly confident that the artifacts we recovered from the site were not re-deposited as we found a range of artifacts including large and very small lithic debitage, indicating that some flint knapping had occurred in the area. Although the landowner was initially cooperative, the area was under cultivation and we did not want to overstay our welcome. Therefore we did not continue our investigation of the area after our initial test pit survey. However, we did conduct more pedestrian survey and auger tests in the adjacent field to the west and in the fields across the river to the south, but did not identify additional deposits worthy of further investigation.

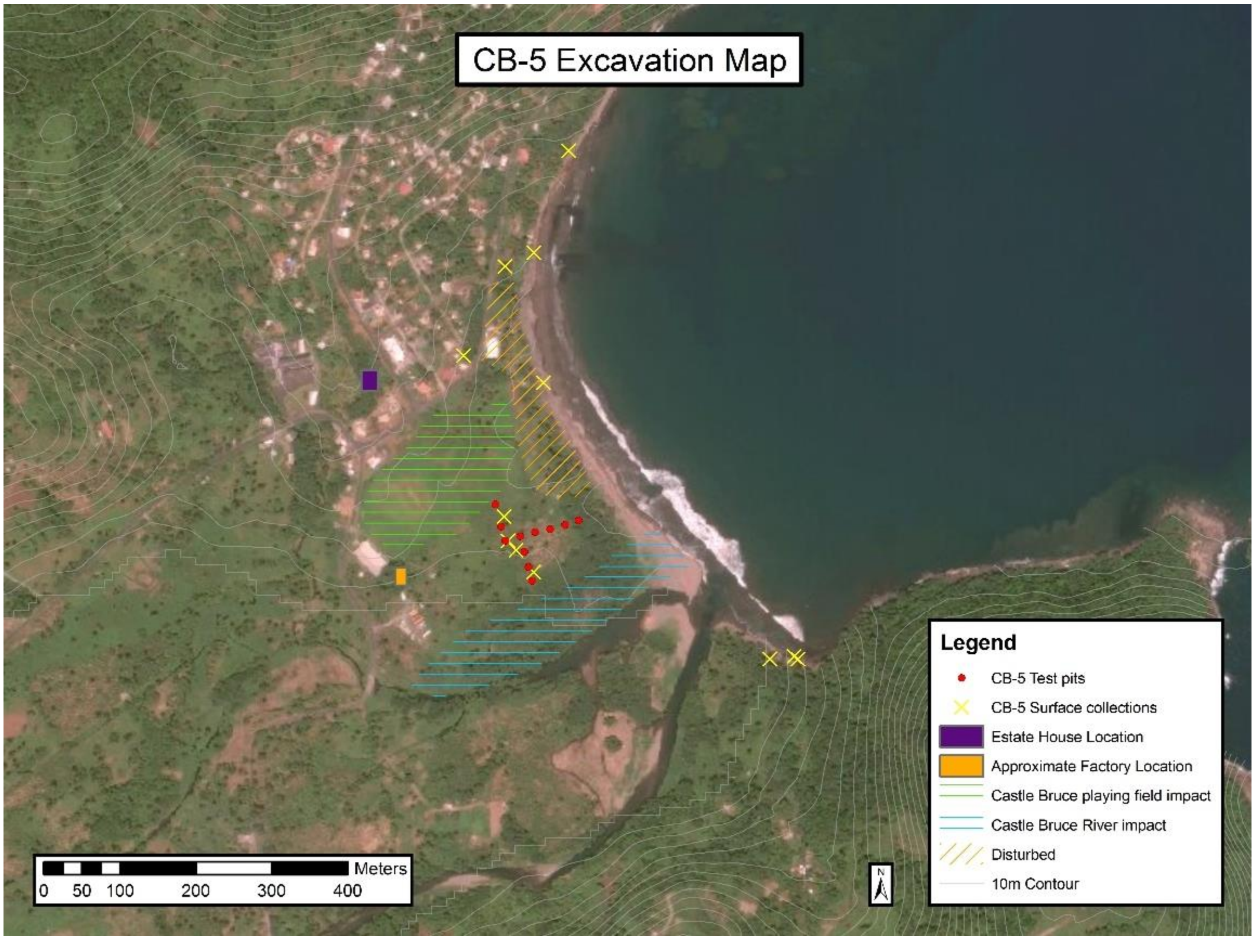

Figure 4-10. Map showing scope of work at CB-5.

Discussion

Unfortunately, CB-5 is a site that is potentially very interesting and important to the overall settlement pattern of Castle Bruce, but also very poorly preserved. We can still learn something by its presence, its setting, and the small sample we recovered, but our understanding of its overall role in the region and its relationship to other sites will probably be forever incomplete. We can speculate that at one time, this coastal area may have been the largest village in the region. It certainly has the largest tract of flat land, as attested by the fact that it was the area selected for the large playing field. That this playing field was situated on the flattest part of the landform farthest from the flood zone indicates that this may have been an optimal location for the original site. This is at least partially confirmed by the discovery of artifacts on both the northern and southern edges of the impact zone for the playing field.

There are some interesting features of the limited assemblage recovered from CB-5. For instance, in comparison to CB-3 or CB-1, there were more decorated vessels from CB-5, potentially indicating an increased ceremonial or ritual function at the site. This would echo the pattern we will see in Delices, where decorated sherds are found in higher incidence at coastal rather than inland sites. However, like the other habitation areas, it also has griddles, which I take to indicate a domestic or residential function to the site as well. As no datable material was recovered from CB-5, it is difficult to determine its chronological relationship to other sites in the area. However, from a purely speculative perspective, it seems very unlikely that occupants of the region would have lived anywhere in the valley without at least some coastal presence at CB-5, which features access to the calmer southern side of the bay, the best place to land and launch canoes (Honychurch, personal communication 2010).

CB-Tronto

Setting and condition of site

Site CB-Tronto, named for the nearby village, is located on the relatively large and high promontory point that juts out over, and dominates the southern edge of St. David Bay (Figure 4-11). From CB-Tronto, one has commanding views of the bay and the surrounding open seas (Figure 4-11). On a clear day, from CB-Tronto, both Martinique in the south and Marie-Galante in the northeast are visible. Site CB-Tronto is an area divided into plots that are under constant and relatively intensive cultivation by seven different families. Being a promontory, CB-Tronto is surrounded by very steep hills, and in some places sheer cliffs. Here, the terrain slopes down directly to the coast which is extremely rocky (Figure 4-11). To the north there are two islands that are accessible by foot at low tide, but the sea is quite rough and the passing can be treacherous.

Figure 4-11. Images of CB-Tronto. A) The cliffs below CB-Tronto, taken from the point, looking west. B) CB-Tronto looking southeast. Fields pictured were systematically surface collected in 2010. C) Surface collecting at CB-Tronto with some assistance.

Although CB-Tronto offers commanding views of the bay and the valley, it is far above the nearest fresh water source. The two nearest sources are half a kilometer away and both are first-order streams, meaning they would not have been available year-round. The fifth-order Castle Bruce River is 0.7 km away, but at this part of the river the water is brackish from the influx of sea water, so one would have to travel farther upstream to collect fresh water. Notably, all three water sources are located ~100 m below CB-Tronto, meaning that bringing water to the site would have required a steep uphill climb.

Because CB-Tronto has been under cultivation for so long, the deposits at the surface are mixed, and there is a good possibility that the site has undergone some deflation, with deposits moving downhill into the sea during periods of heavy rainfall.

This is even more likely given the shallowness of artifacts in this non-depositional environment.

Initial discovery

CB-Tronto was initially identified in 2010 during our pedestrian survey of the Castle Bruce valley. The impulse to look on the high ridge overlooking the bay came after the discovery that much of the valley floor was waterlogged during the wet season. We were encouraged by informants to focus on the southern half of the bay because it was here that the calmer sea currents would have favored canoe travel. Although we found artifacts in this area in 2010, we questioned their original context. There were very few realistic options for landforms to place settlements above the floodplain in this area because the hills are very steep surrounding Castle Bruce, especially on the southern valley margin. However, informants confirmed that there was a much larger flat area up on the promontory than what was visible from below, and that it was under cultivation. Among the dense plantings covering CB-Tronto, there was fairly decent visibility of the ground surface resulting from efforts by the cultivators to keep the fields clean. It soon became apparent that cultural materials covered much of the flat and even the hilly areas flanking the promontory.

Scope of work

In 2010, we conducted systematic surface collections in four different fields that were located around the CB-Tronto promontory (Figure 4-12). The entire landform was separated into different fields for cultivation, and only a small number of them were not planted at the time. It was in those fields that we focused our efforts. Through the surface collections, we identified certain areas as having a higher density of deposits than others. We excavated one 50-x-50-cm test pit in a wooded area directly adjacent to the field that had the highest density of deposits. However, we discovered that most of the artifacts were near the surface and the test pit did not yield a very high density of artifacts.

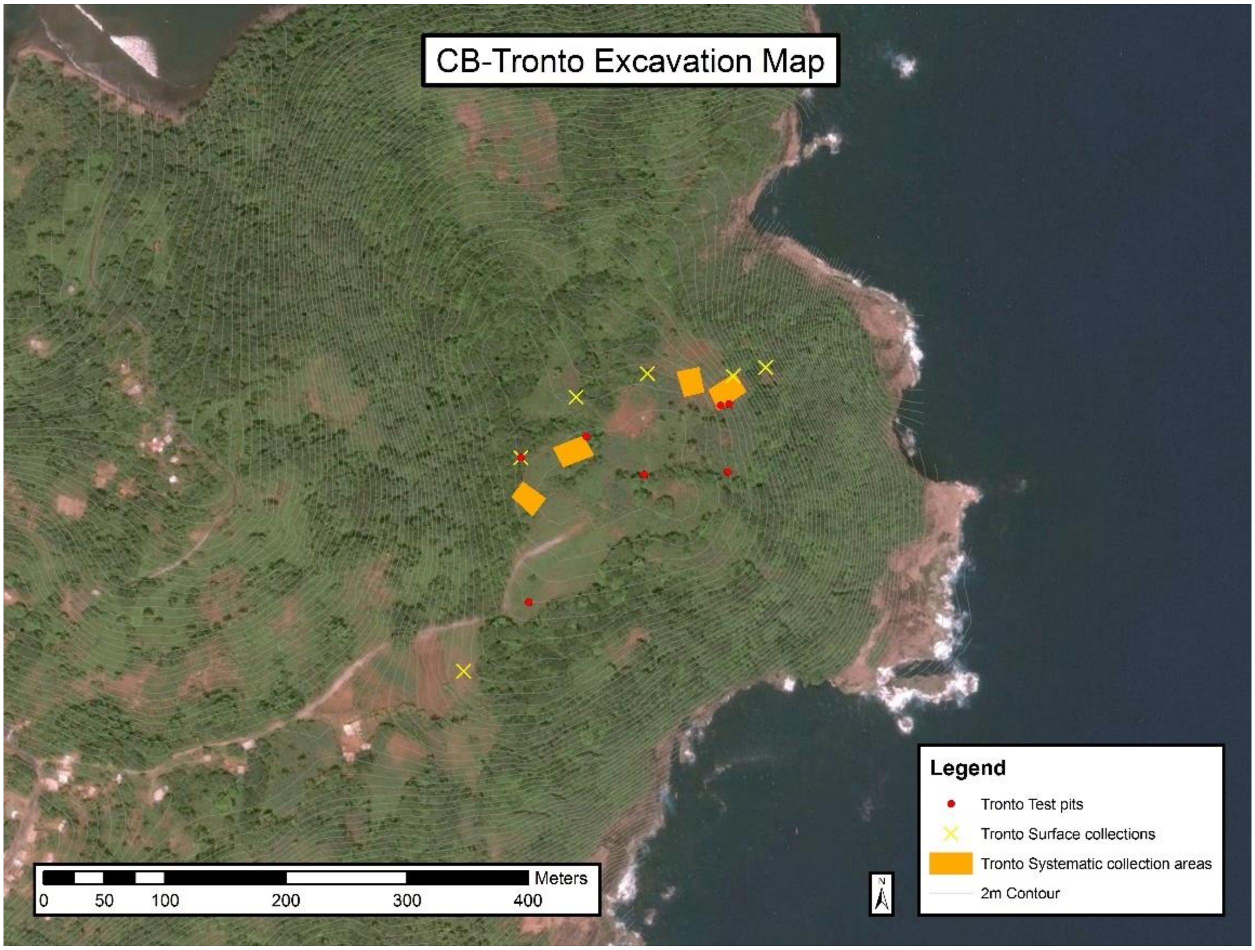

Figure 4-12. Map showing scope of work at CB-Tronto.

In 2012, we returned to CB-Tronto. This time the area was under even heavier cultivation than before, preventing us from establishing transects without impacting the plantings. Therefore we adopted a slightly different strategy than utilized at other sites. We excavated seven 50-x-50-cm test pits placed subjectively on different features of the landscape across the area (Figure 4-12). We aligned all of the test pits to the same declination, and then mapped them in with a handheld GPS.

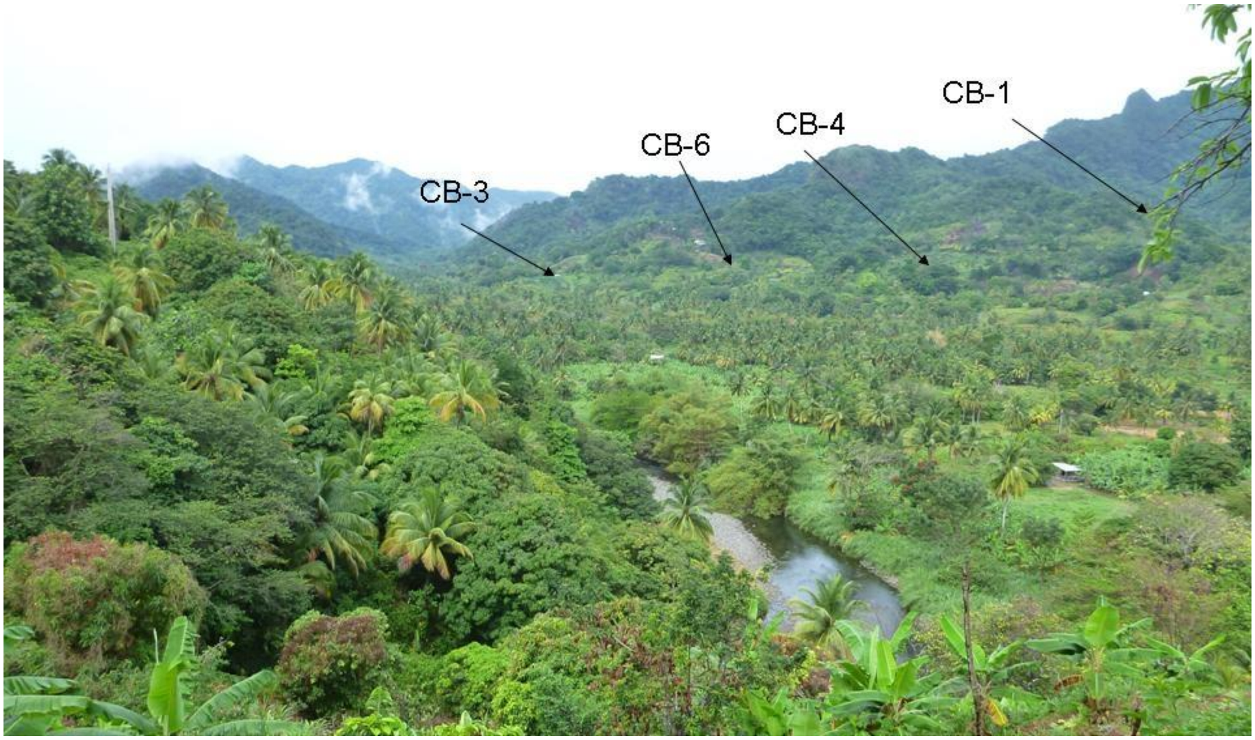

Figure 4-13. View of western Castle Bruce sites from west side of CB-Tronto.

Discussion

CB-Tronto represents a unique site in the overall settlement pattern of Castle Bruce because of its elevated coastal location. However, in the overall settlement pattern for the island and the wider region, it is typical to find sites on these high bluffs above the sea, particularly in the Late Ceramic Age (Bright 2011; de Waal 2006; Hofman et al. 2007). The diversity of the artifact assemblage and the presence of griddles point toward a residential function for the site, which would suggest that fresh water was either collected on site from rainfall or was brought up the steep hill from below. From the elevated position in CB-Tronto, an observer can look back at the valley and see all of the other sites we identified in Castle Bruce (Figure 4-13). Likewise, one can look out to sea and have a commanding view of the surrounding bays, and even glimpse both Martinique to the south and Marie-Galante to the north on a clear day. In subsequent chapters, we will evaluate the role that this heightened visibility may have played in the relationships among settlements in Castle Bruce.

Delices

Natural Setting

Delices, located in the southeastern portion of island, is a wide and highly fertile valley with a relatively large village located on the highlands several kilometers from the coast. Modern Delices is predominantly a farming community, with toloma, cassava, and bay leaf being the most common crops. Although substantial, the village is far less developed than nearby La Plaine to the north and Petite Savanne or Grand Bay to the south. Delices is surrounded by very steep mountains to the south that separate it from Petite Savanne and the Geneva/Grand Bay enclave. To the north, a series of ridges and narrow valleys separate it from the flatter headlands of La Plaine. Delices is notable for having two rivers running parallel down its valley floor. The White River is a fourth-order stream that descends from Boiling Lake, high in the mountains, and gets its name from the cloudy white color of the water that derives from the high sulfur content. The other river to the north is a second-order fresh water stream. Both rivers have gouged deep ravines through the valley, leaving a long gentle slope down to the coast in between, which is under fairly intensive cultivation today. The coastline is rocky and the seas are rough over most of the cobble beach, although there are protected areas in the northern corner of the bay that have served as boat launching areas in the recent past. When approaching Delices by sea, the low and relatively flat valley and beach stand out considerably from the adjacent coastline to the north and south, which is composed of extremely rugged and steep cliffs that rise abruptly from the sea (Figure 4-14). From almost any highland position in the valley, Martinique to the south is easily visible across the channel.

Figure 4-14. Delices Bay from the sea.

Local History

Delices is an area steeped in Kalinago and colonial history. The fertility and habitability of the region is well known, even to the early French colonizers who gave the valley its name, which translates roughly to “delightful place.” The Kalinago name for the area is Quahari (Honychurch 2011). A neighborhood in Delices where a historic Carib village was located is still known as Caribe, although it is now covered by modern buildings. Local inhabitants will tell you that this was one of the last strongholds of the Caribs before they were ultimately pushed north into the area of the modern Carib Reserve. It is said that the healing properties of the sulfur-rich White River was cherished by the Kalinago for bathing.

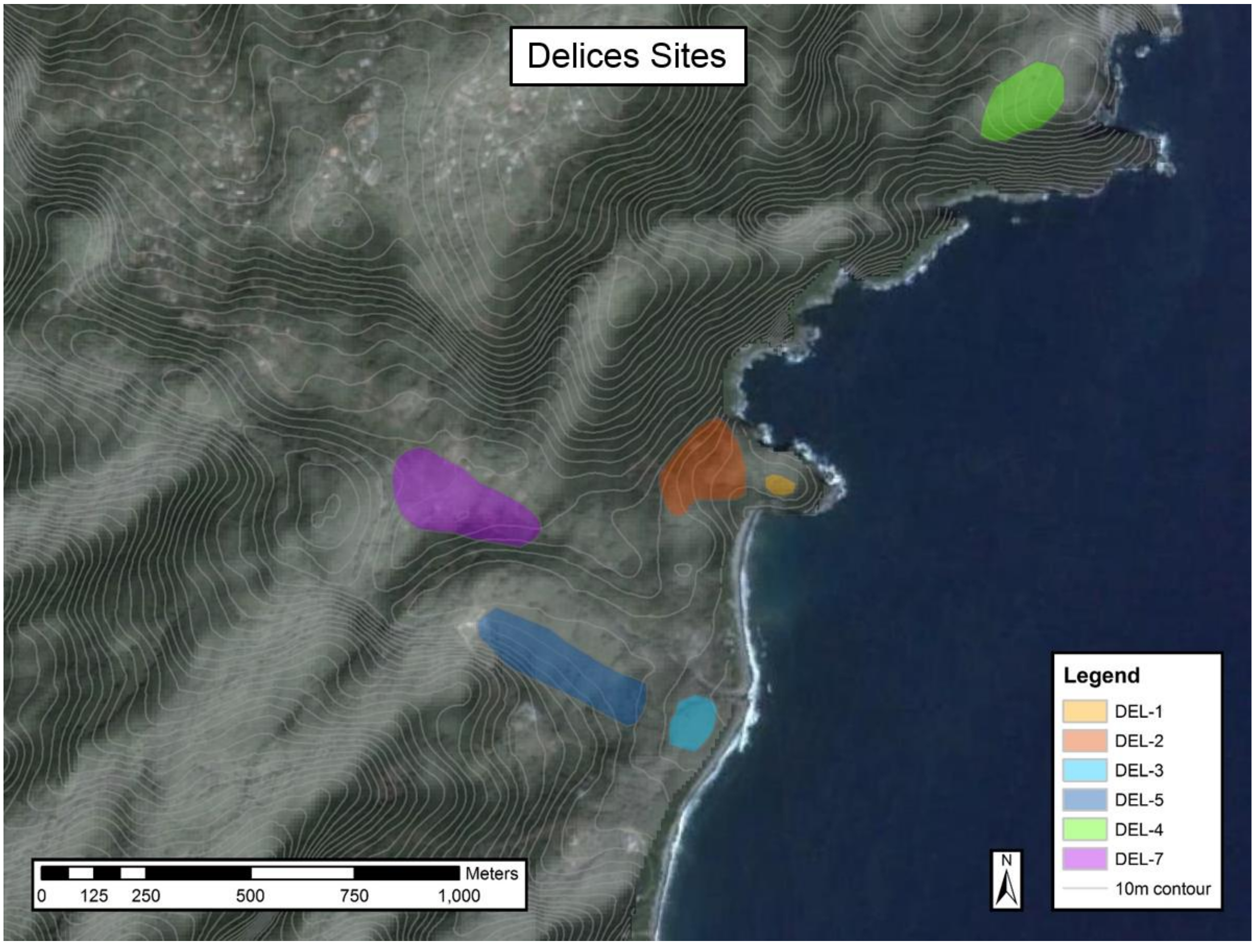

Figure 4-15. Map showing the location of sites in Delices.

Scope of Work and Sites Investigated

Resembling Castle Bruce, Delices is a relatively large region with many potential habitable areas. Rather than attempt total coverage survey, we opted to test as wide a variety of habitable zones within the area as possible. We conducted extensive pedestrian surveys and auger tests, often trying to reach areas that were accessible only by foot. Because so much of the central part of the valley was under cultivation, it was easy to rapidly identify artifacts in many places, leaving more time to investigate the marginal, or elevated, difficult-to-access areas in the micro-region. As with Castle Bruce, tracts of land have been impacted by modern activities such as grading and road building. However, owing to colonial history and the location of the historic estate, certain optimal settings within the area remain intact or under cultivation whereas the village itself and the majority of development are located outside of these optimal settings.

Many areas that we investigated with only pedestrian survey and auger testing turned out to be devoid of cultural materials, including the coastal hills south of DEL-3, the lowland valley between DEL-2 and DEL-4, gardens within the village itself, and large areas at the back, western edge of the valley, both below in the river valley near Victoria Falls, and above, just southeast of the village. However, our coverage was not all-inclusive, and there is still a good possibility that more sites will be identified in the micro-region. A total of seven sites were identified in Delices, but one of them, DEL-6, consisted of only a historic component (Figure 4-15). Furthermore, two pairs of sites (DEL-1/DEL-2 and DEL-3/DEL-5) likely represent separate loci of the same site.

DEL-1 and DEL-2

Setting and condition of sites

Sites DEL-1 and DEL-2 are nearby sites that may have been related. DEL-1 is located on a fairly narrow flat promontory surrounded by steep hills and cliffs (Figure 4-16). It is very likely that deposits at DEL-1 have become deflated over time through the erosion of soils down the very steep terrain. Soils are thin and there are large rock formations in places around DEL-1, leaving only a small area for potential use. DEL-2 is located in the shallow bowl-like depression below and inland from DEL-1, and represents a much larger, although still circumscribed landform with some very flat areas. DEL-2 is positioned well-above sea level and the walk down to the coast involves traversing some fairly steep hills and cliffs.

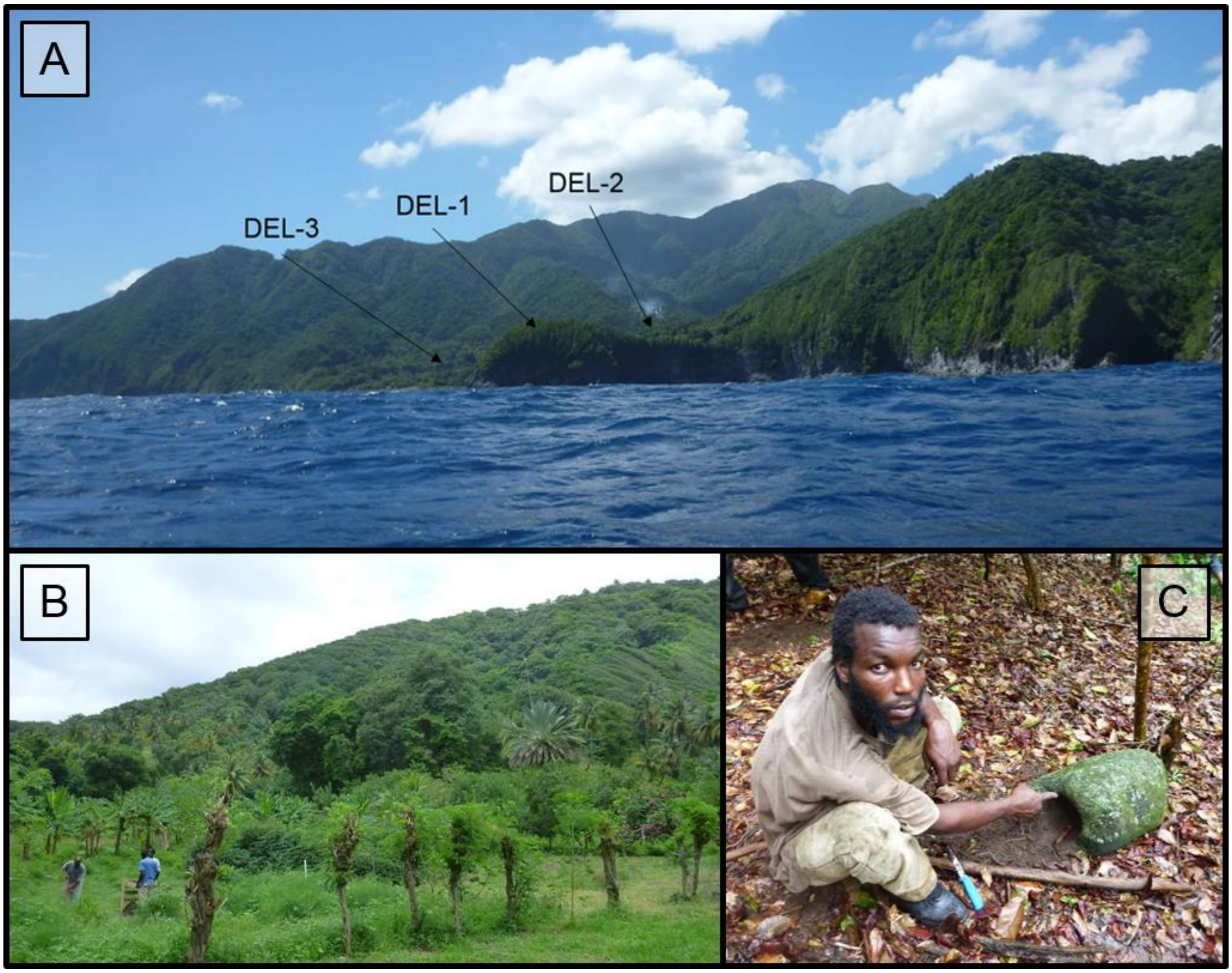

Figure 4-16. Images of DEL-1 and DEL-2. A) View of some coastal sites in Delices from the sea. B) DEL-2, looking northwest. C) Garbo pointing to the "mortar" at DEL-1. See Object 3-1.

Site DEL-2 is located in a small, relatively flat depression among the high rolling coastal hills on the northern edge of the valley (Figure 4-16). The hill overlooking DEL-2 to the east is where DEL-1 is located. Their closeness implies a connectivity, but the lack of recovered materials from DEL-1 make it difficult to confirm. It is likely that DEL-1 was used as an overlook or vantage point because DEL-2 is situated in a depression, featuring poor views of the ocean and surrounding areas. However, because it is somewhat hidden from view from the sea, it would offer good defensibility, which may have been a factor in the positioning of settlements. Plowing activities associated with cultivation, as well as the removal of many medium to large size rocks in the depression, have caused some disturbance to the upper portions of subsurface deposits. However, owing to the well-developed stratigraphy in certain areas of DEL-2, many of the deeper deposits remain intact.

Initial discovery

Sites DEL-1 and DEL-2 were initially identified in 2012, and were the very first sites identified and investigated by the crew during the 2012-2013 field season. Following the 2010 experience of surveying Castle Bruce, and the discovery of an important site, CB-Tronto, on the ridge overlooking the bay, our method for the survey of Delices included investigating promontory points overlooking the bay. From the coast at Pointe Mulâtre, the view to the north includes two ridges, one closer and lower, and the other farther and higher (Figure 4-18). Upon the closer ridge, we found DEL-1 and later we would find DEL-4 on the farther ridge. DEL-1 was initially identified by finding a large mortar on the surface (Figure 4-16). However, subsurface excavations uncovered only one potsherd. It is difficult to assign a date or cultural affiliation to the mortar itself. Site DEL-1 was found first, but when subsurface excavations at DEL-1 returned little cultural material, we then looked in the adjacent valley, a saddle in the landscape between the coastal ridge and the steep mountains leading up to the modern village. We immediately observed a very low density of potsherds and lithic remains on the surface and proceeded with subsurface sampling.

Scope of work

Sites DEL-1 and DEL-2 were both owned by the same person, and although we were given free rein to excavate in the forested area of DEL-1, DEL-2 was under cultivation and there were certain areas we were instructed to avoid, particularly where the sensitive pepper plants were cultivated. At DEL-1, we excavated five 50-x-50-cm test pits covering the flat area of the landform near the mortar we initially identified (Figure 4-17). We suspected that the site had been heavily eroded because it was a small flat surrounded by steep slopes. However, the one potsherd and the large mortar attest to this area being used at some point in the past.

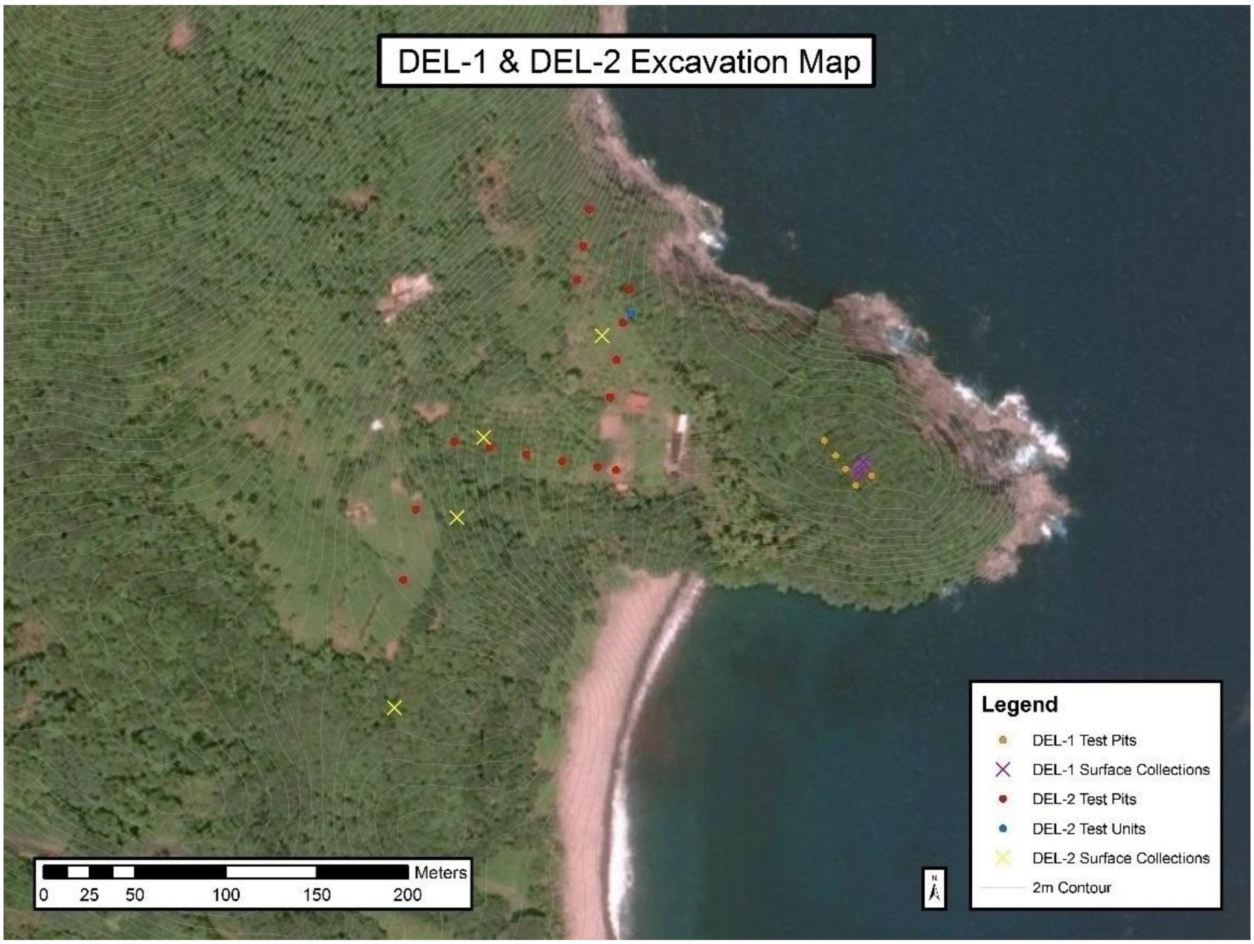

Figure 4-17. Map showing scope of work for DEL-1 and DEL-2.

At DEL-2 we laid out transects to cover as extensive a portion of the landform as possible without impacting the cultivated areas. We began with one transect running east-west along the edge of one of the fields and excavated six 50-x-50-cm test pits along this transect at 10- and 20-m intervals. At the end of this transect, a river separated the landform. We tested the flat area to the south with two 50-x-50-cm test pits along a perpendicular transect at 40-m intervals but recovered no cultural materials, indicating a southwestern boundary for the site. Then we excavated four 50-x-50-cm test pits along a perpendicular transect to the north, skipping a 40 m stretch that was under cultivation. As we moved north along this transect we found increasingly dense deposits of artifacts buried beneath the surface. Test pit 9, the third along this transect yielded an extremely high density, indicating a potential midden context. Beyond that, we excavated three additional test pits to the north until we stopped finding artifacts, indicating the northern boundary, which was near the edge of the landform above a sheer cliff descending to the sea. We returned to excavate a 1-x-1-m test unit adjacent to test pit 9 to further investigate the midden, but were instructed not to conduct more extensive excavations in the surrounding field because of the sensitive plantings there.

Discussion

Site DEL-2 is by far one of the most interesting sites identified during this project. It has some of the most substantial subsurface deposits with the least amount visible on the surface—in addition to some of the best stratified deposits of any site investigated in this study. Its location in the bowl-like depression leaves it fairly hidden from the coast, despite its proximity to the sea.

The small landform and the commanding views offered by the DEL-1 locale along with the limited artifact distribution indicate it may have been an activity area or outlook, perhaps tied to the more substantial occupation at DEL-2. The density of the midden identified on the northern edge of DEL-2, along with the scattered distribution of artifacts on the rest of the immediate landform, suggest that this may have been a multihousehold residential location, perhaps even a small village. Its elevated position above the sea would have only marginally limited its coastal access while offering a more defensive and protected location than the other lowland coastal site at DEL-3 (Figure 4-18).

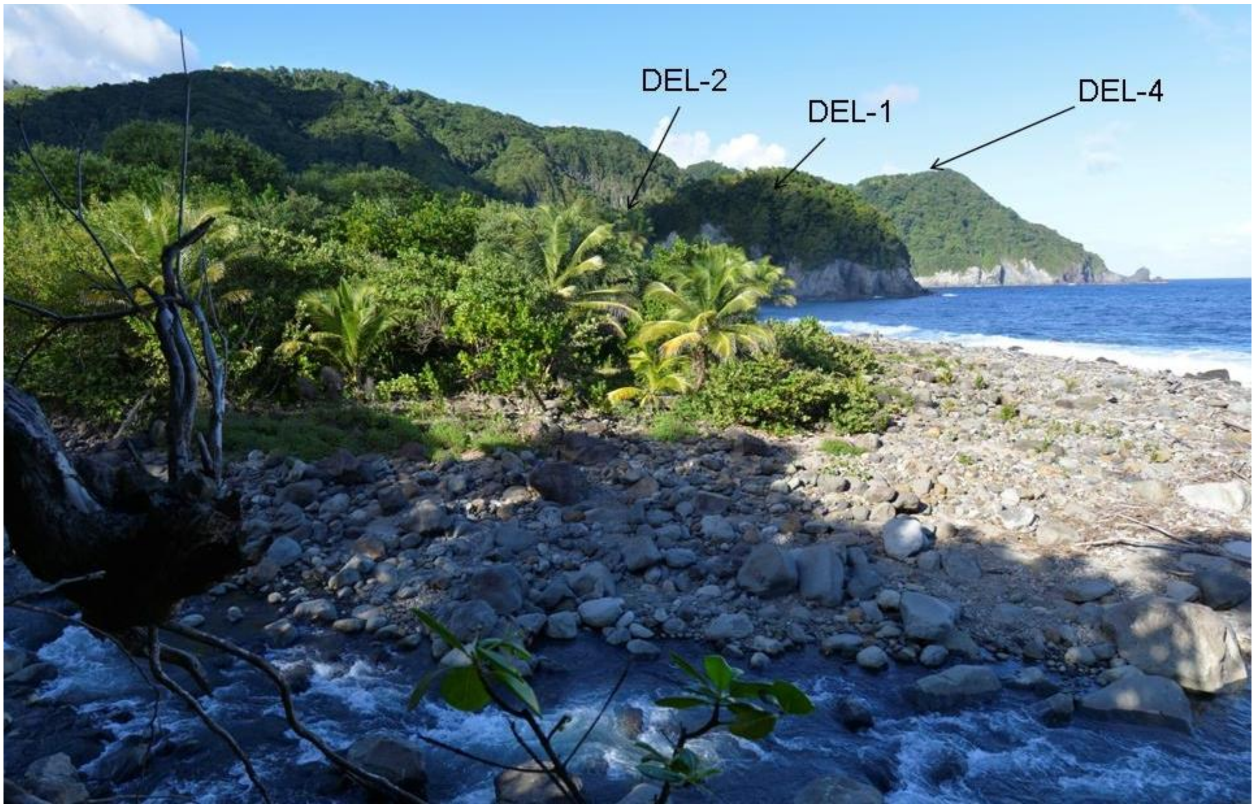

Figure 4-18. DEL-1, DEL-2, and DEL-4 as seen from DEL-3 (photo by Nigel Smith).

From DEL-1, DEL-3 and the entire bay are highly visible, giving the DEL-1 and DEL-2 settlement dyad a potentially strategic/defensive advantage. The soil here is highly fertile according to the current cultivators, and it is located just above the fresh water river that delineates the northern edge of the valley. That said, the habitable landform itself is relatively small in comparison to the area of flat land available to inhabitants of DEL-3, DEL-5, and DEL-7. The artifacts recovered from DEL-2 include flaked lithics, groundstone pestles and the large mortar at DEL-1, and a wide range of different vessel forms including several griddles. These indicate that DEL-2 was both a residential and potential agricultural processing site. The elevated density of decorated vessels may indicate an increased ritual or ceremonial function for the site as well.

DEL-3 and DEL-5

Setting and condition of sites

Site DEL-3 is located on a small elevated coastal flat directly adjacent to where the White River meets the coast. The site is located on the southern bank of the White River, which rises abruptly in a cliff that is steadily eroding into the river (Figure 4-19). The northern bank of the river is much lower. It is likely that the river has changed course over time, and part of the lowland areas north of the river were affected by the changing course of this high-energy river through time. It is also difficult to estimate how large DEL-3 was when it was occupied because two of its edges are being heavily affected by erosion; to the north by the White River, and to the east by the sea. The other two edges of the site have been affected by modern disturbances. The western edge of the site was truncated by a road cut, and to the west of that, a large portion of land was cleared, graded, and covered with tarish (a kind of gravel used for paving roads in Dominica) for a temporary parking area. West of that disturbed area, and continuing inland to the west, is the relatively large, but not very dense site of DEL-5 (Figure 4-19 and Figure 4-20). On the southern edge of the site, another road cut comes down to the sea and the area is disturbed by terraforming. That disturbance extends to the hill that separats DEL-3 from the hilly area to the south, leading to the entrance for the Jungle Bay resort. That higher elevation area is the location of DEL-6, and was tested, but found to contain only a more recent historic component. What is left is a relatively small piece of land, roughly 100 m x 50 m in plan, which still contains intact deposits. What is known is that the deposits in the preserved portion of DEL-3 are very dense, among the densest of any site in Dominica.

Figure 4-19. Images of DEL-3. A) As seen from the bridge over the White River looking east. B) As seen from DEL-7 looking east.

Initial discovery

Site DEL-3 was identified by Honychurch, Petersen, and Bérard in 2005 by the presence of ceramics on the surface eroding out of the road cut that truncates the western edge of the site. In 2005, Petersen excavated one 50-x-50-cm test pit at DEL-3. Although the exact location of the test pit is not known, Honychurch remembers that the test pit was located on the western edge of the site just next to the road cut.

We rediscovered this site in 2012 by identifying additional artifacts eroding out of the surface along the western, northern, and eastern edges of the site. The central portion of the site is completely covered by tall grass, leaving no visibility to identify artifacts on the surface.

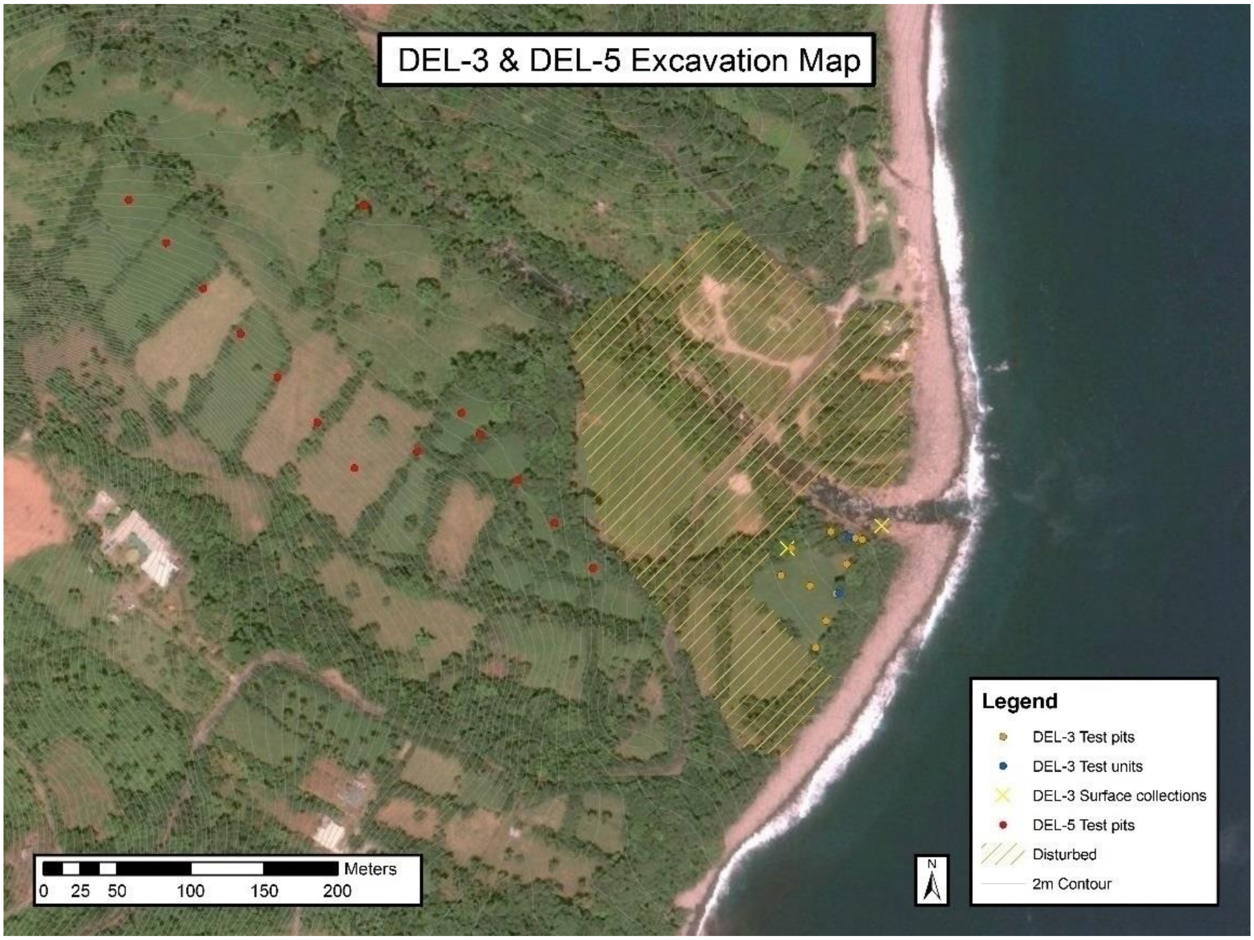

Figure 4-20. Map showing scope of work at DEL-3 and DEL-5.

Scope of work

Work at DEL-3 began by collecting the ceramics that were eroding away from the site. We made two general provenience surface collections. PN 511 contains pottery eroding out of the northern edge of the site, overlooking the White River. Pottery contained in this provenience comes from an approximately 5 m x 2 m area along the edge of the site. Provenience number 512 contains pottery collected from ab approximately 4 m x 1 m area eroding out of the western edge of the site into the deep road cut. In both of these non-systematic collections, we collected only notable pieces that were in danger of washing away and being lost. However, the high density of these findings led us to believe that we were on a fairly substantial site, so we immediately began a more systematic subsurface sampling strategy.

In all, we excavated nine 50-x-50-cm test pits and two 1-x-1-m test units at DEL-3 (Figure 4-20). Test pit 1 was located in the northeast corner of the site near the area where the eroding pottery was collected for PN 511. We situated the pit above the eroding area and placed it on a part of the landform that appeared more intact. From there, we placed a transect of test pits running north to south at an angle of 215° directly across the long axis of the landform. Including test pit 1, we placed five test pits along this transect at 20-m intervas. Test pit 1 and test pit 2 had the densest deposits along this line. We placed a perpendicular transect at the midpoint, and placed two more test pits at 20-m intervals to the west of the transect. Twenty meters east would have placed us off the edge of the site on the rocky coast below. We placed additional test pits on parallel transects to test the northern and western edges of the landform.

When we went across the street to test DEL-5, we selected a different bearing and grid to facilitate a more efficient testing of the landform. At DEL-5 we excavated fourteen 50-x-50-cm test pits, arranged at 40-m intervals at a bearing of 335°. At the midpoint of the transect, we shifted to the west to avoid a large area of disturbance.

The large area between DEL-3 and DEL-2, on the northern bank of the White River is disturbed (Figure 4-18). The river and ocean have eaten away at the area considerably, leaving a very rocky matrix that was obviously exposed in recent history. In addition, some quarrying has been conducted in the area. Unfortunately, this means we will never know if the settlement continued on the northern bank of the river. It is even possible that DEL-2 and DEL-3 were connected by contiguous occupation zones. If that were the case it would represent an extremely large village (~45 hactares).

Discussion

Site DEL-5 was excavated separately from DEL-3, however it is unclear whether they should be considered as part of the same site. They are located close to each other but are separated by a large disturbed area which includes two road cuts and an area that had been graded and surfaced for use as a parking area. DEL-5 does not show the same artifact density or diversity as DEL-3. The deposits are more sparsely arrayed over a larger area. This may suggest that the occupation here grew over time and DEL-5 represents the maximum expanse of the site. It is also possible that DEL-3 and DEL-5 represent different activity areas of the same site. The area near the coast, DEL-3, seems to have been a place of public ceremonial activity, whereas DEL-5, the interior portion of the site, may have served a more domestic or utilitarian function, including agricultural activities. More excavations at DEL-5 will likely be helpful. At this point, we consider DEL-3 and DEL-5 to be separate loci rather than separate sites.

Site DEL-3 has a very robust and diverse pottery assemblage that, along with DEL-2, has among the highest ratio of decorated/prestige vessels. The density of artifacts at DEL-3 is suggestive of long-term occupations. This is juxtaposed against the far more extensive, but accordingly less dense deposits of artifacts across DEL-5. If these sites were occupied contemporaneously, or were part of the same site, it seems possible that the coastal area was the focus for communal ritual and ceremonial activity, such as receiving foreign visitors for example, whereas the interior portions of DEL-5 along the river was designated for more domestic activities such as gardening. This would account for the disparity in the density of artifacts as well as the composition of the assemblages, with DEL-3 representing a much more prestigious selection of pottery and DEL-5 containing more undecorated and utilitarian wares. That no griddles were recovered from DEL-5 might further indicate that this was not a residential area, but more likely an agricultural production or gardening area.

DEL-4

Setting and condition of site

Site DEL-4 is a small site located on an elevated flat high above the coast, north of DEL-2 and DEL-3 (Figure 4-21). DEL-4 is the most remote and most difficult to access site identified in Delices, although it is visible from DEL-3. DEL-4 is located in an area similar to CB-Tronto in Castle Bruce, in that it is a high point on the coast with commanding views of the Bay, but surrounded by extremely steep terrain making it defensible, but also making it difficult to access resources like fresh water. DEL-4 itself is not very flat and it has been under cultivation for many years exposing the subsurface deposits to plowing and rainfall. The deposits at DEL-4 are mainly limited to surface finds, with little in terms of subsurface materials, and we suspect that this is because of deflation and erosion. A large portion of the site on the coastal edge may have eroded away as the coastal cliff sheared off. On the southern edge, archaeological deposits from the top of the slope may have eroded down the hill. The preservation, and therefore representativeness of the deposits recovered there, can be considered poor. That being said, the deposits at DEL-4 do confirm that there was a settlement there, although we may never know the full extent.

Figure 4-21. Images of DEL-4. A) As seen from Delices, looking east. B) The rocky coastline below DEL-4.

Initial discovery

Site DEL-4 was identified initially in 2012 as part of a visibility experiment the crew and I conducted in Delices. We had just finished work at DEL-2 and DEL-3 and were struck by the fact that, from DEL-3, both DEL-7 and DEL-2 were partially visible, but that from DEL-7, DEL-2 was not visible and vice versa. This along with the high density of artifacts recovered form DEL-3, and its optimal coastal location, led us to hypothesize that DEL-3 may have acted as a centralizing locale for the community in the Delices micro-region, and that visibility to this center may have been an important criterion in locating other settlements. The experiment then was to select areas that we could see from DEL-3 and test them to see if we could find sites. From DEL-3, the landform that looked most appealing for settlement was the hill that turned out to be DEL-4 (Figure 4-18). The first surface finds were identified by Junior Felix within moments of stepping into the agricultural fields (as seen in Object 3-1). We conducted surface inspections of agricultural fields in the intervening lowland areas between DEL-2 and DEL-4, which were obscured from DEL-3, but found no Amerindian cultural materials.

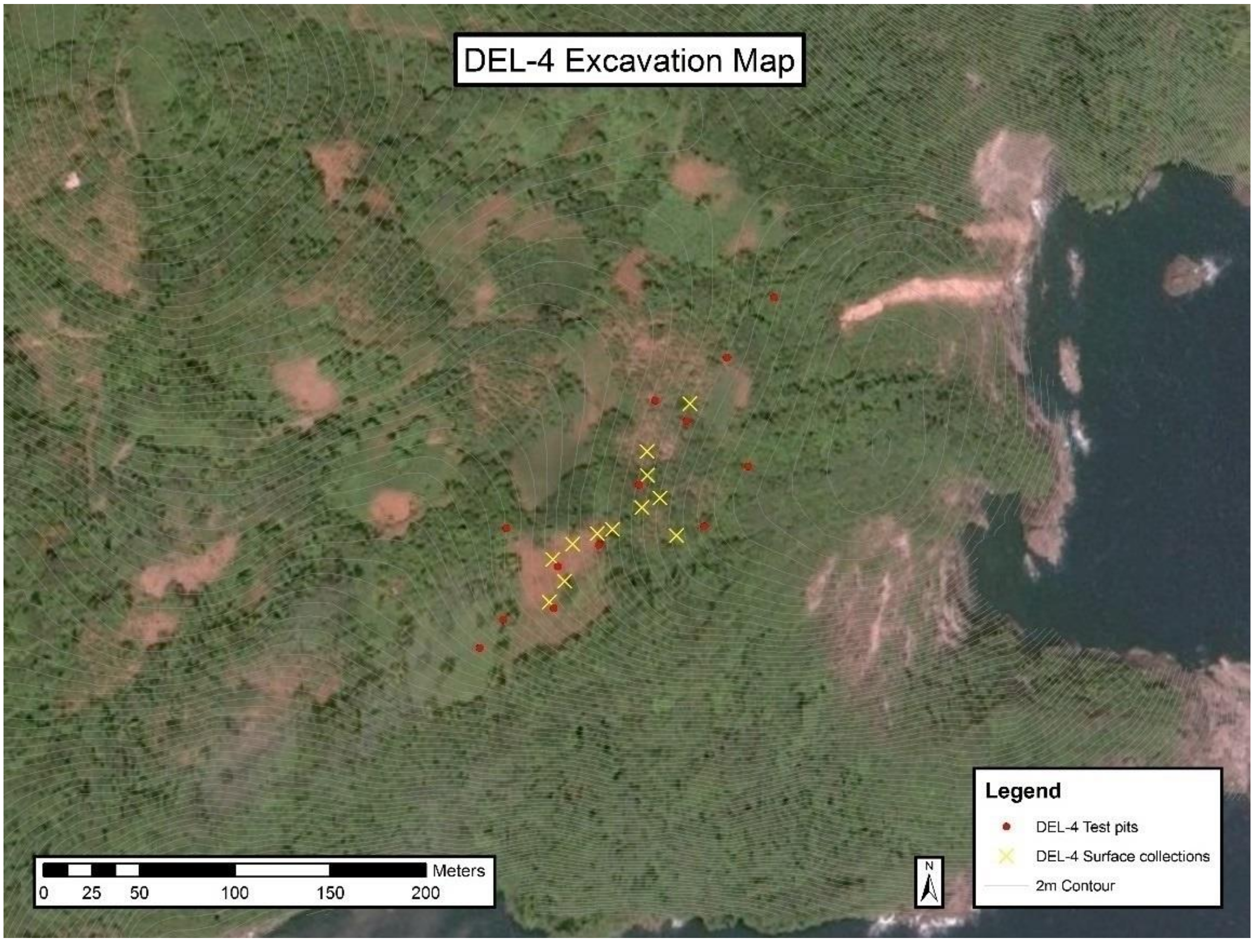

Figure 4-22. Map showing scope of work at DEL-4.

Scope of work

We began by conducting an informal walkover of the entire landform. During this walkover, we flagged any surface finds and then returned with the GPS to collect the surface finds. We then excavated thirteen 50-x-50-cm test pits (Figure 4-22). We arrayed these test pits in such a manner as to cover the one landform we had permission to work on, and on which we identified surface artifacts. There are other nearby landforms worth investigating in the future, however, large portions of the landform near the coast have eroded into the sea, making it likely that a portion of the original site has been lost.

Discussion

Like many sites identified, DEL-4 suffers from poor preservation resulting from coastal erosion and deflation. However, from the artifacts recovered and the setting of the site, there is still something to be learned about its relationship to the overall settlement pattern in Delices. DEL-4 is located in what can be considered a marginal zone of the valley when compared to DEL-2 and DEL-3. It is far above the coast surrounded by very steep cliffs, offering commanding views of the valley. It is visible from DEL-3, but difficult to access. The artifact assemblage was diverse enough to suggest that it was a residential habitation, even though no griddles were recovered. If it was occupied contemporaneously with the coastal DEL-2 and DEL-3, it would make sense as a defensive outlook. Another potential interpretation is that it served as a retreat for coastal occupants during times of stress. Although it is possible that group fissioning and population pressure pushed inhabitants to marginal zones such as this, the crew and I were more struck by the potential advantage that maintaining an outpost like this would have, with its commanding views of the bay, including views to the south toward Martinique that are obscured from DEL-2 and DEL-3. Considering that the area is still praised for its fertility and under heavy cultivation, the only factor making its location marginal is its lack of coastal access, although there is a quite strenuous trail that one can take to the coast from DEL-4. There are large rock formations at the coast where people fish today and where shellfish can be collected from tidal pools (Figure 4-21).

DEL-7

Setting and condition of site

Site DEL-7 is located in a part of Delices known as Fond Thomas. It is a large landform that rises gently from the coast in an east to west manner to the back of the valley where modern Delices and Caribe are located (Figure 4-23). The landform itself is made up of gently rising slopes and flatter areas, and is surrounded on the north and south by steeper slopes that run down to the two rivers, a small quick-flowing freshwater river to the north, and the larger, but also fast-moving sulfurous White River to the south. A large portion of the landform was impacted by the construction of a playing field, which required grading and terraforming, and the construction of the school house across the street. However, most of the area is under full-time cultivation for sweet potato, manioc, and the cash crop of Delices: toloma.

Figure 4-23. Panorama of DEL-7 looking north.

From the overhead map of the Delices area, it may appear that DEL-7 was contiguous with DEL-3/DEL-5. Although DEL-7 is not far away horizontally, it is separated vertically from DEL-3/DEL-5 by a very steep cliff that rises up on the northern side of the White River. When standing at DEL-7 and looking toward the coast, you are looking down on DEL-3 and there is no direct path to get down. In order to walk to the coast, one must take a roundabout path that goes to the north, which is where the modern road was cut. For this reason, we consider DEL-3/DEL-5 and DEL-7 to be separate sites.

Initial discovery

Site DEL-7 was initially identified in 2009, when we conducted a surface inspection in a recently plowed field that was under cultivation by the late Olsen Baron, a friend and informant we met in Delices. Within seconds of looking in the freshly tilled soil, we saw a great deal of pottery, some in fairly dense concentrations. We spoke with Olsen Baron about it, and he informed us that he saw pieces like that all over the field, and pointed out some areas where he had seen it. We got more information from him about the valley. Many different cultivators worked different plots of land all along the landform. We set about to talk with some of the adjacent landowners, most of whom were supportive of our work, allowing us access to additional fields for inspection. We documented the presence of more extensive deposits in the area but did not further investigate until 2013.

Scope of work

In 2009, we conducted a systematic surface collection of two adjacent fields that had recently been plowed, and which had not yet been planted. We walked the entire field, flagging the artifacts, and then came back to collect them, mapping them in with a Brunton pocket transit and longtape from a datum that we mapped in with a handheld GPS. In addition to the systematic collection, we made informal walkovers of several adjacent fields, locating but not collecting several spot finds. We excavated four subjectively placed 50-x-50-cm test pits in areas with higher artifact densities (Figure 4-

24). However, we found that the test pits did not contain much pottery, and that most of the deposit was restricted to the surface.

Figure 4-24. Joshua Toney working on a test pit at DEL-7 in 2009.

In 2013, we returned to DEL-7 to do additional work. First, we conducted informal walkovers of several adjacent areas. Because there were so many different landowners that were cultivating different plots in the area, it took days just to get all the permissions necessary, something that held us back in 2009 when our time was more limited. However, once we had the necessary permissions, we found that DEL-7 was quite extensive. We identified individual artifacts in many different fields, but because the area was under such intense cultivation, there were very few areas that we could actually excavate without affecting the plantings. Toloma and cassava are often grown in very dense configurations. We therefore limited our excavations to a few areas of interest that were outside the areas of cultivation. In total, we excavated fourteen 50-x-50-cm test pits primarily along an east-west transect starting at the cliff overlooking the White River, and continuing west toward the playing field (Figure 4-25). We conducted surface inspections in several fields on the northern side of the road above the ravine that contains the second-order fresh water stream. Although we found scatterings of pottery across the area up to where the land slopes down, the visibility was too poor for systematic collection and the sherds were not collected. Major portions of the site north of the road are impacted by the school building complex.

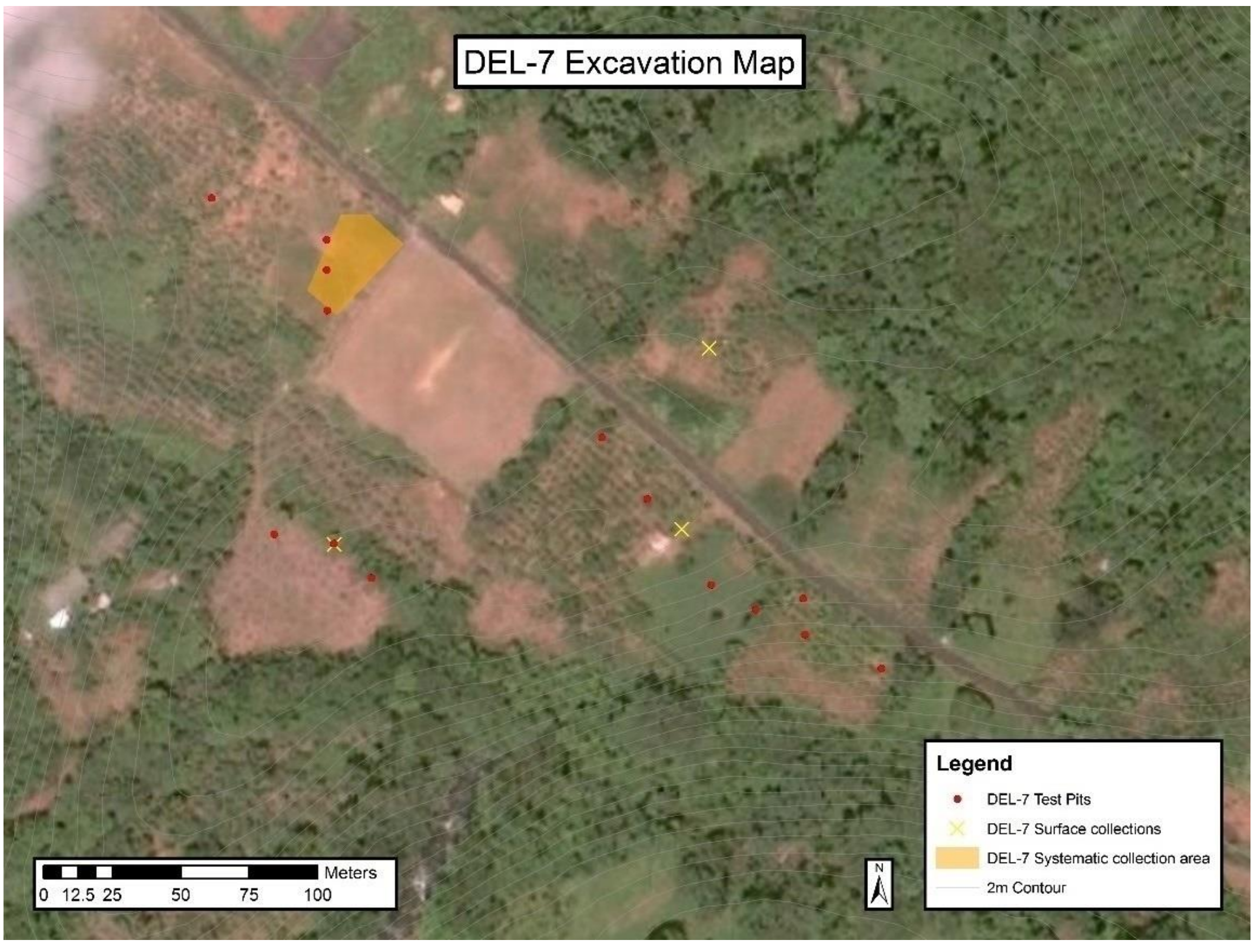

Figure 4-25. Map showing scope of work at DEL-7.

Discussion

Site DEL-7 shares many attributes with the interior site at Castle Bruce: CB-3. It is located inland with prime access to abundant agricultural fields and fresh water, without the potential dangers associated with coastal occupations. The artifact variability as well as the presence of griddles is suggestive of a residential function for the site, but the dispersed nature of the deposits and the low density are also suggestive of an extensive, rather than intensive occupation, perhaps representing a predominantly domestic/agricultural function. However, our coverage was not extensive enough to be sure that we did not miss areas with higher artifact densities. Future work should be geared toward obtaining better coverage of the expansive DEL-7. The close proximity and easy visibility to DEL-3 contrasts with the lack of easy access between the sites, represented by the elevation difference and the difficult-to-traverse river separating the two sites.

Hampstead

Natural Setting

Compared to Castle Bruce and Delices, Hampstead is the least similar in terms of general topography and hydrology. Hampstead is on the flatter northeastern corner of Dominica that stretches from Woodford Hill to Anse Soldat. Whereas Castle Bruce and Delices have large flat valley bottoms surrounded by dominating mountains, the Hampstead micro-region has many smaller lowland areas separated by mountain ridges. These low areas tend to be flat and swampy in the areas behind the beach dunes (Figure 4-26), and ridges rise abruptly to separate such areas. Rows of parallel ridges stack up perpendicular to the coast creating a higher frequency of smaller watersheds and bays than those found in the southeast of the island. These high ridges tend to be fairly narrow, such as A le Platte, and A le Lequois, although some are wider. This area also has the sandiest beaches of the three micro-regions, although the beaches are dark brown/black sand instead of the classic white sand beaches typically associated with the Caribbean.

Figure 4-26. Inundated soils on the boggy flat at Batibou Bay.

Our survey indicated that several coastal sites have been heavily impacted by natural erosion in this region, making the extent of past landforms an unknown in many places. Looking at satellite imagery (e.g., Figure 4-28), it is easy to imagine the shape of ancient landforms and coastlines, as well as the erosion history as the sea ate away at the coast, but these impressions cannot be confirmed. Amerindian artifacts recovered from these erosion zones confirm that sites were impacted, and would have been larger when initially occupied. Furthermore, the villages of Calibishi, Anse du Mei and Anse

Soldat are positioned in optimal coastal settings in the micro-region, impacting archaeological deposits. These limitations made it more difficult to assess intra-micro-regional patterning in Hampstead. Although the settlement data from Hampstead is not comparable to the other study areas, data from the one well-preserved site, HS-2, provides a baseline for inter-micro-regional comparisons.

Local History

The area now known as Hampstead was an estate sold by the British in the 1760s. The Kalinago name for the region is Batibou (Honychurch 2011). The estate featured a sugar factory with a water mill (which is still standing in ruin) powered by the Hampstead River, a fourth-order stream that runs adjacent to HS-2. Estate produce was exported from Batibou Bay, which was protected by a mounted cannon on the promontory near HS-1, which overlooks the bay. The estate, which contains approximately 450 acres between Calibishi and Bense, exchanged hands from the McIntyre family to the government in the 1930s following the epidemic wither-tip disease that affected the lime industry, and again to the renowned Douglas Family in 1946, at which time the boundaries were slightly renegotiated. The area is still maintained by the Douglas family, who granted us access to the entire estate. To the east is Calibishi, a relatively large village that serves as a focus for tourism on this part of the island. A portion of coastline between the estate and Calibishi was apparently dynamited in 1945 to make the harbor safer for boat travel. In recent times Calibishi has continued to spread east. West of the Hampstead estate is the tri-village enclave of Bense in the highlands and the two small coastal fishing villages of Anse Du Mei and Anse Soldat, all three of which are united under one village council.

Scope of Work and Sites Investigated

The scope of work for Hampstead was slightly reduced in comparison to Delices and Castle Bruce. This was for two reasons. It was very far away from where we lived, requiring a 1.45-hour drive each way, and the area was primarily forested, meaning that surface inspections were of very limited productivity. We had to rely more on subsurface sampling to identify sites, resulting in reduced coverage. Six sites were identified (seven if you count the spot finds at Batibou Bay) but only two, HS-1 and HS-2, had substantial intact deposits (Figure 4-27). Not reflected on the site map are all the areas we investigated that did not turn out to have visible archaeological materials on the surface or through auger testing. For example, the bay between Anse Du Mei and Batibou, a beach known locally as Secret Beach, was investigated but we found no cultural materials. However we did find a source of very workable clay at this bay and included this in the neutron activation analysis. The lowland west of A le Platte, an area known as Womabati was investigated with surface and auger testing and yielded no finds. Additionally we investigated the headland directly adjacent to Batibou on the west, but found nothing. Our investigations into the interior regions included pedestrian survey, following river systems into the interior or variably, by following ridgelines, neither of which led to the discovery of Amerindian remains farther into the interior than HS-1. However, interior survey represents the most limited aspect of our Hampstead survey as it was mostly limited to surface inspection resulting from time constraints, and future efforts should be directed toward more systematic investigation of the interior.

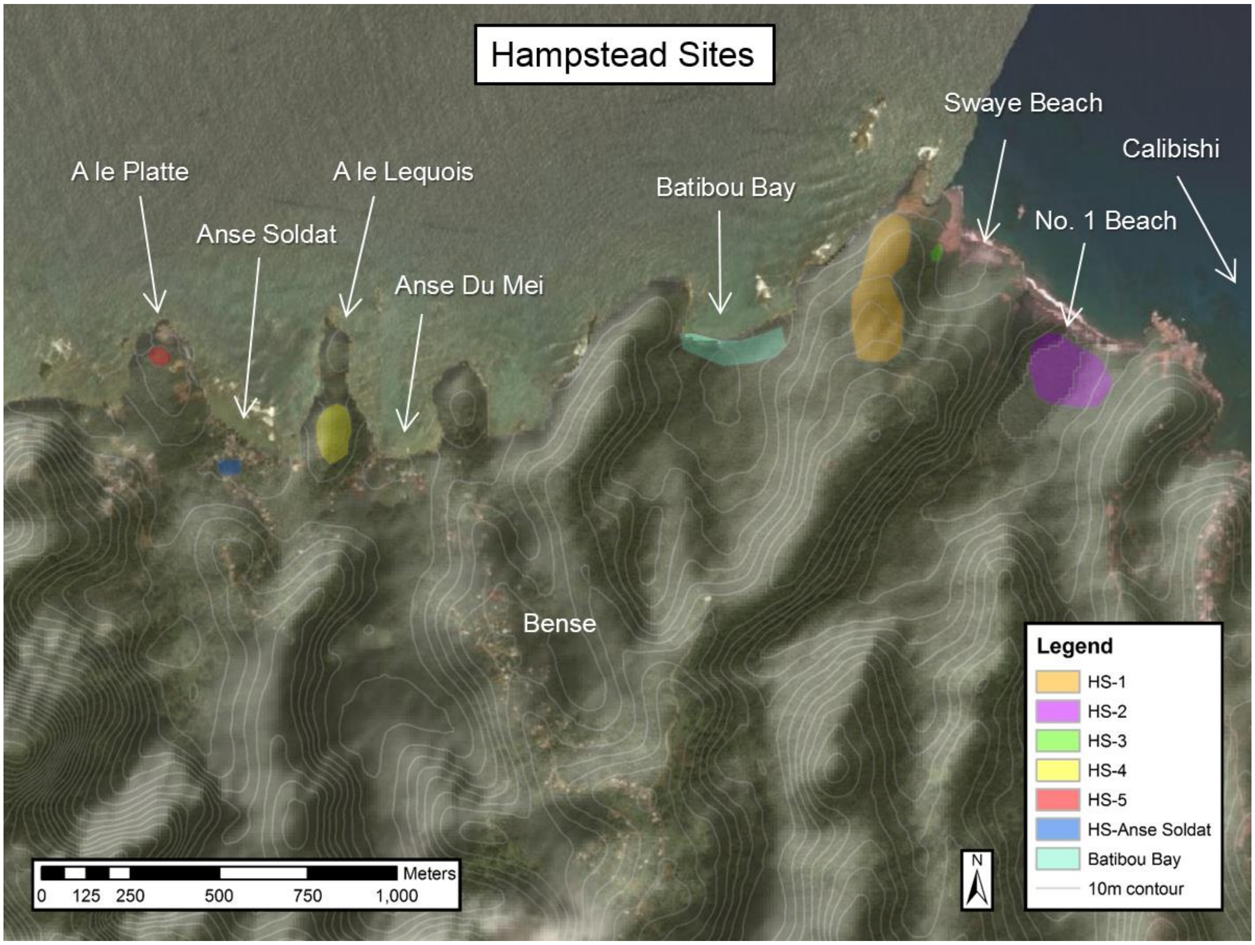

Figure 4-27. Map showing the location of sites in Hampstead.

HS-1 and HS-3

Setting and condition of sites

Site HS-1 is located on the high flat in the triangle between the low coastal village of Calibishi, the high mountain village of Bense and the beach at Batibou Bay. It is near the area where the Douglas family has its farm, and adjacent to the dirt road that leads down to Batibou Bay. At first glance, Batibou Bay appears to be an ideal location for Amerindian settlement. It is a large protected bay with a very large flat area just adjacent. However, the flat by the bay is a bog, inundated with water during most parts of the year (Figure 4-26). Although it is possible that the hydrology has changed over time, and this area was less wet in the past, the current conditions preclude investigation. Away from the boggy area, the terrain rises abruptly from the beach, creating a cliff façade that is typical of many of the narrow beaches in this part of Dominica. The coastline between Batibou Bay and Swaye Beach is an elevated headland with an abundance of exposed rock, which can be seen in the overhead imagery. All of this rock is recently exposed, and the erosion line is clearly seen. The highest density of artifacts recovered from HS-1 came from this area of erosion, which unfortunately seems to indicate that a large portion of the site was lost.

Initial discovery

Site HS-1 was initially identified during the 2009 fieldwork, when we conducted a surface inspection at Batibou Bay and found a very small number of sherds. At that time, we thought that there was a chance that some of the pottery had been re-deposited. It was found on a narrow margin of beach directly between a cliff and the sea, so it did not seem a likely location for habitation. The pottery itself was waterworn, making us think that it had been re-deposited from the sea, and that its initial deposition was either a coastal site that had been eroded away, or an elevated site that had deflated. Our later discovery of HS-1 on the heights above Batibou Bay seem to support the latter, although it is very likely that the coastal flat at Batibou Bay was larger and drier in the past, possibly supporting substantial settlements.

Site HS-1 proper, on the highland above Batibou Bay, was identified in 2013 during our pedestrian survey of Hampstead. It was identified during a group walkover of the area by David Prince, who remarkably found a potsherd on the surface in an area with virtually no surface visibility. In the vicinity of the first surface find, we identified a small cluster of surface finds. An informant told us about a fresh water spring in the area so our initial goal was to cover the intervening area with test pit transects.

Scope of work

In total, we excavated thirty-nine 50-x-50-cm test pits at HS-1 and four at HS-3 (Figure 4-28), which almost certainly represents either a locus of HS-1, or a contiguous deposit separated by post-depositional disturbance associated with the road cut. The initial finds were south of the road, where it bends around the north of the highland flat forming a horseshoe shape. We began by extending transects south and west from the surface finds, attempting to locate site boundaries, which we identified at least partially by the negative test pits at the end of the transect. We then moved toward the bay along a perpendicular transect. Directly across the road, the land began to slope steeply down to the bay but slightly to the east was a relatively flat headland sloping gently to an abrupt eroding cliff face. We adjusted the transect to cover this landform from the road to the cliff face, including perpendicular transects across the other dimension of the site in the area of highest artifact density. We found that the most substantial deposits on the north side of the road were clustered along the eroding cliff face. Approximately 10-20 m inland from the erosion line, the artifact density dropped off sharply. The presence of artifacts eroding directly out of the soil confirms that the landform, and presumably the site, were more extensive in the past. At this time, it is impossible to know its former extent, but it would not surprise me if it once connected to the small island just northwest of the point (Figure 4-28). With our efforts to identify the boundaries of the site, some portions of the middle were neglected and should be the focus of any additional excavations at this site. We had planned to return to do additional testing but were unable during this field season.

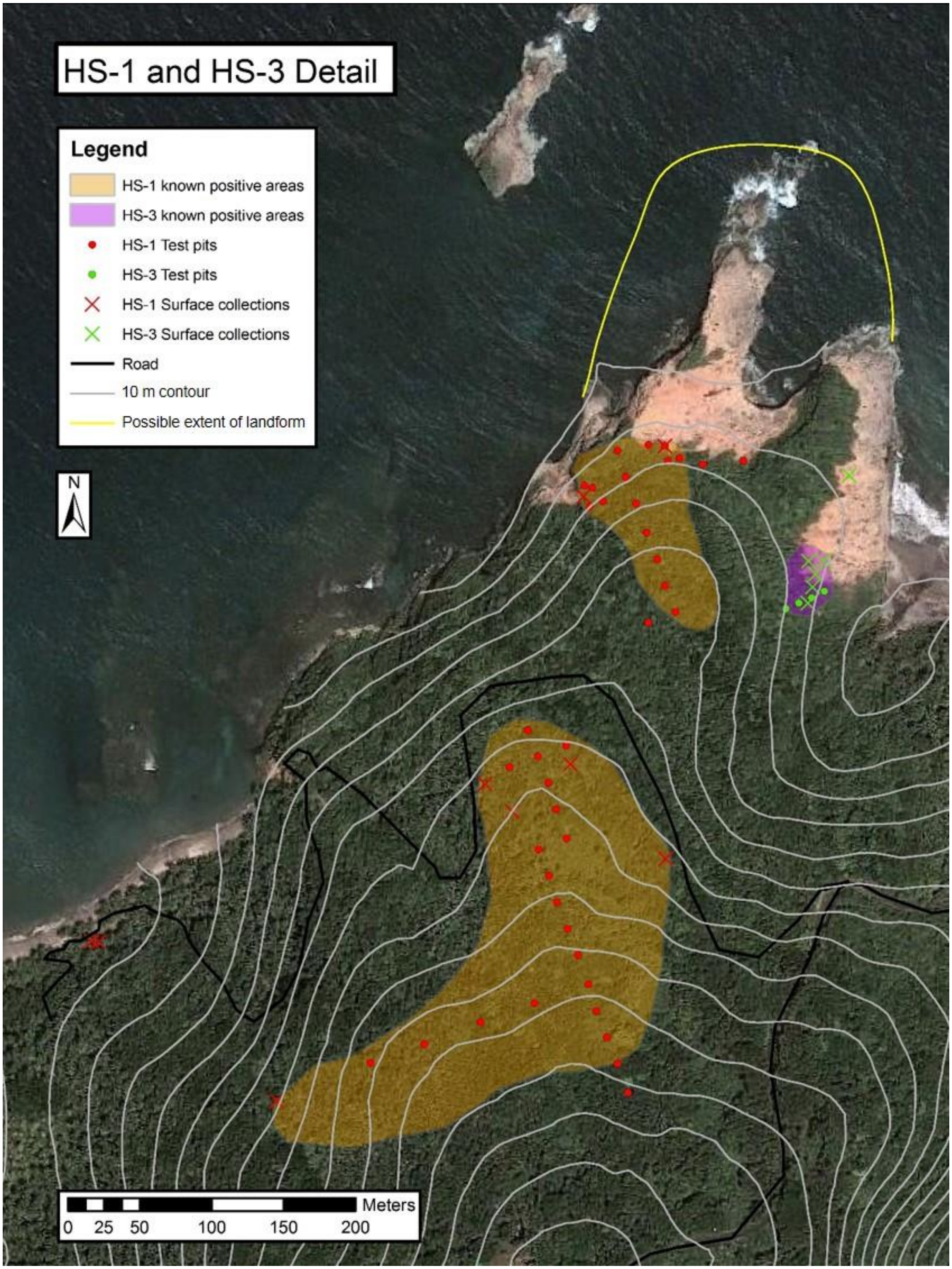

Figure 4-28. Map showing scope of work at HS-1 and HS-3.

Discussion

The assignations of HS-1 (which itself may consist of two separate loci) and HS-3 are a little problematic. They should almost certainly be considered part of the same site. The disturbed area where the road was cut has impacted the middle of the site in a fairly noticeable way, but with minimal additional testing we should be able to determine the relations between these loci. Regardless of the nomenclature, the structure of deposits at HS-1, HS-3 and Batibou Bay, suggests an extensive area of land use with a smaller area of concentrated deposits along the coast, likely representing the residential portion of the site. The southern portions of the site seem to have been only sparsely used because of the diffuse, but widespread nature of the ceramic deposits. This suggests an agricultural function for this portion of the site. Furthermore, I would consider it likely that the pottery we recovered on the surface at Batibou Bay represented the southern boundary of a coastal site that was eroded into the sea. Although in very close proximity, the artifacts recovered from HS-3 are more heavily composed of lithics than pottery, which may suggest a specialized activity or procurement area for lithic production, either within or directly adjacent to HS-1.

HS-2

Setting and condition of site

Site HS-2 is located on a low flat coastal area known as Number One Beach, positioned between Calibishi and Batibou. From HS-1, if you follow the coastal cliff south, eventually you will be overlooking Swaye Beach. If you go down and cross another ridge, you will be overlooking HS-2. From there, it is possible to cross the fourth-order Hampstead River right at the beach because sand has been built up by the sea. However, this appears to be a dynamic coastal region, and it is difficult to know what the river mouth may have looked like in the past. Site HS-2 itself is located in a highly circumscribed lowland area. To the north is the river, which winds around to also circumscribe the western edge of the site. To the east is the sea, and to the south is a very steep cliff that rises up to the ridge separating HS-2 from Calibishi.

Initial discovery

Site HS-2 was initially identified in 2013 through a combination of informant suggestions, pedestrian survey, and subsurface sampling. Jaclyn Douglass, one of the landowners, had mentioned that she thought Number One Beach would be a good spot for us to look based on the kinds of criteria we discussed with her. As it turned out, this was near an area that we had observed in 2009 and were interested in, but which we did not get to investigate at the time. We began our inspection of the area at the road, which is about 2 km inland from the sea following the river. Our plan was to walk along the river until we got to the coast and to look for sites along the way. However, surface visibility was poor, leaving us unable to make a proper surface inspection. We therefore decided to utilize informal subsurface auger tests placed subjectively along the route toward the sea. We spent the entire day navigating the river, which wound through the valley floor, placing auger tests, but found nothing until we got much closer to the bay. Once we got to the last flat between the river and the coast, we excavated the first successful auger test. Even though the sandy area around the auger had excellent ground visibility, there were no artifacts on the surface. This was the result of storm surge and alluvial sand deposits capping the archaeological deposits, which furthermore sink over time into the soft sandy matrix. A surface inspection alone would have failed to identify this substantial and well-preserved site.

Scope of work

Because there was no surface visibility to identify higher artifact densities, we had to conduct a more robust subsurface sampling strategy at HS-2 in order to achieve the coverage we would need to identify the boundaries and orientation of the site. We began by excavating five 50-x-50-cm test pits centered on the positive auger test, and arrayed in a radial pattern around it, in order to quickly identify which direction the deposits were arrayed. One of the test pits, located to the east of the auger, yielded far more substantial deposits. In fact, that test pit had so many large sherds in the wall, we had to extend the pit into a 0.5-x-1-m unit in order to recover them intact.

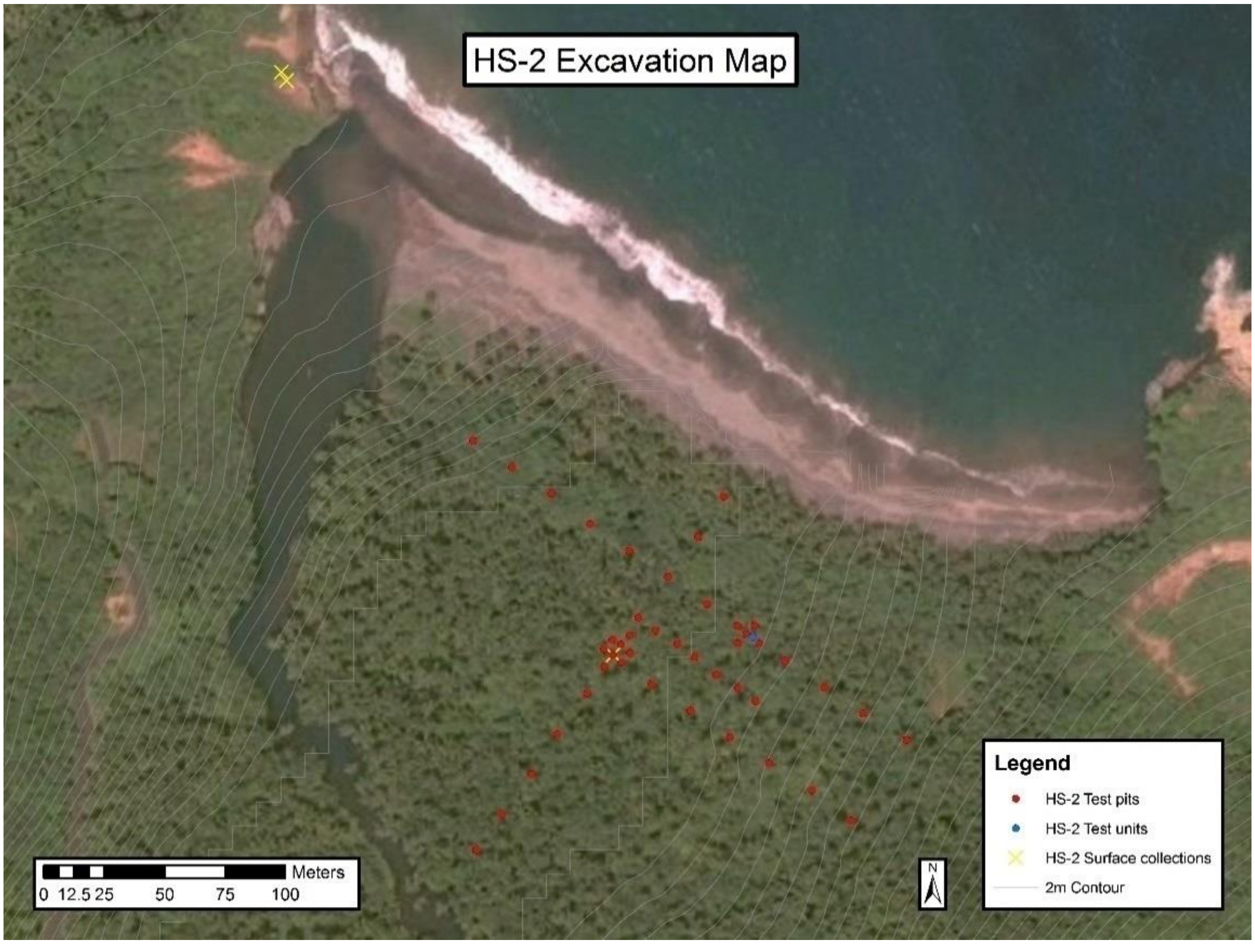

Figure 4-29. Map showing scope of work at HS-2.

Based on the findings of the radial pits, we decided to extend a transect from the auger to the coast at a 50° bearing. Even though we found far fewer artifacts in the pit west of the auger, we still stretched a transect back to the river. Once the transect was excavated, we ran two perpendicular transects across the baseline and extended them to the river on the west, and to the road at the base of the cliff on the east. The double cruciform pattern revealed an area in the middle that had a very high density of artifacts. In order to identify the area of highest artifact density we put a line of short interval test pits between the two perpendicular transects. Once we located a high-artifact-density zone, we placed a 1-x-1-m test unit in the area. In total we excavated forty-three 50-x-50-cm test pits, one 0.5-x-1-m unit, and one 1-x-1-m test unit (Figure 4-29).

Discussion

Site HS-2 has elevated artifact densities, which indicate that it was an important site in the region during the Late Ceramic Age, although evidence of an earlier occupation seems to be lacking at this locale. A range of vessel forms including griddles was recovered, indicating a residential settlement perfectly placed to exploit the river and coastal marine resources. Adjacent finds on the elevated bluffs to the west may have served as lookout posts for the inhabitants and a source for lithic resources, as abundant lithic debitage was found eroding from the surface there. This site is also unique in that a source of very workable clay can be found directly adjacent to the beach. The small beach to the west of HS-2 known as Swaye Beach, which separates it from HS-1/HS-3, was surface inspected and auger tested, but found to be completely devoid of cultural materials. Perhaps this narrow valley was too small or too dynamic for settlement, but it is also possible that flooding and erosion may have erased evidence of sites in that area.

HS-4

Setting and condition of site

Site HS-4 is located on the high and narrow ridge between Anse Du Mei and Anse Soldat known as A le Lequios (Figure 4-30). The area has a relatively wide flat in the south that quickly narrows as the landform moves north. The narrow portions of the landform have been severely impacted by erosion in places. The southwestern portion of the site is truncated by a cemetery with an encircling fence, which occupied the western edge of the wider part of the flat. The southern portion is heavily impacted by the road that cut through to connect Anse Du Mei to Anse Soldat, which also extended up onto A le Lequios, providing access to the cemetery. East of the road and continuing north until the landform becomes very narrow is a portion of land under fairly heavy cultivation.

Initial discovery and scope of work

Site HS-4 was initially identified in 2009, when I was brought to the site by a friend and informant, Peter Domage. Peter had shown us around the area and was helping us get information about landowners and about the history of the area. After spending a day together, he suggested we go up to his pineapple garden, as he thought he remembered seeing Amerindian pottery there. When we went there, the visibility was very limited because, as is common in Dominica, the pineapple fields were covered with black plastic to inhibit weed growth. However, on the margins of the field, pottery was visible. The limited visibility, density of plantings and the adjacent cemetery conspired to prevent a full investigation of the area. We did collect the pottery we found and mapped it in with a handheld GPS. In 2013 we returned after some difficulty in getting in touch with Peter again. With his permission we went back, but found that the same conditions prevented proper excavation. We conducted an informal walkover of the area, this time going as far north as we could to the recently exposed erosion zone, but artifacts seemed to be limited to the wider area near the cemetery. However, erosion in this area precluded adequate evaluation of the sites extent and content, and furthermore, we did not want to excavate anywhere near the cemetery.

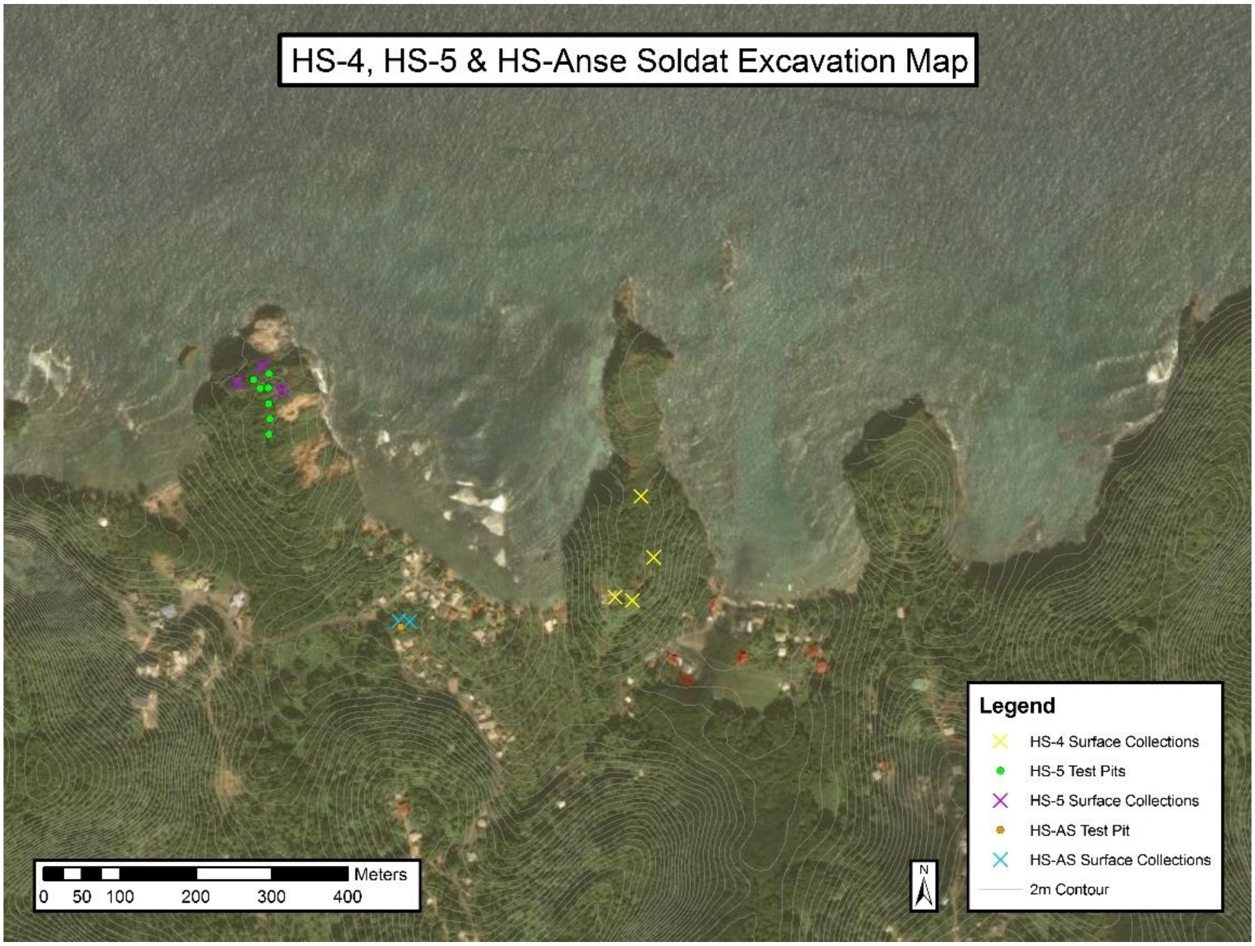

Figure 4-30. Map showing scope of work at HS-4, HS-5, and HS-Anse Soldat.

Discussion

Unfortunately, not much can be said about HS-4 except to acknowledge that a site existed there, but that it has been so heavily impacted that it is difficult to know what the site represents. The area is clearly suitable for gardening, although only small plots are cultivated today. The views from the area are probably the prime draw to this ridge, as with the other narrow promontories in the region. Although it could support a settlement, the size of the landform would restrict it to a very small hamlet or single-family dwelling.

HS-Anse Soldat

Setting and condition of site

Anse Soldat is a small fishing village located on the coastal flat between two high ridges, A le Platte and A le Lequios. The bulk of the lowland area has been heavily impacted by the modern village. The beach area is highly eroded, and buildings are lined up directly on the coastal dune. Both Anse Soldat and Anse Du Mei have very wet and boggy areas on the flats beginning at the back of the beach dunes and continuing until the valleys end abruptly in steep cliffs rising to the heights in the south. Similar marshy lowland environments are typical throughout the area in locales such as at Batibou Bay, Number One Beach, west of HS-2, and Womabati Bay, located west of A le Platte. Toward the back of the village there is a large garden area that has been heavily modified to deal with the inundation. Deep canals have been dug through the lowland gardens and mounded areas were constructed for planting. Although it is very likely that there was once some kind of pre-Columbian occupation at Anse Soldat, only a small number of artifacts were recovered from the lowland and the preservation quality of the site has to be considered very poor. That being said, there are still some areas in Anse Soldat worth investigating. Despite the presence of houses along the beach, intact remains may exist in yards and gardens.

Initial discovery and scope of work

HS-Anse Soldat was identified in 2009 as part of our first preliminary surveys of Dominica. This consisted of a pedestrian survey through the village and in the gardens south of the village. As with HS-4, Peter Domage served as a guide and informant and volunteered to work with us when we excavated a test pit at this site. The pedestrian survey only yielded one piece of pottery and a conch shell axe. A 50-x-50-cm test pit was excavated directly adjacent to the surface finds (Figure 4-30). However, no cultural materials were recovered from the test pit and the stratigraphy hinted that the area had been heavily disturbed by the construction of the village, with possible fill deposits calling into question the provenience of the surface finds.

In 2012 we returned to HS-Anse Soldat and performed a more widespread pedestrian survey of the garden areas behind the village as well as the lowland area at Womabati Bay, the bay just west of HS-Anse Soldat. These surveys yielded no additional finds.

Discussion

Similar to HS-4, there is very little we can say about HS-Anse Soldat at the moment except to recognize that there was some pre-Columbian activity in the area. The small amount of material recovered from our survey indicates either that the lowland areas like HS-Anse Soldat were not the focus of occupation, or that they were heavily impacted by modern development and coastal erosion and are poorly preserved. I would argue that a combination of those factors contribute to the limited assemblage recovered from the area.

HS-5

Setting and condition of site

Site HS-5 is located on the high ridge known as A le Platte, which separates Womabati Bay to the west and Anse Soldat on the east (Figure 4-30). Much like HS-1, HS-3, and HS-4, this high ridge is heavily eroded on the northern edge and on both east and west sides, leaving only a fairly narrow flat on the top. Like other ridges in the area, the location affords superior views of the surrounding areas. The area is covered now in fallow gardens and light tree cover.

Initial discovery and scope of work

Site HS-5 was first identified in 2013 when the crew and I were conducting pedestrian surveys in the area, and was one of the last sites investigated in Hampstead. After searching the Womabati and Anse Soldat lowlands, and finding few artifacts, we decided to check the ridge as was our custom at this point. We found two pieces of what appeared to be Amerindian pottery, and one piece of historic ceramic on the surface. We therefore decided to move ahead with subsurface sampling. We stretched a transect running north to south across the middle of the landform from where it began to slope down to the sea in the north, to where the landform became very narrow and sloped down to the village of Anse Soldat. That transect contained five 50-x-50-cm test pits spaced out at 20-m intervals. A low-density mixture of pre-Columbian and colonial artifacts were recovered from the three northernmost test pits on the transect, but the last two were devoid of cultural material. We excavated two more test pits on perpendicular transects to cover the western edge of the landform but both pits were negative for cultural material.

Discussion

As with HS-4, so little material was recovered from HS-5 that it is difficult to say anything more than that it was an area that was used in the past, but for what exactly, we do not know. The sightlines make the area a prime lookout spot, which no doubt accounts for the colonial period artifacts recovered from the area, including a gunflint, which may point toward a strategic military position. The area would be suitable for habitation for a very small group or family, and in fact, a small shack with an adjacent garden can be found on this property. However, the landform is too small to support anything more than that. As with other ridges in the area, we cannot assume that the landform was the same size in the past as it is today as the entire coastline in this region is characterized by substantial and fairly extensive erosion.

Chronological Relationships

In order to establish chronological relationships among the sites studied, six specimens were submitted to Beta Analytic for AMS radiocarbon dating (see Table 4-1 for 2σ calibration; also see Figure 4-35). Because many of the sites excavated were still under cultivation, and because slash and burn is still a technique used frequently in gardening, charcoal samples from near-surface contexts had to be discounted. Instead I selected samples from either sealed/buried contexts, basal strata, or organic residues recovered from potsherds. In one case, the organic temper from a vessel recovered from CB-1 permitted us to directly date the pottery. Below, I describe the context from which each of the samples was drawn, and discuss my interpretation of the chronological relationships.

Table 4-1. Radiocarbon assays from five different sites.

Lab #	Site	Context	Specimen Type	Conv. C^{14} age	2σ Age Range (mid-point)
Beta-367733	HS-2	Test unit 1, NE quad 110-120 cmbd	Organic residue on sherd	870 +/- 30 BP	Cal BP 900-730 (815)
Beta-366737	CB-1	Test pit 1 0-10 cmbs	Bulk sherd organics	840 +/- 30 BP	Cal BP 790-690 (740)
Beta-366738	CB-3	Test unit 1, NW quad 91 cmbd	Charred material	890 +/- 30 BP	Cal BP 910-730 (820)
Beta-366739	DEL-2	Test unit 1, NE quad 78 cmbd	Charred material	1450 +/- 30 BP	Cal BP 1390-1300 (1345)
Beta-366740	DEL-2	Test unit 1, NE quad 96 cmbd	Charred material	2380 +/- 30 BP	Cal BP 2470-2340 (2405)
Beta-366741	DEL-3	Test pit 1 49 cmbs	Charred material	1900 +/- 30 BP	Cal BP 1920-1810 (1865)

HS-2 (Beta-367733)

From HS-2, one radiocarbon assay returned a conventional age estimate of 870 +/- 30 BP. This assay comes from organic residue recovered from a potsherd found in a deep layer, 110-120 cm below datum (~65-75 cm below ground surface) in test unit 1 (Figure 4-31). The test unit yielded very deep deposits, but was located in a very loose sandy matrix, permitting artifacts to move downwards over time. This suggests that the stratigraphic relationships among artifacts cannot be considered reliable. Therefore, although there was abundant charcoal in the matrix in deeply buried strata, we could not clearly associate the charcoal to the artifact deposits. Fortunately, we recovered one potsherd with enough organic residue attached to be directly dated. Although there is only one age estimate from this site, I consider it to be fairly representative of the earliest occupation at HS-2. In looking at the ceramic assemblage from HS-2, the variation is not suggestive of multiple components and similarities to regional ceramic taxonomies situate that site in the Late Ceramic Age, with both Cayo and Suazoid traits evident in the assemblage. Unfortunately, with only one age estimate, there is no range to suggest the length of occupation at HS-2. However, because of the depth from which we recovered the potsherd, despite the potential for vertical mobility of artifacts in the sandy matrix, it is considered likely that this estimate represents the earlier end of the occupation.

Figure 4-31. North wall profile of test unit 1 at HS-2.

CB-1 (Beta-366737) and CB-3 (Beta-366738)

Site CB-1 is the most likely site to represent a single household occupation, probably tied to other settlements in Castle Bruce, such as those at CB-3, CB-5, and CB-Tronto. More than any other micro-region, the pattern of dispersed but integrated or networked occupations seems apparent in Castle Bruce. This is supported by the limited range of radiocarbon age estimates from this watershed. From CB-1, we obtained one radiocarbon assay. Although there were potential features at CB-1 such as the possible postmold and the ambiguous pit feature, we were still tentative about dating charcoal from these features as their cultural affiliation could not be confirmed. Also the shallow nature of the deposits left doubts about slash and burn contamination. However, we recovered one potsherd from CB-1 that had an abundance of organic temper. We therefore elected to have Beta Analytic assay the bulk organics in the sherd. This returned a conventional age estimate of 840 +/- 30 BP, which would suggest the occupation at CB-1 was roughly contemporaneous with the occupation at HS-2.

Site CB-3, like CB-1, is positioned in a locale that implies a networked affiliation to other sites in the settlement system. Because it is so far removed from the coast, it is considered unlikely that CB-3 would be occupied without concurrent occupations on the coast to exploit marine resources and to maintain awareness of the surroundings. The integrated community model is supported by the radiocarbon assay from CB-3. This assay was obtained from a piece of charcoal recovered from the interface of the second and third strata of test unit 1 (Figure 4-32). The second strata contained the highest density of artifacts, whereas the third stratum was basically devoid of artifacts once excavation extended below the slightly mixed interface. Although this charcoal does not come from a feature context, it can be considered affiliated with the cultural materials as it was horizontally associated with potsherds found at the base of the strata. The conventional age estimate recovered from the piece of charcoal was 890 +/- 30 BP, making it roughly contemporaneous with the assays obtained from both HS-2 and CB-1.

Although there are only two radiocarbon assays from Castle Bruce, I consider these to be reliable age estimates. They both come from sites that could be considered marginal areas compared to the more likely settlement areas closer to the coast. Both sites produced griddles and other ceramic vessels suggesting a residential function. Site CB-3 in particular has the dimensions of a larger settlement or even a small village. Although we were not able to recover reliable datable material from the coastal sites at CB-5 and CB-Tronto, I suspect that future excavations will reveal that they were at least partially contemporaneous with both CB-1 and CB-3. Given that late-Saladoid-like pottery decorations were recovered from CB-5, it would seem to suggest that the familiar pattern of nuclear coastal villages expanding into surrounding areas during the post-Saladoid period (Bright 2011; Callaghan 2007; de Waal 2006; Hofman et al. 2008b), may also characterize the settlement trajectory at Castle Bruce.

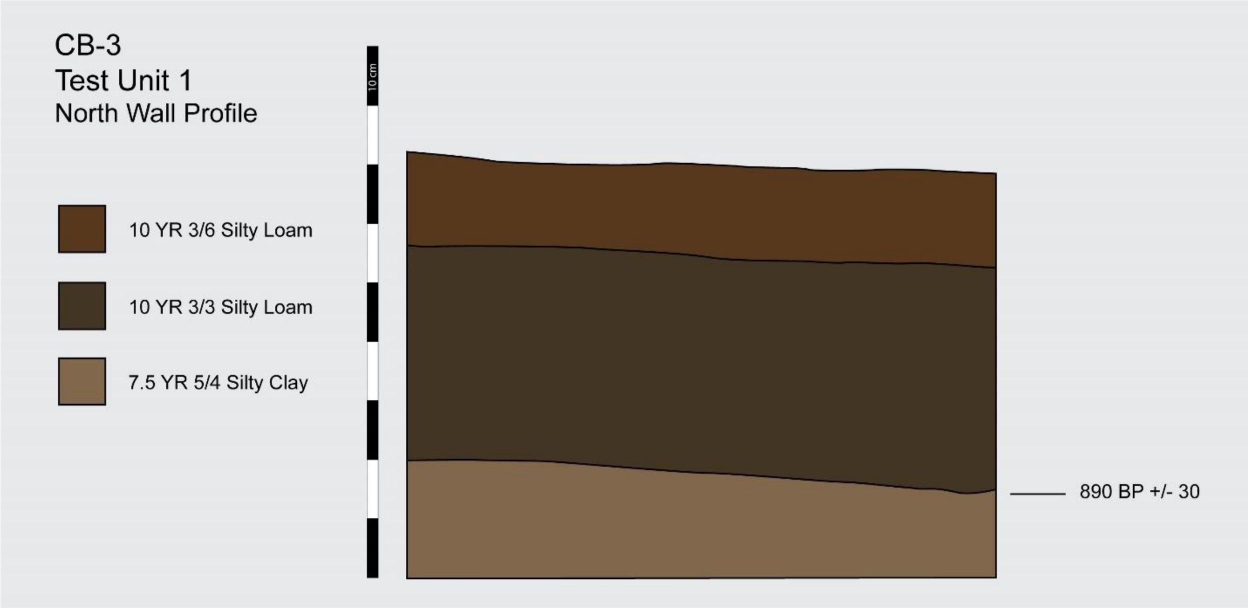

Figure 4-32. North wall profile of test unit 1 at CB-3.

DEL-2 (Beta-366739) and (Beta-366740)

The test unit at DEL-2 offered the best stratigraphy of any site we encountered. It also yielded some of the densest deposits of artifacts from a potential midden context, second only to DEL-3 in terms of density. Scattered throughout the excavation there was charcoal in loose association with the artifacts. However, as the area had been under recent cultivation, we had to disregard charcoal found close to the plow-zone. The test unit revealed five strata (Figure 4-33). The top four strata were all artifact bearing, although the second and fourth darker strata had higher concentrations, with the highest concentration by far coming from the fourth stratum. There were very few concentrations of charcoal in the lower levels, but we did find two that we submitted for radiocarbon assays. The first was obtained from the artifact-dense fourth stratum and returned a conventional age estimate of 1450 +/- 30 BP. This sample was recovered from the middle of the stratum and was in direct association with pottery.

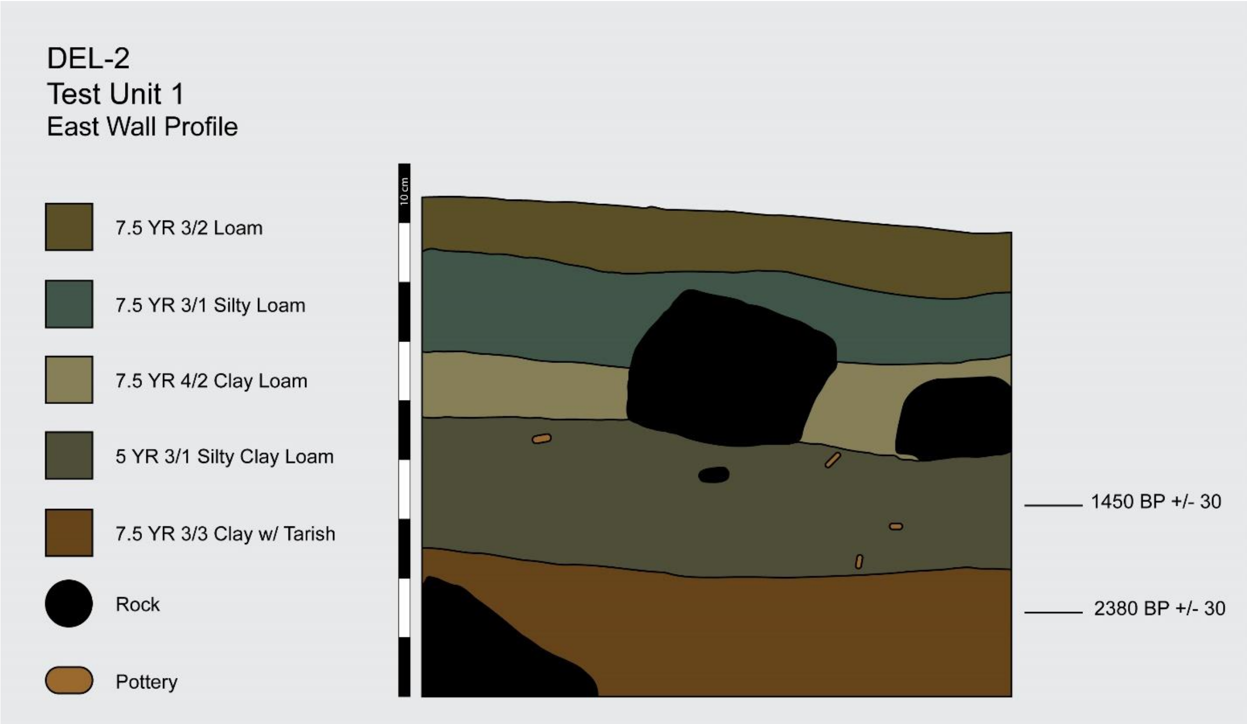

Figure 4-33. East wall profile of test unit 1 at DEL-2.

The second assay comes from the deepest stratum, just below where the deepest artifacts were recovered. It returned an earlier age estimate of 2380 +/- 30 BP, which probably represents the earliest or basal date for the site, if not the micro-region.

If this age estimate is truly associated with the occupation, it would place DEL-2 among the earliest Ceramic Age sites in Dominica. This also suggests a length of occupation for the site that lasted more than a millennium, although nothing at this point guarantees that it was occupied continuously through this span of time.

DEL-3 (Beta-366741)

Site DEL-3 had the highest density of artifacts of any site we investigated. However, it is not a very well stratified site and a portion of it continues to erode into the White River. It has also been heavily impacted by a modern road cut and other terraforming activities. However, a small portion of the site has remained relatively in-tact and it was in this area that we focused our excavations, particularly in the areas most likely to be impacted by near-future erosion. Test pit 1 was one such excavation, perched right on the edge of the erosion zone above the White River. It yielded a high density of artifacts, particularly from the second stratum, which was encouraging as it appeared many of the deposits were spared the from the intrusive 25-cm-deep plow zone (Figure 4-34). This test pit yielded a very high number of decorated vessels as well as a wide variety of decorative motifs. Datable material from the nearby test unit was not recovered, but we had recovered some charcoal in association with pottery at the base of the second stratum of test pit 1. Although artifacts carried into the lower third stratum, it appeared as if they were mixed in from above and tapered off toward the rocky barrier at the base of the pit. For this area of the site, the context from which the charcoal sample was taken can be considered representative of the earliest deposits. With just one age estimate from the site, it is impossible to project a full chronological range for the occupation, but considering the basal context from which the 1900 +/- 30 BP age estimate was obtained, and the density of artifacts recovered above, it would be reasonable to assume that DEL-3 was still occupied in 1450 BP and perhaps later, bringing it roughly in line with the occupation at DEL-2.

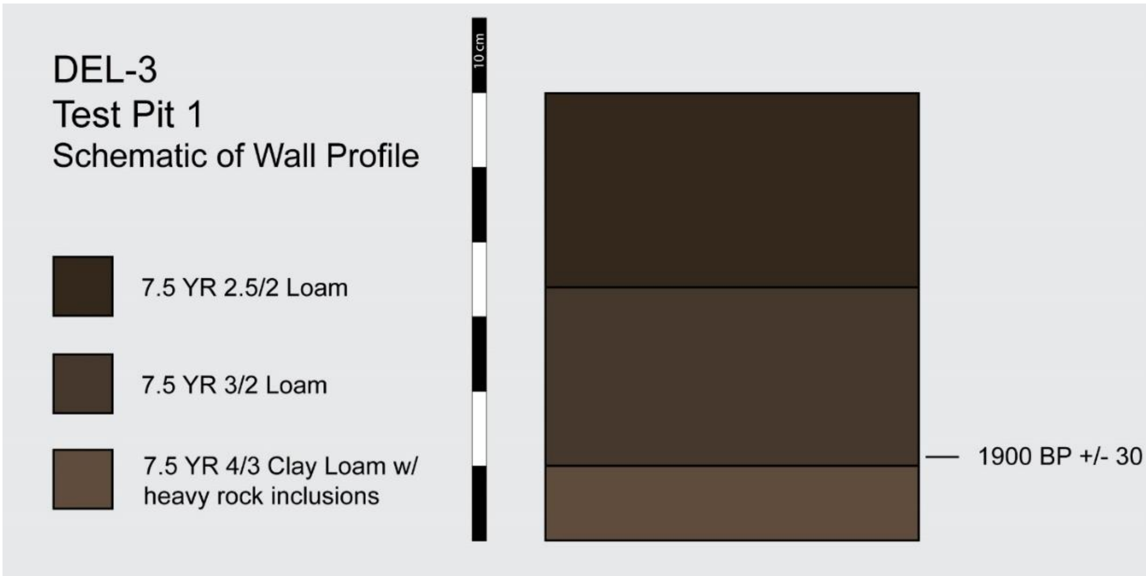

Figure 4-34. Schematic of wall profile of test pit 1 at DEL-3.

Discussion

With only six radiocarbon age estimates, the present understanding of chronological relationships among the sites can be considered only tentative. However, the age estimates available offer some interesting possibilities about how to interpret settlement patterns in Dominica, and more importantly, how to proceed with future work. The apparent contemporaneity of HS-2, CB-1, and CB-3 is particularly intriguing as it opens avenues for synchronic comparisons that are critical for understanding multisite communities. However, we have to be careful to not equate contemporaneous radiocarbon age estimates with contemporaneous occupation in a straightforward manner, as seasonal, shifting, and logistical mobility patterns, as well as changes in these practices through time, could account for settlement patterning, and invalidate the assumption of contemporaneity. With that caveat, the radiocarbon assays obtained from

Castle Bruce would fail to reject the hypothesis that communities in this micro-region were organized in contemporaneously occupied, functionally interdependent settlements.

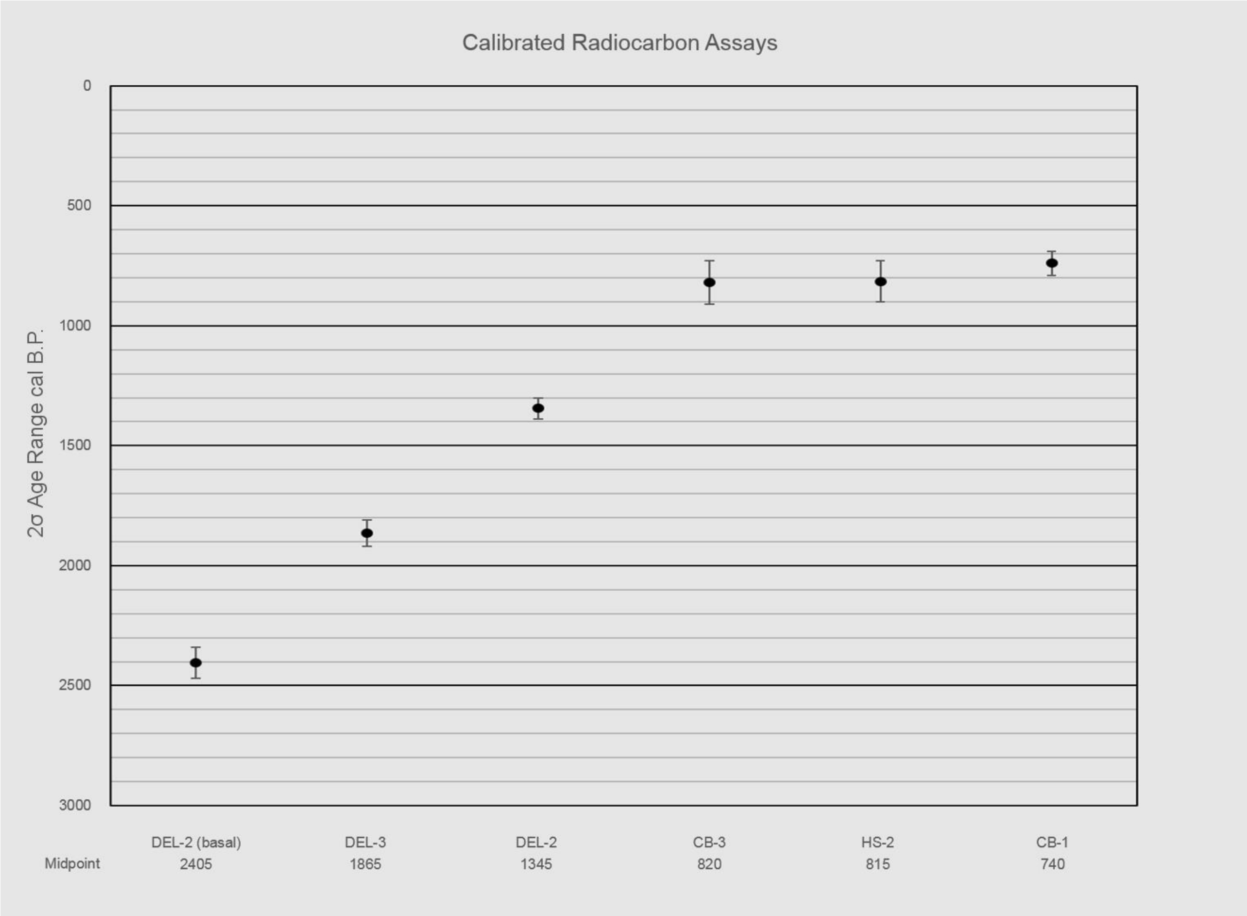

Figure 4-35. Calibrated radiocarbon age estimates from five sites.

The radiocarbon age estimates from Delices are a little more problematic and require more interpretation. On one hand, it makes perfect sense that Delices would be the site for the earliest Saladoid occupation on the east coast, and indeed, the ceramic assemblages are indicative of this Saladoid presence. It is less clear from the radiocarbon assays obtained from Delices how to interpret the later post-Saladoid developments in the region and how to interpret the alternating age estimates from DEL-2 and DEL-3. Although the three assays from Delices are earlier than the age estimates from Hampstead and Castle Bruce, the context from which the charcoal was recovered needs to be considered as well. The 2380 +/- 30 BP age estimate from DEL-2 was taken from just below the deepest artifact-bearing layer in the 85-cm-deep test unit and the 1900 +/- 30 BP age estimate from DEL-3 was taken from the deepest artifact-bearing layer in the 60-cm-deep test pit. Thus, these estimates should be interpreted as representing the earlier end of the range of occupation. The two assays from the test unit at DEL-2 are separated by approximately 900 years. Although the older assay comes from the basal layers, the younger one comes from the middle of the densest artifact-bearing stratum, approximately 35 cm below the shallowest deposits (Figure 4-33). These age estimates could still be consistent with an occupation that ranges into the late ceramic and proto-historic periods. We have the lower end of the range and a critical next step in the research will be to determine the upper. Because the radiocarbon assays offer only limited evidence as to the relationships among the sites studied, in the next chapter, I present a detailed analysis of the artifact assemblages in order to develop further insights into possible relationships within each of the micro-regions and among them.

CHAPTER 5
ANALYSIS AND RESULTS

Having looked at each of the three micro-regions and the sites investigated in some detail, I now present the various analyses conducted. Before examining the results however, I first discuss the hypotheses to be evaluated, and some of the assumptions I made in order to derive test implications. The hypotheses are simply restatements of the first two research questions. The analytical strategy involved constructing a series of comparisons at local and micro-regional scales to explore dimensions of variability using inferential and descriptive statistics, measurements of diversity, and proportional data for certain categorical attributes. Tests were designed to identify statistically significant differences among the compared assemblages, but such tests are only as useful as the questions they address and the selection of variables to which they are applied (formulas utilized can be found in Appendix B). As summarized in Chapter 3, great care was taken in selecting variables for analysis that were considered likely to permit the kind of inferences about community organization, regional interaction, and site function that the research questions demand.

The goal of the tests is to accumulate evidence of difference, or lack of difference among the assemblages. In general, the tests will have as the null hypothesis that the compared assemblages are not different, can be thought of as drawn from the same population, or that observed differences result from sampling. When a test fails to reject the null hypothesis, depending on the attribute being considered, it could indicate affinity or isomorphism between sites in terms of activities carried out with pottery, or that there was little functional differentiation between the compared assemblages. In such a case we also have to evaluate the possibility that the result is attributable to sampling. If the test has grounds to reject the null hypothesis, it could indicate differences, the nature and implications of which will require further examination. In Chapter 6, other evidence–such as contextual landscape clues, ethnohistoric and ethnographic data, related regional archaeological data, and results from other analyses—is incorporated to help interpret the results of these tests.

The analysis is divided into three main parts. First is the technofunctional attribute analysis, which includes a series of statistical tests on six variables: rim shape, rim orientation, orifice diameter, wall thickness, surface treatment and the application of decorative elements. Second is the analysis of paste selection and preparation, which includes sections on the neutron activation analysis and the petrographic analysis of aplastic inclusions. Finally, the chapter concludes with the lithic materials analysis.

Hypotheses and Assumptions

The first hypothesis to evaluate is that sites within micro-regions were functionally differentiated, and that this differentiation was characteristic of a particular community organization based on interdependence, serving to integrate multiple sites. The null hypothesis, that there is no difference between sites, could be interpreted in several ways. If the same activities involving pottery were practiced at different sites, or if the same group of people was moving sequentially between sites but basically performing the same activities at each one, we should fail to reject the null hypothesis. These possibilities would be suggestive of more or less autonomous communities. However, if sites were occupied sequentially by different groups of people that made or used pottery differently, we might commit a type I error and incorrectly reject the null hypothesis. For this reason, to address the hypothesis, not one, but several tests are implemented to look for congruence in the results, all of which require interpretation.

The focus on technological style and communities of practice help to alleviate this concern, because we expect that functionally differentiated sites in an integrated community will feature similarity in certain attributes (i.e., clay selection/preparation, forming technique), but difference in others (i.e., rim shape, orifice diameter).

This hypothesis is addressed at the local (intra-micro-regional) scale by framing comparisons among sites found within micro-regions. These comparisons are subject to issues of sample size, as some of the smaller sites investigated, although critical to understanding settlement patterns and community organization, did not yield large enough samples of vessels to participate in the statistical tests employed. This is particularly true of Hampstead, where only HS-2 yielded a sufficient sample of vessels to be comparable. For intra-micro-regional integration, only Castle Bruce and Delices can be analyzed. Within these micro-regions, only sites with large enough samples are included when sample size would affect the results.

A number of assumptions are made in order to derive test implications for this hypothesis. First, is that functional differentiation is reflected in the variable composition of vessel forms that constitute assemblages. This assumption is supported by ethnohistoric observations (e.g., Breton 1958a), ethnographic analogy (e.g., Boomert 1986), and other archaeological studies from the Caribbean (e.g., Espenshade 2000), which indicate that specific vessel forms had specific functions, even though some range of morphological variation existed within functional categories (Boomert 1986). Three more assumptions follow from this: sites yielding griddles functioned minimally as domestic/residential sites; small-orifice serving vessels, especially when decorated, likely functioned in ceremonial or ritual contexts, such as feasting or drinking parties;

and large-orifice, thick-walled, undecorated vessels likely served a domestic processing, storage, or brewing/fermenting function. The next major assumption is that higher ratios of microlithic artifacts are likely related to agricultural processing, particularly in the construction of graters. To the degree that lithics can be associated with such domestic activities, sites with elevated lithic proportions can be assigned a domestic/agricultural processing function. This assumption is further evaluated in the lithic materials analysis. Another assumption is that it is more likely that coastal sites will be occupied in the absence of an interior occupation than interior sites occupied in the absence of coastal occupations (Bradford 2001). Finally, an assumption of relative contemporaneity between certain sites is made to facilitate comparisons. By holding time constant, once the variability in the assemblages is characterized, the degree to which time may explain differences can be explored.

The second hypothesis, involving an evaluation of the enclave model, is that, at times, communities in different micro-regions were integrated with one another, forming regional, rather than locally autonomous polities. The “enclave” communities described by Trouillot (1988) were characterized by physical and socioeconomic boundaries, within which he identified the spatial and social extent of truly integrated communities. This unit, the enclave, served to structure, or at least mediate, the relationship between the integrated local community, and external forces including the other *imagined community* of Dominica, the Nation. In this analysis, enclave is defined as a sociopolitically autonomous unit, even though it may integrate a number of small settlements within a bounded area. Interaction with other enclaves occurs, but is not the kind of interaction and interdependence that characterize truly integrated communities.

This hypothesis questions the degree to which such social boundaries and relationships are evident in the pre-Columbian archaeological record. As before, the null hypothesis can be thought of as the possibility that there are no differences between micro-regions. The more tests that reject the null hypothesis, the more difference revealed, the greater the likelihood that we can think of differences between micro-regions as representing some kind of boundary between communities, whether temporal, social, political, or other. If few tests reject the null hypothesis, it might suggest that there is a greater degree of interconnectivity between micro-regions and would support the hypothesis that occupants of these micro-regions belonged to integrated communities. However, because integrated communities can be organized around patterned differences (i.e., centers and peripheries), when individual tests reveal statistically significant differences, it is open to interpretation whether it constitutes a rejection of the null hypothesis relating to inter-micro-regional integration. Depending on the test, and the attributes considered, I will offer a range of possible interpretations.

To derive test implications, I assume that a high degree of similarity in multiple ceramic manufacturing techniques is more indicative of integration than mere interaction, and represents shared membership in an integrated community of practice, particularly when independent lines of evidence reveal few differences in the technical systems or technical choices made by potters. I also assume that the degree to which a community is regionally oriented will be reflected in the assemblages by an elevated expression of extra-local influence, including: more exotic or imported materials; a higher diversity of ceramic manufacturing techniques; and higher proportions of decorated vessels because of factors including, but not limited to: the diffusion of ideas, the increased need to signal information symbolically, and the centralization of regional ceremonialism at specific locales, whether involving material exchanges or not. If certain micro-regions are found to be more regionally oriented than others, it might suggest that resident communities were less like enclaves, less autonomous and potentially integrated with other communities.

This hypothesis is evaluated at the regional (inter-micro-regional) scale by framing comparisons between the combined assemblages from each micro-region. As the scale of analysis expands and the data are re-framed to facilitate broader comparisons, the number of unknown or unaccounted-for factors that could contribute to variability in the assemblages increases and is compounded. This is because the comparisons are framed between assemblages drawn from multiple sites within micro-regions, potentially grouping unrelated occupations and functionally distinct assemblages. This necessitates the contemporaneity assumption, which as before, can then be re-evaluated to explain differences. I also make the assumption that the range of activities involving pottery carried out in the micro-regions is sufficiently represented in the micro-regional assemblages.

There is something else about this shift in scale that should be considered. At the regional scale, we, as archaeologists, do not experience the island and the relationships between places in the same way we do within micro-regions. Amerindians no doubt experienced these different scales of relations in ways we might not even be able to imagine, let alone reconstruct. While working within micro-regions, we got familiar with the spatial relationships among sites and the arrangement of sites on the landscape, which provided contextual knowledge we then used to form specific questions to be addressed archaeologically. For example, through our experience in survey, intervisibility and floodplain hydrology came to light as important variables in settlement positioning. But not being expert canoe paddlers, it is difficult for us to experience the “islandscape” in the same way. We took boat trips up and down the coast so we could view the micro-regions as they would have been seen by sea. We spent some time learning about canoe manufacture and voyaging from the Kalinago. But how can we know how interconnected these communities were, and if they were interconnected with each other specifically?

Because this might not be an obtainable goal with the available evidence, instead I investigate regionality as the degree that extra-local influence is evident in each micro-region. I first ask, how regionally oriented were these communities? Then the possibility that interconnectivity extended between the specific micro-regions investigated can be evaluated. Once the micro-regions are characterized in this manner, the nature and implications of any interconnectivity or evidence of enhanced regionality can be explored.

In the following paragraphs, I start by describing the total pottery assemblage and provide summary statistics. I then present the results of the various statistical tests conducted on comparisons of morphological attributes, exploring patterning in the assemblages at different scales of analysis, shifting back and forth between intra- and inter-micro-regional comparisons to provide evidence to evaluate these hypotheses. In general, for each attribute I begin by discussing the total assemblage, then the assemblages from each micro-region, followed by a within-micro-region, site-by-site discussion of certain aspects of the assemblages. As the results are considered, it is important to keep in mind that no one test will provide the evidence needed to support one or another interpretation. Rather, it is in the congruence among results of several different tests that such evidence can be found.

Technofunctional Attribute Analysis

Description of Pottery Assemblages

This study uses a vessel unit of analysis. In total, there were approximately 11,205 sherds recovered from fieldwork. Of those, we were able to establish a minimum number of 785 vessels by matching body sherds to rim sherds, and combining rim sherds into vessel lots. Table 5-1 shows the distribution of vessel lots and griddles by site and micro-region. It is immediately clear that the number of sherds and vessels is not equivalent among micro-regions. Castle Bruce and Hampstead each returned very similar numbers of vessels, whereas Delices returned just over six times the amount. Although it is possible that this reflects actual demographic variation, it could also be attributed to three other factors: sampling, time, and taphonomy.

Sampling. The subsurface sampling strategy was designed as much to look for boundaries of sites as to examine denser portions of sites. For this reason, some of the smaller sites are represented by very small assemblages. Furthermore, as we used a systematic, rather than random sampling strategy, samples used in the analysis might not be statistically representative of the sites from which they were drawn and violate the assumptions of certain statistical procedures (Drennan 2009). For this analysis, I avoid drawing inferences from tests that rely on this assumption, knowing that the issue can be addressed as future research increases the samples we have to analyze.

Table 5-1. Inventory and minimum number of vessels for sites and micro-regions.

	Sherd Count	Rim Vessels	Griddles
Hampstead			
HS-1	157	6	1
HS-2	1228	55	5
HS-3	57	5	1
Total	1442	66	7
Castle Bruce			
CB-1	48	5	1
CB-3	970	46	2
CB-5	122	12	1
CB-6	35	1	1
CB-Tronto	183	24	2
Total	1358	88	7
Delices			
DEL-2	2913	175	14
DEL-3	4895	318	18
DEL-4	60	8	0
DEL-5	260	20	0
DEL-7	277	63	1
Total	8405	584	33
Grand Total	11205	738	47

Time. The radiocarbon age estimates from Delices suggest an earlier first occupation for the micro-region, but the basal nature of these dates suggest that occupations persisted into later periods as well. Although based on only three age estimates, the occupations in Hampstead and Castle Bruce appear to be roughly contemporaneous and later than the earliest occupations at Delices. However, it is my belief, based on the context from which the radiocarbon samples in Delices were drawn, that additional radiocarbon assays will show that later occupations in Delices were roughly coeval with occupations at Hampstead and Castle Bruce. This provides the justification for comparing Delices to Castle Bruce and Hampstead, but also suggests that any variation from the Delices assemblage must consider time as a possible explanation.

Taphonomy. Taphonomic processes, both naturally occurring and resulting from modern development, have affected almost all of the sites, but some sites are more heavily impacted than others. Sites in Delices were better preserved than sites in Castle Bruce and Hampstead, although road cuts, grading, quarrying, and erosion caused by the White River, have all impacted sites in the micro-region. DEL-3, one of the sites most heavily impacted, still yielded the largest assemblage, even though the scope of excavations was equivalent to or less than other sites. In Castle Bruce, CB-5 was extremely impacted by a combination of factors including sea action, erosion caused by the meandering river course, colonial plantation activities, and the construction of the playing field. In Hampstead, HS-2 was the densest site and also the best-preserved. In contrast, both HS-1 and HS-3 were severely impacted by erosion, to the point that it is impossible to determine how large or dense the original sites were. A further consideration is the impact that Dominican small-scale cultivation techniques have on the preservation of sites. Many people keep their gardens meticulously clean, tending to them more or less every day. We had several informants tell us that they would sometimes remove potsherds by hand and by sweeping or raking. For these reasons, comparing the different sites and micro-regions by the bulk or density of cultural materials would be misleading.

Trends in Diversity and Distribution of Morphological Attributes

Rim shape

Rim shape and orientation are two of the most critical variables governing overall vessel morphology (Figure 5-1). We grouped all vessels preserving rim morphology into

10 basic categories: Flanged, interior flanged, flat, pointed, round, special decorated, thickened flat, thickened pointed, thickened round, and griddles (Figure 5-2). In the calculations that follow, the interior flanged category is ignored because it contains only two specimens, although three vessels with both interior and exterior flanges could have been included. For rim shape, I present a detailed description of the analysis in order to clarify the analytical procedures, which are then presented in a more straightforward manner for the remaining attributes.

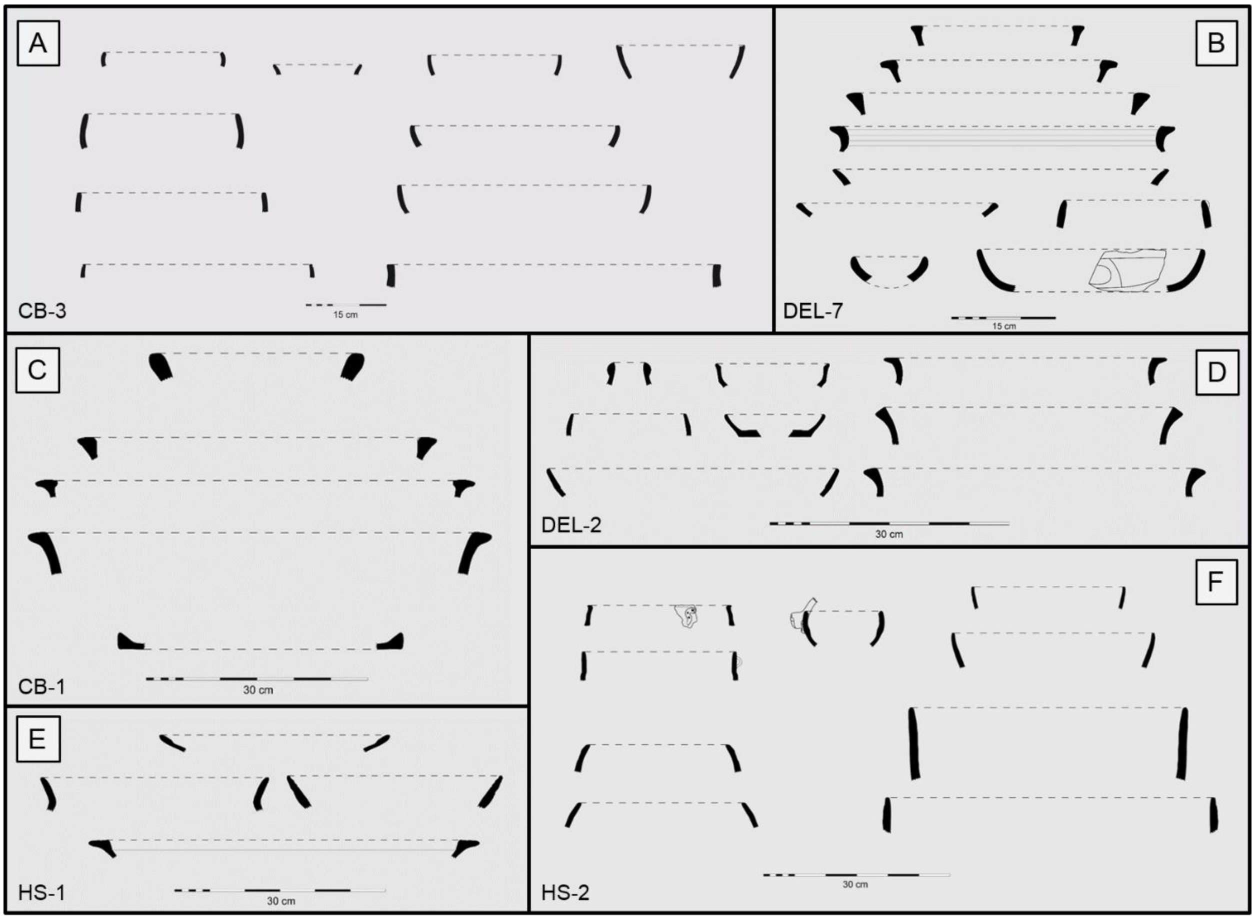

Figure 5-1. Vessel reconstructions. A) Site CB-3. B) Site DEL-7. C) Site CB-1. D) Site DEL-2. E) Site HS-1. F) Site HS-2.

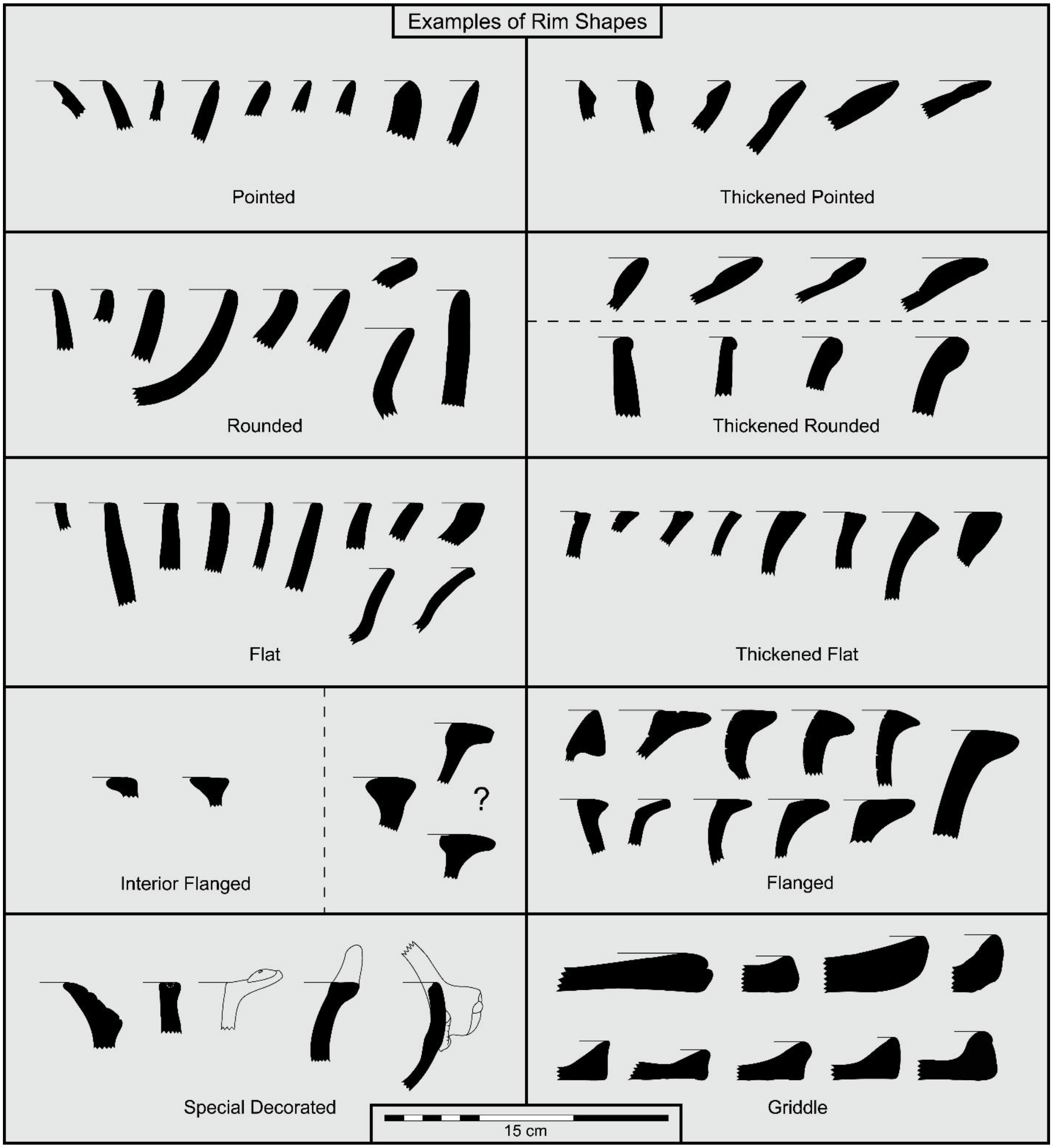

Figure 5-2. Examples from 10 rim shape categories. Notice that the thickened rounded category should be split into interior thickened and exterior thickened (Hofman 1993) but was not coded that way during the analysis. Also, some flanges flare inward and outward, but were coded as normal flanges.

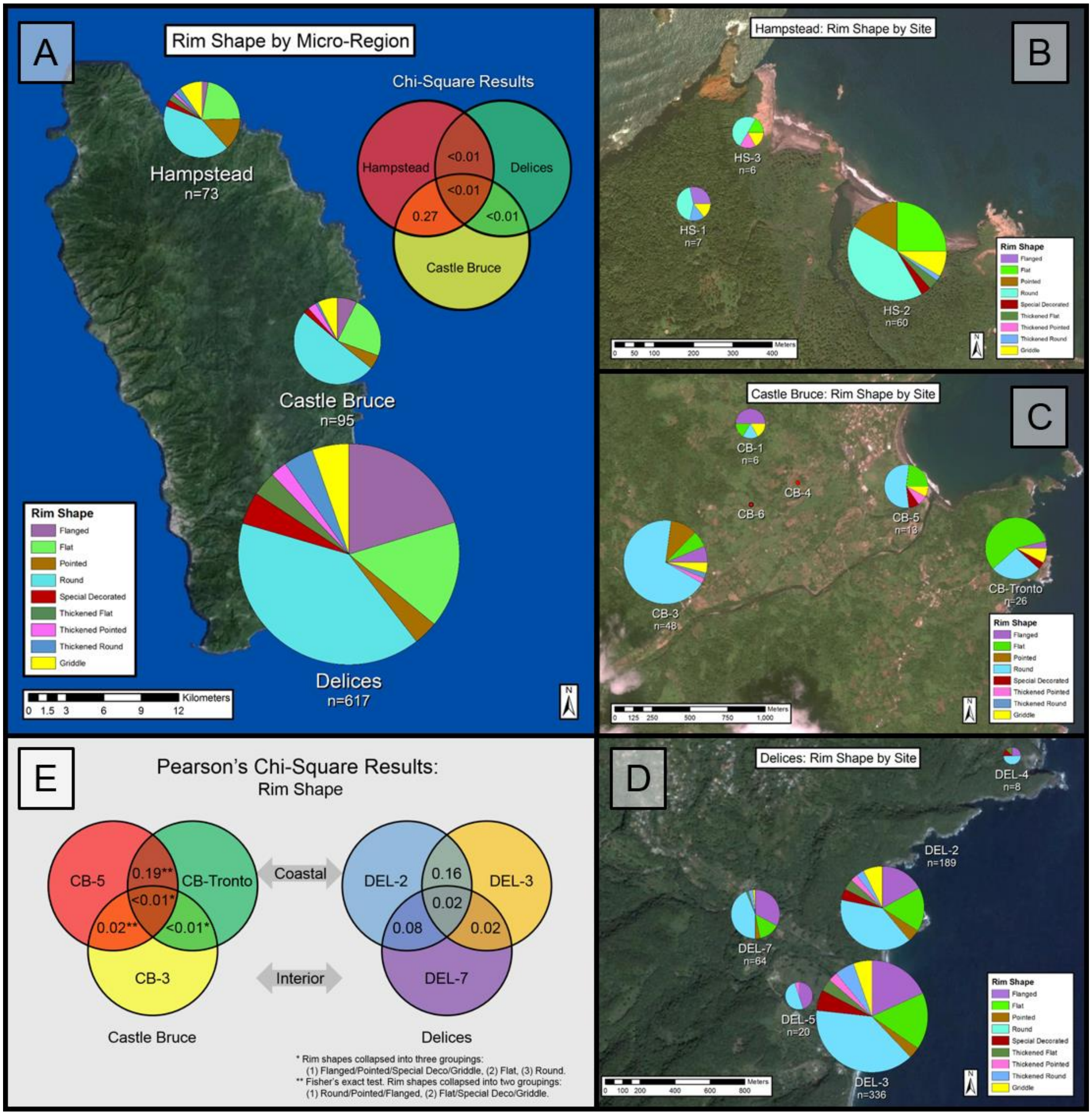

Figure 5-3. Distribution and proportion of rim shapes. A) Rim shape proportions by micro-region. The flanged and pointed categories show the most micro-regional variation. Inset shows results (expressed as *p*-values) of Pearson's chi-square tests comparing rim shape by micro-region. B) Intra-micro-regional variation for Hampstead; C) Castle Bruce; D) Delices. E) Chi-square results (expressed as *p*-values) for intra-micro-regional comparisons.

Table 5-2. Rim shape frequencies by site and grouped by micro-region.

	Flanged		Interior Flanged		Flat		Pointed		Round		Special Decorated		Thickened Flat		Thickened Pointed		Thickened Round		Griddle		Total
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
Hampstead																					
HS-1	2	29%	0	0%	0	0%	0	0%	3	43%	0	0%	0	0%	0	0%	1	14%	1	14%	7
HS-2	0	0%	0	0%	15	25%	10	17%	25	42%	2	3%	2	3%	0	0%	1	2%	5	8%	60
HS-3	0	0%	0	0%	1	17%	0	0%	3	50%	0	0%	0	0%	1	17%	0	0%	1	17%	6
Total	2	3%	0	0%	16	22%	10	14%	31	42%	2	3%	2	3%	1	1%	2	3%	7	10%	73
Castle Bruce																					
CB-1	3	50%	0	0%	1	17%	0	0%	1	17%	0	0%	0	0%	0	0%	0	0%	1	17%	6
CB-3	3	6%	0	0%	3	6%	5	10%	33	69%	0	0%	0	0%	1	2%	1	2%	2	4%	48
CB-5	0	0%	0	0%	3	23%	0	0%	7	54%	1	8%	0	0%	1	8%	0	0%	1	8%	13
CB-6	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	1	50%	0	0%	1	50%	2
CB-Tronto	1	4%	0	0%	15	58%	0	0%	7	27%	1	4%	0	0%	0	0%	0	0%	2	8%	26
Total	7	7%	0	0%	22	23%	5	5%	48	51%	2	2%	0	0%	3	3%	1	1%	7	7%	95
Delices																					
DEL-2	32	17%	1	1%	32	17%	9	5%	74	39%	8	4%	8	4%	5	3%	6	3%	14	7%	189
DEL-3	61	18%	1	0%	55	16%	11	3%	130	39%	20	6%	12	4%	9	3%	19	6%	18	5%	336
DEL-4	2	25%	0	0%	0	0%	0	0%	4	50%	1	13%	1	13%	0	0%	0	0%	0	0%	8
DEL-5	9	45%	0	0%	0	0%	0	0%	10	50%	0	0%	0	0%	1	5%	0	0%	0	0%	20
DEL-7	21	33%	0	0%	9	14%	2	3%	28	44%	0	0%	1	2%	0	0%	2	3%	1	2%	64
Total	125	20%	2	0%	96	16%	22	4%	246	40%	29	5%	22	4%	15	2%	27	4%	33	5%	617
Grand Total	134	17%	2	0%	134	17%	37	5%	325	41%	33	4%	24	3%	19	2%	30	4%	47	6%	785

Beginning with a comparison of rim shape among the three micro-regions, Figure 5-3 shows pie charts that display the proportion of rim shapes recovered from each micro-region (counts and percentages can be found in Table 5-2). The pie charts are scaled to the size of the assemblage they represent. At first glance, there appears to be a high degree of similarity in the distribution of rim shapes, but patterns can be discerned. Certain rim shapes appear in similar proportions across watersheds whereas others fluctuate (Table 5-3).

One of the most obvious trends in rim shape between micro-regions is the variable distribution of flanged rims. Flanged rims are most prevalent in the south, constituting 20% of all vessels in Delices. In Castle Bruce, only 7% of rims are flanged and a mere 3% in Hampstead, where only two vessels with flanged rims were recovered. In contrast, pointed rims are more prevalent in the north, constituting 14% of all rims in Hampstead as compared to 4% in Delices and 5% in Castle Bruce. Thickened flat rims are absent from Castle Bruce and the only two vessels with interior flanges were found in Delices. Several categories appear in proportions that do not seem appreciably different. Griddles, for example, appear in fairly even proportions, although they are somewhat more prevalent in Hampstead (10%) than in Castle Bruce (7%) or Delices (5%).

The relatively small samples under consideration here can affect the inferences drawn from statistical comparisons. In order to look at the effect of sample size on these proportions, I calculated the standard error of the observed proportions relative to the sample size (Drennan 2009). The standard error was calculated at the 95% confidence level for each category in each micro-region (Table 5-4). This standard error, when added or subtracted to the sample proportion, defines the range in which we can be 95% confident that the actual population proportion falls (Table 5-5). The micro-regions with the smaller sample sizes, Hampstead and Castle Bruce, have higher standard errors associated with them, and the highest tend to be in those categories that are disproportionate relative to Delices, specifically the flat and round categories that appear over-represented in the north. In the special decorated category, the range for all three micro-regions overlap whereas in the flanged category, the high estimate for Hampstead falls well below the low estimate for Delices, indicating potentially significant variation among the regions.

To determine more accurately the significance of this variation, I performed a series of chi-square tests for association between location (variably framed at the intra- and inter-micro-regional scale), and proportion of rim shapes recovered. First, the Pearson's chi-square statistic (Table 5-6) was calculated to evaluate the null hypothesis that proportions from the compared assemblages are not significantly different, or that observed differences between populations result from sampling. In order to have 95% confidence that differences are real and not the result of sampling—in order to reject the null hypothesis—derived *p*-values must be equal to or below 0.05. Rejecting the null hypothesis at a 95% confidence level does not necessarily prove the null hypothesis wrong, it merely indicates statistically significant differences in the sampled assemblages with a high probability that these are reflective of real differences in the actual population proportions associated with different micro-regions.

Table 5-3. Proportions of each rim shape by micro-region.

	Hampstead (n = 73)	Castle Bruce (n = 95)	Delices (n = 617)
Flanged	2.7%	7.4%	20.3%
Flat	21.9%	23.2%	15.6%
Pointed	13.7%	5.3%	3.6%
Round	42.5%	50.5%	40.0%
Special Decorated	2.7%	2.1%	4.7%
Thickened Flat	2.7%	0.0%	3.6%
Thickened Pointed	1.4%	3.2%	2.4%
Thickened Round	2.7%	1.1%	4.4%
Griddle	9.6%	7.4%	5.4%

Note. Interior flanged rims were disregarded due to the very small (n = 2) sample.

Table 5-4. Standard error for proportions in Table 5-3 at the 95% confidence level.

	Hampstead (n = 73)	Castle Bruce (n = 95)	Delices (n = 617)
Flanged	3.8%	5.4%	3.2%
Flat	9.7%	8.7%	2.9%
Pointed	8.0%	4.6%	1.5%
Round	11.6%	10.3%	3.9%
Special Decorated	3.8%	2.9%	1.7%
Thickened Flat	3.8%	0.0%	1.5%
Thickened Pointed	2.7%	3.6%	1.2%
Thickened Round	3.8%	2.1%	1.6%
Griddle	6.9%	5.4%	1.8%

Table 5-5. Low and high estimates of the population proportion for different rim shapes by micro-region. Calculated at a 95% confidence level.

	Hampstead		Castle Bruce		Delices	
	Low	High	Low	High	Low	High
Flanged	-1.1%	6.6%	2.0%	12.7%	17.1%	23.5%
Flat	12.2%	31.6%	14.5%	31.8%	12.7%	18.5%
Pointed	5.7%	21.8%	0.7%	9.9%	2.1%	5.1%
Round	30.9%	54.0%	40.3%	60.8%	36.1%	43.9%
Special Decorated	-1.1%	6.6%	-0.8%	5.1%	3.0%	6.4%
Thickened Flat	-1.1%	6.6%	0.0%	0.0%	2.1%	5.1%
Thickened Pointed	-1.4%	4.1%	-0.4%	6.8%	1.2%	3.7%
Thickened Round	-1.1%	6.6%	-1.0%	3.2%	2.8%	6.0%
Griddle	2.7%	16.5%	2.0%	12.7%	3.6%	7.2%

Table 5-6. A series of chi-square tests on proportions of rim shapes.

	Cells with expected count >5	Pearson's chi-square *p*-value	Cramer's *V* statistic
All three micro-regions	83%	<0.001	0.171
Hampstead vs. Castle Bruce	92%	0.273	0.194
Hampstead vs. Delices	83%	<0.001	0.210
Castle Bruce vs. Delices	92%	0.003	0.160
DEL-2 vs. DEL-3 vs. DEL-7	89%	0.016	0.138
DEL-2 vs. DEL-3	100%	0.162	0.124
DEL-2 vs. DEL-7	83%	0.076	0.203
DEL-3 vs. DEL-7	83%	0.018	0.185
CB-3 vs. CB-5 vs. CB-Tronto*	78%	<0.001	0.377
CB-3 vs. CB-Tronto*	100%	<0.001	0.576
CB-3 vs. (CB-5 + CB-Tronto)*	100%	<0.001	0.467
CB-3 vs. CB-5**	75%	0.022***	0.316
CB-5 vs. CB-Tronto**	100%	0.185***	0.224

* Rim shapes collapsed into three groupings: (1) Flanged/Pointed/Special Decorated/Griddle, (2) Flat, (3) Round.

** Rim shapes collapsed into two groupings: (1) Round/Pointed/Flanged, (2) Flat/Special Decorated/Griddle.

*** These are results of the Fisher's exact test, which was implemented due to the small sample size in a 2-x-2 contingency table.

Table 5-7. Diversity and dominance indexes by micro-region.

	Hampstead	Castle Bruce	Delices
Categories (*S*)	9	8	10
Individuals (*n*)	73	95	617
Simpson (1-*D*)	0.74	0.68	0.77
Berger-Parker (*d*)	0.42	0.51	0.40

Table 5-8. Diversity and dominance indexes by site.

	DEL-2	DEL-3	DEL-5	DEL-7	CB-3	CB-5	CB-Tronto	HS-2
Categories (*S*)	10	10	3	7	7	5	5	7
Individuals (*n*)	189	336	20	64	48	13	26	60
Simpson (1-*D*)	0.78	0.78	0.55	0.68	0.51	0.64	0.59	0.73
Berger-Parker (*d*)	0.39	0.39	0.50	0.44	0.69	0.54	0.58	0.42

The chi-square test merely reveals associations; it does not measure the strength of the association. For this, the Cramer's *V* statistic is employed, which is derived from the Pearson's chi-square statistic and expressed in relation to overall sample size and the number of cells in the chi-square contingency table. The greater the difference between observed proportions and expected proportions, the larger the Cramer's *V* value. The test returns a value between zero and one, and the closer the value is to one, the stronger the association (Drennan 2009).

In order to explore the variation between micro-regions with chi-square tests, the observed categories had to be consolidated because 80% of the expected-value cells must exceed five for the results to be considered valid (Drennan 2009). With 10 categories, because some are represented by such small observed values, the test conditions were violated. I therefore grouped the thickened flat, thickened pointed, thickened round, and special decorated vessels into one category. There are four reasons that I selected this grouping: (1) these categories contributed the least to the overall assemblages, each one contributing less than 5% to each micro-region assemblage; (2) The proportions for these categories were the most equivalent across micro-regions, with the largest difference being the 3.6% difference between thickened flat rims in Castle Bruce and Delices (Table 5-3); (3) This grouping allowed me to successfully run almost all of the chi-square tests I intended to except for a small few, whereas other groupings I tried would only work for some tests and not others; (4) Thickened rims very often represent shallow bowls that were likely serving vessels (Figure 5-1, Figure 5-2, and Figure 5-6), which theoretically put them closer functionally to the special decorated rims than other categories. This left six categories remaining (flanged, flat, pointed, round, special decorated/thickened, and griddle), the variable distribution of which can be examined with chi-square tests.

When all three micro-regions are compared, the chi-square test returned a *p*-value less than 0.01, indicating a very significant difference between these assemblages that is very unlikely to result from sampling. The Cramer's *V* test returned a value of 0.17 indicating that, although the association between micro-region and rim shape proportions is significant, the association is weak. This was the first indication that there were considerable differences between the micro-regions, but it is important to remember that, by comparing all three micro-regions simultaneously, this test masks a tremendous amount of variability that could be contributing to the results.

Next, I split the micro-regions into three pairs, Hampstead and Castle Bruce, Hampstead and Delices, and Castle Bruce and Delices, and ran chi-square tests on each of these groupings to see if any of the micro-regional assemblages stood as more different from the others. The Hampstead-Castle Bruce comparison returned a *p*-value of 0.27, which fails to reject the null hypothesis. However, that should not indicate that these assemblages are completely isomorphic, as there remains a 73% probability that there are significant differences between the assemblages. When we factor in that Hampstead and Castle Bruce have the smallest sample and the greatest taphonomic impact on the condition of sites, we have to be conservative with how much weight this one test is given. The tests for both Hampstead-Delices and Castle Bruce-Delices returned *p*-values low enough to reject the null hypothesis.

Moving to the intra-micro-regional comparisons, variation between sites is presented for Hampstead, Castle Bruce and Delices (Figure 5-3), even though only the latter two are evaluated statistically with the presently available data. Because many of the sites yielded assemblages too small for most statistical analyses, I selected a subsample of three sites each from Castle Bruce and Delices. These six sites had the largest samples, and in each micro-region, two of the sites are coastal (CB-5, CB-Tronto, DEL-2, DEL-3) and the third is an inland site (CB-3, DEL-7), which is an interesting dimension of variability to explore. Figure 5-3E provides a useful breakdown of the *p*-values for the different comparisons. Note that in both micro-regions there is less difference between the coastal sites than there is between coastal sites and the interior site.

The three-way comparison between DEL-2, DEL-3, and DEL-7 returned a *p*-value of 0.02, indicating that there are significant differences among the rim shape proportions constituting the three assemblages. Some more interesting patterns emerge when we make three sets of two-way comparisons. DEL-2 and DEL-3, which are both coastal sites, are the least different. The chi-square test returned a *p*-value of 0.16, which fails to reject the null hypothesis, indicating that perhaps a similar range of activities involving pottery can be associated with these sites. In the comparisons between each of the coastal sites and the interior site, DEL-2 and DEL-7 appear less different than DEL-3 and DEL-7. The chi-square test for DEL-2 and DEL-7 returned a *p*-value of 0.08, whereas the test for DEL-3 and DEL-7 returned a *p*-value of 0.02, low enough to reject the null hypothesis. The Cramer's *V* statistic for all of these comparisons was near or below 0.2, so any of these associations should still be considered weak.

In Castle Bruce, a similar pattern emerges when coastal sites are compared to interior sites. However, because of the smaller samples in Castle Bruce, I had to construct the chi-square tests differently by collapsing certain rim shape categories together so that the cells of the contingency table had sufficiently large values. In experimenting with different ways of grouping these, it became clear that fluctuations occurred in the results depending on how categories were grouped. In creating the groupings (Table 5-6), I only combined categories whose proportions appeared in similar ratios between sites to ensure I was not canceling out variability among the assemblages. To make certain comparisons, I had to collapse the categories down to just two groupings, permitting the use of the Fisher's exact test, which is better for small samples. The results of these tests should be considered with this in mind.

As in Delices, the greatest difference can be seen between either of the coastal sites (CB-5 and CB-Tronto) and the one interior site (CB-3), whereas the least difference can be seen between the two coastal sites. For the chi-square tests comparing all three sites, comparing CB-3 to CB-Tronto, and comparing CB-3 to the combined totals from CB-5 and CB-Tronto, *p*-values less than 0.01 were returned. This last comparison was made after the Fisher's exact test comparing CB-5 to CB-Tronto returned a *p*-value of 0.19, which fails to reject the null hypothesis, suggesting that these assemblages may have similar rim shape proportions. I grouped CB-5 and CB-Tronto together so I could compare interior and coastal contexts with a larger number of category groupings, and the test did reveal significant associations. The Fisher's exact test comparing CB-3 to CB-5 returned a *p*-value of 0.02, low enough to reject the null hypothesis.

In Castle Bruce, the comparisons between the different sites yielded relatively high Cramer's *V* scores, ranging from 0.22-0.58 (Table 5-6), which indicate moderate to very strong associations between location and rim shape proportion. This highest score derives from the comparison between CB-3 and CB-Tronto, two sites located in very different ecological settings in the valley. One interpretation that could be made is that in Castle Bruce, there is a stronger differentiation between activities represented at different sites, or a specialized function for CB-3. In Delices, there may have been more overlap in the activities represented at different sites, leading to weaker associations between rim shape and location. However, this variation could also result from the fact that samples are smaller in Castle Bruce and that categories had to be grouped, or that occupations in Delices seem to represent a longer time span. This represents the type of patterning that such exploratory tests can reveal, which provide questions to evaluate with other evidence and in future research.

Next, I evaluate diversity among the assemblages, another dimension of variability involving rim shape distributions that can lead to insights into site function and the range of activities exhibited at different sites. For this analysis, I make the assumptions that more diverse assemblages reflect a greater range of activities conducted at a site and that assemblages more dominated by particular rim shapes reflect a higher degree of specialization.

Table 5-7 and Table 5-8 show the scores for the Simpson's diversity index and the Berger-Parker dominance index calculated on the rim shape proportions for micro-regions and a selection of sites, and the same information is displayed graphically in Figure 5-4 for the micro-regional comparison and Figure 5-5 for the site-level comparisons. Considering micro-regional variation first, it appears that both the Hampstead and Delices assemblages are more diverse, whereas the Castle Bruce assemblage is more dominated by fewer rim types. The significance of the variation among the diversity indexes can be evaluated with a diversity *t*-test. Figure 5-4 shows the *p*-values calculated for the three comparisons. The lower the *p*-value, the more likely the difference in diversity between micro-regions is significant. The diversity expressed in the Hampstead and Delices assemblages is not significantly different ($p = 0.51$), whereas the Castle Bruce assemblage is significantly less diverse than Delices ($p = 0.03$). Castle Bruce also appears less diverse than Hampstead, although the *p*-value of 0.24 indicates only a 76% probability that this difference is statistically significant.

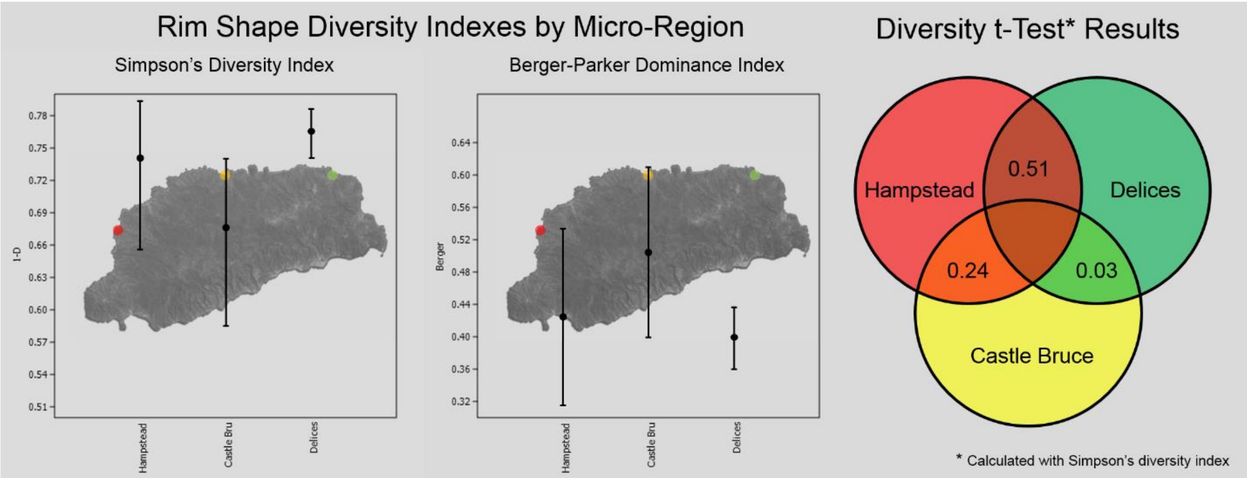

Figure 5-4. Diversity indexes of rim shape by micro-region and results (expressed as *p*-values) of diversity *t*-tests comparing micro-regions. Lower *p*-values indicate a more significant difference in the Simpson's diversity index (see Appendix B for formulas and bootstrapping method).

Figure 5-5 displays the diversity and dominance index scores for the sites within Castle Bruce and Delices as well as the scores from HS-2, which are included for comparison. They are arranged by micro-region and grouped by coastal and inland settings. If we examine the diversity in the assemblages from sites within micro-regions we can see that coastal sites are more diverse than interior sites in Castle Bruce and Delices. Even though the diversity scores are higher in Delices in general, a similar pattern of decreasing diversity moving away from the coast can be seen in both micro-regions.

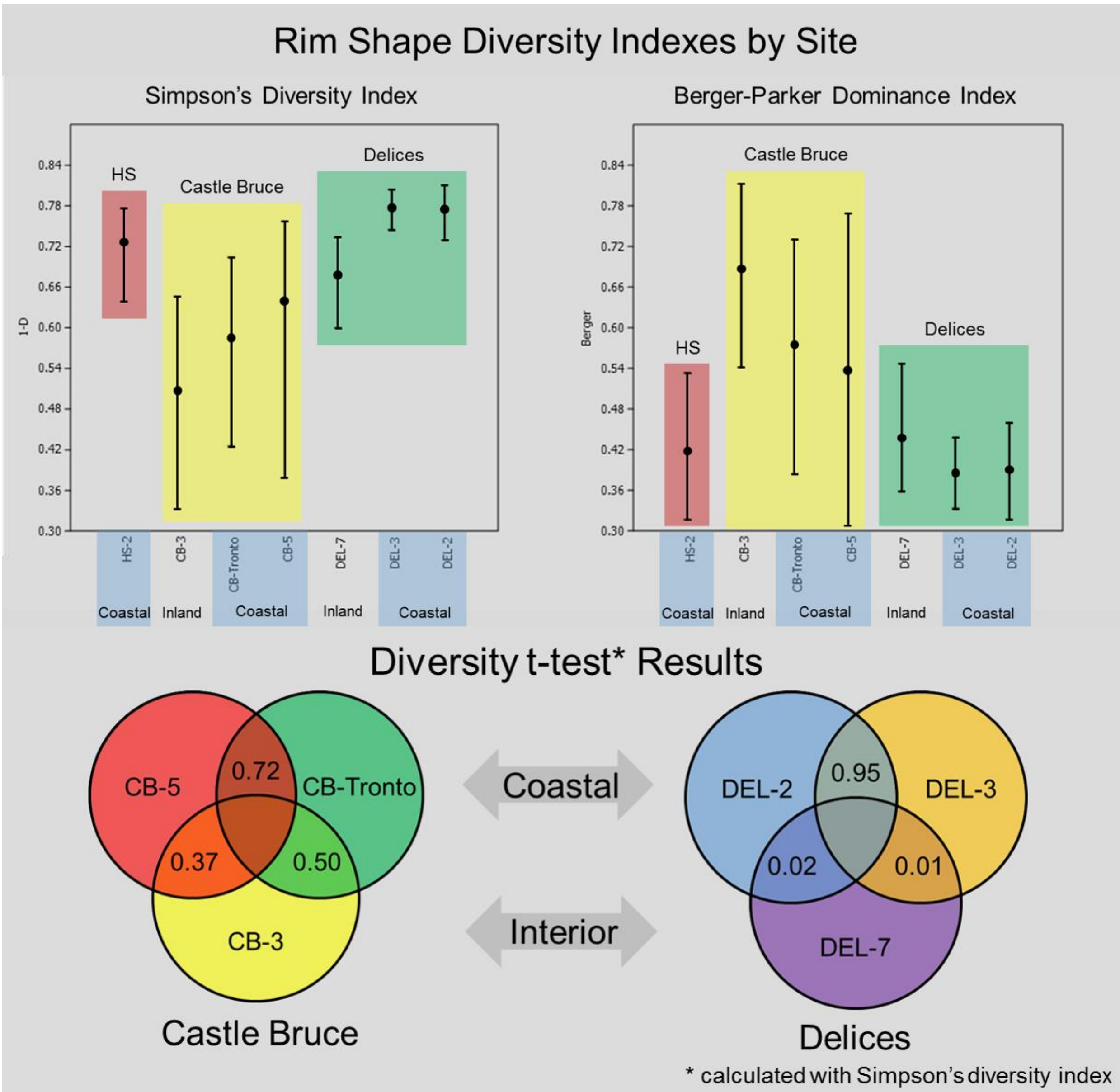

Figure 5-5. Diversity indexes of rim shape by site (see Appendix B for formulas).

Figure 5-5 also shows the results of the diversity *t*-tests for the three comparisons in each micro-region, grouping coastal sites along the top, and interior sites on the bottom. Again, a pattern emerges that echoes the results of the chi-square tests. Coastal sites in both micro-regions are less different than either coastal site is to the interior site, although the pattern is more likely to be statistically significant in Delices. In Castle Bruce, the tests returned *p*-values that fail to reject the null hypothesis, although lower values were returned for the comparisons between inland and coastal settings.

The analysis of the rim shape attribute has begun to define some interesting patterning that makes sense with much of what the crew and I expected from our impressions in the field. There are significant differences between sites within micro-regions, and some significant differences between micro-regions. Interior sites seem more specialized as the assemblages are more dominated by fewer rim forms. Coastal sites are less different from one another and typically display the greatest diversity of rim shapes when compared to interior sites. This may indicate that a different range of activities was carried out in these contexts, and that a wider variety of uses for pottery is expressed at coastal sites.

Orientation

Orientation is an aspect of vessel morphology that plays a critical role in the overall shape of a vessel, particularly affecting the two main categories of interval scale data we will be examining next, orifice diameter and wall thickness. The goal with orifice diameter and wall thickness will be to address variability in the composition of assemblages with respect to site function and manufacturing techniques by using statistical tests to compare the distributions. Before using orifice diameter and wall thickness in this way, the effect that orientation has on these attributes of vessel morphology should be examined.

Figure 5-6 shows examples of different rim orientations arranged along the spectrum from inflaring on the left to outflaring on the right. The graph reveals the dominance that the outflaring category has over orientation, and this requires explanation. For a large number of vessels analyzed, we have to assume that a substantial portion of rim fragments were too small to preserve the morphological character required to differentiate outflaring vessels from necked vessels. An unknown portion of the dominant outflaring group is in reality, just coded incorrectly because of this lack of evidence, suggesting that some caution should be used when making inferences based on orientation.

Figure 5-7C shows the mean orifice diameter of all vessels grouped by rim orientation, illustrating the effect that orientation has on orifice diameter. Vessels with a restricted orifice, whether inflaring or necked, tend toward a smaller orifice diameter, whereas vessels with the largest orifice diameter are straight-walled or mostly straight, outflaring slightly. A one-way analysis of variance (ANOVA) test, assuming equal variance, revealed that only the differences between inflaring and outflaring, between inflaring and outflaring/straight, and between inflaring and straight, are statistically significant at the 90% simultaneous confidence level (using Fisher’s multiple comparison method, see Appendix B). Figure 5-7D shows the similar effect that orientation has on wall thickness, with the noticeable difference that the outflaring category does not co-vary with the others. There is clearly a wider range of vessels forms within the dominant outflaring category.

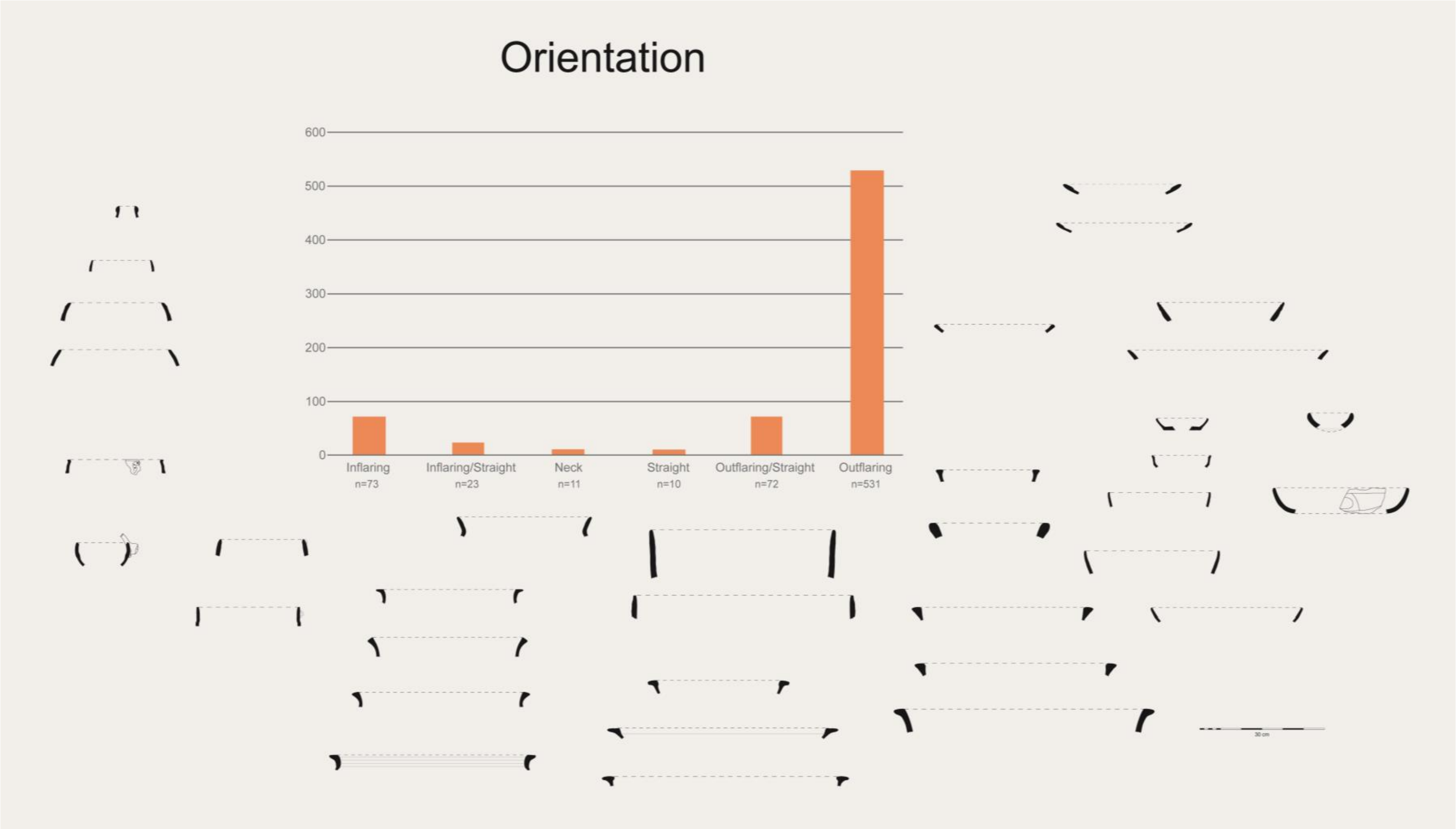

Figure 5-6. Chart showing the frequency of the various possible rim orientations.

Table 5-9. Rim orientation by site. Notice the dominance of the outflaring category. Some unknown portion of outflaring rims actually belong to necked vessels that did not preserve enough morphology to be identified.

	Inflaring		Inflaring/ Straight		Necked		Outflaring		Outflaring/ Straight		Straight		Total
	n	%	n	%	n	%	n	%	n	%	n	%	n
Hampstead													
HS-1	0	0%	0	0%	1	20%	3	60%	0	0%	1	20%	5
HS-2	14	31%	7	16%	2	4%	19	42%	1	2%	2	4%	45
HS-3	0	0%	0	0%	0	0%	4	80%	0	0%	1	20%	5
Total	14	25%	7	13%	3	5%	26	47%	1	2%	4	7%	55
Castle Bruce													
CB-1	0	0%	0	0%	0	0%	5	100%	0	0%	0	0%	5
CB-3	1	2%	2	4%	0	0%	32	70%	9	20%	2	4%	46
CB-5	0	0%	0	0%	0	0%	10	83%	2	17%	0	0%	12
CB-6	0	0%	0	0%	0	0%	1	100%	0	0%	0	0%	1
CB-Tronto	4	17%	1	4%	0	0%	17	71%	2	8%	0	0%	24
Total	5	6%	3	3%	0	0%	65	74%	13	15%	2	2%	88
Delices													
DEL-2	26	15%	4	2%	5	3%	122	71%	13	8%	2	1%	172
DEL-3	23	7%	9	3%	2	1%	245	78%	34	11%	2	1%	315
DEL-4	0	0%	0	0%	0	0%	7	100%	0	0%	0	0%	7
DEL-5	1	5%	0	0%	0	0%	16	80%	3	15%	0	0%	20
DEL-7	4	6%	0	0%	1	2%	50	79%	8	13%	0	0%	63
Total	54	9%	13	2%	8	1%	440	76%	58	10%	4	1%	577
Grand Total	73	10%	23	3%	11	2%	531	74%	72	10%	10	1%	720

The inverse relationship between orifice diameter and wall thickness for outflaring vessels is likely attributable to the very shallow, thin-walled serving vessels such as those seen in the upper right-hand corner of Figure 5-6, which often feature thickened/pointed or thickened/rounded rims. Inflaring vessels also appear to tend toward thinner walls, which is surprising because they are often larger vessels than their outflaring counterparts with similar orifice diameters. A one-way ANOVA test, assuming equal variance, revealed that the only statistically significant difference in the mean wall thickness among different orientation categories is between the inflaring and outflaring/straight categories. This is unsurprising as there is a very wide range of potential vessel sizes that could share a similar orientation. Although orientation can clearly affect the mean orifice diameter of an assemblage, it will only do so if inflaring vessels are found in appreciable quantities. However, their distribution is not even, and certain assemblages, notably in Hampstead, have higher frequencies of restricted-orifice vessels (Table 5-9).

To test the significance of the variability in orientation between the assemblages, I again utilized the Pearson's chi-square statistic. Figure 5-7F shows the results of the three-way comparison between micro-regions as well as the three pair-wise comparisons. Although Castle Bruce and Delices are not statistically different in their relative proportions of inflaring, necked, outflaring and straight-walled vessels ($p = 0.22$), all the other comparisons returned p-values less than 0.01, low enough to reject the null hypothesis. To the degree that orientation affects overall morphology, which is considerable, the suite of vessel shapes that potters in Hampstead produced appears distinctive from Delices and Castle Bruce.

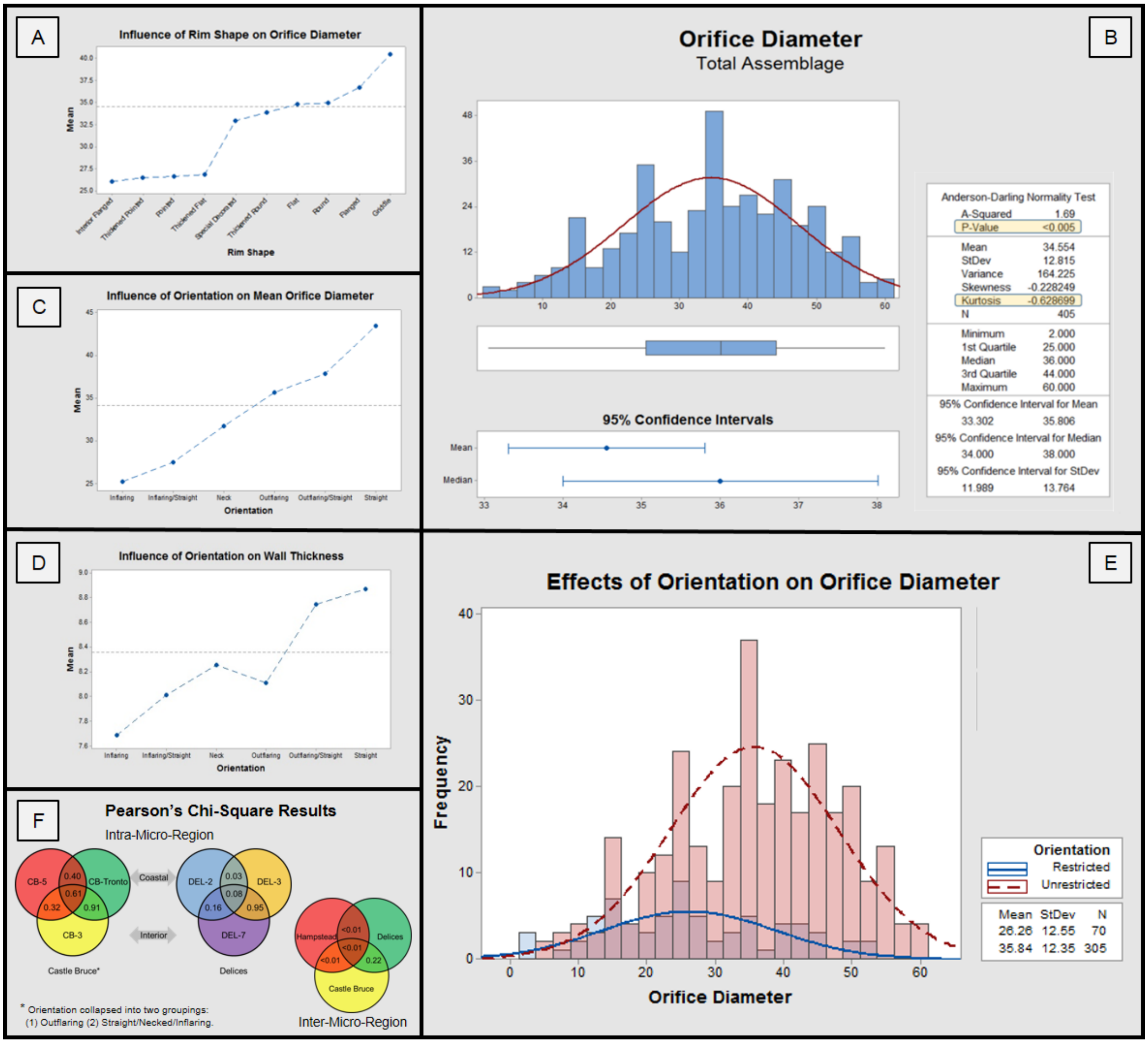

Figure 5-7. Orientation and orifice diameter figures. A) Influence of rim shape on orifice diameter. B) Chart showing a histogram and summary statistics for orifice diameter of the total assemblage. Highlighted portions show statistics that suggest the distribution is not normal. C) Influence of orientation on mean orifice diameter for the total assemblage. D) Influence of orientation on mean wall thickness for the total assemblage. E) Chart showing overlapping histograms for orifice diameter of restricted- and unrestricted-orifice vessels. Orientation only accounts for about 15% of the variation in orifice diameter. F) Results (expressed as *p*-values) of Pearson's chi-square tests comparing rim orientation within and between micro-regions.

At the intra-micro-regional scale, assemblages from sites within Castle Bruce and those from within Delices do not exhibit nearly the level of variability observed for rim shape. In Castle Bruce, all four chi-square tests failed to reject the null hypothesis. Although rim shape varies significantly between assemblages, necked vessels are completely absent from the Castle Bruce assemblage, and only 9% of vessels have an inflaring orientation. All sites in the micro-region are composed of mostly outflaring rims, but clearly this category contains within it a certain amount of variability, as rim shape comparisons on the same assemblages appear significantly different.

In Delices, the chi-square tests revealed patterning almost completely opposite to the comparison of rim shape (Figure 5-7). In that comparison, DEL-2 and DEL-3 were least different, whereas DEL-3 and DEL-7 had significant differences. Here, the comparison between DEL-3 and DEL-7 returned a very high *p*-value of 0.95, indicating very similar proportions of like-oriented vessels. At the same time, DEL-2 and DEL-3, when compared, returned the only *p*-value low enough to reject the null hypothesis. Although these two sites feature similar proportions in the rim shape comparisons, the elevated incidence of inflaring vessels at DEL-2 is influencing this comparison.

There are two ways to look at these tests on orientation. On the one hand, the variability that is captured within the dominant outflaring category, along with the bias introduced by the often fragmentary sherds, introduce severe limitations on the usefulness of the orientation attribute. On the other hand, the fact that these problems exist, and significant patterning still emerged in the comparison between micro-regions, might suggest that orientation should not be dismissed so easily. With the mixed results of rim shape and orientation in mind, the next attribute to examine is orifice diameter.

Orifice diameter

The histogram in Figure 5-7B shows the multi-modal distribution of orifice diameter measurements, along with summary statistics on the right. Two important statistics highlighted in the chart are the *p*-value result for the Anderson-Darling normality test (<0.005) and the kurtosis (peakedness) score (-0.63), statistics that point toward a non-normal distribution for this variable. At this point, we should remember that there are reasons to believe that the distribution of several variables will be non-normal, and likely bimodal, as Boomert (2011) has demonstrated. Orientation is one of several factors that might be causing this multi-modal distribution.

Figure 5-7E shows two overlapping histograms. The red histogram shows the orifice diameters for unrestricted-orifice (outflaring, outflaring/straight, straight) vessels, and the blue histogram shows the orifice diameter for restricted-orifice (inflaring, inflaring/straight, necked) vessels. This demonstrates that even though orientation has an effect on orifice diameter for individual vessels, in the overall assemblage, the low incidence of inflaring vessels fails to account for the multi-modality still evident in the outflaring histogram. One possible explanation is that restricted-orifice necked vessels, incorrectly coded as outflaring, account for the remaining multi-modality.

The other critical factor and likely explanation lies in vessel function. If we look at the vessels in Figure 5-6, the shallow bowls, likely serving vessels of some kind, have smaller orifice diameters than the large, flanged vessels, even though these large vessels often feature restricted orifices. These large-orifice vessels seem more apt for storage or agricultural/domestic production functions. It is easy to imagine that the slightly restricted orifice on these large flanged vessels could have a functional explanation, such as providing a platform for fastening a lid with cordage. Let us assume for a moment that larger-orifice-diameter vessels are more likely to be tied to a domestic or utilitarian storage/processing function, whereas smaller-orifice-diameter vessels, even though a small percentage will be from large vessels with inflaring or necked rims, are more likely to be tied to serving/drinking/ceremonial functions. This assumption is supported if we look at the influence that rim shape has on orifice diameter (Figure 5-7A). The rim shapes with the highest mean orifice diameters are griddles and vessels with flanged, flat or round rims. Thickened flat, thickened pointed, pointed, and special decorated vessels fall at the lower end of the spectrum. The thickened pointed, thickened flat, thickened round and special decorated rims in particular tend to be associated with shallow bowls (Figure 5-2) likely used for serving food or drink, possibly in ritual or ceremonial contexts. With these characteristics of orifice diameter and the relationship to function and vessel morphology in mind, we can now examine how orifice diameter varies within and between micro-regions.

Figure 5-8 shows the histograms, summary statistics, and normality tests for orifice diameter in each of the three micro-regions, along with pie charts representing the ratios of restricted- to unrestricted-orifice vessels. Both Hampstead and Delices appear to have non-normal distributions, so in addition to the two-sample *t*-test for comparison of means (with no assumption of equal variance), I used the non-parametric Kruskal-Wallis comparison of medians to identify significant differences in orifice diameter between micro-regional assemblages.

Figure 5-9 shows the mean orifice diameter for each micro-region and the *p*-values from the two tests at both inter- and intra-micro-regional scales. Hampstead and Delices are the two micro-regions with the least different median orifice diameters, whereas there are significant differences between both of these micro-regions and Castle Bruce, which features the highest mean orifice diameter. It seems likely that the higher incidence of restricted-orifice vessels in Hampstead (Figure 5-8) may be contributing to the reduced mean orifice diameter there. If we are correct in the assumption that smaller orifice unrestricted vessels are more likely related to ceremonial vessels or serving vessels for feasting and drinking, then this might indicate that such activities are expressed more frequently or are more centralized in Delices, and perhaps Hampstead, than in Castle Bruce.

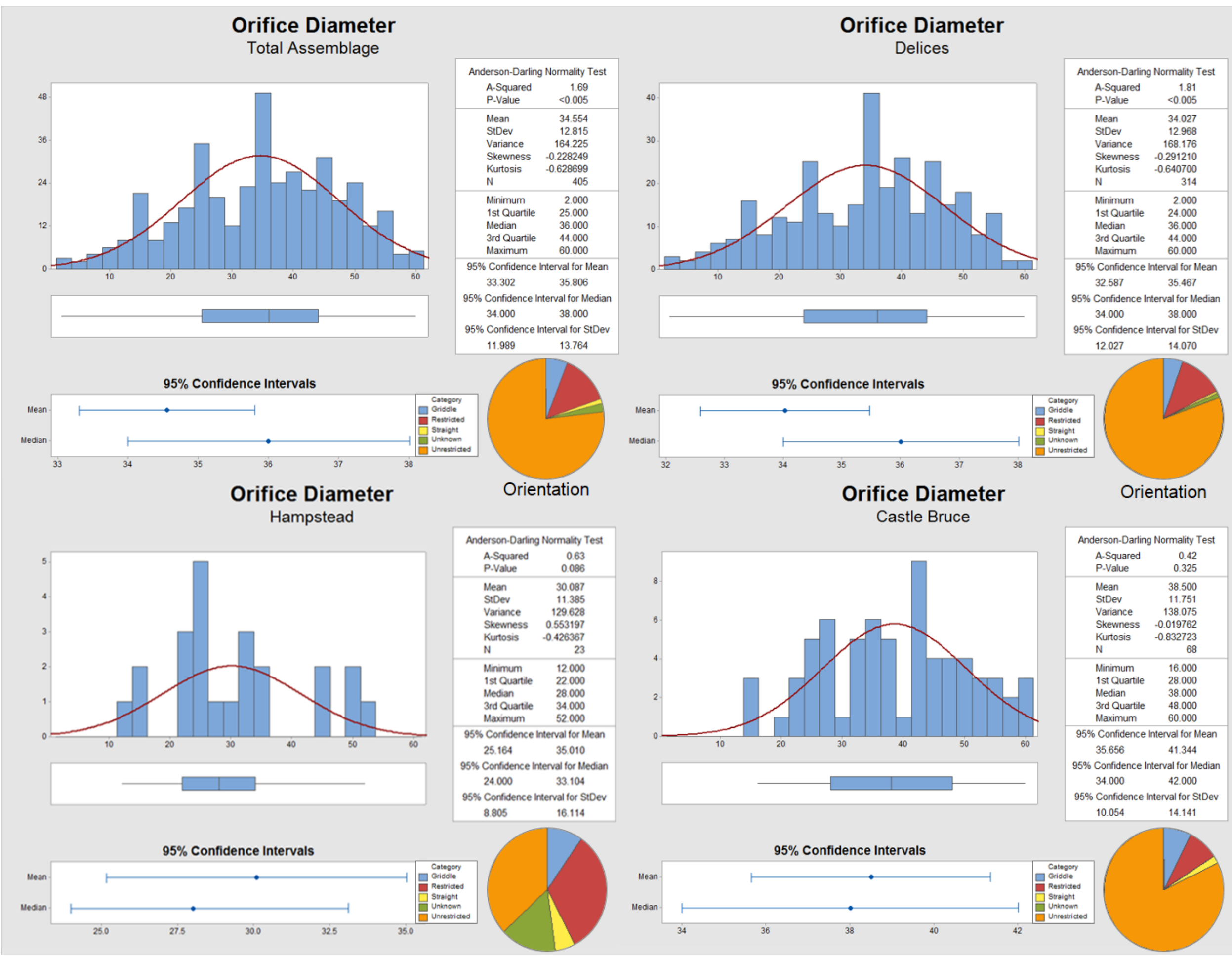

Figure 5-8. Histogram and summary statistics for orifice diameter for the total assemblage and for each micro-region. Orientation pie charts help to explain the reduced mean orifice diameter in Hampstead.

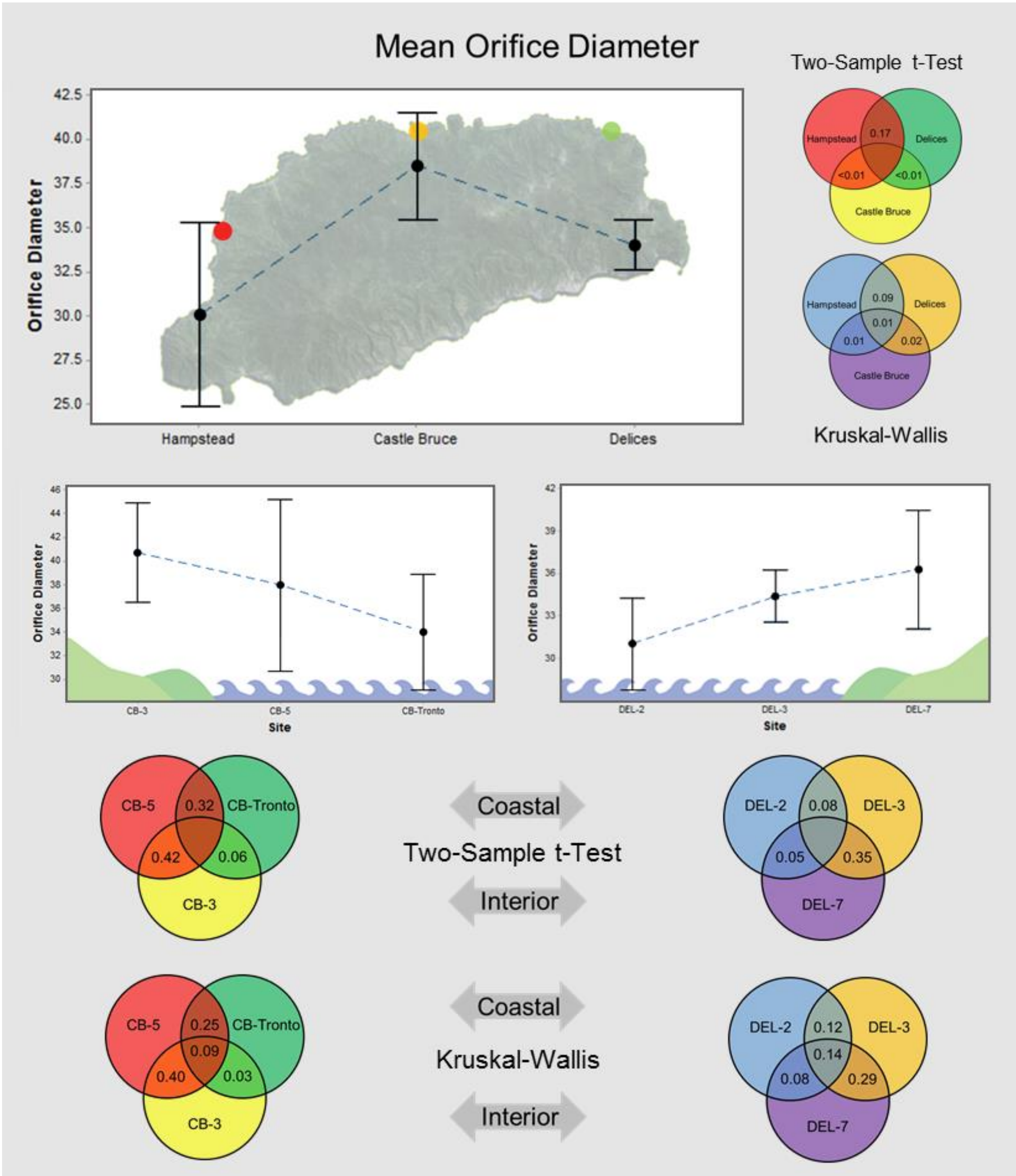

Figure 5-9. Orifice diameter statistics. Plots showing mean orifice diameter and 95% confidence interval by micro-region and by site within micro-region. Also shown are the results of the two-sample *t*-test and Kruskal-Wallis significance tests (displayed as *p*-values) at both scales. Schematic drawing indicates coastal (above water) versus inland or upland (above land) settings. Not meant to represent actual scale.

Moving in for a closer look at the intra-micro-regional variation, the patterned differences between interior and coastal sites become apparent. Figure 5-9 shows the mean and 95% confidence interval for orifice diameter at sites in each micro-region. In the graphic, the intervals above water represent coastal sites and the intervals above land represent interior sites. Two patterns are immediately apparent. First is that the sites with small sample sizes, such as CB-5, have the largest error range for the confidence interval. The other pattern still emerges however, in which coastal sites tend to have a smaller mean orifice diameter than interior sites. To test the significance of these differences, again I utilized a two-sample *t*-test along with the non-parametric Kruskal-Wallis test. The results of a three-way comparison between all pairs of sites can be seen in Figure 5-9.

In each micro-region, there are some disparities that are more significant than others, but in both cases, the most significant differences appear between a coastal and an interior site, with much lower probabilities that there are significant differences between coastal sites. In Castle Bruce, as with the rim shape attribute, the comparison between CB-3 and CB-Tronto returned very low *p*-values, indicating a high probability that the assemblages have different mean orifice diameters and that this does not result from sampling. In Delices, although all *p*-values from the Kruskal-Wallis test were above the level required to reject the null hypothesis, the lowest score ($p = 0.08$), returned from the comparison between DEL-2 and DEL-7, is mirrored by a *p*-value of 0.05 from the two-sample *t*-test, whereas there is only a 65-71% probability that the difference between the DEL-3 and DEL-7 assemblages is statistically significant. That DEL-3 appears less different from DEL-7 than it does from DEL-2 reverses the trend identified for rim shape proportions and diversity. However, it mirrors the patterning in orientation proportions, and the higher ratio of inflaring rims at DEL-2 may be causing the variability between the coastal sites, although the *p*-values returned from both tests comparing orifice diameter from the DEL-2 and DEL-3 assemblages were above 0.05.

Wall thickness

The next attribute examined is wall thickness, which plays a role in overall vessel morphology, but also has an effect on the performance characteristics of a vessel (Braun 1983), and can be seen as related to the skill of the potter and the intended use of the vessel (see Appendix A). As the only other interval-scale-variable examined here, wall thickness is analyzed in a similar manner to orifice diameter. The histograms in Figure 5-10 show that, as with orifice diameter, wall thickness does not appear to follow a normal distribution. Whereas orifice diameter exhibited a multi-modal distribution, wall thickness is positively skewed, with a max outlier at 19.2 mm and the majority of the assemblage falling in the 5-10 mm range. There is a hint of bimodality in the total assemblage that is slightly exaggerated in the Hampstead assemblage, which has the lowest kurtosis value.

Figure 5-11 shows the mean and 95% confidence interval for the assemblages from each of the three micro-regions. Delices has the lowest mean wall thickness, which we might expect given that it has the oldest occupations. Saladoid pottery is traditionally regarded as having thinner walls (Curet 1997), which may be affecting the mean wall thickness of the assemblage. At first glance, it appears odd that Hampstead, which had the lowest mean orifice diameter, has the highest mean wall thickness. Furthermore, Delices and Castle Bruce co-vary with one another in relation to orifice diameter and wall thickness, whereas Hampstead varies inversely, yielding a lower mean orifice diameter but a higher mean wall thickness than Delices. Because the distributions violate the normality assumption, again, the non-parametric Kruskal-Wallis test is employed to evaluate the statistical significance of this variability (Figure 5-11).

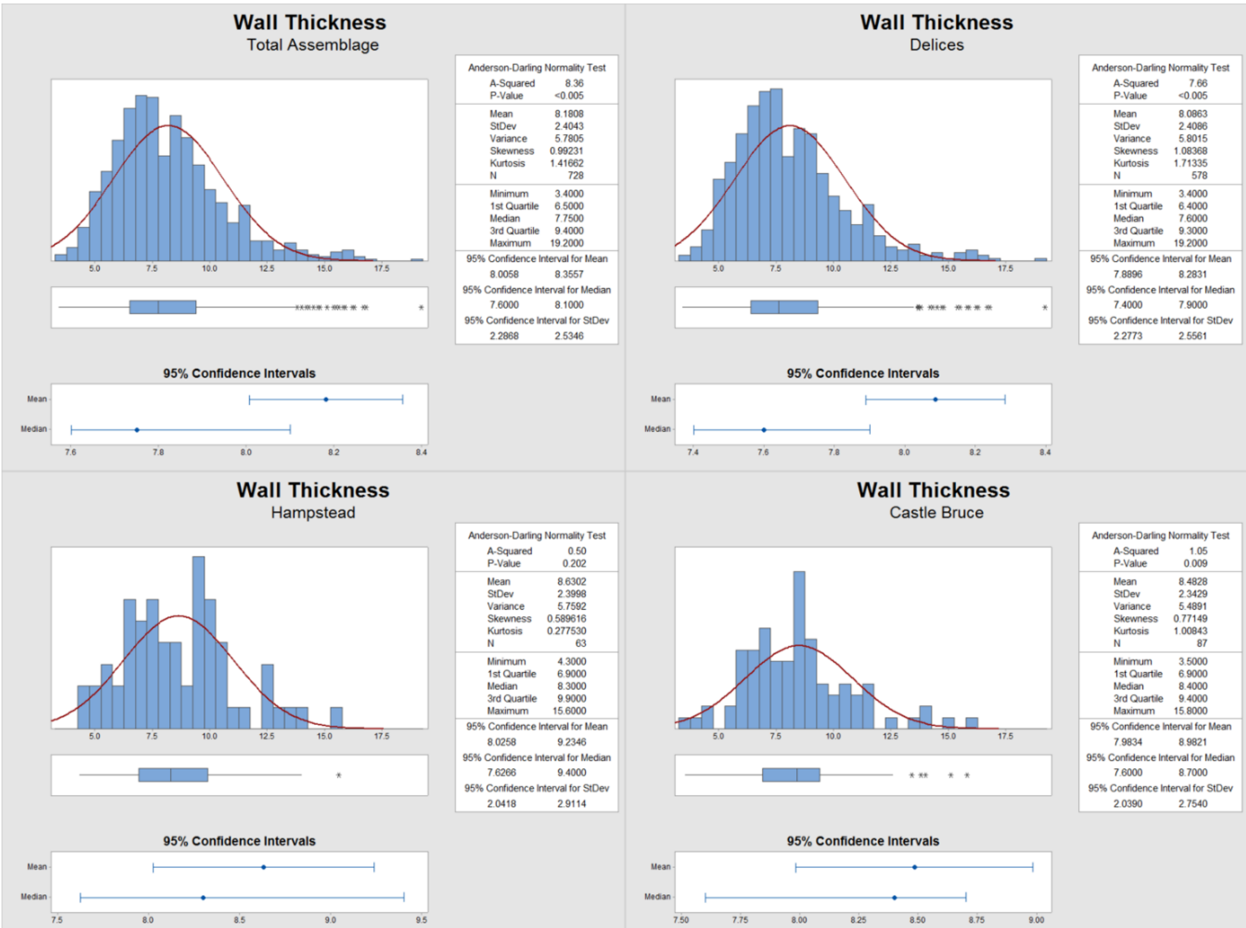

Figure 5-10. Histogram and summary statistics for wall thickness for the total assemblage and for each micro-region.

Although the Castle Bruce and Hampstead assemblages were the most dissimilar when comparing orifice diameter, the two-sample *t*-test (p = 0.71) and the Kruskal-Wallis test (p = 0.70) both indicate that the difference in mean wall thickness between these assemblages is not statistically significant, which is probably attributable to differences in rim orientation proportions.

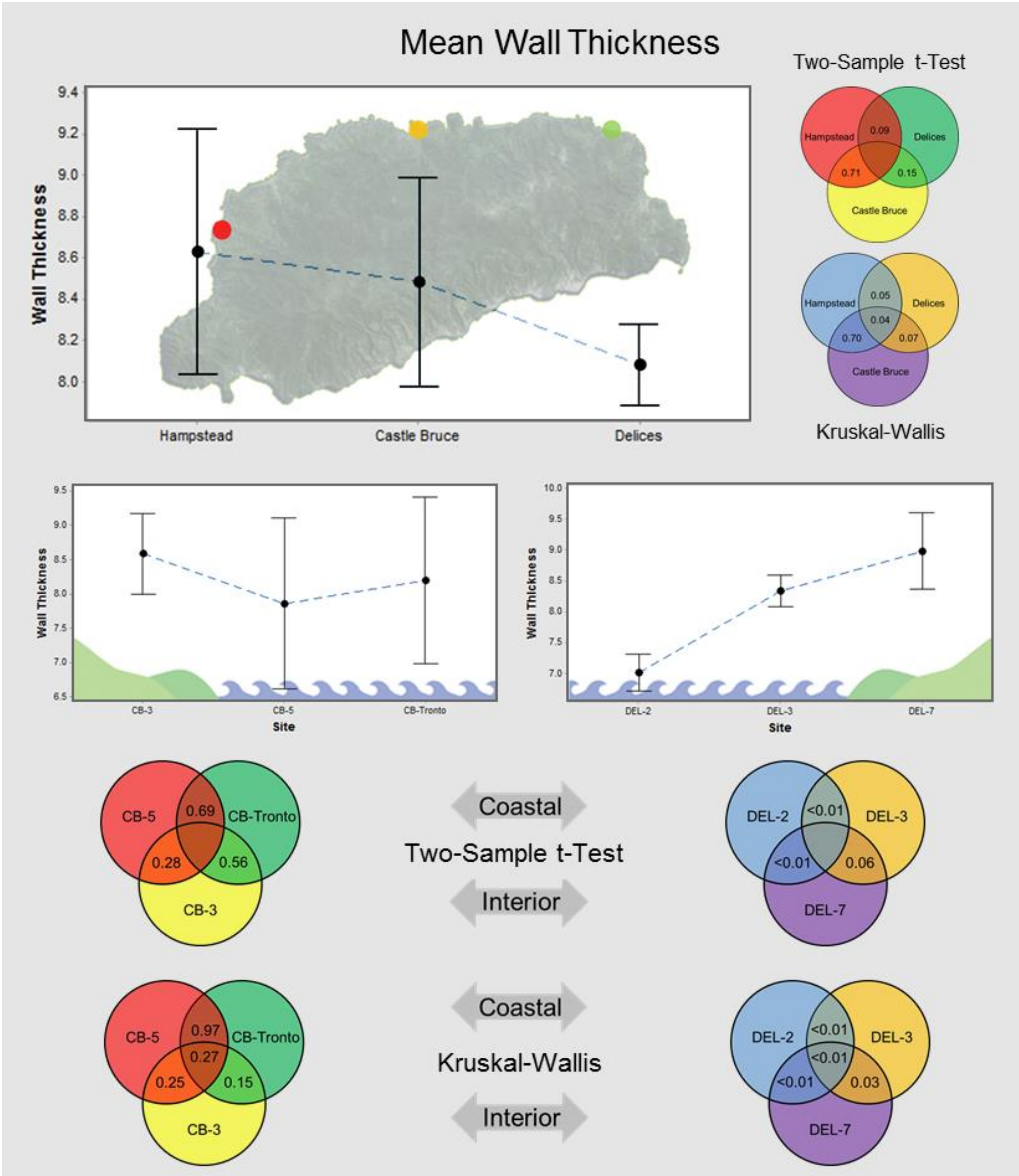

Figure 5-11. Wall thickness statistics. Plots showing mean wall thickness and 95% confidence interval by micro-region and by site within micro-region. Also shown are the results of the two-sample *t*-test and Kruskal-Wallis significance tests (displayed as *p*-values) at both scales. Schematic drawing indicates coastal (above water) versus inland or upland (above land) settings. Not meant to represent actual scale.

The Castle Bruce and Delices assemblages had orientation proportions that were not significantly different, and for both wall thickness and orifice diameter, their means stayed in relative position to one another. In contrast, the Delices and Hampstead assemblages, which feature varying orientation proportions, have a statistically significant difference in mean wall thickness (p = 0.05 for Kruskal-Wallis) despite their lack of difference when comparing mean orifice diameter.

Within micro-regions, the pattern observed for orifice diameter, in which larger vessels were associated with interior sites, is repeated for wall thickness (Figure 5-11). If anything, the pattern appears more pronounced for wall thickness, at least for Delices. The variation within the Castle Bruce and Delices assemblages was evaluated with the Kruskal-Wallis test (Figure 5-11). In Castle Bruce, although all the p-values returned are too high to reject the null hypothesis at the 95% confidence level, the highest p-value (0.97) derives from the comparison between coastal sites CB-5 and CB-Tronto. Comparing interior site CB-3 to CB-5, there is a 75% probability that the difference is significant, and an 85% probability in the comparison between CB-3 and CB-Tronto.

A different pattern emerges in Delices, where significant variation in wall thickness is evident among all the compared sites. If we follow the assumption that thicker-walled vessels are more likely to function in the domestic realm, while thinner-walled vessels are more likely to represent a serving, ritual, or feasting function, then perhaps those types of activities are expressed more strongly at coastal sites, and particularly at DEL-2. If this same assumption is applied at the micro-regional scale, then the Castle Bruce assemblage begins to reflect a more specialized domestic or utilitarian function whereas Delices appears to be the micro-region where a wider range of activities are centralized, including ceremonial feasting and drinking.

Surface treatment

Surface treatment is an important, but complex attribute for which variability can be interpreted to mean many different things. Are the various ways of finishing a pot reflective of different culturally learned manufacturing techniques, different performance characteristics related to intended use (Skibo et al. 1997), aesthetics, or some combination of these and other potential factors as well? In order to keep the focus on technological style, I chose to foreground the manufacturing technique implied by various surface treatments, but still consider the functional aspects of different surface treatments. From this perspective, when two assemblages have similar proportions of surface treatments, it can indicate a similar learning environment within a particular technical system, which can be thought of as a community of practice. More difference in the tools and techniques used to treat the surfaces of vessels indicate more distinctive technical systems surrounding the manufacture of pottery, as well as a potentially different range of activities intended for the use of the vessel.

We used an additive coding system (Appendix A) and categorized vessels by the application of treatments used to form the interior and exterior surfaces, using the modifier “finished” when a paint or slip was applied after one or a combination of surface treatments. Approximately 20% of vessels feature a different interior and exterior surface treatment. When the interior and exterior codes are combined, they create forty-six different combinations, of which sixteen are represented by a single vessel, and twenty-nine are represented by five vessels or less. The ten most commonly occurring combinations account for 85% of all vessels (Figure 5-12). Note that it is generally more common for interior surfaces alone to receive additional paint or slip finishes than it is for either both to receive finishes or for exterior surfaces alone.

Figure 5-13 and Figure 5-14 show pie charts representing the ratio of interior and exterior surface treatments in the micro-regional assemblages (specific values and proportions can be found in Table 5-10 and Table 5-11). Hampstead immediately appears different from the other two micro-regions, with a notably higher proportion of burnished and brushed/burnished surface treatments. Likewise, the Castle Bruce and Delices assemblages contain much higher proportions of well smoothed and well smoothed/finished surfaces, two categories that are not represented in the Hampstead assemblage.

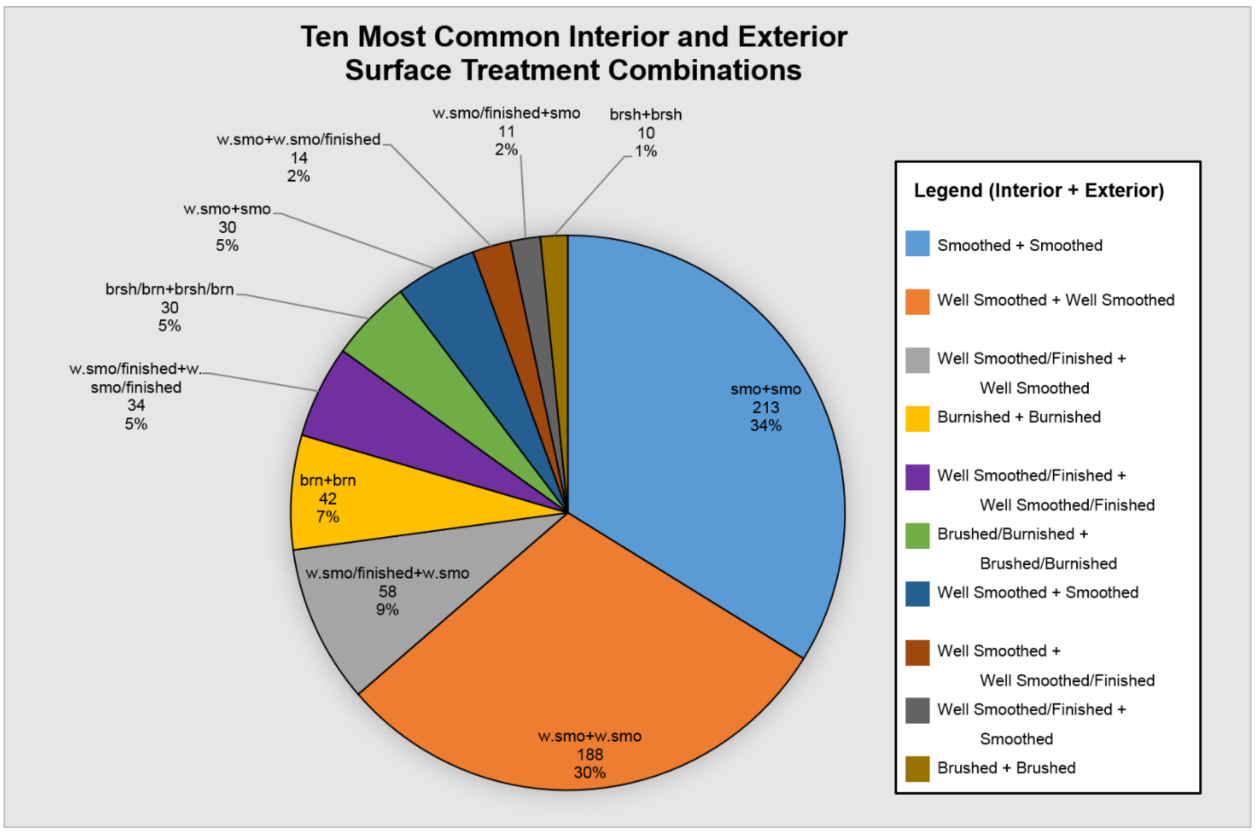

Figure 5-12. Pie chart showing the ten most common interior and exterior surface treatment combinations.

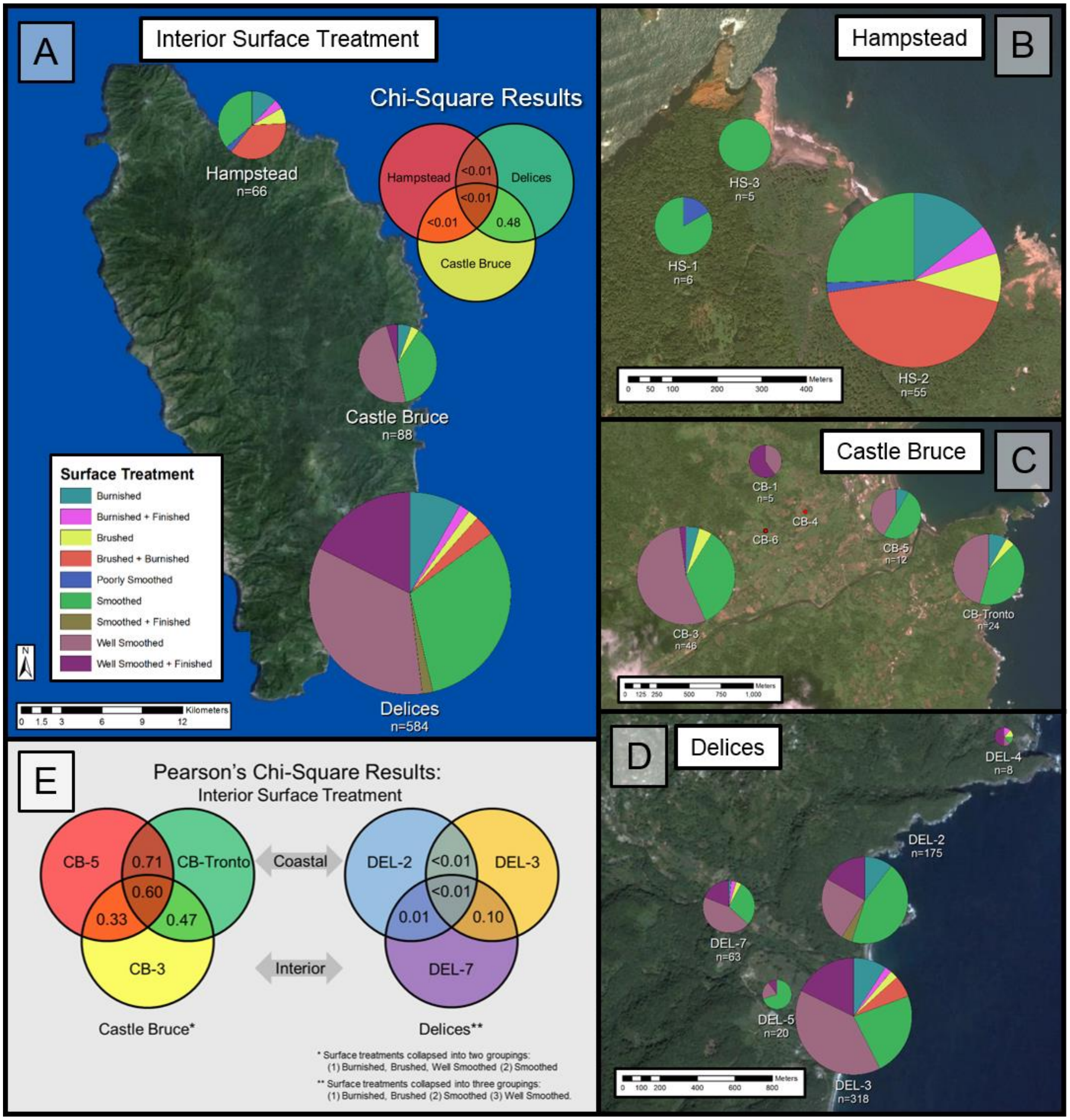

Figure 5-13. Interior surface treatment figures. A) Proportions of interior surface treatments by micro-region. Pie charts are scaled to reflect size of the assemblage. Results (expressed as *p*-values) of Pearson's chi-square tests comparing surface treatment proportions by micro-region. B) Hampstead. C) Castle Bruce. D) Delices. E) Chi-square results (expressed as *p*-values) for intra-micro-regional variation.

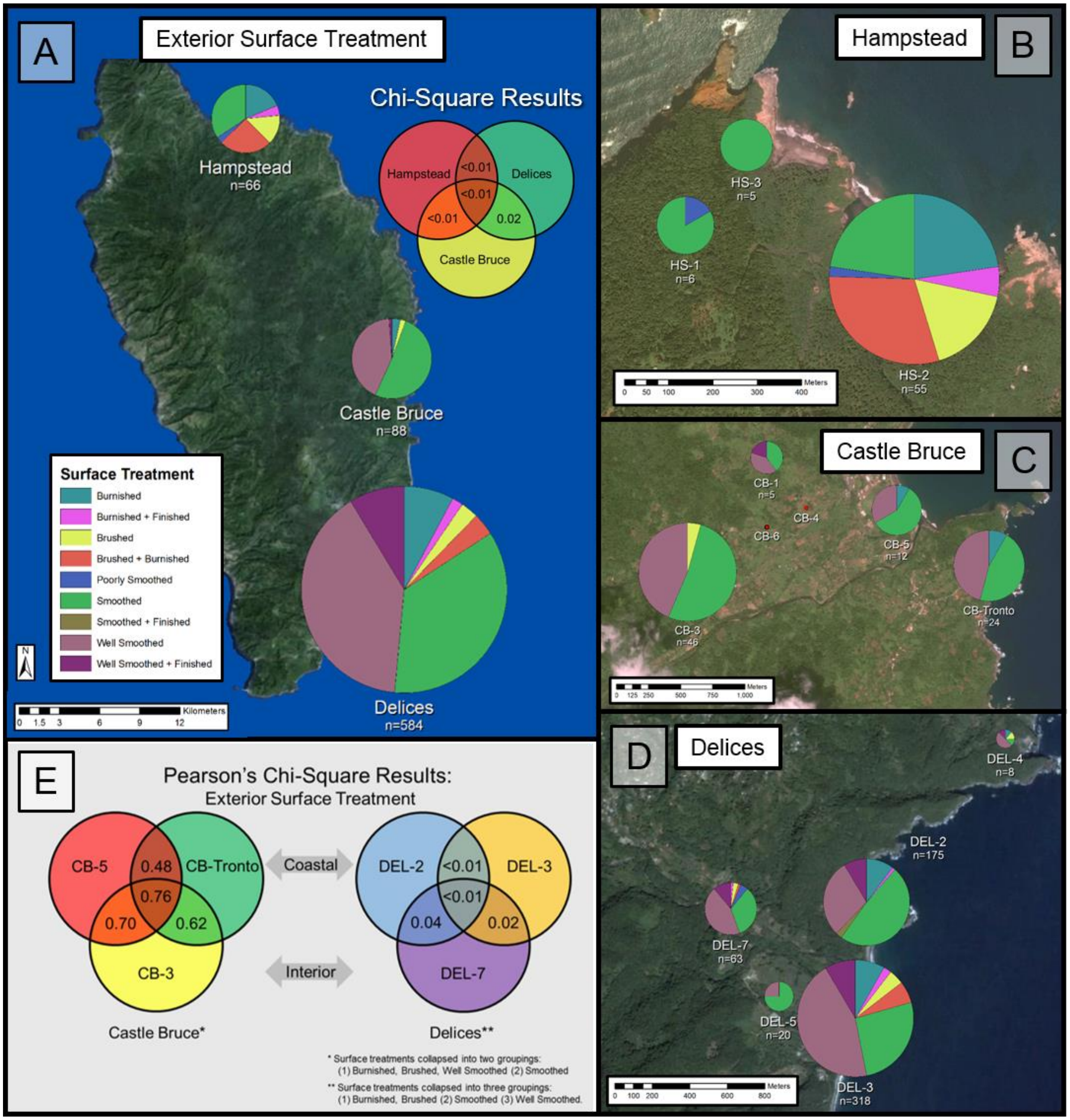

Figure 5-14. Exterior surface treatment figures. A) Proportions of exterior surface treatments by micro-region. Pie charts are scaled to reflect size of the assemblage. Results (expressed as *p*-values) of Pearson's chi-square tests comparing surface treatment proportions by micro-region. B) Hampstead. C) Castle Bruce. D) Delices. E) Chi-square results (expressed as *p*-values) for intra-micro-regional variation.

Table 5-10. Interior surface treatment by site.

	Burnished		Burnished/ Finished		Brushed		Brushed/ Burnished		Poorly Smoothed		Smoothed		Smoothed/ Finished		Well Smoothed		Well Smoothed/ Finished		Total
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
Hampstead																			
HS-1	0	0%	0	0%	0	0%	0	0%	1	17%	5	83%	0	0%	0	0%	0	0%	6
HS-2	8	15%	3	5%	5	9%	24	44%	1	2%	14	25%	0	0%	0	0%	0	0%	55
HS-3	0	0%	0	0%	0	0%	0	0%	0	0%	5	100%	0	0%	0	0%	0	0%	5
Total	8	12%	3	5%	5	8%	24	36%	2	3%	24	36%	0	0%	0	0%	0	0%	66
Castle Bruce																			
CB-1	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	2	40%	3	60%	5
CB-3	2	4%	0	0%	2	4%	0	0%	0	0%	16	35%	0	0%	25	54%	1	2%	46
CB-5	1	8%	0	0%	0	0%	0	0%	0	0%	6	50%	0	0%	5	42%	0	0%	12
CB-6	0	0%	0	0%	0	0%	0	0%	0	0%	1	100%	0	0%	0	0%	0	0%	1
CB-Tronto	2	8%	0	0%	1	4%	0	0%	0	0%	10	42%	0	0%	11	46%	0	0%	24
Total	5	6%	0	0%	3	3%	0	0%	0	0%	33	38%	0	0%	43	49%	4	5%	88
Delices																			
DEL-2	18	10%	1	1%	0	0%	0	0%	1	1%	77	44%	7	4%	42	24%	29	17%	175
DEL-3	29	9%	6	2%	7	2%	19	6%	0	0%	73	23%	3	1%	125	39%	56	18%	318
DEL-4	0	0%	1	13%	1	13%	0	0%	0	0%	1	13%	0	0%	1	13%	4	50%	8
DEL-5	0	0%	0	0%	0	0%	0	0%	0	0%	14	70%	0	0%	4	20%	2	10%	20
DEL-7	1	2%	2	3%	2	3%	0	0%	0	0%	18	29%	0	0%	28	44%	12	19%	63
Total	48	8%	10	2%	10	2%	19	3%	1	0%	183	31%	10	2%	200	34%	103	18%	584
Grand Total	61	8%	13	2%	18	2%	43	6%	3	0%	240	33%	10	1%	243	33%	107	14%	738

Table 5-11. Exterior surface treatment by site.

	Burnished		Burnished/ Finished		Brushed		Brushed/ Burnished		Poorly Smoothed		Smoothed		Smoothed/ Finished		Well Smoothed		Well Smoothed/ Finished		Total
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
Hampstead																			
HS-1	0	0%	0	0%	0	0%	0	0%	1	17%	5	83%	0	0%	0	0%	0	0%	6
HS-2	12	23%	3	6%	9	17%	16	30%	1	2%	12	23%	0	0%	0	0%	0	0%	53
HS-3	0	0%	0	0%	0	0%	0	0%	0	0%	5	100%	0	0%	0	0%	0	0%	5
Total	12	19%	3	5%	9	14%	16	25%	2	3%	22	34%	0	0%	0	0%	0	0%	64
Castle Bruce																			
CB-1	0	0%	0	0%	0	0%	0	0%	0	0%	2	40%	0	0%	2	40%	1	20%	5
CB-3	0	0%	0	0%	2	4%	0	0%	0	0%	24	52%	0	0%	20	43%	0	0%	46
CB-5	1	8%	0	0%	0	0%	0	0%	0	0%	7	58%	0	0%	4	33%	0	0%	12
CB-6	0	0%	0	0%	0	0%	0	0%	0	0%	1	100%	0	0%	0	0%	0	0%	1
CB-Tronto	2	8%	0	0%	0	0%	0	0%	0	0%	11	46%	0	0%	11	46%	0	0%	24
Total	3	3%	0	0%	2	2%	0	0%	0	0%	45	51%	0	0%	37	42%	1	1%	88
Delices																			
DEL-2	18	10%	2	1%	0	0%	0	0%	0	0%	85	49%	4	2%	51	29%	15	9%	175
DEL-3	26	8%	7	2%	13	4%	19	6%	0	0%	83	26%	1	0%	141	44%	27	9%	317
DEL-4	1	13%	0	0%	1	13%	0	0%	0	0%	1	13%	0	0%	4	50%	1	13%	8
DEL-5	0	0%	0	0%	0	0%	0	0%	0	0%	15	75%	0	0%	5	25%	0	0%	20
DEL-7	0	0%	2	3%	2	3%	0	0%	3	5%	21	34%	0	0%	28	45%	7	11%	63
Total	45	8%	11	3%	16	3%	19	3%	3	1%	205	35%	5	1%	229	39%	50	9%	583
Grand Total	60	8%	14	3%	27	4%	35	5%	5	1%	272	37%	5	1%	266	36%	51	7%	735*

* Three vessels had an unknown or unpreserved exterior surface treatment.

Interestingly, several of the surface treatments that are over-represented in Hampstead are present in the Delices assemblage, but in lower ratios, and absent or severely under-represented in Castle Bruce.

Chi-square tests were used to determine the significance of the variation in surface treatment proportions, and again, I had to combine certain categories in order for the test to be valid. For this analysis, I grouped finished and unfinished categories first (e.g., burnished and burnished/finished were combined). However, the test was still not working because too many cells in the contingency table were returning expected values below five. I therefore combined the brushed with the brushed/burnished category, and the poorly smoothed with the smoothed category. These compromises allowed me to run valid chi-square tests, but cancelled out some of the variability we were trying to capture with our coding system.

Figure 5-13 and Figure 5-14 show the results of the three-way comparison as well as the three two-way comparisons for interior and exterior surface treatments respectively. In all tests involving Hampstead, a *p*-value below 0.01 was returned, indicating very significant differences between the Hampstead assemblage and assemblages from Delices and Castle Bruce. Comparing Hampstead to Castle Bruce, the association between location and surface treatment is very strong, returning a Cramer's *V* score of 0.67 for interior surface treatment, and 0.65 for exterior. When comparing Hampstead and Delices, the association is weaker, but would still be considered strong. For interior surface treatment, this comparison returned a Cramer's *V* score of 0.45, and 0.39 for exterior. These lower Cramer's *V* scores probably reflect the absence of surface treatments in Castle Bruce that are present in both Hampstead and Delices.

When comparing Castle Bruce and Delices, the high *p*-value of 0.48 for the interior surface treatment comparison suggest that the proportion of interior surface treatments is not significantly different. Looking at exterior surface treatment however, the *p*-value of 0.02 is low enough to reject the null hypothesis, and indicates that these assemblages might not be as similar as the interior surface treatment test suggests. However, the very low Cramer's *V* score of 0.12 suggests that this is a weak association. Looking back at the pie charts in Figure 5-14, it is evident that the well smoothed/finished and burnished exteriors are under-represented in Castle Bruce relative to Delices. This turns out to be a fairly interesting variation because, when these finishes are applied only to the exterior of a vessel, they seem more likely to reflect an aesthetic decision, as opposed to a performance decision.

Moving in to examine intra-micro-regional variation with chi-square tests, the samples become smaller, so I had to further combine categories for the tests to be valid. In Delices, to get valid results I only had to combine the brushed and the burnished categories, leaving three groupings to be compared. In Castle Bruce, this same grouping did not work because the brushed and burnished categories were represented by such small samples. Because brushing, burnishing, and smoothing well all require additional steps beyond just simple smoothing, I decided to group these together, leaving just two groupings to compare in Castle Bruce. Different patterning is expressed in the three-way comparisons among sites in Castle Bruce and Delices (Figure 5-13 and Figure 5-14).

In Castle Bruce, all of the comparisons returned high *p*-values that fail to reject the null hypothesis. This suggest that sites in Castle Bruce have proportions of both interior and exterior surface treatments that are not statistically different. At first, I thought this may be because of the grouping I constructed, but other groupings returned similar *p*-values. Observing the pie charts in Figure 5-13 and Figure 5-14, it is apparent that CB-3, CB-5, and CB-Tronto each have fairly similar proportions represented, even if CB-5 does not have any brushed vessels and CB-Tronto lacks any examples of a well-smoothed and finished interior. Because the Castle Bruce comparison is still based on a small sample, these results should be accepted cautiously. However, when compared to the results of test on other attributes of the same assemblage, which showed general trends of variation between interior and coastal sites, it is notable that surface treatment does not seem to co-vary with these other attributes.

The intra-micro-regional relationships in Delices reveal a different trend. In many of the other comparisons between sites in Delices, DEL-2 and DEL-3 appeared less different relative to their comparisons to DEL-7. When looking at surface treatment, the pattern does not hold up. Five out of the six two-way comparisons and both three-way comparisons returned *p*-values below 0.05, indicating significant differences in surface treatment proportion among all three sites. The only *p*-value that fails to reject the null hypothesis (0.10) was in the comparison of interior surface treatment between DEL-3 and DEL-7. Burnished surfaces are severely under-represented at DEL-7, with only one vessel whose interior is burnished. Likewise, brushed and brushed/burnished vessels are not represented in the DEL-2 assemblage. As these specific techniques tend to be associated with the Troumassoid and Suazoid ceramic series (Petersen et al. 2004), perhaps this indicates that later occupations in Delices were more centralized around the DEL-3 locale than DEL-2, although I would hesitate to make that argument with the current available evidence. However, the fact that the DEL-2 assemblage also features a mean wall thickness significantly lower than DEL-3 would be consistent with this interpretation.

Decorative elements

In this section the decorative elements of the ceramic assemblages are compared. Of all the attributes analyzed here, perhaps decorative elements are the most sensitive to issues of time as there is a general trend toward fewer decorated vessels in post-Saladoid assemblages (Allaire 1991; Hofman et al. 2008b; Petersen et al. 2004; Wilson 2007). In general, decorated pottery constitutes a minority of the overall assemblage, as is common in the Caribbean, but this ratio depends on how we define decorative elements, specifically whether or not monochromatic paint is treated as a decorative element. In the last section, paint was applied as a modifier for surface treatment, although this distinction had to be factored out of the chi-square test. But paint certainly has a decorative quality, particularly when applied to exterior surfaces or in patterns, regardless of how simple these patterns may be. For example, a number of flanged rims had paint applied only to the top of the rim.

With monochromatic paint included, 32% of all non-griddle vessels had some form of decorative element applied, but the most common decorative element was vessels featuring red paint applied only to the interior (n = 59) (Table 5-12). Was this related to decorative style or was it an aspect of technological performance characteristics, perhaps used to reduce the permeability of the vessel wall? This category more than doubles the next most common category, vessels with red paint applied to both interior and exterior (*n* = 27). Red paint applied to only the exterior surface is the fourth most common category (*n* = 20). If these monochromatic paint categories are excluded, along with the slip only category (*n* = 7), then the percentage of non-griddle vessels with a decorative element applied drops from 32% to 16%.

There are several factors to consider. With fragmentary remains, it is impossible to distinguish between completely painted surfaces, which would be expected for a functional explanation, and surfaces painted in some pattern, which would be expected for a decorative explanation. However, there is no good reason why the same technique could not have both an aesthetic quality and a functional benefit. Since several examples exist that do have paint applied in what appears to be a decorative pattern, as well as co-occurring with several other decorative elements, clearly this technique has both functional and decorative aspects to it. Also, because monochromatic painted surfaces occur in uneven distributions among micro-regional assemblages (Figure 5-15), it represents a dimension of variability I do not want to ignore. Furthermore, the approach to decoration taken here has more to do with the suite of techniques used than the aesthetic or symbolic content of the actual decorations. Finally, because the only statistics I use to characterize the distribution of decorative elements are diversity indexes, and monochromatic surfaces do contribute to this diversity, I chose to keep them in consideration for this analysis.

Much like with surface treatment, I reduced the variation in the decorative elements down to a smaller number of categories, including: anthropomorphic adorno, black paint/pitch, eye motif, exterior red paint, interior red paint, interior and exterior red paint, lug/panel, painted pattern, punctate, simple (horizontal) broad line incision (BLI),

BLI pattern (curvilinear or scrolls), zone incised crosshatched (ZIC), zoomorphic adorno, and undecorated (Figure 5-16). Additional categories were derived from various combinations of these, some of which were more common than others (Table 5-12).

Figure 5-15A shows the proportions of decorative elements by micro-region, and immediately the skewed distribution can be seen. As with surface treatment, Castle Bruce and Delices appear less different from each other than from Hampstead in terms of the actual types of decorative elements represented. However, the ratio of decorated to undecorated vessels appears markedly different between Castle Bruce and Delices, whereas Hampstead falls in between, but features a different suite of decorative elements. Figure 5-15E shows the results of diversity indexes for decorative elements by micro-region. The trend seen here echoes closely the trend seen in diversity of rim shape, where Hampstead and Delices are significantly different in the categories represented, but in both cases, they are more diverse assemblages than represented at Castle Bruce. A diversity *t*-test was conducted and each comparison returned a *p*-value less than 0.01, suggesting that the difference in diversity between each pair of micro-regions is statistically significant.

At the intra-micro-regional scale, variation in decorative elements can be seen in Figure 5-15. In Castle Bruce, interior sites CB-1 and CB-3 have only vessels with painted surfaces. CB-3 has one vessel with interior red paint, whereas CB-1 has two red painted vessels and one with black paint or pitch on the interior. CB-Tronto has one decorated vessel featuring simple BLI. The coastal site CB-5 has the most decorated vessels, even though it has the smallest sample. One vessel features an eye motif on a modified flange and the other has a BLI/ZIC pattern on an interior rim (Figure 5-16).

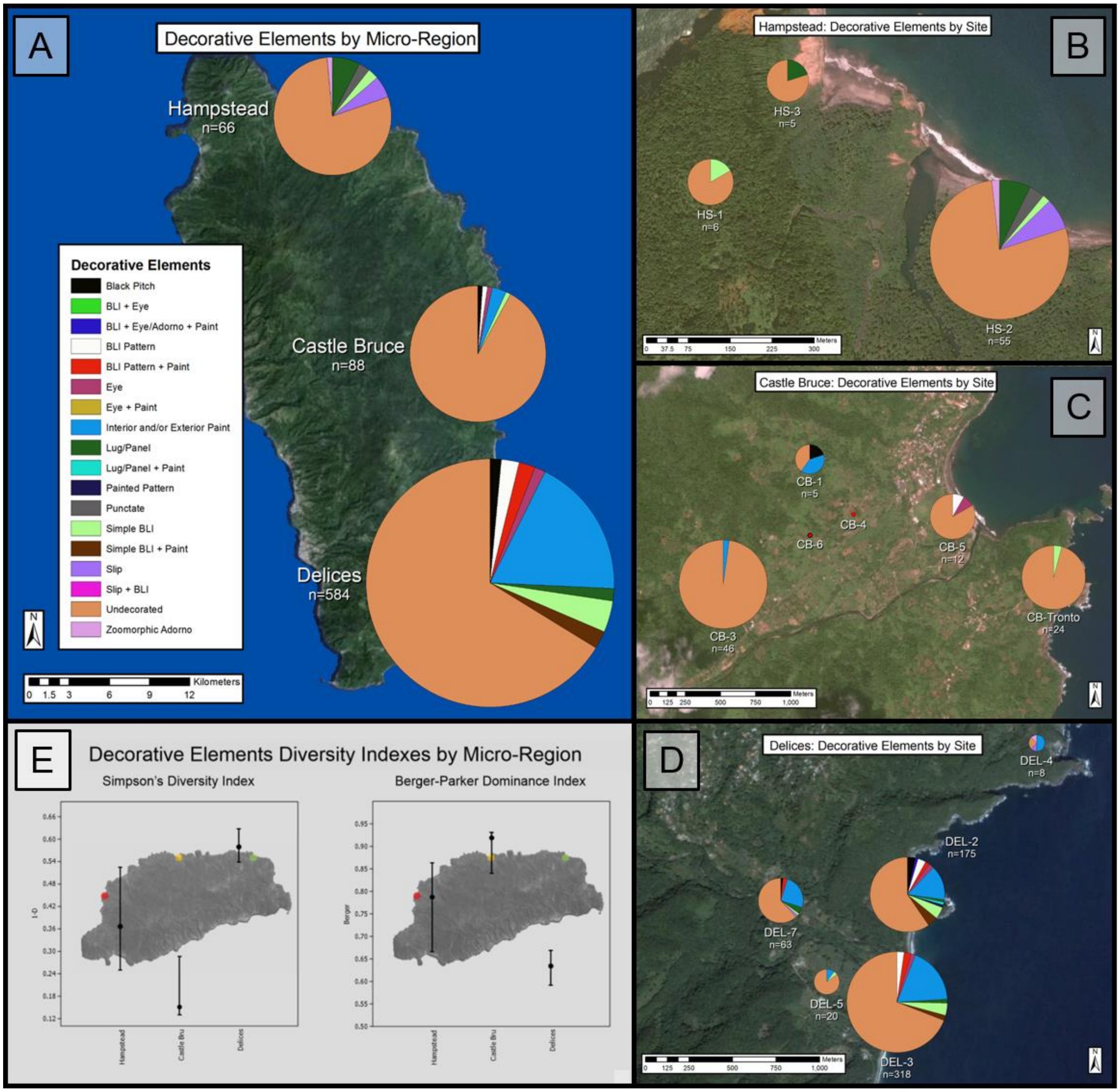

Figure 5-15. Decorative elements figures. A) Charts showing the proportion of decorative elements by micro-region. See Table 5-12 for counts of various decorative elements. Charts showing the proportion of decorative elements by site in: B) Hampstead; C) Castle Bruce; D) Delices. E) Diversity indexes of Decorative elements by micro-region (see Appendix B for formulas).

Figure 5-16. Decorative elements from all three micro-regions. Similar horizontal broad line incisions (simple BLI) on flanged vessels from DEL-3 and HS-1.

Table 5-12. Frequency of decorative elements in pottery assemblages by site.

Decorative Element	CB-1	CB-3	CB-5	CB-6	CB-Tronto	DEL-2	DEL-3	DEL-4	DEL-5	DEL-7	HS-1	HS-2	HS-3	Total
Anthropo. adorno	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Black Pitch	0	0	0	0	0	3	1	0	0	1	0	0	0	5
Black Pitch + Paint	1	0	0	0	0	3	0	0	0	0	0	0	0	4
BLI + Adorno + Paint	0	0	0	0	0	1	1	0	0	0	0	0	0	2
BLI + Eye	0	0	0	0	0	0	2	0	0	0	0	0	0	2
BLI + Eye + Paint	0	0	0	0	0	1	1	0	0	0	0	0	0	2
BLI Pattern	0	0	0	0	0	6	7	0	0	0	0	0	0	13
BLI Pattern + Paint	0	0	0	0	0	3	7	0	0	2	0	0	0	12
Eye	0	0	1	0	0	4	4	0	0	0	0	0	0	9
Eye + Paint	0	0	0	0	0	0	2	0	0	0	0	0	0	2
Exterior Red Paint	0	0	0	0	0	4	10	0	0	6	0	0	0	20
Interior Red Paint	2	1	0	0	0	16	27	3	2	8	0	0	0	59
Int. and Ext. Rd Paint	0	0	0	0	0	6	18	1	0	2	0	0	0	27
Lug/Panel	0	0	0	0	0	2	4	0	0	3	0	4	1	14
Lug/Panel + Paint	0	0	0	0	0	2	3	0	0	0	0	0	0	5
Painted Pattern	0	0	0	0	0	2	1	0	0	0	0	0	0	3
Punctate	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Simple BLI	0	0	0	0	1	9	12	0	1	1	1	1	0	26
Simple BLI + Paint	0	0	0	0	0	8	5	0	0	0	0	0	0	13
Slip	0	0	0	0	0	1	0	1	0	1	0	4	0	7
Slip + BLI	0	0	0	0	0	1	2	0	0	0	0	0	0	3
ZIC	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Zoomorphic adorno	0	0	0	0	0	0	0	1	0	0	0	1	0	2
Undecorated	2	45	10	1	23	103	210	2	17	39	5	43	4	504
Total	5	46	12	1	24	175	318	8	20	63	6	55	5	738

Delices features the most diverse assemblage of decorated vessels, which may be attributable to the contribution of terminal Saladoid and early Troumassoid vessels. Some of the decorated vessels show strong similarities to decorated vessels recovered by Bullen (1964, 1965) from the Pearls site in Grenada, particularly the Pearls rim lugged, Pearls cross hatched, and Pearls inner rim and lip incised types (Figure 5-16). In contrast to Castle Bruce, all of the sites in Delices contain decorated vessels beyond simple painted surfaces, although DEL-5 contains only one vessel featuring simple BLI. Between DEL-2, DEL-3, and DEL-7, DEL-2 has the highest ratio of decorated vessels at 41%, followed closely by DEL-7 at 38%, and DEL-3 at 34%. All of these are higher than the ratio for the total assemblage. Unlike at Castle Bruce, decorated vessels featuring more than simple painted surfaces are found at interior sites as well as coastal sites and in significantly higher proportions.

Although there is some overlap between Hampstead and the other micro-regions in the types of decorative techniques applied, HS-2 stands out as noticeably different, a pattern that we noticed in the field while excavating. Of particular interest are the circular punctate patterns found on one rim and on one appliqué coil pattern (Figure 5-16). The high relief owl head adorno with the horizontal incisions along the wing also represents a unique decorative element found only in Hampstead. Both of these look very similar to vessels recovered from the Anse Petite Rivière site on La Désirade (Hofman et al. 2004a:175, figure 8). The owl head adorno vessel also shows affinity with decorative elements identified by Boomert (1986:26) in St. Vincent as Cayo, particularly the owl seen in his figure 9A. Although the two owls have a very different look, the technique of incising or punctating coil appliqués is certainly similar.

Furthermore, that these decorative elements co-occur in an assemblage also featuring elevated levels of brushed (scratched) surfaces, is similar to what Boomert (2011) reports for other Cayo sites in the region.

Comparison of Paste Characteristics in Ceramic Assemblages

In this study, I employed neutron activation analysis to characterize paste variability. The goal was to evaluate differences in manufacturing technique among the micro-regions with regards to paste selection as well as to look at the composition of local assemblages to identify the degree to which regional imports could be identified. It was assumed that certain types of pottery were more likely to be produced locally, whereas others were more likely to be traded/imported. I therefore structured the sample to reflect a range of vessel shapes, vessel sizes, paste colors and decorative elements applied. Samples of pottery and raw clays were prepared and analyzed by Jeffrey Ferguson and Michael Glascock (2014) of the Archaeometry Laboratory at the University of Missouri Research Reactor Center (MURR) following the procedures outlined by Glascock (1992).

Selection of Sample

The selection of the sample to be tested was of critical importance. I had to narrow it down from approximately 11,000 sherds. In total, I selected 150 vessels for inclusion in the neutron activation analysis. Sample selection was based on a set of explicit assumptions developed during the course of fieldwork. First I assumed that certain types of vessels were more likely to be made locally than others. Griddles are considered among the most difficult vessels to transport owing to their large, flat, shape and their often uneven thickness. I therefore assumed that griddles were more likely to be manufactured locally than other wares. With respect to storage vessels, we were less certain. On the one hand, storage vessels are rather large, but it was still conceivable that storage vessels were carried by canoe to transport provisions required for long trips. However, basketry seems like a more logical choice for such a function. We also considered that storage vessels could be carrying perishable trade goods and exotic ceramics could enter the archaeological record as a container, rather than the actual medium of exchange. Finally, we assumed that decorated vessels, often thought to function as ceremonial or prestigious wares, but also associated with shamanism, could have circulated in elite spheres of exchange.

In order to test these assumptions, I drew samples as evenly as possible from these three groups of vessel types, griddles, decorated serving vessels, and storage vessels, for inclusion in the neutron activation analysis. The selection of this sample was designed such that intra-micro-regional variation could be characterized in Delices, and the samples from the other two micro-regions could be included in the comparison to characterize inter-micro-regional variation. I also wanted the study to address variation both within and between micro-regions but did not want the sample from any one assemblage to be less than 30. I therefore decided to take 90 samples from Delices, 30 each from DEL-2, DEL-3, and DEL-7. Each sample was divided by vessel form, 10 griddles, 10 storage, and 10 decorated sherds. Then I drew 30 samples from each of the other micro-regions, again divided by vessel form. From Hampstead, I took almost all the samples from HS-2, supplementing with griddles from HS-3 and HS-1. From Castle Bruce, because assemblages from the sites are small, the sample of 30 had to be drawn from a number of different sites. This had the added advantage of addressing intra-micro-regional variation in Castle Bruce, but this would have to be done with reduced samples.

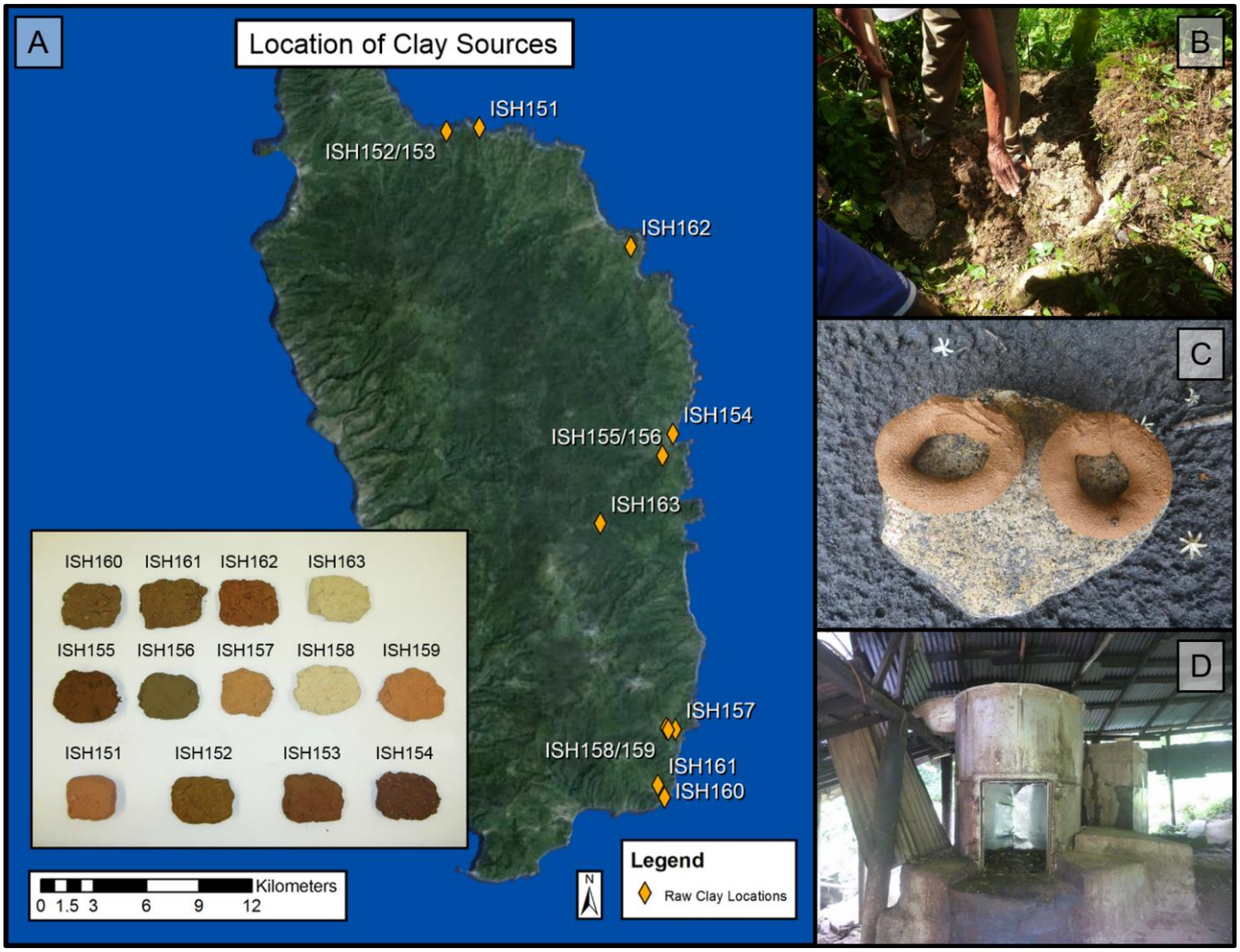

Figure 5-17. Clay harvest figures. A) Map showing the location of raw clays harvested for INAA. Inset shows the different clays after they were baked. B) Mr. Martinez shows Marcus and me where he harvests clay for making pottery. C) Coils made from clay we harvested for INAA. We made coils to assess their workability. D) A Bay Rum distillery in Delices. In the past, these were sealed with clay, but now a flour paste is used more frequently. However, at most of the distilleries we visited, the owners remembered exactly where they used to get clay for this purpose and were often kind enough to show us these locations, all of which were sampled and submitted for INAA. Full credit is given to Edward Thomas for the idea to talk to the Bay rum distillers to find these clay sources.

Harvesting Clays

The eastern portion of the island has the most ancient volcanic deposits, contributing to the clayey soils found there (Roobol and Smith 2014). The clay samples were collected from locations spread along the east coast, mostly from within the three micro-regions, although some were selected from other areas. All of the clays were found with the help of local informants. Our first informant, who also collaborated with Marcus and me to conduct educational activities at primary schools (Object 3-2), was a local potter who took us to the place where he harvests his clay (Figure 5-17B). This location, Tefem, was the most remote from the three watersheds, and located furthest inland. He also told us about a well-known clay source in Marigot, which is approximately midway between Hampstead and Castle Bruce along the east coast. Another big source of information about local clays came from individuals who operate bay rum distilleries. In the recent past, bay rum distillers used clay to seal their distilleries (Figure 5-17D). The characteristics they look for in a clay are similar to the needs for making pottery, and several knew where to find clays and were able to show us these locations. Upon identifying a clay source, we performed a simple workability test to determine if the clay would be suitable for potting (Figure 5-17C). Putting together the information we received from informants, we selected thirteen samples for inclusion in the study (Figure 5-17A). They exhibited a wide range of colors that we found reflected the range of colors observed in the pottery assemblages.

Results of Neutron Activation Analysis

The neutron activation analysis revealed a general pattern of local manufacture for most pottery, with some possible evidence for intra-island exchange, but no unequivocal evidence for inter-island exchange. The limited spatial extent from which the samples were drawn and the relatively small size of the sample, preclude a definitive analysis of patterns of production and exchange. However, as the first neutron activation analysis of pre-Columbian pottery from Dominica, this represents a useful first step for exploring possible dimensions of variability in the assemblages, developing a baseline of data on both pottery and raw clay composition against which both future studies and the other aspects of this analysis can be compared, and developing hypotheses to guide future research.

Although not used to identify the composition groups originally, results of the neutron activation analysis are presented here in bivariate scatterplots based on a principal component analysis of the variance in the elemental composition of the sample (Glascock 1992). The biplot in Figure 5-18A includes vectors that show the relative influence of the different elemental variables included in the principle component analysis. The two main axes of the biplot represent the first two principal components, which account for 50.8% of the elemental variability in the sample. The biplot in Figure 5-18B shows the four distinct composition groups identified by Ferguson and Glascock (2014) through visual inspection of multiple bivariate elemental scatterplots. Groups one through three were represented by only a small number of vessels, so multivariate statistics such as Mahalanobis distance, which would normally be used to confirm group membership, could not be used reliably. In contrast, composition group four dominates the assemblage (Table 5-13). All of the 150 ceramic samples were shown to belong to one of the four composition groups or to show a general affiliation for group four. None of the composition groups have any clear association to the previously established composition groups from the Caribbean, and therefore it was impossible to identify any clearly imported ceramics (Ferguson and Glascock 2014).

Group one

Group one is composed of only five specimens, and is distinct in its low concentrations of chromium. All five specimens in this group come from Castle Bruce and Hampstead, the northern two micro-regions, which may suggest a production area somewhere in the north. However, because the group accounts for less than 10% of the total samples from each micro-region, it is likely that the actual production area is somewhere else, possibly in the north. Of the five samples that belong to group one, two bowls and one griddle were recovered from CB-Tronto, and two bowls come from HS-2. Looking closer specimens from HS-2 that belong to group one, it is intriguing that these two bowls feature relatively unique design techniques not observed outside of Hampstead, including the owl head adorno with coil appliqué wings and the broken S-shaped coil preserving three circular punctations (both pictured in Figure 5-16).

Group two

Group two consists of 12 specimens, and was separated primarily for its high chromium levels. Twenty-three percent of the sample from Castle Bruce, 10% of the sample from Hampstead, and only 2% of the sample from Delices belong to group two. Therefore, it cannot be said there is strong evidence for any clear production area, but it is more common along the central/northern portion of the east coast. Outflaring bowls and inflaring jars both belong to this group, which contains no griddles.

Group three

Group three consists of 10 specimens, and is distinct in its high concentrations of iron and vanadium. Interestingly, all 10 of the specimens in this cluster come from

Hampstead, accounting for a third of the samples from the assemblage. This suggests that either Hampstead was the production area for this pottery, or that occupants of the Hampstead region maintained exchange relationships with a group of pottery producers that did not exchange equally with occupants of the other micro-regions. This localization of group-three specimens lends further support to the differences exhibited between Hampstead and the other two micro-regions.

Table 5-13. Distribution of composition groups by site.

	Composition Group					
Site	1	2	3	4	4 (unas)	Total
Hampstead						
HS-1	0	0	0	0	1	1
HS-2	2	3	10	8	5	28
HS-3	0	0	0	1	0	1
Total	2	3	10	9	6	30
Castle Bruce						
CB-1	0	0	0	1	2	3
CB-3	0	5	0	5	2	12
CB-5	0	2	0	1	2	5
CB-6	0	0	0	1	0	1
CB-Tronto	3	0	0	6	0	9
Total	3	7	0	14	6	30
Delices						
DEL-2	0	0	0	23	7	30
DEL-3	0	0	0	23	7	30
DEL-7	0	2	0	24	4	30
Total	0	2	0	70	18	90
Grand Total	5	12	10	93	30	150

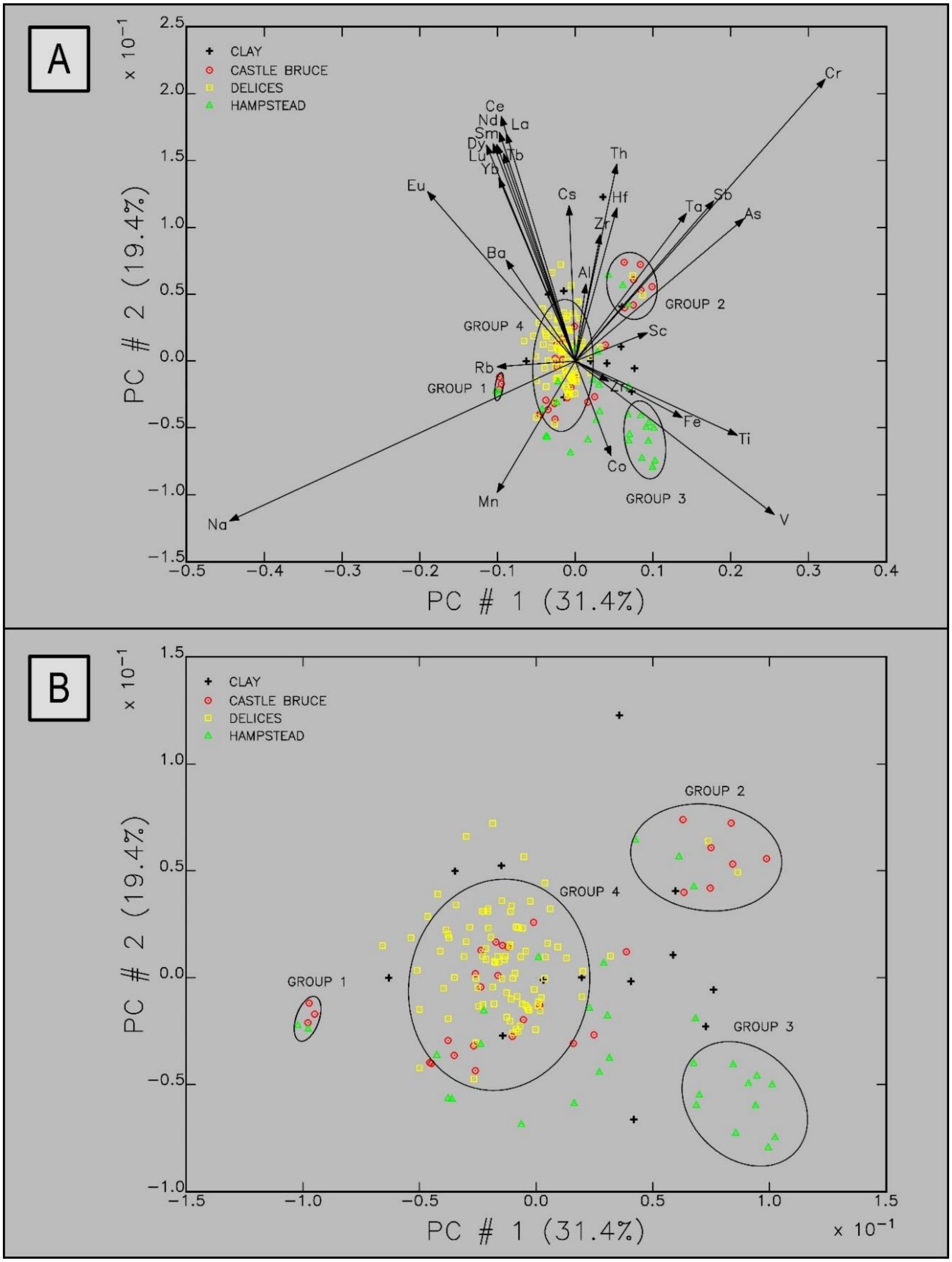

Figure 5-18. Bivariate plots of principle components 1 and 2. Ellipses represent a 90% confidence level for membership in the group. A) Vector plot of principal components (x1.5 scale). B) Composition groups identified by Ferguson and Glascock (2014).

Group four and unassigned samples

Group four is by far the largest group, and is fairly ambiguous with no apparent internal patterning. Ferguson and Glascock made attempts to separate the cluster using scatterplots, cluster analysis, and principal component analysis, but were unable to separate the cluster successfully. Mahalanobis distance projections were used to remove the samples most varied from the main group-four cluster, which were then categorized as group four-unassigned. The majority of the Delices sample (78%) can be attributed to group four, with another 20% belonging to group four-unassigned. This leaves only two of the ninety specimens from Delices, which were assigned to group two. Although not conclusive, this does indicate that pottery belonging to group four was very likely produced in Delices or in the near vicinity. Group-four pottery is also found in the other watersheds, but in much smaller proportions. Approximately 46% of the Castle Bruce sample, and 30% of the Hampstead sample belong to group four, and each watershed has another 20% belonging to group four-unassigned.

Clay samples

Mahalanobis distance calculations were made to assess the probability that clay samples belonged to the any of the four composition groups identified. Although none of the clay samples could be assigned to any composition group at the 90% confidence level, two clays stood out from the rest, returning the highest probabilities for membership in one of the composition groups.

The clay sample ISH160 has a 39.6% probability of belonging to the group of ceramics constituting composition group four. This is intriguing because composition group four dominates the Delices assemblage, and the clay sample ISH160 was harvested from the next watershed over from Delices, Petite Savanne. Even more interesting is that these areas are separated by one of the tallest and steepest mountains in Dominica. In fact, it was not until the 1970s that these adjacent villages were actually connected by a road, and that road is now the steepest pass in Dominica. Before the road was built, people frequently travelled between the villages by boat, although a foot path did connect them as well.

The clay sample ISH152 has a 35% probability of belonging to the group of ceramics constituting composition group three. Group three was the composition group that was only found in Hampstead and ISH152 is a clay that was harvested in the Hampstead micro-region. We recovered the clay sample from Secret Beach, which is located just west of Batibou Bay, between Batibou and Anse Du Mei.

Taken together, these results indicate that some of the clays we collected may have been very close to the sources used to make group-four vessels in the south and group-three vessels in the north. More extensive sampling of clays and pottery from these micro-regions would surely help to evaluate this possibility. However, given the affect that the inclusion of temper can have on the chemical signature of pottery, it might be unlikely to find clays that cluster more closely with the pottery specimens. This is particularly true in light of the results of the petrographic analysis (discussed more thoroughly in the next section), which indicate a high probability that aplastic inclusions in the pottery were added as temper and not naturally occurring in clays.

Discussion

Although not in line with our expectations, the neutron activation analysis revealed patterning and dimensions of variability that could not be identified with traditional ceramic analysis. When compared to the results of the other analyses they raise specific questions that will guide future research.

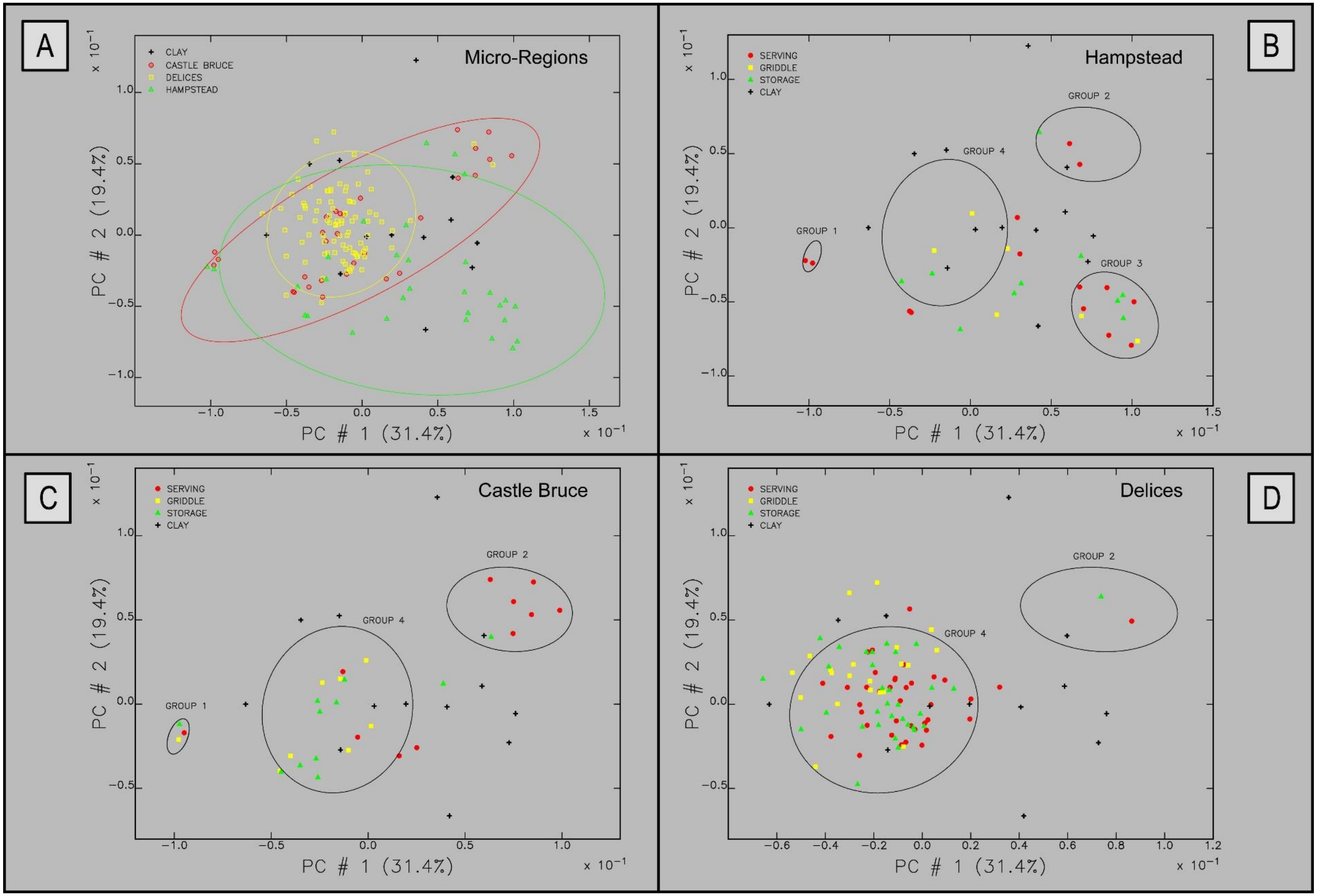

Figure 5-19. INAA results by micro-region. A) Variation in the diversity of groups represented in micro-regions. B) Composition groups by vessel type for Hampstead; C) Castle Bruce; and D) Delices.

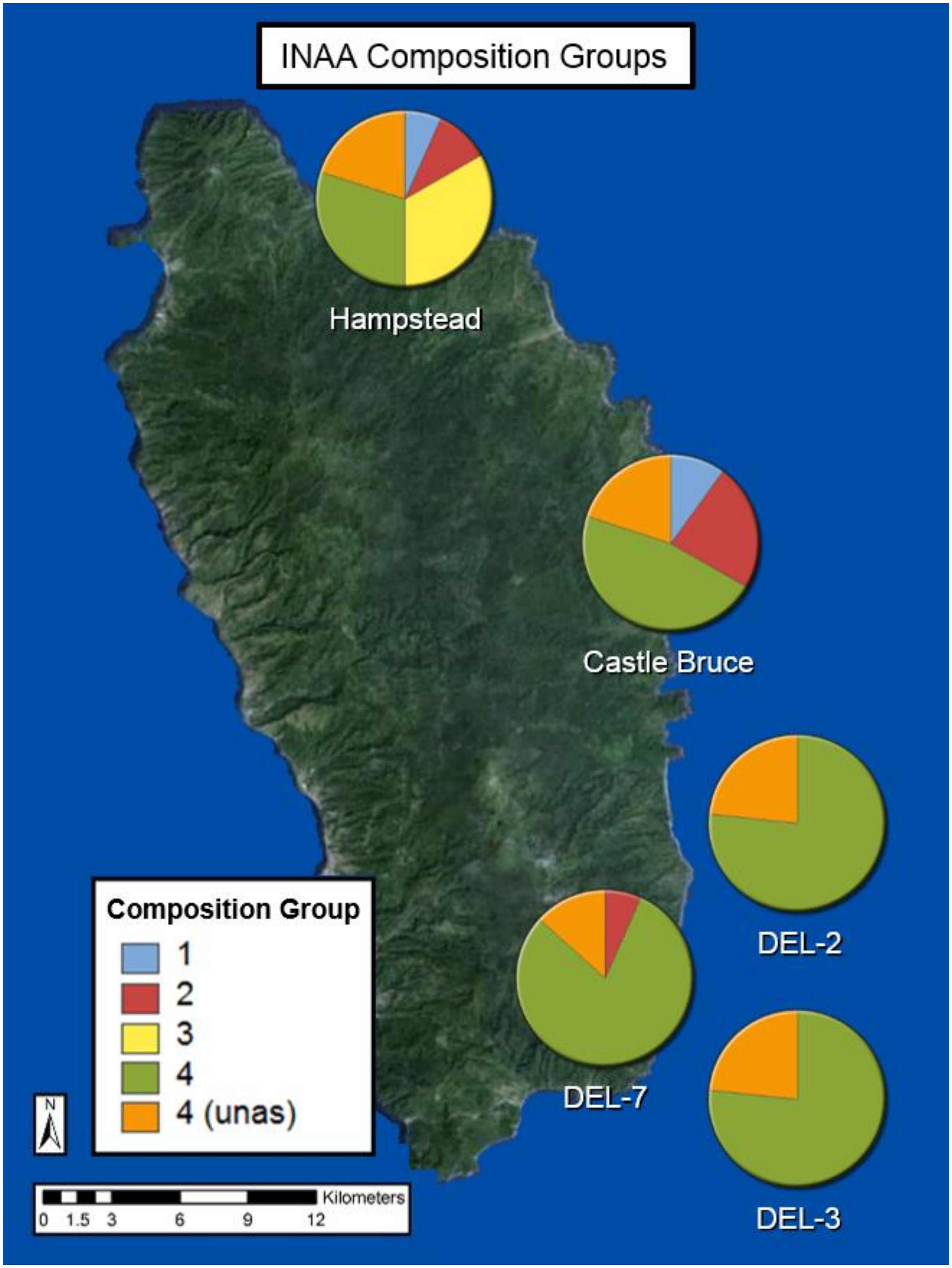

Figure 5-20. Map showing the relative frequencies of composition groups in the three micro-regions. Each pie chart represents n = 30 specimens.

The biggest surprise was the homogeneity of the Delices sample. Figure 5-19A shows the same biplot as Figure 5-18B, except here the 90% confidence intervals are drawn around the micro-regional assemblages rather than the composition groups. This illustrates the very tight clustering of Delices specimens, and the wider spread of the Castle Bruce and Hampstead specimens owing to the diversity of composition groups represented in those assemblages. The same pattern can be seen in Figure 5-20, which helps to visualize the increased compositional diversity in Hampstead and Castle Bruce, despite being represented by samples three times smaller than Delices.

There are a number of interpretations that might explain this pattern. The first possibility is ecological, that potters in both regions had a similarly sized catchment area from which they collected clays, but that geological variability caused the Hampstead assemblage to appear more diverse. In other words, the practices surrounding clay harvesting might not be different, but if Hampstead is more geologically diverse, similar practices could result in divergent results. We might consider this scenario, in which no social or economic factors really contribute to this variability, as the null hypothesis. Future work should try to characterize the variability of clays by collecting and analyzing more samples from the areas where the two potential source clays were harvested. If geological variability can be ruled out as the cause for this pattern, then alternate interpretations can be explored.

One such interpretation has Delices acting as a specialized production and distribution center for pottery. The apparent south to north trend in group-four membership would seem to support the conclusion that pottery produced in or near the Delices micro-region, or raw materials from the area, were radiating out to the other areas through exchange. This would explain the occurrence of group-four specimens in the other micro-regions as well as the diminishing proportion of group-four specimens as distance from Delices increases. If Delices represents a production zone, should Castle Bruce and Hampstead be characterized as consumption zones? If communities in these micro-regions were relying more on exchange than production, it might explain the diversity in both of their assemblages. Both have equivalent proportions of group one, perhaps coming from a different, rival production zone that maintained exchange relations in both Castle Bruce and Hampstead. This would explain the absence of group-one specimens in the Delices sample. The distribution of group-two vessels, the only other group besides four that is represented in all three micro-regions, may also represent an unknown production origin outside of the study area. Hampstead also appears as if it may be in or near the production zone for group-three vessels, the composition group found only in Hampstead with chemical similarity to a nearby clay source (ISH152). Perhaps in Hampstead, some combination of local production and exchange account for the diversity in the assemblage.

The fact that group-four vessels from Hampstead (Figure 5-19B) and Castle Bruce (Figure 5-19C) both include numerous griddles would seem to discount the hypothesis that group four represents a tradeware, unless the assumption that griddles are less likely to be exchanged is false. From this perspective, the composition group most likely to represent a tradeware is group two, which is found in all micro-regions but contains no griddles. The predominance of serving vessels along with the small number of storage vessels that constitute composition group two (Figure 5-19B-D) would support this interpretation, and is in line with our assumption that smaller serving and ceremonial vessels were the most likely to be exchanged. Furthermore, the fact that all three vessel types are represented by group three in Hampstead and group four in Delices (Figure 5-19D), would support the interpretation that these are production zones, but this line of reasoning would also position Castle Bruce as a production zone for group four.

Another possibilities that should be considered is that the distribution of group-four specimens does not reflect exchange at all, but instead is attributable to the incorporation of widely available raw materials into paste recipes in all three micro-regions, perhaps used at reduced frequencies in the north. If that is the case, it is possible that the variation from group four that initially distinguished the other composition groups is actually the result of different tempering materials being added to clays harvested from across the island, which do not themselves exhibit much chemical variability. The general affinity that several of the different clays show to group four would support this conclusion (Ferguson and Glascock 2014), but the lack of baseline geological data, together with the complex volcanic history of the island and the inability to distinguish between temper and paste composition with neutron activation analysis prevent a clear resolution to these issues. However, this is a possibility that can be re-examined with the results of the petrographic analysis.

Temper and Thin Section Petrography

A petrographic analysis of a subsample of the vessels analyzed by neutron activation was conducted by Ann S. Cordell of the Florida Museum of Natural History Ceramic Technology Laboratory. The goals of the petrographic analysis were to characterize variability in the composition and texture of aplastic inclusions, and to compare pottery specimens to the raw clay samples. Specifically, we wanted to determine the degree to which aplastic inclusions were naturally occurring in clays or were added as temper. The addition of temper affects the performance characteristics of ceramic vessels, but also reflects the context in which the technique of preparing clay was learned (Bronitsky and Hamer 1986; Rye 1976). Therefore, this body of evidence provides a useful comparison against aspects of the attribute and chemical analyses. The degree of similarity in paste preparation between communities is addressed by examining paste variability in reference to the neutron activation results and through comparison of the assemblages by micro-region, whereas variability among the various vessel types is used to augment the functional distinctions drawn by the morphological attribute analysis.

A sample of 52 sherds and all 13 clays were selected for inclusion in the petrographic analysis, and were selected prior to receiving the results of neutron activation analysis. Cordell and I chose the sample by making a visual inspection of the 150 vessels selected for neutron activation analysis, and subsampling vessels that exhibited the widest range of temper characteristics within the structure of the sample selection criteria previously laid out. From each of the five 30-sample groups, we selected 10-11 vessels, with at least three from each of the broad vessel type categories, decorated/serving bowls, griddles, and storage vessels. Small test tiles were made from the 13 raw clay samples by Cordell and fired in an eclectic kiln at 600° c for 30 minutes (Figure 5-17). Thin sections were made of all 65 specimens by Spectrum Petrographic, Inc.

Results of Petrography

Three main dimensions of variability in the petrographic data are evaluated here. The first examines bulk composition, expressed as the ratio between three prominent constituent categories: percentage of clay matrix; percentage of crystalline sands; and percentage of combined volcanic rocks (Vol), ferric nodules/opaque oxides (Fe), clay lumps (CL), and grog (G). The second considers only aplastic constituents, and separates the combined category to examine the ratio between crystalline sands, volcanic rocks, and combined Fe, CL, G. In her analysis, Cordell further separated the crystalline sand and non-sand categories into prominent constituents to further refine the temper groupings. However, for this analysis, the majority of relevant compositional variability can be discerned with an analysis of just bulk composition and aplastic composition. Finally, the texture of aplastic inclusions was analyzed by comparing the size indexes of prominent constituent categories. These ratios were used first by Cordell in assigning temper groups (Figure 5-21), and then again to address compositional variability among micro-regions and vessel types (Figure 5-23 and Figure 5-24).

Temper groups

The samples were first rough sorted into gross categories on the basis of presence and relative abundances of prominent constituents. In order to quantify the relative abundance of inclusions and to refine the paste category definitions, point counts were made using a petrographic microscope with a mechanical stage (Stoltman 1989, 1991, 2001). A counting interval of 1-x-1-mm was used, and each point or stop of the stage was assigned to one of the following categories: clay matrix, void, silt particles, and very fine through very coarse aplastic inclusions of varying compositions. For cases in which fewer than 175 points were counted (*n* = 9 of 52 pottery thin sections and 12 of 13 clay sample thin sections), the thin sections were rotated 180° on the mechanical stage and counted a second time (after Stoltman 2001:306). Most point counts were made using the 10X objective and the size of aplastic inclusions was estimated using an eyepiece micrometer with reference to the Wentworth Scale (Rice 2005:38). Point-count data were used to calculate a variant of Stoltman's sand size index (2001:314) for three prominent constituent categories: crystalline sand; volcanic minerals; and combined ferric oxides, clay lumps, and grog (Table 5-16, Table 5-17, and Table 5-18). In total, eight temper groups were identified by Cordell using these methods. Two-sample *t*-tests were used to identify statistically significant differences in texture and composition among temper groups and the various clays at the 95% confidence level.

Group A. This group consists of five samples and is characterized almost exclusively by volcanic rock temper. The percentage of volcanic rock inclusions is significantly greater than the mean for volcanic rock constituents in the comparative clay samples. Although local clays may have some natural volcanic rock constituents, the statistically significant variation from the pottery samples support the interpretation of the volcanic rock component of group A as being actual temper. This is also supported by statistically significant differences in mean percentage of matrix (Table 5-14) and particle size of volcanics (Table 5-17). Examples of group A were recovered from all three micro-regions, but Hampstead contributed only one sample (Table 5-15).

Group B1. Group B1 consists of eight samples, which are characterized by an abundance of crystalline sands of predominately felsic and mafic composition along with some lesser volcanics. On the basis of statistically significant differences in bulk composition observed between pottery in this group and the comparative clay samples, it seems very likely that this sand was added as temper. On the other hand, the mean percentages of volcanics, ferric nodules, and opaque oxides, are not statistically different from the clay samples, indicating that they may have been naturally occurring constituents in paste recipes (Figure 5-21). Specimens from group B1 were only recovered from Delices (Table 5-15).

Group B2. This category consists of 11 samples, and, similar to B1, is characterized by an abundance of crystalline sands of felsic and mafic composition. The groupings were subdivided on the basis of percentage of volcanic inclusions, which is significantly lower in B2 than B1, but is within the range of percentages observed in the comparative clay samples. This could suggest either that clays with lower percentages of volcanics were selected or that some volcanics were added as temper to pottery in the B1 group. Regardless, the two groupings are very similar and may reflect natural variation in constituent volcanics of the clays that were used. Similarity is supported by neutron activation results, in which all samples are affiliated with INAA composition group four or four-unassigned. Group-B2 pottery was recovered in all three micro-regions.

Group C. This group consists of 10 samples and, similar to B2, is characterized by an abundance of crystalline sands of felsic and mafic compositions and lesser volcanics. Compositionally, the percentage of sand, volcanics, ferric nodules and opaque oxides in groups B1, B2, and C, are not statistically different. This similarity is also reflected in the neutron activation results, in which all samples in these groups are affiliated with INAA composition group four or four-unassigned (Table 5-23). The category was distinguished on the basis of higher percentage of amphiboles among the mafic sands, which make up 3% of the bulk composition. Two cases (designated C2) feature smaller particle sizes (mean SSI of 1.30 versus 1.68 for C1). Group-C samples were recovered from both Delices and Castle Bruce, but not Hampstead.

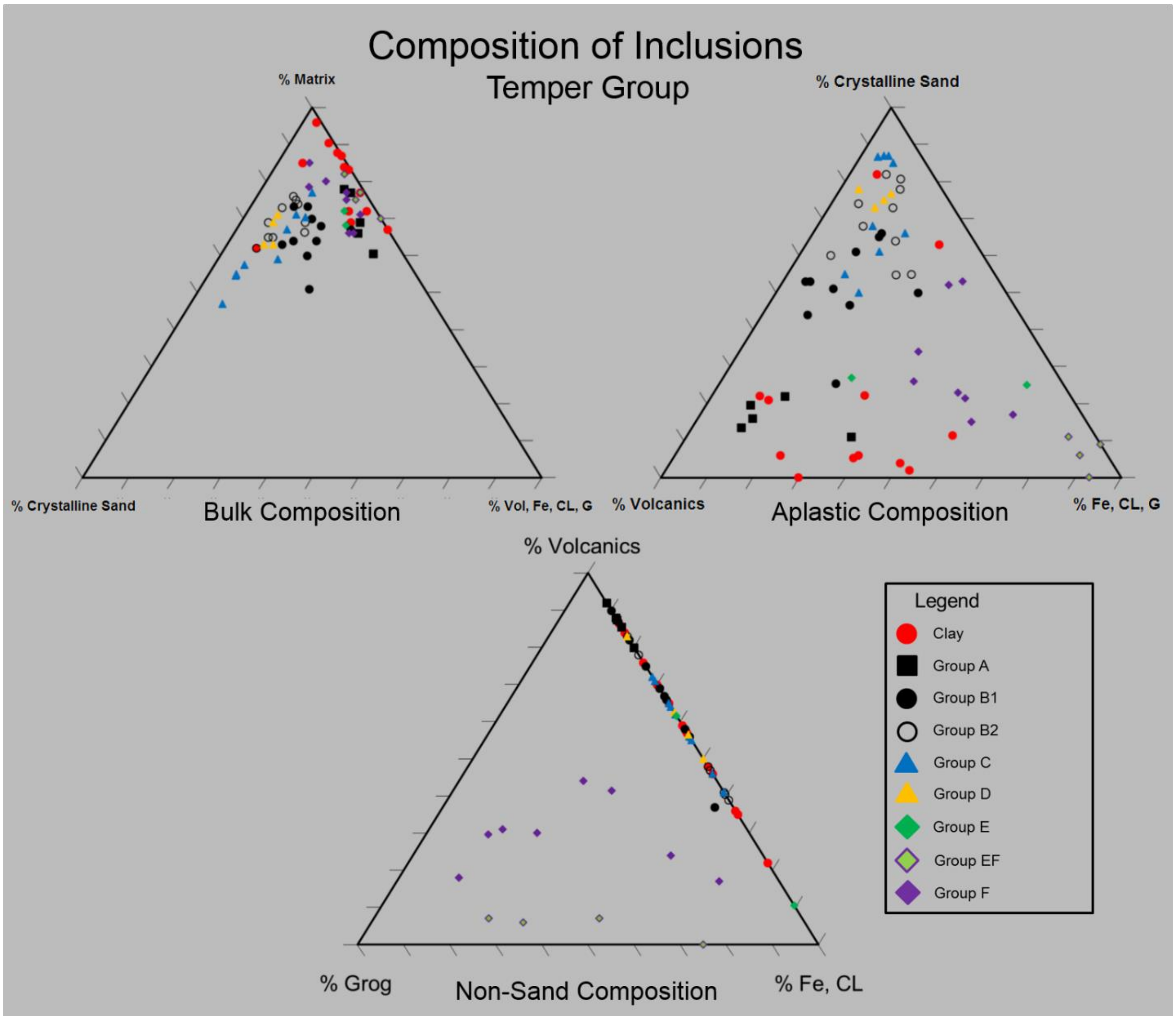

Figure 5-21. Triplots showing the composition of temper groups in terms of bulk composition, aplastic composition, and non-sand composition.

Group D. This is a small group of only four samples, all of which were recovered from Delices. According to *t*-tests, group D is not statistically different from group-B2 samples, except for having a lower proportion of ferric nodules/opaque oxides. As with groups B1, B2, and C, group-D samples belong to INAA composition groups four and four-unassigned (Table 5-23). Cordell separated this group based upon apparent differences observed during visual inspection. Two samples (D1) have coarse texture and two (D2) have fine texture.

Group E. This is a small group of only two samples, both of which were recovered from Hampstead, and both of which feature a brushed/burnished interior surface treatment and a burnished exterior, techniques more associated with the Hampstead assemblage (Figure 5-13 and Figure 5-14). They are characterized by an unusual composition in which the modal constituent category is ferric nodules and/or opaque oxides, with a mean of 14% of the bulk composition (Table 5-14). They have lower amounts of sand and volcanics constituents, consistent with those naturally occurring in the clay samples. This grouping differs from most of the sample, and Cordell suggests that it may represent a distinct potting tradition involving temper selection or the use of distinctive clay resources. This difference is also reflected in the neutron activation results, as both group-E samples belong to INAA composition group three, which was only recovered from the Hampstead sample.

Group EF. This is a small group of only four samples that represents a combination of prominent constituents from category E, and F, grog temper. As with Group E, Cordell suggests that this grouping represents a distinct potting tradition involving temper selection or the use of particular clay resources, differing from most of the sample, which is again reflected in the neutron activation results. All samples in group EF belong to INAA composition group two. Group EF is unique in that it is found in both the Hampstead and Castle Bruce samples, but not from the Delices sample.

Group F. This category consists of eight samples, and is characterized by the prominence of grog tempering, which constitutes a mean of 7.6% of bulk composition for the group (Table 5-14). There are also low percentages of sand, volcanics, and ferric/opaque oxides, consistent with those of the clays samples. Similar to groups E and EF, this group appears to represent a distinct potting tradition, but in this case, it is distinctive based primarily on the selection and processing of temper. Despite this difference, Group-F samples have an affiliation with INAA composition group four and four-unassigned. Group F was not found among the Castle Bruce sample, but was recovered from both the Hampstead and Delices samples (Table 5-15).

Micro-regional variation

When the petrographic data are reframed with reference to location (site/micro-region), they can be used to look at the variability between micro-regions and within each micro-region, although sample size is very small for Hampstead and Castle Bruce Figure 5-23B. In the triplot for bulk composition in Figure 5-23A, some clear patterns of separation can be seen among the micro-regional groupings. The Delices sample appears to form the tightest cluster in the middle of the plot, although a second Delices grouping can be seen along the non-sand axis. The Hampstead and Castle Bruce samples are also split along a similar dimension, although there is greater distance between the groupings. When looking at the aplastic composition alone, the separation between sand tempered and non-sand tempered pottery becomes clearer. Hampstead is the only micro-region to feature predominately non-sand tempered pottery, whereas both Delices and Castle Bruce assemblages are mostly sand-tempered. This pattern is contrary to expectations based on ecology, as Hampstead is the region featuring the sandiest beaches, whereas Delices soils tend to be composed of silt and clay, and the beaches feature almost all cobbles and comparatively little sand. Clearly, raw material procurement practices are not straightforward, and require further investigation.

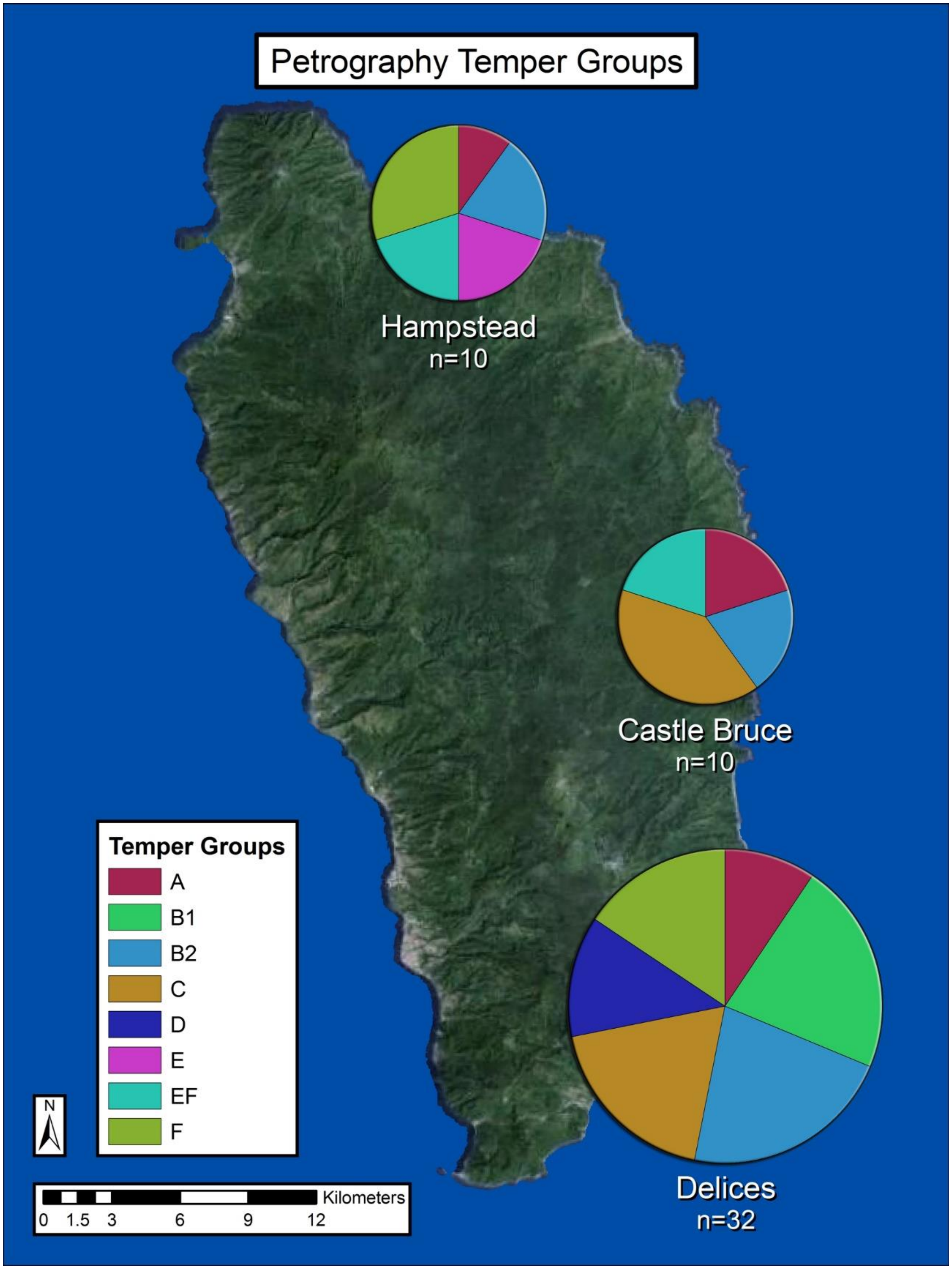

Figure 5-22. Petrography temper groups by micro-region.

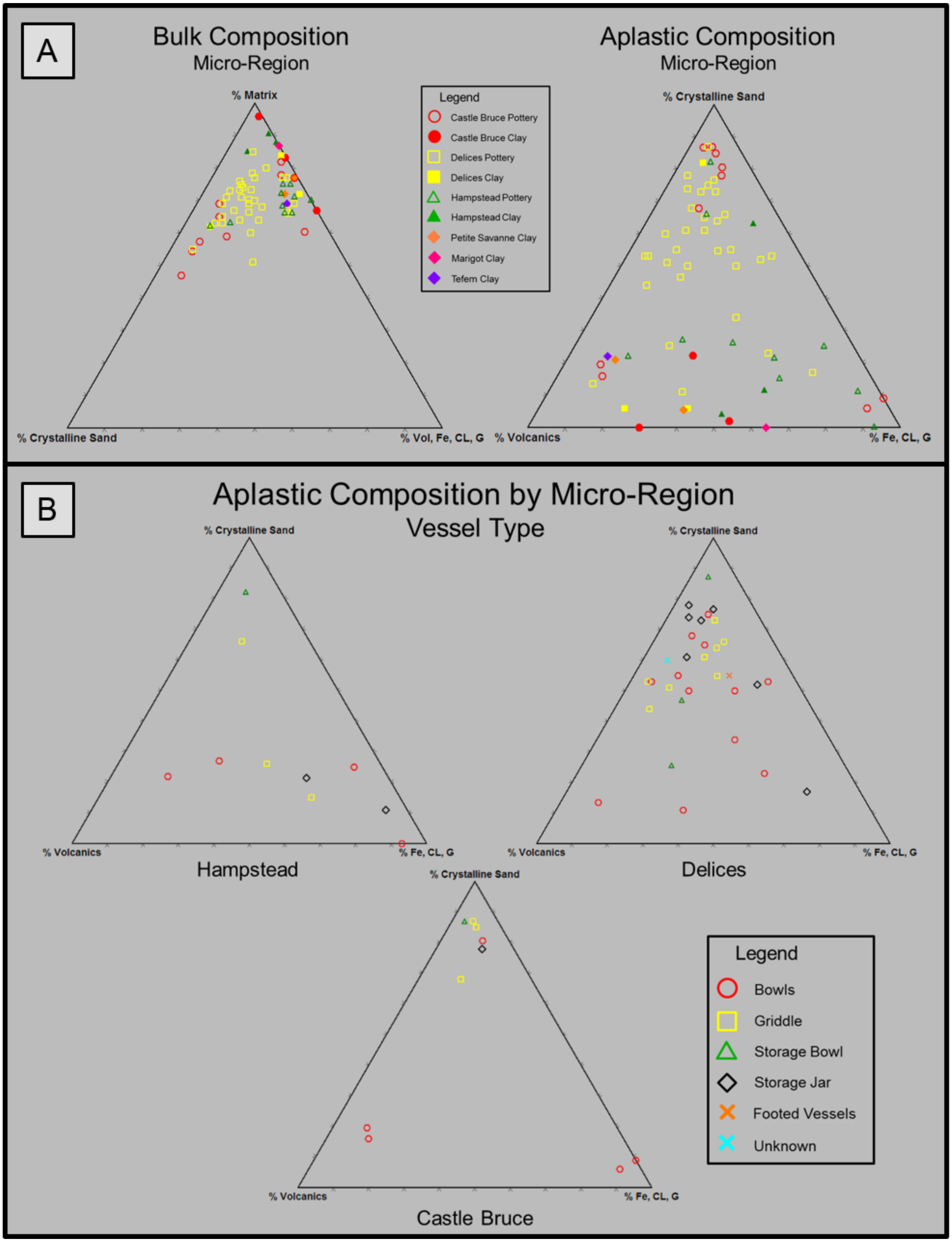

Figure 5-23. Micro-regional variation in petrography. A) Bulk and aplastic composition by micro-region. B) Aplastic composition by vessel type and micro-region.

Table 5-14. Composition of aplastic inclusions in the different temper groups identified by Cordell.

Temper Group	Sample n	Voids %	Silt %	Matrix %	Sand %	Volcanics %	Grog %	Ferric %	Clay Lumps %	Quartz+ %	Plagio-clase %	Mafics %	Pyro-xenes %	Amphi-bole %
Clays	13	7.8	3.9	75.8	4.6	10.0	0.0	5.8	<1.0	<1.0	2.8	1.5	1.1	<1.0
A	6	9.2	4.2	65.1	5.5	20.5	0.0	3.2	<1.0	<1.0	4.5	1.0	<1.0	<1.0
B1	7	9.9	2.4	62.3	18.4	13.3	0.0	3.5	<1.0	1.7	11.9	4.9	3.4	1.0
B2	11	10.6	3.4	65.0	21.2	5.1	0.0	4.4	1.0	<1.0	15.3	5.8	5.0	<1.0
C	10	11.2	4.4	58.6	27.6	5.4	0.0	3.5	<1.0	1.0	19.9	6.9	6.3	3.0
D	4	9.2	2.6	63.8	25.5	5.2	0.0	1.9	1.0	<1.0	19.2	6.0	4.8	<1.0
E	2	9.0	3.0	66.0	7.8	8.0	0.0	14.0	<1.0	0.0	3.8	4.0	4.0	<1.0
EF	4	10.2	4.5	71.4	1.5	1.1	11.8	8.2	1.0	1.0	<1.0	<1.0	<1.0	<1.0
F	8	8.0	3.7	70.9	7.0	5.6	7.6	3.4	1.0	<1.0	4.9	1.9	1.4	<1.0

Table 5-15. Distribution of temper groups by micro-region.

	Temper Groups								
Micro-region	A	B1	B2	C	D	E	EF	F	Total
Hampstead	1	0	2	0	0	2	2	3	10
Castle Bruce	2	0	2	4	0	0	2	0	10
Delices	3	7	7	6	4	0	0	5	32
Total	6	7	11	10	4	2	4	8	65

Table 5-16. Sand size index for temper groups.

		Sand Size Index				
Temper Group	Sample size	Range	Mean	% VFF	% Medium	% CVC+
Clays	13	0.50-2.40	1.50	57.7	26.2	16.7
A	6	1.00-1.47	1.23	65.9	28.8	5.3
B1	7	1.37-1.92	1.65	49.2	30.1	20.7
B2	11	1.45-1.99	1.68	48.0	30.0	22.0
C1	8	1.49-2.04	1.68	49.5	26.7	23.8
C2	2	1.25-1.36	1.30	64.8	26.1	9.1
D1	2	1.23-1.50	1.36	60.4	35.4	4.2
D2	2	1.74-1.79	1.76	42.1	33.2	24.7
E	2	1.18-1.47	1.32	65.8	23.7	10.5
EF	4	1.00-2.29	1.76	44.4	35.0	20.6
F	8	1.13-1.70	1.40	59.1	28.6	12.3

Table 5-17. Volcanics size index for temper groups.

		Volcanics Size Index				
Temper Group	Sample size	Range	Mean	% VFF	% Medium	% CVC+
Clays	13	0.05-2.91	1.72	50.5	23.5	26.0
A	6	2.03-2.61	2.27	27.8	27.0	41.2
B1	7	2.00-2.73	2.31	27.5	30.5	42.0
B2	11	1.96-3.77	2.64	22.1	17.6	60.3
C1	8	1.88-2.89	2.59	19.6	24.2	56.2
C2	2	1.57-2.02	1.80	48.1	23.6	28.3
D	4	1.35-2.43	1.80	45.4	29.6	25.0
E	2	1.42-1.66	1.54	58.4	22.4	19.2
EF	4	1.20-3.00	2.11	35.0	15.0	50.0
F	8	1.17-2.25	1.76	43.3	28.5	28.2

Table 5-18. Fe, Clay Lumps, and Grog size index for temper groups.

		Fe, Clay Lumps, Grog Size Index				
Temper Group	Sample size	Range	Mean	% VFF	% Medium	% CVC+
Clays	13	0.50-2.44	1.51	58.1	21.5	20.4
A	6	1.20-2.56	1.79	43.5	31.1	23.6
B1	7	1.00-2.38	1.70	47.9	34.5	17.6
B2	11	1.04-2.57	1.66	58.5	17.4	24.1
C	10	1.08-2.41	1.81	47.3	22.4	30.3
D	4	1.45-2.86	1.93	45.3	21.3	33.4
E	2	1.08-1.36	1.22	82.3	11.8	5.9
EF	4	1.75-2.26	2.11	38.4	17.8	43.8
F	8	1.82-2.44	2.08	35.2	28.5	36.3

Relationship to technofunctional analysis

By framing the petrographic data with reference to vessel type, the petrographic analysis can be compared to the technofunctional attribute analysis. The sample was originally drawn to include decorated/serving vessels (coded here as bowls), griddles, and storage vessels, which were further subdivided into bowls and jars depending on whether they had an unrestricted or restricted orifice. Figure 5-24 shows triplots that display the bulk composition and proportion of aplastic inclusions by vessel type, along with interval plots showing 95% confidence intervals for mean orifice diameter and wall thickness for the analyzed samples. The interval plots show that the bowl category feature vessels with smaller orifice diameter and wall thickness than griddles and storage vessels, although only the differences between bowls and storage bowls are statistically significant. This difference is echoed in the petrographic analysis, as the bowl category is significantly different from both storage jars and storage bowls in terms of percentage of sand contributing to the bulk composition of the vessel. When just the composition of aplastic inclusions is examined, the bowl category is significantly different from griddles as well. In all of these comparisons, the bowls feature lower quantities of aplastic inclusions, which can be seen in the triplot in Figure 5-24. The size indexes also show the separation of the bowl category. Bowls feature significantly lower sand and volcanic size indexes than storage bowls and griddles, and for all other constituents, bowls have a significantly lower size index than storage jars. This can be seen very clearly in the separation between bowls and other vessel types in the crystalline sand triplot in Figure 5-25. Table 5-19 through Table 5-22 show the temper group affiliations, mean percentages of three temper size categories, bulk composition, and aplastic composition for different vessel types.

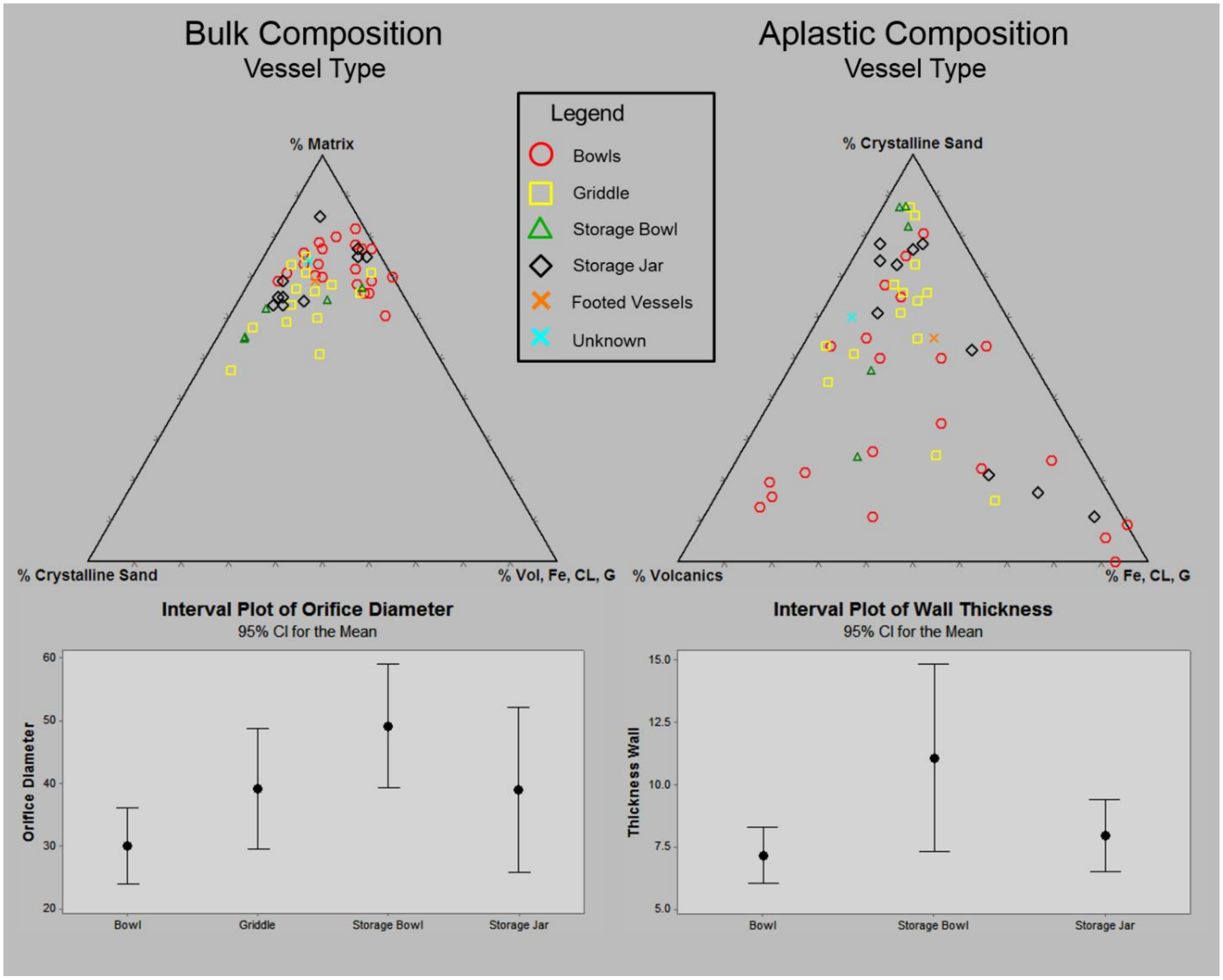

Figure 5-24. Bulk and aplastic composition by vessel type, along with interval plots showing 95% confidence intervals around the sample mean for orifice diameter and wall thickness.

Table 5-19. Petrographic temper group of various vessel forms.

	Temper Group										
Vessel Type*	A	B1	B2	C1	C2	D1	D2	E	EF	F	Total
Bowl	5	1	4	0	2	0	1	2	3	3	21
Griddle	0	3	3	6	0	0	0	0	0	2	14
Storage Bowl	1	1	1	2	0	0	0	0	0	0	5
Storage Jar	0	1	2	0	0	2	1	0	1	3	10
Total	6	6	10	8	2	2	2	2	4	8	50

* Two vessels excluded because their vessel form was unknown.

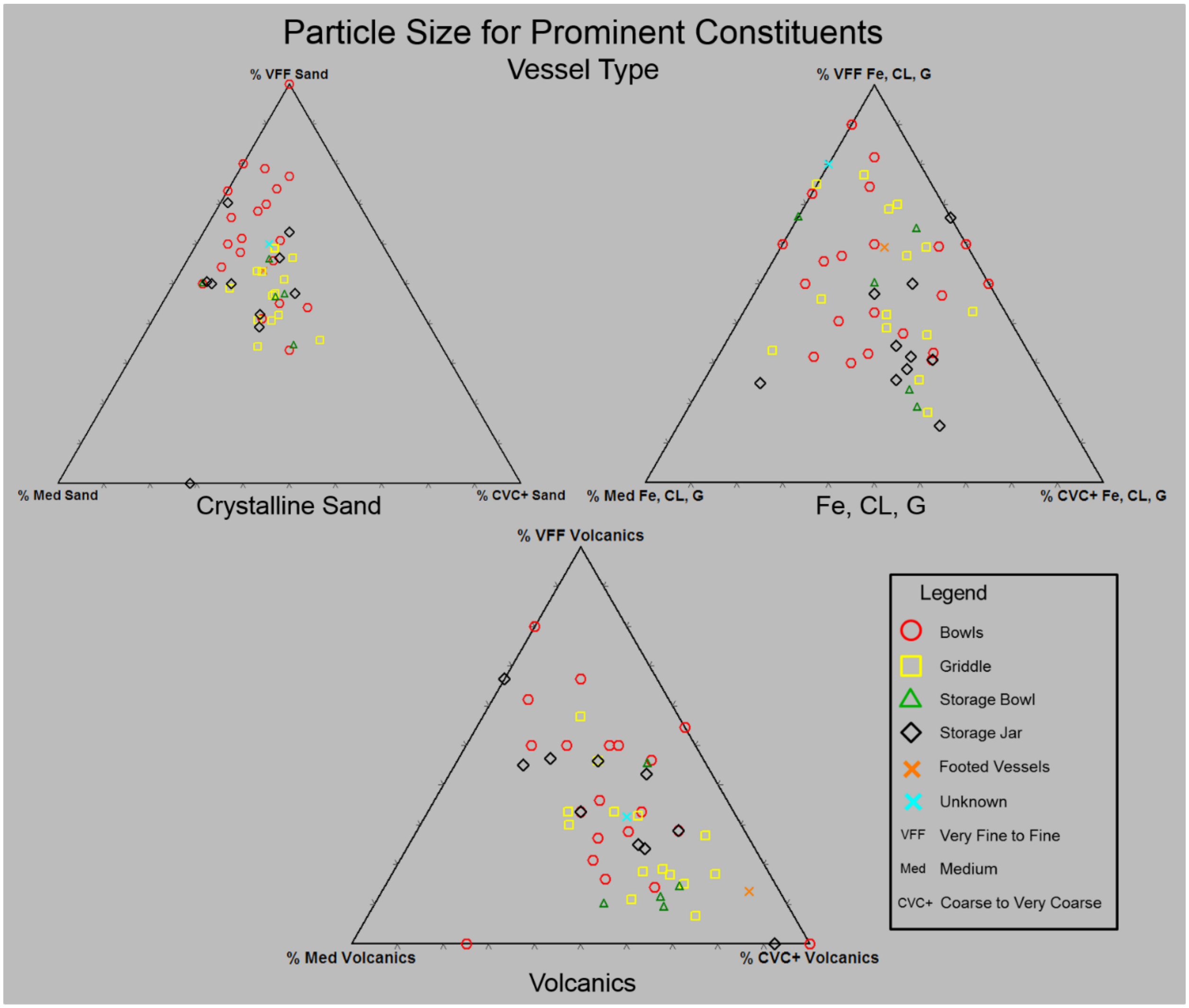

Figure 5-25. Triplots displaying the percentage that size categories contribute to the prominent constituent categories: crystalline sand, volcanics, and Fe, CL, G.

Table 5-20. Mean percentage of size categories for prominent constituents.

		Crystalline Sand			Volcanics			Fe, Cl, G		
Vessel Type	n	% VFF	% Med	% CVC+	% VFF	% Med	% CVC+	% VFF	% Med	% CVC+
Clays	13	48.8	22.2	13.7	50.5	23.5	26.0	58.1	21.5	20.4
Bowl	21	62.6	25.3	12.1	35.6	24.1	35.5	52.2	23.7	24.1
Griddle	14	47.7	29.8	22.4	26.1	23.8	50.2	49.4	22.6	28.0
Storage Bowl	5	46.8	31.9	21.3	18.0	25.7	56.3	44.4	25.9	29.7
Storage Jar	10	46.9	36.1	17.0	35.8	24.8	39.3	35.5	27.1	37.4

Table 5-21. Bulk composition of matrix and aplastic inclusions by vessel form.

		% Matrix			% Crystalline Sand			% Vol, Fe, CL, G		
Vessel Type	n	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
Clays	13	62.0	96.0	79.4	0.0	31.0	4.6	3.0	33.0	15.9
Bowl	21	60.5	82.0	72.6	0.0	25.0	9.9	6.0	33.1	17.5
Griddle	14	47.0	75.0	63.9	4.0	46.0	21.6	6.5	25.0	14.5
Storage Bowl	5	54.5	67.0	60.5	8.0	39.4	26.9	6.0	25.0	12.6
Storage Jar	10	63.0	85.0	70.1	3.0	29.0	17.5	7.0	22.0	12.4

Table 5-22. Aplastic composition by vessel form.

		% Crystalline Sand			% Volcanics			% Fe, CL, G		
Vessel Type	n	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
Clays	13	0.0	82.0	18.9	8.0	71.0	46.6	6.0	64.0	34.5
Bowl	21	0.0	80.7	36.0	0.0	75.7	30.8	6.0	93.0	33.2
Griddle	14	15.0	87.0	58.1	7.0	46.0	23.0	5.0	60.0	18.8
Storage Bowl	5	25.4	87.0	65.5	8.0	49.2	22.5	3.8	25.4	12.0
Storage Jar	10	11.0	78.0	54.2	6.0	27.0	15.8	4.0	83.0	30.0

As several have shown (Braun 1983; Bronitsky and Hamer 1986; Skibo et al. 1989), the addition of temper can increase the thermal shock resistance of a vessel, so it is expected that griddles should feature more aplastic inclusions than serving bowls. Because the crystalline sands feature very low levels of quartz, which was absent in half of the pottery samples, these crystalline sands would be a very good tempering agent for raising the thermal shock resistance of a vessel. The fact that there are no significant differences in the bulk composition or aplastic composition among griddles and both types of storage vessels, may indicate that some of these were not actually storage vessels, but were actually cooking vessels, although this would not necessarily alter the domestic function to which they were attributed.

Relationship to neutron activation analysis

One of the biggest shortcomings of this analysis is that we did not have the luxury to wait for the results of the neutron activation analysis before selecting the sample for petrographic analysis. Had we been able to do so, we would have selected a more representative sample from INAA composition groups one, two, and three. This would have been useful in helping to determine the degree to which variable temper composition may have affected the results of the neutron activation analysis. When these data are compared, the trend observed in the chemical composition, in which Delices featured the tightest clustering and the least diversity, is somewhat repeated, which can be seen in Figure 5-23. With that being, said, in terms of the number of different temper groups represented, Delices does show the highest diversity, with six different groups present, although a diversity *t*-test showed that the difference is not statistically significant in relation to Hampstead, which contained five temper groups, or Castle Bruce, which contained four. In this regard, the practices surrounding the preparation of clays seems more varied in Delices relative to clay selection, which appears to have been more consistent. The fact that the most salient differences in clay preparation in Delices exist between serving bowls and the other vessel types, presents intriguing possibilities about variable manufacturing processes between pottery producers who were still using the same or similar clays. However, the very small samples considered here, along with the lack of detailed geological control that affected the interpretation of the neutron activation results, reduce inferences made at this stage to speculation.

Table 5-23. Relationship of petrography temper groups to INAA composition groups.

	INAA Composition Groups					
Temper Group	1	2	3	4	4(unas)	Total
A	2	0	0	2	2	6
B1	0	0	0	6	1	7
B2	0	0	0	10	1	11
C1	0	0	0	7	1	8
C2	0	0	0	1	1	2
D1	0	0	0	0	2	2
D2	0	0	0	2	0	2
E	0	0	2	0	0	2
EF	0	4	0	0	0	4
F	0	0	0	4	4	8
Total	2	4	2	32	12	52

The apparent association that INAA composition groups three and two have to temper groups E and EF respectively (Table 5-23), seems to indicate that both paste selection and paste preparation may have co-varied from the total assemblage for certain vessels. This is made all the more compelling when it is considered that both of these temper and INAA composition groups were absent from Delices (with the exception of two vessel belonging to INAA composition group two). These results provide some support for the possibility that tempering materials were causing INAA composition groups one, two, and three to appear different from group four. However, the fact that temper group A did occur in INAA composition group four, failing to drive those samples out of the group-four cluster, and the very small samples from composition groups two and three that were analyzed petrographically, do not permit a resolution to this issue. Although the pattern appears weak with the available data, when these differences are considered along with all the other analyses presented, it reinforces differences already established between the Hampstead micro-region and both Castle Bruce and Delices.

Discussion

Although the petrographic analysis is based on a relatively small sample size, it reveals some very interesting patterns that corroborate other analyses discussed here. First, the relationship to the technofunctional attribute analysis supports the assumption that there are functional differences between small-orifice, thin-walled vessels, and large-orifice, thick-walled vessels. The apparent trend in which the former feature both less and generally smaller aplastic inclusions added as temper, reinforces the notion that these were finer wares, and can be juxtaposed in terms of both function and manufacturing technique against the more coarsely tempered utilitarian wares such as storage vessels and cooking vessels, including both pots and griddles. A further consideration as to this bimodal tendency is the gender-affiliated vessel dimorphism that has been observed, in which men produced drinking and ceremonial vessels, whereas women more often produced utilitarian and undecorated wares (Boomert 1986, 2011). Perhaps the petrographic data reflect variable clay preparation practices between male and female pottery producers. While certainly not conclusive, this hypothesis would benefit from further examination.

Lithic Materials Analysis

In looking at the various lithic assemblages across the sites and micro-regions studied, a number of interesting patterns emerge. First of all, the distribution of lithics is not even, suggesting that the activities associated with stone tools were not practiced at all sites equally. However, no site is devoid of lithic materials, meaning that the degree of specialization between sites is not so great that activities associated with lithic materials were absent from any particular site. So the first interesting pattern to look at is the distribution of lithics across sites. The second interesting pattern is the ratio of locally acquired lithic material to imported lithic materials. This is also not even by site; certain sites contain higher ratios of imported lithics than others. This variable can be used as a proxy measurement for the degree of regionality expressed in the interactions at any particular site in the community. This is an extremely critical variable when understanding the sociality of inter-regional interaction as expressed in an intra-regional settlement pattern. We can look at both of these patterns at different scales, between sites within micro-regions and between micro-regions by grouping the sites within micro-regions together.

During the lithic analysis, every piece of stone material recovered was identified macroscopically into one of seven groupings: red jasper, yellow jasper, Antigua chert, other chert, chalcedony, quartz/quartzite, and other, which included types of stone that only appeared singularly or extremely rarely (Figure 5-26). These groupings can then be sorted into whether they are likely to be local, exotic, or unknown. Red jasper, for example, is almost certainly harvested locally in Dominica, as it is found in many places around the island, although it may show up naturally in different proportions in different micro-regions. Antigua chert, on the other hand, is certainly imported, although the method of importation may vary (Knippenberg 2006). It is also possible that voyaging Dominicans harvested such exotic stones themselves outside of any exchange alliance.

The Materials Recovered

Red jasper

Red Jasper (Figure 5-26) is the most commonly recovered material and includes the ubiquitous smooth red jasper, the less common rough red jasper, and the even less common red jasper with white veins. All of these types of jasper can be found naturally in many regions of Dominica in small pebbles and larger cobbles. Often times they can be found in river beds, such as the Castle Bruce River which has abundant red jasper. They can also be found on the beaches as ocean or river worn cobbles. The Kalinago will tell you that this stone was used to make grater chips for manioc processing, and this is certainly something that I have considered as well. As we were going through the lithic materials, I was looking for flakes that could have been grater chips and identified certain ones based on shape. Although it is possible that pieces of red jasper are imported, for this analysis I am assuming that all red jasper is locally acquired.

Yellow jasper

Yellow jasper is found less frequently than red jasper. Although we had seen some specimens of yellow jasper naturally in the rivers, it was not with anywhere near the frequency that we would encounter the more common red jasper. However, for this study I assume that like the red jasper, the yellow jasper is a locally acquired material.

Antigua chert

There has been much written in the Caribbean about the prevalence of chert from Antigua, a source that was apparently discovered by early foraging groups that moved into the Caribbean (Davis 1993), and which continued to be exploited into the later Ceramic Age. Knippenberg (2006) is notable for having conducted a provenance study of this and other lithic sources in the northern Lesser Antilles, and for tracing their distribution at sites throughout the Caribbean. That Antigua chert is found in Dominica is unsurprising, but the pattern by which they are distributed at only certain sites in the settlement pattern is potentially very revealing.

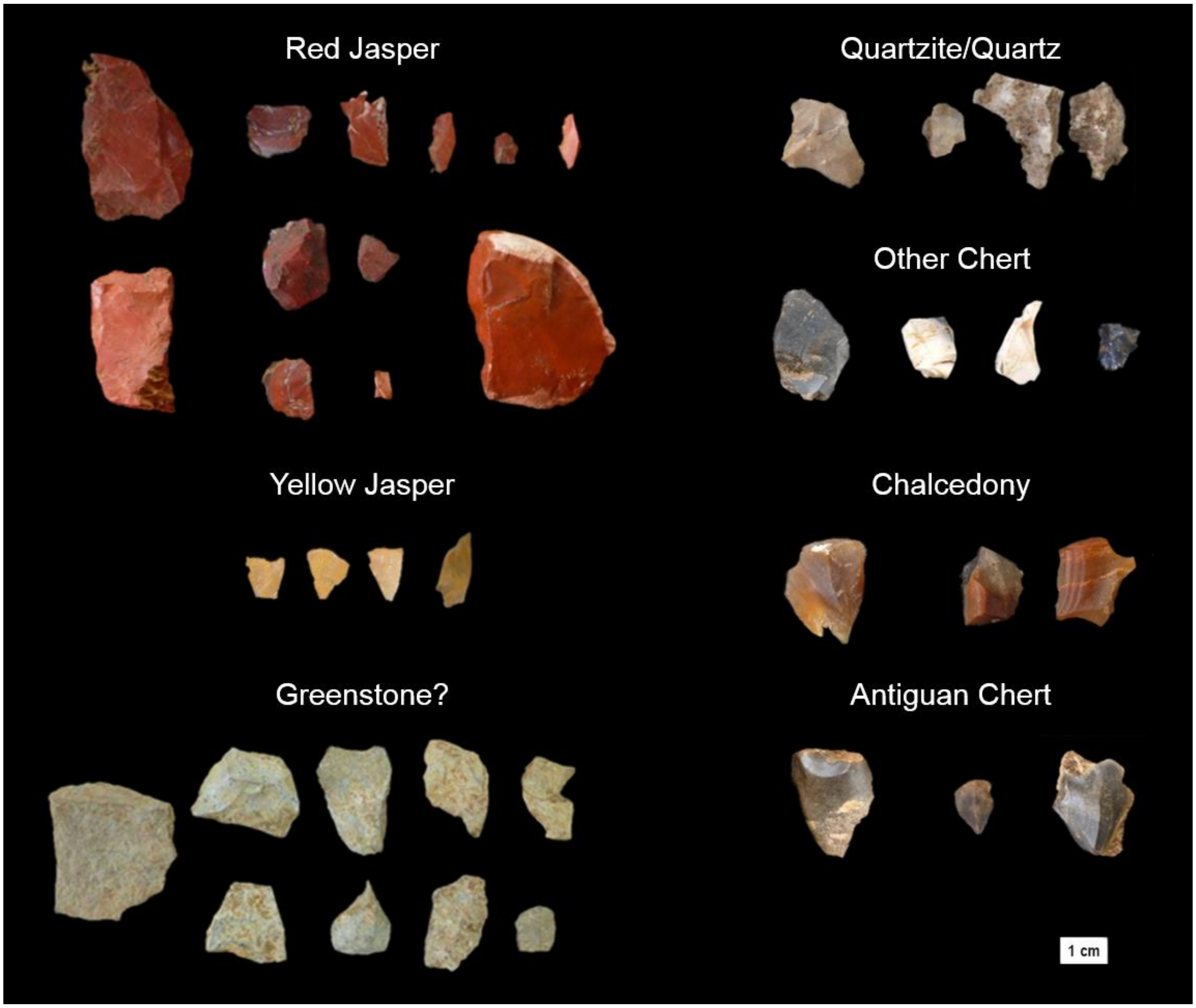

Figure 5-26. Examples of various lithic materials.

Other chert

This category included a variety of stones that have the characteristics of chert, but not the easily identifiable honey-tinted grey of chert from Antigua. The most common occurrence in this category is white chert, which is common in many places in the Caribbean, but whose provenance is unknown.

Table 5-24. Lithic material by micro-region.

	Red Jasper (L*)		Yellow Jasper (L)		Antiguan Chert (E)		Chalcedony (E)		Greenstone? (U)		Other Chert (U)		Quartz/ Quartzite (U)		Other (U)		Total
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
Hampstead																	
HS-1	0	0%	0	0%	0	0%	0	0%	0	0%	4	100%	0	0%	0	0%	4
HS-2	26	46%	2	4%	1	2%	1	2%	0	0%	22	39%	0	0%	4	7%	56
HS-3	21	72%	0	0%	0	0%	0	0%	0	0%	8	28%	0	0%	0	0%	29
Total	47	53%	2	2%	1	1%	1	1%	0	0%	34	38%	0	0%	4	4%	89
Castle Bruce																	
CB-1	13	100%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	13
CB-3	166	79%	4	2%	0	0%	0	0%	32	15%	4	2%	5	2%	0	0%	211
CB-5	25	78%	1	3%	1	3%	1	3%	0	0%	1	3%	2	6%	1	3%	32
CB-6	11	85%	0	0%	0	0%	0	0%	0	0%	0	0%	2	15%	0	0%	13
CB-Tronto	14	93%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	1	7%	15
Total	229	81%	5	2%	1	0%	1	0%	32	11%	5	2%	9	3%	2	1%	284
Delices																	
DEL-2	12	21%	11	20%	3	5%	6	11%	0	0%	22	39%	1	2%	1	2%	56
DEL-3	42	65%	2	3%	11	17%	0	0%	1	2%	5	8%	3	5%	1	2%	65
DEL-4	1	100%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	1
DEL-5	22	76%	1	3%	2	7%	0	0%	0	0%	3	10%	1	3%	0	0%	29
DEL-7	10	77%	2	15%	0	0%	1	8%	0	0%	0	0%	0	0%	0	0%	13
Total	87	53%	16	10%	16	10%	7	4%	1	1%	30	18%	5	3%	2	1%	164
Grand Total	363	68%	23	4%	18	3%	9	2%	33	6%	69	13%	14	3%	8	1%	537

Note: * (L)ocal, (E)xotic, (U)nkown.

Chalcedony

Chalcedony was identified macroscopically by its translucence and waxy luster. It was recovered in very limited quantities (*n* = 9) across the excavations, but its rarity is intriguing. As opposed to the near ubiquitous distribution of local jasper, this limited quantity may suggest that it was a valued or exotic resource for lithic tool producers in Dominica. Unfortunately, it is not clear whether chalcedony could be obtained locally, or is only found abroad. However, because we never encountered chalcedony in the environment like we did jasper, for this study, I am assuming that the chalcedony is not a locally acquired material.

Quartz/quartzite

Quartz and quartzite were identified macroscopically by their color and translucence. They constitute a small quantity of the total assemblage of lithics (*n* = 19).

Greenstone

There was one type of stone that could not be identified, but appeared to be a type of greenstone. It was found in abundance (*n* = 32) at CB-3 and one flake was recovered from DEL-3. Because the specimens were highly weathered, we were not able to satisfactorily determine if they were artifacts. However, their direct association with other Amerindian artifacts in several test pits would support the conclusion that this was a type of stone used almost exclusively at CB-3, a site that already yielded more lithics than any other site (Table 5-24). However, I cannot be confident in the greenstone designation until the specimens are analyzed by a specialist.

Other

The "other" category simply includes all examples of lithic materials that cannot be grouped into one of the other six categories. Of these, four are groundstone objects, one is a carnelian bead that cannot be attributed confidently to a pre-Columbian origin, and three are flaked stone. One piece of flaked stone was initially believed to be obsidian based on macroscopic observation. Because of the uniqueness that such a find would have, this artifact was submitted to MURR for XRF analysis, but the high levels of Iron, Calcium, and Strontium and low levels of Manganese, Rubidium or Zirconium led Glascock (personal communication 2013) to conclude that it was more likely a piece of glassy basalt. The other two may have been some type of riverstone.

The Manioc Grater Hypothesis

Throughout this study, I have assumed that higher incidence of lithics at a site could be taken as evidence for a domestic, or food-processing, site function. One common use for lithics was to make chips that would be inserted into a board to construct a grater (Figure 5-27E) for processing manioc (Berman et al. 1999; Crock and Bartone 1998; Loven 1935). A comment made by Breton (1958a:35) confirms this for Dominica.

> The grating device of the Caribs is a small plank covered with sharp little inlaid stones. After supper all the women grate only the manioc roots which will be used the following day, because ordinarily they eat only fresh bread. The women wash and then grate the manioc and reduce it to a flour.

Although this use for stone is not uncommon for the Amazon or the Caribbean, DeBoer (1975) warns that archaeologists should not assume that manioc was the only plant processed in this way, so the grater chips should not be taken automatically as evidence of manioc cultivation. Regardless of this possibility, from the above quote, in tandem with what our Kalinago informants told us and what has been observed over vast regions of the Amazon, it seems clear that stone grater chips were used for food processing. Walker (1983) conducted use-wear analysis to identify grater chips archaeologically. He notes that ethnographic grater chips tend to be between 2 and 10 mm along their longest axis. Both Walker and Berman (1999), who analyzed microlithics from the Bahamas, note that bipolar reduction is often used to produce suitable flakes for this purpose. Figure 5-27E shows a histogram of the maximum length for all non-core flaked stone recovered. It should be noted that because ¼-inch mesh was used, we would not expect to recover lithics smaller than 6.35 mm (although even slightly larger pieces could easily have fallen through the screen), which is reflected in the histogram. It is clear from the positively skewed distribution that smaller stone flakes dominate the assemblage. The concentration of small flakes supports the notion that flakes were inserted into boards to make graters (Crock and Bartone 1998; Walker 1983) and the use of lithics to serve as a proxy for assigning a domestic function to sites with elevated levels of lithics. An interesting corollary follows; to the degree that we accept this proxy, and provided we assume that Breton was accurate in indicating that the use of these grater boards was the strict domain of women, lithics can also be used as a proxy to demarcate gendered space.

Distribution of Lithic Materials

Grouping the different lithic varieties down to just three categories, local, exotic, and unknown, allows us to identify patterns in the variable importance that regional interactions resulting in the movement of stone materials, played at different sites and micro-regions. Figure 5-27 shows the distribution of lithic artifacts by micro-region. In many of the ceramic analyses, Castle Bruce contained lower quantities of most traits, such as decorative elements and diversity of rim shapes, than Delices or Hampstead. However, here, Castle Bruce stands out for having an elevated quantity of lithic materials. Furthermore, it is readily apparent that the assemblage of lithics from Castle

Bruce is composed overwhelmingly of materials that can be acquired locally, whereas higher ratios of known imports, such as chert that likely derives from Antigua, can be found in Hampstead and Delices.

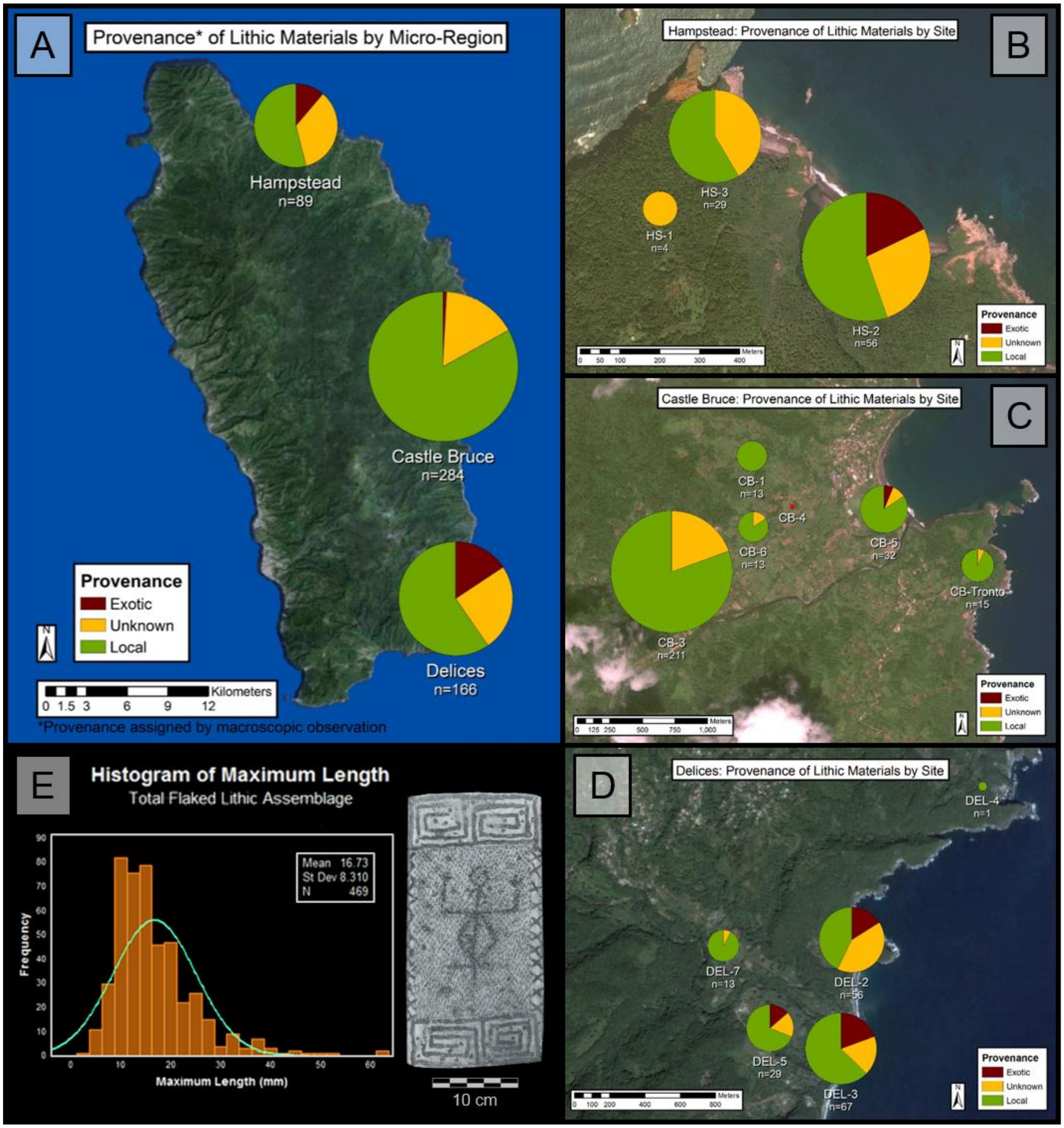

Figure 5-27. Lithic materials analysis. A) Charts showing ratio of exotic, unknown, and locally acquirable lithic materials by micro-region. B) Hampstead. C) Castle Bruce. D) Delices. E) Histogram showing the maximum length of flaked stone lithics and an example of a Wai Wai manioc grater (from the collection of James B. Petersen) (Crock and Bartone 1998).

Figure 5-27 show the intra-micro-regional variation in lithic assemblages. Both Hampstead and Castle Bruce show patterns that do not mirror trends seen in the ceramic analysis. For example, in Hampstead, HS-3 yielded more lithic materials than HS-1, even though the number of ceramic vessels recovered was similar. However, because HS-1 and HS-3 are likely loci of the same site, this would seem to suggest some kind of intra-site variation. Furthermore, because many of the lithics from HS-3 were found in informal surface collections, the elevated proportion is not strictly comparable to the other assemblages.

In Castle Bruce, some of the most divergent and interesting patterning can be seen (Figure 5-27). CB-3 features extremely elevated levels of lithic materials relative to the other sites in the micro-region. Although none of the recovered materials are known exotics, if the questionable greenstone from this site turns out to be an imported material, then the unknown category from this site would change to exotic. The only exotic lithic materials recovered from Castle Bruce are one example of Antiguan chert and one example of chalcedony, both of which were recovered from the coastal site CB-5.

In Delices, the quantity of lithic materials seems to vary more consistently with the quantity of vessels recovered by site (Figure 5-27). However, the known exotics are restricted to the coastal sites DEL-2 and DEL-3. Although exotics were recovered from DEL-5, because this site is likely a separate loci related to DEL-3, the pattern holds up. The interior site DEL-7, although not featuring the elevated quantities of lithics that CB-3 did in Castle Bruce, contains a similar lack of exotic materials.

With the last results of the lithic materials analysis presented, this chapter is brought to a close. In the final chapter, the results from the various analyses will be discussed, synthesized, and compared. Other diverse lines of evidence are incorporated—including impressions the crew and I developed while working in the field, information we gathered through interaction with informants in the community, ethnohistoric and ethnographic data, and archaeological data from other regional studies—in order to address the three primary research questions, and outline the immediate and long-term goals for future work in Dominica.

CHAPTER 6
DISCUSSION AND CONCLUSIONS:
INTERNAL AND EXTERNAL (MICRO)-REGIONALITY

In the previous chapter, the analyses were presented by initially considering inter-micro-regional patterning, and then exploring the smaller-scale relationships among sites within micro-regions. In this chapter, I examine each of the micro-regions individually, discussing some ways to interpret the settlement patterns and artifact variability. This is followed by an expanded look at inter-micro-regional relationships and a discussion of the hierarchical and heterarchical nature of these relationships. Throughout, I reintroduce findings from other archaeological and ethnographic studies from the region to provide context and comparison. However, before discussing the archaeology further, I first present a selection of ethnohistoric passages that reveal information about daily, routine practices in the social fields of subsistence, resource procurement, settlement decisions, and mobility, which are directly relevant to the interpretations that follow.

An Ethnohistory of Practices

In the Greater Antilles, the chiefdoms encountered by Columbus were documented, and archaeologists have made great utility of these few documents to model aspects of Taino social organization, including a system of social stratification with chiefly lineages (Curet 2002; Wilson 1990). It has also been argued that archaeologists have relied too uncritically on these documents, what has been called the “tyranny of ethnohistory” (Curet 2003; Keegan 2006; Maclachlan and Keegan 1990 in reference to Wobst 1978). With regard to social organization, this can be problematic as it is believed that the Spanish projected many aspects of their own political systems on the Taino just as the French may have done later in the Windward Islands (Curet

2003; Hulme 1986; Whitehead 1995a). In the Spanish case, the observations of only a few *Cacicazgos* in Hispaniola may not be applicable to other regions of the Caribbean (Curet 2002, 2003; Keegan 2006), although ethnographic and ethnohistoric scholarship indicates strong similarities in political organization, ethnic affiliation, and mythological systems among communities in the Greater Antilles, the Lesser Antilles, and Greater Amazonia during historic and proto-historic periods (Whitehead 1995a).

Regardless, there are many chronicles from Dominica, Guadeloupe, and Martinique, which provide clues about aspects of daily life as well as social organization during the early colonial period (e.g., Bouton 1958; Breton 1958a, 1958b; Du Tertre 1958; and see Hulme and Whitehead 1992). As with all ethnohistoric documents, they cannot be taken at face value, but they can be scrutinized to uncover details about the practices contributing to archaeological patterning. In Dominica, many of the documents have a very specific applicability because they address some of the unique ecological conditions and archaeological configurations considered in this study. Here, the passages from the dictionary compiled by the French missionary, Raymond Breton (1958a), and translated by McKusick and Verin for the Human Relations Area Files, are used heavily.

Breton spent 19 years, from 1635 to 1654, living mostly with the Kalinago in Dominica (Hulme and Whitehead 1992). During that time, he and his fellow missionaries compiled a dictionary translating the language, along with an account of Kalinago practices and traditions they had learned in order to facilitate religious conversion. The sense I get from reading the document is that Breton's (1992) aim was to be as accurate as possible so that the success of their mission could be properly judged. This provides justification for confidently applying the descriptions of certain practices from these accounts to archaeological contexts—particularly in the kind of details that would seem mundane or of little consequence to the observers, but which have important archaeological relevance, such as culinary habits, and descriptions of house and village structures.

Extrapolating from these documents, and incorporating what is known from archaeological studies in the region, it is possible to piece together a fairly robust model of land-use practices, settlement structure, and the types of mobility associated with resource procurement and regional interactivity in Dominica. Because food remains were not recovered in our excavations, the information on culinary habits is particularly useful. These were based primarily on horticulture, fishing, hunting and gathering (Myers 1978). Breton (1958a:27) recognized several different cultivars, primarily root crops such as various types of manioc and sweet potato, as staples of the diet:

> The Carib women go to their gardens every day to dig sweet potatoes or manioc, and the wives of the captains go just as the others do. After they have uprooted the crop they clean the soil and replant the manioc or potatoes. They do not use spades, nor hoes, because they are not accustomed to them, but use a sharp stick. They dig the soil with it and make a ditch for manioc, then go back loaded with their full carrying basket.

This reliance on manioc—or at least root crops in general—is reported ubiquitously throughout the circum-Caribbean and greater Amazonian macro-region, but is corroborated for Dominica in many accounts (for reviews see Myers 1978 and Taylor 1949). Root crop cultivation was augmented with maize, which was both roasted and fermented to make a beverage called *palinot*, which Breton apparently favored (1958a:37). Protein included agouti—which were hunted “with the same eagerness that the French hunt hares” (Breton 1958a:29)—some birds, turtle as well as turtle eggs harvested from nests, land crab, both river and marine fish, crayfish, and according to one passage, manatee.

> When the Caribs see a pair of tortoises they give a shout and immediately jump into a canoe. Approaching the tortoises very quietly they slip a cord around the flipper of the male which they are only able to catch in this way, unless they use harpoons. The female is sometimes captured by a cord and sometimes by harpooning, but usually females are captured on the beach where they go to lay eggs. To catch manatee, tortoise, and other big sea animals the fisherman called the harpooner takes his little canoe and goes to the place where the fishing is to be done. (Breton 1958a:29)

In addition to these coastal resources, various other resources had to be harvested from the interior forests, which the Kalinago visited with some regularity, even tending gardens in the interior: “when they are working high in the mountains and are not able to return the same day they say, ‘I sleep in my garden’” (Breton 1958a:15-16). From these interior forests, they would also need to harvest gommier, the massive trees used to construct dugout canoes, and oüalloman reed (*Ischosiphon arouma*), which was used for making a wide variety of baskets, furniture, and tools such as the *mátapi*, or cassava squeezer. This oüalloman reed, referred to by Taylor (1935, 1938) as Larouman or l’uarumâ, is still used by the Kalinago in Dominica for making a variety of baskets. Several informants told us that it grows high up in the bush, and that people can make a decent amount of money harvesting and distributing this valuable plant to basket makers producing for the tourist trade. Additional utility crops such as calabash and cotton were used and managed, if not cultivated.

> Cotton is indispensable to the Caribs for hammocks, for stringing ornaments, and for tying the feathers on their arrows. They also use it to fasten their arrowheads made either of green wood or of the tail of the sting ray, in place of iron. It is to obtain cotton that leads them to fish at the Saints or to catch crabs at Marie-Galante, for they make clearings in those places to grow cotton. You see very few Caribs who do not always carry a small roll of cotton in their baskets (Breton 1958a:28).

This passage is very revealing. In the first place, the importance of a crop that is essentially invisible in the archaeological record is revealed. In addition, the passage indicates that cotton was cultivated on either the Saints or Marie-Galante, presumably because Dominica receives too much rainfall to grow cotton anywhere but the driest portions of the west coast (Drigo 2001). However the real value in this passage is the insight into the ease with which movement between islands occurred—the ordinariness of inter-island mobility. A similar sentiment is expressed in this passage from Bouton (1958:1), another French missionary and a contemporary of Breton:

> It is not possible to state the true number of the Caribs on Martinique, because they are continually and actively visiting and passing among those of Dominica and the other islands. Sometimes there are many Caribs here and sometimes fewer.

Taking the resource procurement practices and descriptions of inter-island mobility presented in these accounts together with the highly varied patchwork of ecological zones that characterizes Dominica, it is apparent that mobility played a major role in the organization of labor and the organization of communities on the islandscape. However, reports characterize settlements as relatively permanent and well-kept.

> The Caribs have only a very small clearing at the place where they live, which is a place for the *carbet* and some smaller houses around it. . . . Nevertheless, they are always near rivers because they would not be able to forego water either for drinking or for bathing. There is a yard between the *carbet* and the other houses. Each one cleans the area of it [sic] in front of his own house (Breton 1958a:15).

The imagery that Breton conjures is of relatively stable villages that are kept meticulously clean. The village is organized around what the French called the *carbet*—originally called *táboüi* by the Kalinago in Dominica—or men's house, which served multiple functions including as communal male dormitory, where men slept apart from women, and as the location in the village where public social, political, and ceremonial activities were centralized.

> The men's house (táboüi) was a barn-like oval to rectangular building, measuring 18-30 x 6-7.5 m (135-225 m^2) and reportedly capable of holding up to 120 hammocks. . . . If the men's house was entirely closed, it had two doors, one at either end. Besides, it had a small opening in the roof, the 'devil's opening,' which allowed the shaman's tutelary spirit to enter during a séance. The táboüi was surrounded by small family houses, i.e., oval to round huts with palisaded walls consisting of reeds fastened across and roofs covered with palm leaves. These huts had only one opening and were divided into two parts, one serving as the sleeping quarters of women and unmarried children and the other one forming the kitchen (Boomert 2009:658-659).

The circular plaza village described in these passages, anchored by the carbet, shows similarities to circular villages known to be associated with both modern and pre-Columbian Arawak groups in Amazonia and the Antilles (Heckenberger and Petersen 1995). The social relations embedded in this arrangement are further commented on by Breton (1958b:15) in his account of Guadeloupe:

> They are divided into families, and these families are composed of several households which live together and form a sort of hamlet under the father of the family. The father's sons and daughters are married and live in their own huts. They first make a large common hall 60, 80, or 100 feet long, more or less, which they call a *carbet*. Around this large hut they build small ones for individual families.

That villages exhibited a degree of permanence and structure, even during this time of strife when the Kalinago were forced to abandon many parts of their homeland, suggests that prior to European contact, villages were likely to have been even more stable and elaborate. This assumption finds support in a passage by Breton (1958a:11), who, remarking on the small size of villages, seems to have realized the effects that colonial pressure had on the Kalinago:

> This is planned so that the Europeans will not be able to know about them or capture them by surprise. It is for the same reason that the greater part

> of them are established on the windward side of the island, because here the waves are rough and terrain is high and it is difficult to gain access to it.

Furthermore, if comparisons between pre-Columbian and modern Arawak villages in the Xingu are any indication, we can assume that in general, villages would have been larger, accommodating bigger populations before the European diseases and hostilities brought on demographic nadir (Heckenberger 2005; Heckenberger et al. 1999; Heckenberger et al. 2008). That villages exhibited a degree of permanence and planned structure, whereas extensive mobility characterized patterns of resource procurement, suggests that mobility was logistical rather than residential (Binford 1980), an unsurprising characteristic, but one with important implications for the interpretation of archaeological settlement patterns.

Implied in these descriptions of Kalinago villages is a certain amount of communal labor, and it may be useful to question the degree to which this labor should be described as family, festive, or corvée (Kolb and Snead 1997). Although Breton (1958a:11) does not comment on the construction process for these houses directly—except to say that the process of constructing a carbet or pirogue can take up to a year—he does comment on the labor involved in dragging gommier trees from the interior to the coast: “when a pirogue is made people are asked to help drag it down from the mountain to the sea. They are invited to the feast which follows. In this country if there is no feast, there is no work party.” Although this passage seems to situate communal labor securely in the realm of festive labor, I would emphasize again that this type of labor also implies a degree of organization along lines of kinship or household, and that an element of coercion characteristic of corvée labor could be operative in these same processes.

In more specific relation to the social relationships implied by canoe-based regionality, several insights into different aspects of canoe travel can be derived from ethnohistoric and ethnographic materials.

> Pirogues, called canaoa, are the galleons of the Caribs. They are 60 feet long more or less. They are raised on the sides with planks. They hold crews of fifty to sixty men and even more. The distance between gunwales in the middle is eight to ten feet, and they have two very large and wide sails. They travel 200 to 300 leagues on the sea, and go as far as Cayenne and Surinam to join the Galibis who are their allies, either to barter their goods and bring back other kinds, or to form an army to attack the Arawaks who are their enemies. They carry grated flour in bundles in their canoes. (Breton 1958a:18)

This passage reveals the range of distance covered in these voyages, the exchange activities conducted, and the long-distance social relationships forged and strengthened during these trips. As to canoe-based economic exchanges, the 1595 account by Robert Davies' (Andrews 1959:383; cited in Myers 1978:328) of Captain Amias Preston's voyage mentions a stop at Dominica.

> Here the Indians came unto us in canoes made of an whole tree, in some wherof [sic] were 3 men, in some 4 or 6, and in others 12 or 14, and brought in them plantans [sic], pinos, and potatoes, and trucked with us for hatchets, knives, and small beadstones.

These passages situate at least some inter-island, canoe-based mobility in the realm of economic exchange. They also hint at the range of variation in canoe dimensions, and the size of crews required to paddle them. Other comments worth evaluating relate to the sociopolitical roles embedded in the process of canoe voyaging, with the caveat that categorical sociopolitical observations are amongst the ethnohistoric evidence that should be evaluated most critically. Du Terte (1958:32)—a French missionary residing in Guadeloupe on and off between 1640 and 1657, whose writing exhibits a predisposition toward the “natural” quality of the “noble savages” occupying the French Antilles (Hulme and Whitehead 1992)—remarks on the sociopolitical nature of canoe navigation.

> The one who assumes the responsibility for a trip is called a captain, and he commands the pirogue. He gives orders for everything necessary for the embarkation, although he is not more highly considered by the others because of his role.

Du Terte (1958:32) goes on to present a slightly contradictory description of political leadership roles.

> The Caribs have three kinds of captains who command them. The first are masters of canoes or pirogues. The second have settlements of their own. The third kind of captain is elected by common consent, either because he has shown great courage in war or because he has killed many of their enemies.

Although these passages present an intriguing foray into the sociopolitical implications of canoe travel, it is also clear that Du Terte provides a simplified image of sociopolitical divisions, potentially biased by his thesis on the primordial naturalness of his subjects.

In sum, canoe travel was a daily reality for some members of society—specifically men—a central practice constructing and supporting community relations. It should hold as much importance for us as the investigation of agriculture, house construction, or any other aspect of daily life on which we might focus to glean insights into the social relations of production and labor underwriting sociopolitical structures. At this point, more specific questions about the organization of these practices emerge. For example, how specialized of an activity was canoe building? Did all men participate, or only some? Was it a full-time occupation for some, or were men who served as captains for canoes also the same men who tended and slept in their interior gardens? What role did women play in this process, even if not directly as paddlers and captains?

Were all communities equally focused on canoe building and the regional interactivity or maritime focus that this process implies, or were certain communities more oriented toward maritime activities whereas others were more terrestrially focused, spending more time on horticultural activities and gathering riverine resources? Did different members of the same community diversify into specializations, or were specialized communities integrated with neighboring communities? These sorts of details will play an important role when we return to the discussion of the archaeological analysis, bearing in mind the ethnohistoric observations pertaining to daily practice, mobility, division of labor, and village/house structure.

Sociopolitical Organization through Ethnographic Homology

In this section, ethnohistoric documents and ethnographic homology—in this case between Arawakan diasporic communities thought to have a shared ancestry—are incorporated to help infer hierarchical and heterarchical relations from the archaeological patterning. Breton (1958a) and DuTerte (1958) certainly drew a distinction between commoners and “important” people, “kings” and “captains,” further noting a degree of occupational specialization in which certain individuals were in charge of certain activities, such as receiving guests, captaining inter-island voyages, leading religious ceremonies, and sponsoring work parties to build houses and canoes. It is possible that prior to the disruption caused by European contact and demographic nadir, these roles would have been more well-defined or institutionalized.

As to specific ethnographic homologies between greater Amazonia and the Antilles, a laundry list of shared cultural ‘traits’ relate Saladoid to Arawakan peoples, such as large sedentary concentric villages, manioc agriculture, a spatial dimension to social integration referred to as regionality, and a suite of material culture. Invoking a theoretical orientation derived from Bourdieu's (1972) notion of habitus, Santos-Granero (2002) describes the concept of an Arawakan ethos as "made up not of rules, strategies, or ideological constructs but of unconscious dispositions, inclinations, and practices, which shape those rules, strategies, and ideologies while being shaped by them" (Santos-Granero 2002:44). In outlining the five elements of an Arawakan ethos, the principal criteria for inclusion were empirical, not theoretical. These elements are not exclusive to Arawak-speaking peoples, but when found among Arawak-speaking peoples, they were all found together (Santos-Granero 2002:44-45). The Arawakan ethos can be characterized by: (1) a repudiation of endo-warfare, (2) an inclination towards regional sociopolitical integration, (3) an emphasis on descent, consanguinity, and commensality, (4) a tendency for ancestry, genealogy, and inherited rank to form the basis of political leadership, and (5) the tendency for religion to assume centrality in personal, social and political life. Accepting that these elements of the Arawakan ethos would have been carried by the earliest Saladoid migrants into the Antilles in some form of structurally homologous habitus, even if expressed in relatively diverse practices through time, is a central thesis of the Arawakan Diaspora model (Heckenberger 2002).

Other substantive themes drawn out of the specialist Arawakan literature are institutional social hierarchies and hereditary chiefly ascension within the framework of genealogy, or what has been called the theocratic-genealogical mode of leadership (Heckenberger 2002; Santos-Granero 2002; Whitehead 1994:39). In the Upper Xingu for example:

> There can be no doubt of the essence of this hierarchy. All people, men and women, are born either high-ranking (*aneti*) or not. But although chiefliness (to be *aneti*) is a matter of heredity, to be a chief is not: chiefs are not born but made, constructed through a series of life-crisis rituals

> that distinguish individuals as chiefs and, in turn, further legitimize their lines (Heckenberger 2005:296).

But for an Arawakan chiefdom to perpetuate itself in this model, the genealogy must not only stretch back in time, acquiring power and legitimacy through connections to mythological ancestors, it must also stretch out across space in a material way, naturalizing while exercising its power across the landscape. At the local-scale this is materialized in the relationship of bodies to the structure of the village, which are often circular with central plazas.

> Of particular interest in the present context is the centralization and exclusivity of public ritual and decision-making embodied in the central plaza. In ring villages, the plaza depicts unity and egalitarianism, while simultaneously restricting access to select social actors. ‘Equal’ access to public activities and ritual performance is spatially represented by the distribution of houses equidistant to the central area. . . . However, in practice the ubiquitous ‘male-centricity’ represents a transformation of this egalitarian ethos based on gender and age. The Upper Xingu example provides insight into the process by which incipient patterns of hierarchy, based on principles of gender and seniority and embodied in the plaza, can be transformed into actual control of public ritual and political action by certain segments of society. Increasingly restricted access to or privatization of central public space and hence, public affairs truncates the egalitarian principle of equal access and creates more enduring patterns of social inequality. (Heckenberger and Petersen 1995:382)

Again, the compelling factor in applying this model is not strictly theoretical and these hierarchical relationships are not mere abstractions, these characteristics are empirically documented across many regions of the Caribbean and Amazon (Heckenberger 2002, 2011; Heckenberger and Petersen 1995; Santos-Granero 2002; Whitehead 1995a). This specific sociopolitical organization cannot truly be understood without a consideration of the ecology of manioc, or root crop horticulture. Its use as a staple provided the means for a society whose basic economic production was accomplished at the level of household production, but a highly formalized division of labor accompanies elaborate systems of elite exchange and sociopolitical maneuvering. Power is not necessarily dependent on the marshalling of labor to complete organized community-level agricultural projects, such as the building of irrigation systems typical in rice, grain, and maize agriculture for other, more arid parts of the world. However, other projects, such as building houses and constructing and voyaging canoes involved more community labor.

A corollary to this model is that, because demography and centralization of domestic production are not causally related to power hierarchies but spatiality and ritual practice are, Arawakan polities take on the characteristic of demographic and spatial fluidity, while maintaining institutional hierarchies inherent to their organization (Heckenberger 2005). “The minimum size of such a following, its threshold for political effectiveness, [is] in turn defined by conditions external to any given group (such as the presence of extant polities competing for the same human resources or the preexisting rules of political succession) and [is] itself varied over time” (Whitehead 1994:39). The archaeological units most appropriate to the study of such small-scale sociopolitical configurations are households, communities composed of households, and polities constituted of communities in different micro-regions.

Perhaps it is now clear why earlier, in Chapter 2, I introduced the concept developed by Blanton (1995) of household reproductive strategies. This theory provides a method for analyzing sociopolitical phenomena on these small scales, particularly for societies in which complexity is not thought to be a function of demography. If we assume for a moment that Breton’s (1958a:23-24) understanding of post-marital residence was accurate, then his insights serve to corroborate aspects of Arawakan social hierarchies considered here.

> The men follow their wives and not the wives the men, unless they are captains. Thus those who have many daughters have a greater advantage, for their sons-in-law come to live with them, clear their gardens, make their houses, and go fishing for them. As soon as a daughter is born she is destined for her maternal cousin. . . . The boy goes to the place or dwelling of his promised wife, but only after the parents have consented. If the girl is going to marry a captain or the son of a captain, as it sometimes happens, she is conducted by her father and mother to his dwelling.

This dualistic pattern of post-marital residence can be seen as a result of elite lineages and chiefs, perceived ethnohistorically as captains, promoting a household continuity strategy within the chiefly lineage (sensu Blanton 1995). With both son and daughter marriages bringing in-laws under the authority of chiefly households, elite lineages centralized power and labor under the control of powerful carbets, whose longevity was contingent on successful regional integration.

The household perspective encourages us to look for institutionalization of such hierarchies in the material and spatial dimensions of the built environment; and in the ritualization of daily practices evident in the highly structured, formalized, politicized or gendered use of space, in which aspects of the social order are naturalized through sanctification (Blanton 1995). The generalized dichotomy between single-family dwellings (private/domestic/female), and carbets (public/ritualized/male)—with its symbolically charged formalized structure—presents an example of the sanctification process in which social inequality is naturalized in the structure of the built environment. In the following sections, I examine these issues in relation to the archaeological patterning.

Internal Archaeological Patterning within Micro-regions

In this section, I examine each micro-region, discussing the internal relationships among sites in order to address the first research question: In what ways were multiple sites within micro-regions functionally differentiated and what does this reveal about community organization at the local, intra-micro-regional scale? When possible, I link specific archaeological patterns to ethnohistoric observations on related practices. For each micro-region, if possible, I propose a range of possible interpretations and suggest those I find most likely based on the available evidence.

Hampstead

In this study, the investigation of Hampstead was the least comprehensive, which is unfortunate because, when the three micro-regions are compared, Hampstead has often stood out as the most different, making the potential contemporaneity of Hampstead and Castle Bruce settlements intriguing.

The overall settlement pattern along with the contemporaneity of sites in Hampstead is difficult to discern with the current data. There are certain similarities to the overall pattern found in Delices and Castle Bruce, such as the presence of sites on promontory points featuring commanding views of the bay, although the relations between these sites are less evident. The incomplete settlement data make any discussion of the division of labor and functional differentiation exhibited between sites purely speculative. That being said, there is variability that hints at a networked, functional interdependence characteristic in the settlement pattern that is exhibited more clearly in the other micro-regions. This can be seen most clearly in the differences between lowland coastal sites, such as HS-2 and HS-Anse Soldat, and upland promontory or interior sites such as HS-1, HS-4, and HS-5.

With regard to the artifact assemblages from Hampstead, one of the more considerable dimensions of variability was between vessel wall thickness and orifice diameter. Hampstead was unique in that the elevated proportion of restricted-orifice vessels seems to have caused wall thickness to vary inversely with orifice diameter. Within the micro-region, this inverse relationship was also seen in the variation between HS-2 and HS-1/HS-3. This, along with the observed, but not quantified variability in rim shapes between these sites (Figure 5-1), is suggestive of inter-site functional differentiation. Unfortunately, the samples recovered from the upland sites were too small to permit comparisons such as those made between larger assemblages from Castle Bruce and Delices. However, in the next section, when Hampstead is evaluated on external, rather than internal relationships, the recovered samples become more comparable.

Castle Bruce

Castle Bruce provides perhaps the clearest picture of what a watershed community may have looked like in the past. Sites investigated are situated chiefly in four different locales, or ecological zones within the valley: the high coastal hills south of the bay, the coastal floodplain adjacent to the rivermouth, the high bluffs along the northern valley margin, and the rolling hills toward the back (western boundary) of the valley at the confluence of two rivers. Each of these zones offers ecological conditions that would have been favorable for certain activities or advantageous in terms of defense or regional awareness. In order to take advantage of all the useful settings and resources in this highly diverse and patchy valley, the overall settlement pattern is one of multiple settlements with variable size and function spread over a relatively large area, rather than a highly nucleated or centralized village plan.

There are a number of ways to interpret this settlement pattern. One interpretation is that each site was occupied at different times and that different locations were favored for settlement through time, perhaps following shifts in demography or subsistence strategy (Watters 1982). Alternatively, similar groups of people may have occupied the micro-regions over time, but they were quite mobile, moving between different locales seasonally. A third option is that, at times, several sites within the micro-region were occupied contemporaneously as a result of either logistic mobility (Binford 1980) or a de-centralized settlement pattern.

There are several reasons to suspect the latter interpretation, the most important of which are functional variation and interdependence. Each of the different sites is located in a part of the micro-region to exploit some particular aspect of the local ecology, but no one area offers everything that a community would need. The viewsheds that link settlement positions also imply an inter-relatedness characteristic of contemporaneous occupation or use of intervisible locales. In fact, CB-1 was occupied relatively contemporaneously with at least one other site in the micro-region, CB-3. A single radiocarbon age estimate was retrieved from CB-1 with a conventional age estimate of 840 +/- 30 BP, which corresponds well with the age estimate from CB-3 of 890 +/- 30 BP. It is considered extremely unlikely that these two interior sites would be occupied at the same time without a contemporaneous coastal presence at the CB-5 or CB-Tronto locales. If this interpretation is correct, it would support the hypothesis that contemporaneous multisite configurations were networked, if not thoroughly integrated in Castle Bruce.

The relationship between interior sites CB-1, CB-3, CB-4, and CB-6 to coastal sites CB-5 and CB-Tronto is critical to understanding the organization of the community at Castle Bruce, and critical factors in this relationship may include canoe manufacture and voyaging. The coastal occupants needed access to the interior for the materials to build canoes, and interior occupants needed coastal access for regional awareness, marine resources and travel. I see no possibility in which these sites could have been occupied contemporaneously and not been integrated into some functional unit. Would the occupants of the interior sites have had their own canoes, or was canoe travel the province of coastal occupants? Another possibility is that Castle Bruce represents an example of a community more terrestrially focused, or less regionally oriented. A combination of factors support this conclusion, including the ecological favorability the micro-region has for agriculture and the diminished evidence for extralocal influence seen in the lithic materials analysis. A better understanding of site function is required to address these questions.

If we compare the results of the ceramic and lithic analyses to the setting of sites with respect to ecological zones, we can find support for the interpretation that sites in Castle Bruce were functionally differentiated. The first clue to such a differentiation comes simply from the size and position of sites. Coastal sites feature smaller orifice vessels with thinner walls than interior sites. There is also significant variation in rim shape, suggesting that overall vessel shape, along with the range of activities for which vessels were used, exhibit a degree of specialization depending on location in the micro-region. The intriguing counterpoint is the apparent homogeneity in surface treatments that crosscuts this variability. This indicates that potters had similar manufacturing techniques for crafting a range of vessel types. It follows that extant morphological variability may be a function of intended use, rather than of social distance between potters belonging to distinctive communities of practice.

The position of CB-5, where the river feeds into the bay, is ideal for exploiting marine and riverine resources, and for canoe launching and landing, but flooding could inhibit agriculture in this area, where today, only flood-resistant tree-based crops are cultivated (e.g., banana, plantain, coconut). Furthermore, CB-5 may have been less than ideal for regional awareness and defense as there is a restricted view beyond the immediate bay. The identifiable but limited evidence for an increased occurrence of decorated wares, and vessels featuring a smaller mean orifice diameter and wall thickness than CB-3, may suggest an increased ritual function for this locale, perhaps serving as the sociopolitical or ceremonial public center for the micro-region. The fact that this assemblage, while featuring a smaller sample size than CB-3 or CB-Tronto, still returned the highest ratio of decorated wares, the highest diversity of rim shapes, and the only examples of exotic lithic materials in Castle Bruce, would provide some support to this conclusion.

CB-Tronto is unique in that it offers commanding views of the bay, views of all the other sites in the valley (Figure 6-1), along with views of the islands to the north and south. This site may have been agriculturally viable, but could not support a large population because of its relatively small area and limited access to fresh water, unless collected by rainfall, or carried up the hill from a kilometer below. The geographical closeness of CB-Tronto and CB-5, when compared to the artifact variability and the extreme differences in viewshed afforded by the two locales, imply an inter-relatedness.

This is supported by the lack of differences revealed between the two coastal assemblages throughout the analysis, including in rim shape and surface treatment proportions. CB-Tronto exhibits a more limited range of activities, the assemblage being slightly less diverse in terms of rim shape and decorative elements, and lacking in exotic lithic materials, but such differences do not contradict the interpretation that these sites were functionally differentiated but integrated parts of a larger settlement system.

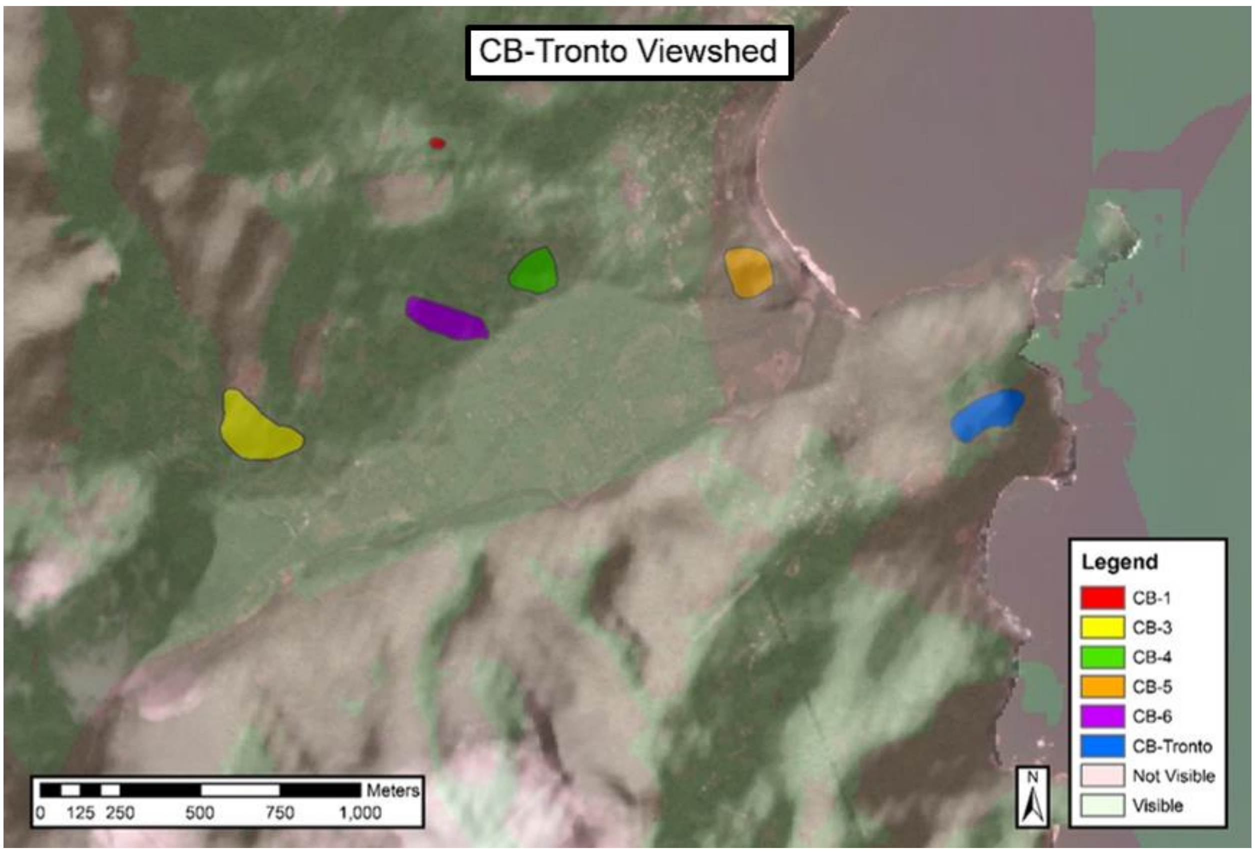

Figure 6-1. Viewshed analysis from CB-Tronto.

Site CB-3 is positioned to take advantage of riverine resources and abundant agricultural fields, but is far inland, limiting its coastal access. The interior locale provides some of the clearest evidence for a specialized domestic function, yielding the least decorated pottery but the most abundant lithic artifacts. The CB-3 assemblage returned the highest Berger-Parker dominance index (d = 0.69) for rim shape of any site for which this statistic was calculated. More than any other site, the assemblage from CB-3 is dominated by one rim shape category, in this case, round rims. Furthermore, the pottery recovered from CB-3 features an elevated mean orifice diameter and wall thickness relative to coastal sites CB-5 and CB-Tronto. These characteristics reinforce the utilitarian nature of the assemblage and the specialized domestic function for the site, which in turn imply a degree of functional interdependence with the coastal occupants, whom residents of CB-3 would have at least relied upon for defense and regional awareness. A further possibility to be explored is that this functional interdependence included a system of economic redistribution involving maritime resources (including marine animals, but also non-local materials such as cotton) gathered by coastal occupants, and agricultural/forest resources contributed by occupants of CB-3.

Figure 6-2. View of CB-5 and CB-Tronto from CB-1, looking southeast.

Sites CB-4, CB-6, and CB-1 are positioned above the floodplain providing easier access to upland forest resources and agricultural fields. From these sites, there are views of CB-5 and CB-Tronto (Figure 6-2), but being positioned on such small landforms, these settlements there were too small to be independent, which implies connectivity to other contemporaneous settlements. For example, if CB-1 does represent a single house or domestic area, it follows that it would be tied to a larger village or network of sites in the micro-region.

Taking this line of reasoning a step further, a more speculative possibility that should be considered for sites CB-3, CB-1, CB-4 and CB-6 is that they were not separate settlements from contemporaneous occupations on the coast, even though the site deposits are discrete. Perhaps these locales contained the smaller family houses—described in the ethnohistoric accounts as having surrounded a centralized space for public rituals and ceremonies (Boomert 2009, 2011; Breton 1958a)—that were tied functionally and socially to a carbet, or similar public structure, located at the village center, in this case CB-5. Perhaps prior to European colonization, the small village layout later observed by Breton (1958a) and others was structurally similar, but expanded to broader scales. Is this pattern structurally similar to the typical Arawakan plaza village, but writ large on the landscape such that the village encompasses the entire watershed?

One piece of evidence that is particularly compelling in this regard comes from the relationship between CB-3 and CB-5. The extremely elevated presence of lithics at CB-3 has been argued to represent a domestic or agricultural processing function for the site, which would have had a female gender affiliation, following the observed division of labor drawn minimally along gender lines (Breton 1958a). A similar scenario could also explain the very small sites of CB-1, CB-4, and CB-6, themselves too small to represent an entire village, and also featuring the undecorated wares, griddles, and lithics that have come to be associated with the female side of the labor division. The men that resided at these interior sites almost certainly engaged in occupations in nearby areas, perhaps tending to duties in the interior, on the coast, or abroad, but the assemblages recovered from these sites, reflecting the activities actually carried out there, appear to be primarily female-gendered.

Although the evidence cannot be considered conclusive, I propose as a working hypothesis that communities in Castle Bruce should not be considered from the perspective of any individual site. The community was organized as a network of functionally differentiated, integrated settlements positioned within view of one another to take advantage of different ecological zones in the micro-region and were anchored by a centralizing locale at CB-5. This coastal site, theoretically containing at least one major carbet or similar analogous (male-gendered) public space, may have served as a hub for canoe-based regional interactions. Furthermore, such public spaces likely functioned to centralize processes of economic redistribution and ceremonialism while legitimizing hierarchical relationships.

Delices

Delices was the micro-region bearing the densest deposits as well as featuring the longest record of occupation. However, the distinctions among many of the sites in Delices are questionable when compared to Castle Bruce, where deposits were found discretely on distinct landforms. In Delices, perhaps because it was occupied over a longer period, and because the landscape has changed so much since initial occupation, the boundaries between individual sites are difficult to discern. For example, it is possible that DEL-2, DEL-3, and DEL-7 were all part of the same site, perhaps representing the maximum expanse of a village whose dimensions changed over time. This was something that the crew and I considered while in the field, but unfortunately, because the area between the sites is disturbed, we will never know if there were contiguous deposits that linked these otherwise discrete sites. If they did represent the maximum dimensions of a village, then it was a very large (~45 hectare) village. Our investigations south of DEL-3 (opposite direction from DEL-2) showed that the site ended rather abruptly. If DEL-3 was larger than it is now, which seems probable because of the high density of artifacts recovered from the western and northern erosion lines, it very likely extended north toward DEL-2. Another possibility is that over time, residents of the micro-region favored different types of locations for settlement, and that the sites were sequentially occupied.

The positioning of settlements within the micro-region shares similarities with Castle Bruce. Sites are located in four different types of locales, including the low coastal hills north of the bay, the low coastal area adjacent to the rivermouth, the high hills above the coastal cliffs north of the bay, and on the gentle rise between the two rivers that resolves into rolling hills at the base of the western mountains that bound the area. As in Castle Bruce, to the degree that a coastal presence was an essential element of canoe-based regionality, it is presumed to be more likely that the coastal sites DEL-2 and DEL-3 were occupied in the absence of DEL-7, but less likely for DEL-7 to have been occupied without a contemporaneous coastal presence.

The ceramic analysis reveals both significant differences in certain attributes among sites, and an important lack of difference in certain attributes as well. The coastal sites DEL-2 and DEL-3 feature assemblages with smaller average orifice diameter and wall thickness but also more diversity in rim shape, surface treatment and application of decorative elements than the interior sites DEL-5 and DEL-7. I interpret this to suggest that DEL-2 and DEL-3 functioned as locales for ceremonial gatherings and rituals in the micro-region. The larger orifice diameter and wall thickness characterizing DEL-7 indicates that more of the assemblage is used for domestic functions such as processing and storing cultivated and gathered resources. This makes sense in conjunction with the location of DEL-7 on the abundant, fertile fields of the interior highland rise overlooking the valley floor. The presence of griddles and storage/brewing vessels together with vessels more likely to represent a serving or ceremonial function suggest that DEL-7 was also a residential site, and more importantly, although ceremonial activities were centralized to a degree at DEL-2 or DEL-3, certain of these activities were also practiced at interior sites such as DEL-7. A possible interpretation would have this representing some combination of ritual practices functioning at the household level along with more integrating community-wide public ceremonialism localized at the coast—the social, if not exactly geographical center of intra-micro-regional politics.

These results are intriguing when comparted to the impressions the crew and I developed while excavating these sites. We all thought that DEL-3 functioned as some kind of center, or centralizing location for ceremonial activities in the micro-region. This impression derived from the optimal location, elevated above the mouth of the White

River; the elevated rate at which we were finding highly ornate decorated vessels; and from the density of the deposits across the site. In part, the uniqueness of DEL-3 is supported by these tests. That DEL-3 was more dissimilar from DEL-7 than DEL-2 partially supports this notion, but the lack of difference for certain comparisons between DEL-3 and DEL-2, the other coastal site, suggests that it may not have been as unique as we thought, and perhaps similar practices were carried out at these locales. The tests that show their lack of difference include: rim shape proportions and diversity, mean orifice diameter, INAA composition groups represented, and proportions of decorated wares and exotic lithic materials (p = 0.11 and p = 0.90 respectively for chi-square tests conducted but not reported in the previous section). The apparent differences in mean wall thickness, rim orientation and surface treatment proportions, could be interpreted as either functional differentiation in the assemblages, or be explained by the potential non-contemporaneity for occupations at these two locales. One hypothesis worth considering is that the alternating radiocarbon assays from DEL-2 and DEL-3 indicate a shift in focus between the locales through time, but better chronological resolution is necessary to seriously evaluate this possibility.

Regardless of the uniqueness of DEL-3, the most salient result of these tests is that coastal sites in Delices are less different from one another than either of them is from the one interior site. We have already proposed that DEL-7 was more likely to have served a domestic production or agricultural processing function, inferred primarily from the higher incidence of undecorated utilitarian wares featuring a higher mean orifice diameter and wall thickness, along with its location in the valley among the most extensive tract of flat arable land. These differences are mirrored by the variation in rim shape proportions and diversity, and the lack of exotic lithic materials at DEL-7.

Intervisibility between sites clearly played an important role in Delices, but because the sites represent a greater time depth, the role that this intervisibility played in linking specific sites is less clear. However, the intervisibility apparent between DEL-3, DEL-1, and DEL-4 (Figure 6-3, Figure 6-4, Figure 6-5)—along with the apparent lack of sites identified in the non-visible intervening lowlands—suggests that at times during the occupation, the viewsheds linking sites and providing vantage over the surrounding waters may have been critical. Site DEL-4 stands out in this settlement pattern as being the most separate, and located in perhaps the most marginal location.

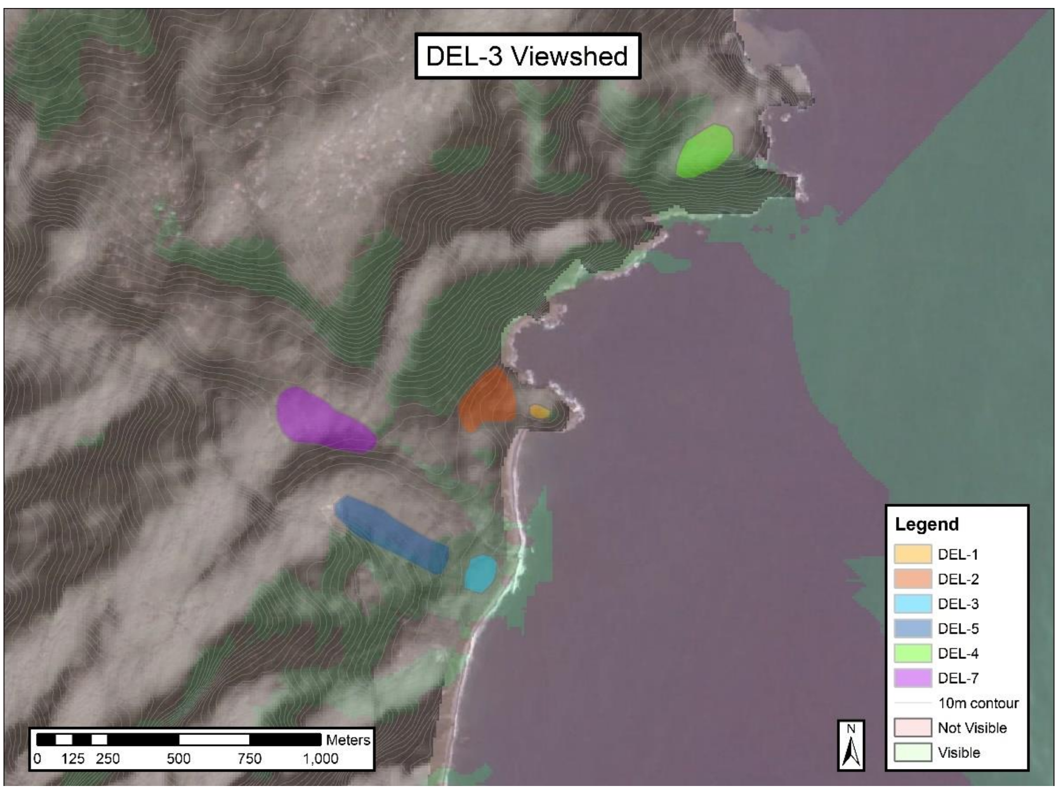

Figure 6-3. Viewshed analysis from DEL-3.

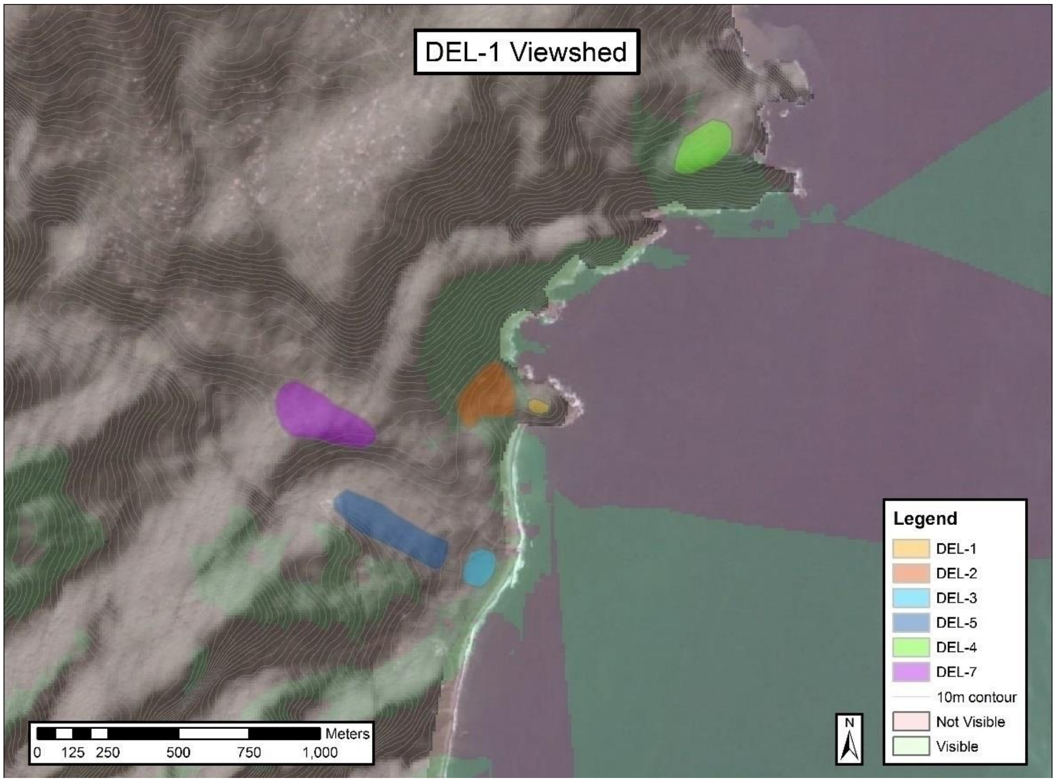

Figure 6-4. Viewshed analysis from DEL-1.

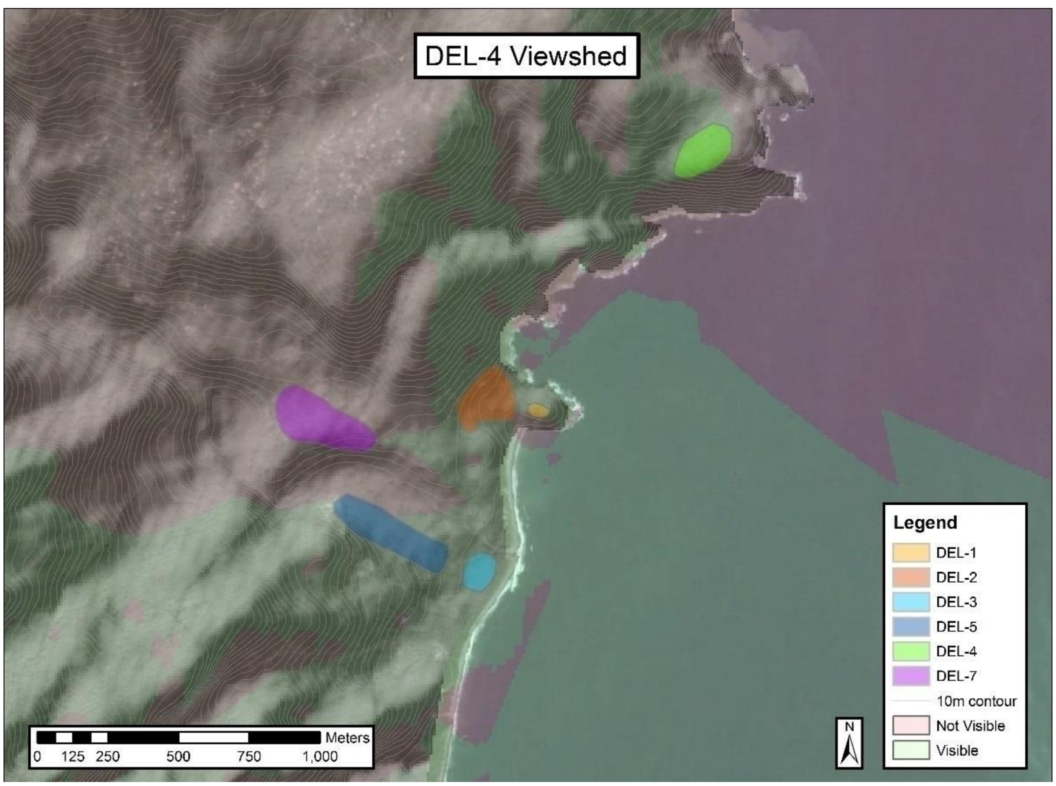

Figure 6-5. Viewshed analysis from DEL-4.

The high elevation above a sheer cliff face precludes it from easy coastal access, but also makes it a more defensible position with excellent viewsheds of the area, including views of DEL-2 and DEL-3 (Figure 6-5).

Much like Castle Bruce, the relationship between interior sites like DEL-7 and DEL-5 and coastal sites like DEL-3 and DEL-2 is intriguing, as well as the perspective that ethnohistoric observations bring to the patterning. The structured set of ceremonial practices centralized at either DEL-2 or DEL-3 through time, was likely centered on a location that housed a major carbet or similar public ceremonial space, integrating dispersed hamlets, and delineating male- and female-gendered space throughout the micro-region based on a set of structural socio-spatial relationships reflected in the built environment. The same functional interdependence and hypothesized system of economic redistribution proposed for Castle Bruce may have functioned in Delices as well, although the pattern is both more pronounced in certain attributes (e.g., wall thickness, orifice diameter, distribution of exotic lithic materials), and less pronounced in others (e.g., surface treatment, distribution of decorative elements). The patterning revealed by this study certainly requires further detailed work in Delices to bring resolution to some of these issues.

External Connections between Micro-Regions: Mobility and Interactivity

In this section, I address the second research question: To what extent were communities integrated at larger spatial scales? Were local communities autonomous, or were they integrated into higher-order regional polities? This includes an evaluation of the enclave model, and the possibility that communities in the three micro-regions were integrated beyond the physical boundaries that circumscribed them. The important thing about the enclave model is, it reminds us that in Dominica, when communities are connected between micro-regions, it is not an accident—it is the result of specific historical social relationships. The island possesses physical barriers that are easily overcome, but likely only done so for specific reasons, many of which may not be strictly economical (Santos-Granero 2004).

Whereas in the last section, settlement data and information on subsistence taken from ethnohistoric accounts were applied, here I consider information pertaining to mobility, exchange, and regional social integration. Going back to Breton's account, there are many clues as to the interactivity on a regional scale of different communities both within Dominica and with communities in South America and on other islands such as Martinique, Marie-Galante, and Guadeloupe. In an earlier passage from Breton's (1958a) dictionary, we saw that the Kalinago would travel regularly to the Saints and Marie-Galante to fish and harvest cultivated cotton crops. The following passages taken from Breton (1958a:2-7) provide additional insight into Kalinago regionality. "Caribs who come from other islands are also people of this nation. . . . When they change islands and when they go to another carbet, drink and food are not refused them. They reciprocate equally to others in a similar situation." Although this presents a very generalized picture of inter-community interactivity, it is clear that the real sociopolitical landscape, particularly in pre-Colonial times, was more complex than this (Dreyfus 1983; Whitehead 1995a).

In this section, I will address the degree to which regionality is expressed in the archaeological patterning in each micro-region. The micro-regions are discussed in a slightly different order to facilitate the logical flow of ideas presented. When considering these micro-regions, it is important to remember that my survey strategy, by isolating three distinct watersheds, leaves the intervening areas and the relationship between those areas unknown. Just because there is a lack of evidence from some of those areas, it should not be assumed that these areas were less populated simply because the predictive model I utilized ranked them differently.

Hampstead and the La Soye District Enclave

The most expansive enclave identified in Dominica by Trouillot (1988) was the La Soye enclave, which stretched ~20 km of coastline, from Anse Du Mei in the northwest, to Pagua Bay in the southeast, at the northern edge of Kalinago territory (Figure 6-6). Hampstead is located toward the northwestern edge of this area, with Anse Du Mei representing the western edge of our survey area. In order to evaluate an archaeological sample that covered the same extent, the results from Hampstead should minimally be compared to findings from the rest of this geologically and ecologically distinct region of northeastern Dominica, particularly the work conducted by Boomert and the University of Leiden team. Distinct similarities to Boomert's (2009, 2011) description of their excavation and the ceramics can be seen. For example, the assemblage from HS-2 contains a combination of scratched/brushed surface treatments; coil appliqué and punctate decorative treatments, including rim punctations; and vessel morphology similar to Cayo vessel forms 1, 4, 5, 8, and possibly 3 (Boomert 1986:19-23). These results seem to indicate that the community or communities that resided in the northeast were not only interacting within the confines of Trouillot's enclave, but as a group, were regionally oriented toward mainland Kalina groups, perhaps slightly different spheres of interaction than seen in Castle Bruce or Delices. We have to be careful here though, to not equate a lack of isomorphism in pottery assemblages with a lack of interaction. At least we can propose that potters resident in

Hampstead were members of distinct communities of practice relative to potters in Castle Bruce or Delices.

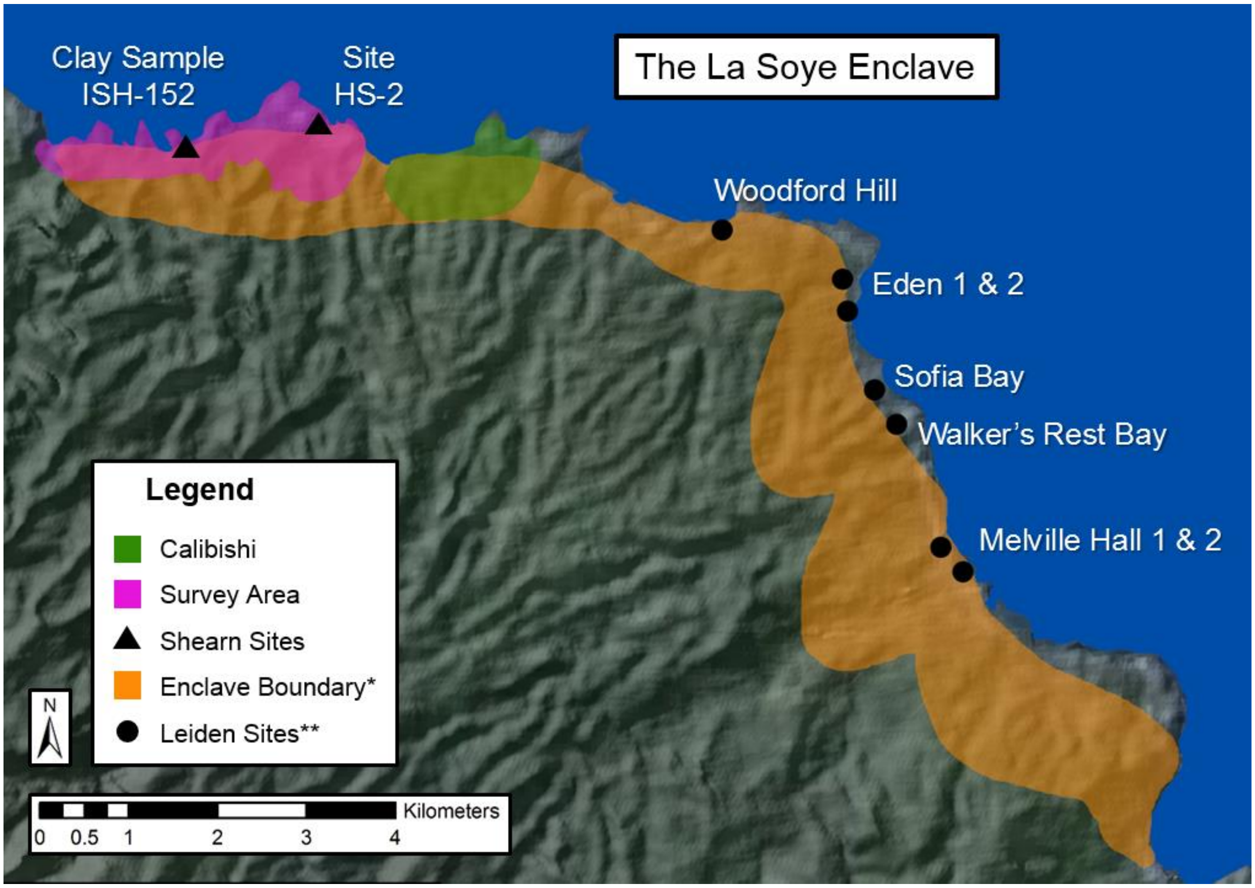

Figure 6-6. The La Soye enclave according to *Trouillot (1988) with sites studied by **Boomert (2009, 2011).

On the one hand, the dissimilarity in the ceramic assemblages between Hampstead and the other two micro-regions seems to suggest that this community was enclave-like, that it was not integrated with other communities in Dominica, or at least those resident in Castle Bruce or Delices. This finds at least partial support in the neutron activation results, which indicate that a clay found locally in the area, ISH152, may have been used to manufacture pottery belonging to INAA composition group three, found only in this northern micro-region. However, the boundaries of this enclave evidently did extend beyond the immediate watershed down to the southeast toward

Woodford Hill and Melville Hall (Boomert 2009, 2011), if the perceived lack of difference between the Hampstead assemblage and the descriptions of the Leiden excavations hold up, which should be investigated more thoroughly in the future.

On the other hand, the evidence for inter-island mobility, both in the ethnohistoric passages described above, and in the presence of exotic lithics such as Antigua chert and pottery from all identified INAA composition groups, call into question the degree to which this community was truly economically autonomous and socially bounded. The diversity indexes from Hampstead for rim shape and decoration, were least different in value, if not content, from those found in Delices, which was taken to suggest a higher degree of external influence than exhibited in Castle Bruce. Furthermore, although the proportion of surface treatments was significantly different between Hampstead and the other two micro-regions, the presence of surface treatments in Delices, represented heavily in Hampstead but missing from Castle Bruce, supports the interpretation that communities in these micro-regions interacted or trafficked in the same spheres—spheres from which Castle Bruce occupants may have been excluded, or for which they had to travel to other centralizing locales, such as Delices, in order to participate. At this level of analysis, we approach the limits of what we can interpret from the available evidence, but this kind of exploratory reasoning is helpful for directing future research.

Delices and the Pointe Mulâtre Enclave

Trouillot (1988) grouped the Delices micro-region within what he called the La Plaine-Pointe Mulâtre enclave (Figure 6-7). In terms of ecology and geology, the grouping makes sense, particularly in reference to the location of the modern Delices village. Although most of the archaeological sites identified were located below the modern village, on Fond Thomas or the coastal Pointe Mulâtre area, modern Delices is situated above the ridge bounding the micro-region, on the southern end of the long, relatively flat highland that stretches to La Plaine. These villages are now connected by a very straight stretch of road. Pre-Columbian communities appear more oriented towards Pointe Mulâtre, although the relationship between Delices and La Plaine, where sites were identified but not excavated (Shearn and Toney 2009), is something to be further investigated. Furthermore, the exclusion of Petite Savanne from the enclave makes sense from the perspective of modern Dominican transportation technology. These areas, separated by two of the steepest kilometers in Dominica, were only connected by a road in the late 1970s. During the pre-Columbian period, these areas may have been more closely connected by canoe travel. As seen in the neutron activation results, this finds partial support in the apparent similarity between the Petite Savanne clay sample ISH160, and INAA composition group four.

One of the most intriguing patterns brought to light by the analysis was the relationship between the overall morphological variability in the Delices assemblage and the neutron activation results. From our initial impressions developed in the field, we all thought that Delices, and specifically DEL-3, functioned as a hub for regional interaction, and a center for ceremonial activities and economic redistribution. Considering that Delices had the greatest diversity in both rim shape and decorative elements, along with elevated proportions of exotic lithic materials, we expected that substantial portions of the ceramic diversity would be accounted for by imported wares. The variability among the assemblages in Delices, along with the heterogeneity within each of the site assemblages, contrasts with the neutron activation results, in which Delices returned the strongest signature for local pottery production.

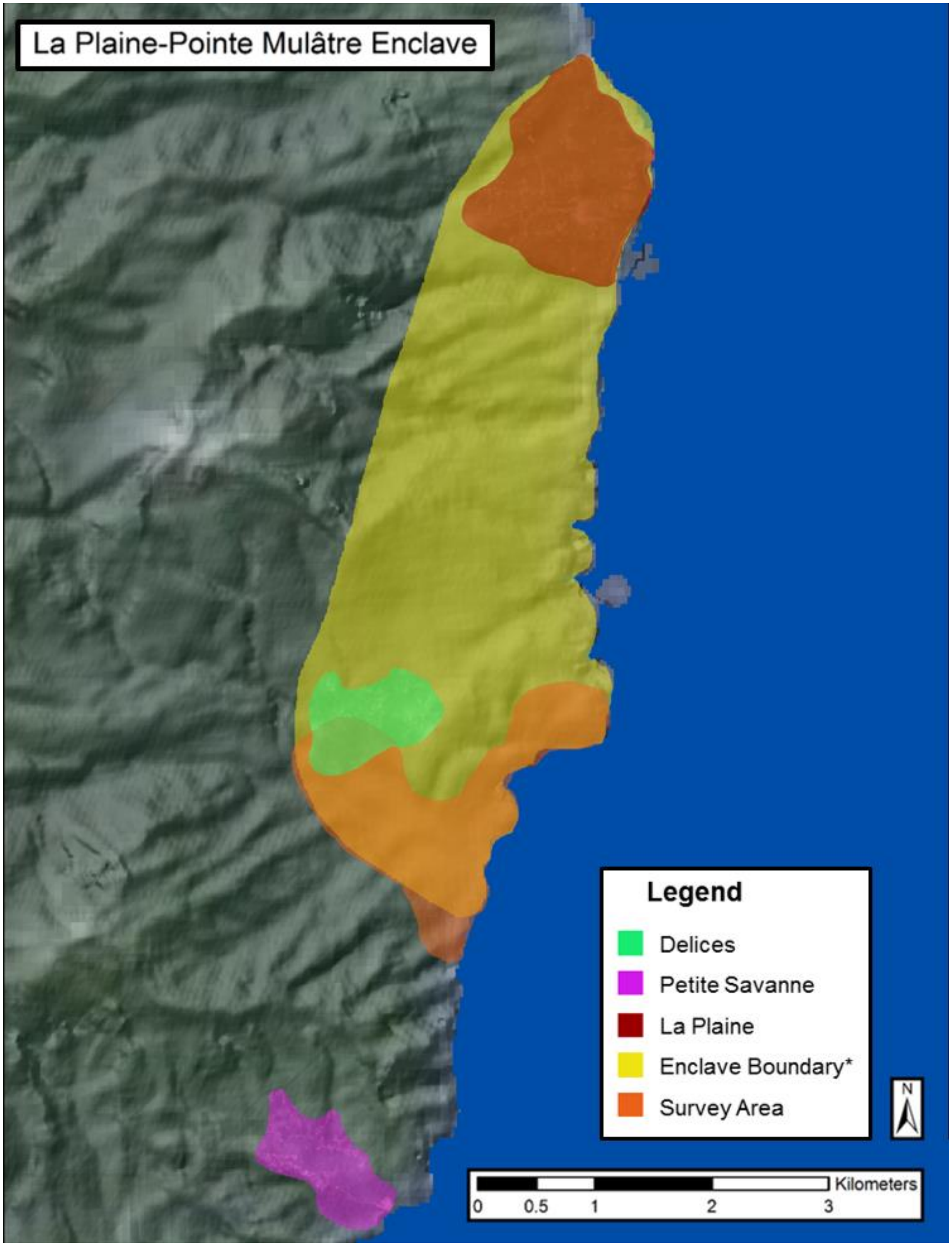

Figure 6-7. The La Plaine-Point Mulâtre enclave according to *Trouillot (1988).

We very consciously selected vessels for neutron activation analysis that we thought represented the extreme ranges of form, color, and decoration. The tight clustering of clays seen in the principal component biplots, indicate a homogeneity in the paste recipes used to make the wide variety of vessel shapes and decorative treatments in the micro-region. This indicates a continuity of practice relating to resource gathering—perhaps tying successive generations to a particular place of historical/ancestral importance (Santos-Granero 2004)—and to the technical choices involved in producing acceptable paste recipes. The counterpoint to this similarity in paste recipes was the variable tempering practices observed between serving bowls and storage vessels/griddles, perhaps supporting the idea of a gendered dimorphism in pottery manufacturing practices.

This led to the formulation of a new hypothesis, that Delices was a production and possible distribution zone for pottery, which was made more intriguing by the discovery that the provenance of the clay most similar to INAA composition group four, which dominates the Delices assemblage, is located in the adjacent watershed of Petite Savanne. However, while the evidence for production remains strong, the evidence for distribution is weakened by the functional composition of group-four vessels recovered from other micro-regions.

If the importation of ceramics does not account for the morphological diversity in the Delices assemblage, other explanations should be explored. Possible scenarios that could account for the variability in rim shape, surface treatment, and the application of decorative elements evident in Delices include: the exchange of ideas through increased regional voyaging by occupants of Delices, either in raids or in friendly exchanges; the exchange of ideas through the elevated regional orientation of the community in Delices, which acted as a hub and likely destination for voyaging foreigners to visit, perhaps for ceremonial practices and feasts centralized in Delices; or the exchange of marriage partners coupled with a household continuity strategy, in which powerful chiefs managed to centralize post-marital residence for both male and female junior household members, moving people into Delices who brought new or different styles and techniques to bear on locally produced ceramics. I propose that all three of these scenarios could have been operating at different times or in concert over the course of occupation in Delices, and together, they account for a substantial amount of the archaeological patterning we identified.

Although pottery does not appear to be moving into Delices, exotic lithic materials clearly are, and the dense deposits and continuous record of occupation seem to suggest that people were moving into Delices as well. The community in Delices drew people in, bringing into the community with them new or different techniques for manufacturing pottery. We propose that Delices functioned as an integrating locale for communities in the region. Ritual practice, ranging from marriage alliances to warfare and raiding, could have served to draw in residents from other micro-regions and exotic goods such as lithic materials. The growing population may have made it more likely that daughter communities splintered off from Delices, and goods such as pottery may have radiated out from this locale. This could account for the marginal location of certain settlements in the micro-region, such as DEL-4.

My interpretation of the settlement patterns and artifact assemblages is that the community that resided in Delices was a community that was highly regionally oriented.

Furthermore, Delices, more than any other micro-region, appears to function as a regional center, having the quality of integrating people from distant communities into both the co-resident community of sites in Delices, through human movement, and into a regional ritual community supported by economic redistribution within the community at the local level, and public ceremonialism, which served to integrate non-co-resident communities at the regional, and possibly macro-regional scale. This integration likely included a range of practices from friendly exchanges, sociopolitical maneuvering through the manipulation of marriage alliances and post-marital residence, mobilization of labor for elite sponsored projects such as building and voyaging canoes, and ritualized warfare supporting alliances with communities in other parts of the region.

Castle Bruce as Potential Enclave or Daughter Community

Castle Bruce represents the one enclave identified by Trouillot (1988) whose dimensions more or less match the survey area for the present study. This likely results from the geographic reality that this watershed is highly circumscribed by the local topography. However, these physical overland boundaries clearly represented something very different to the Amerindian communities than they do for modern Dominicans as the technology of travel—canoe-based versus vehicle and road-based mobility—fundamentally alters the experience of Dominica. The regionality that linked settlements and communities seems to have overridden the physical boundaries that we might perceive as dominating the Dominican landscape, at least in certain micro-regions, such as Delices. With these factors in mind, should Castle Bruce be thought of as an enclave?

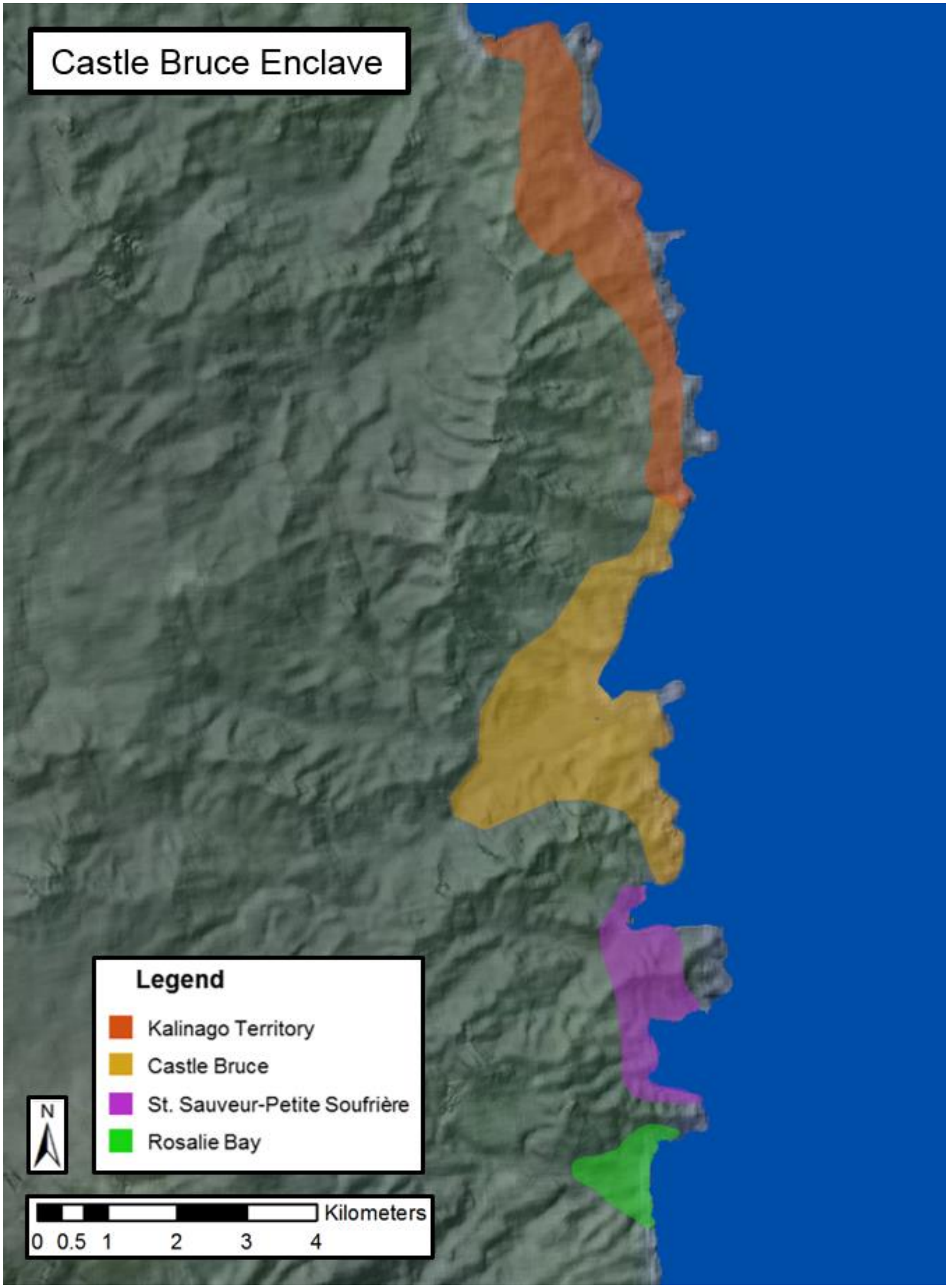

Figure 6-8. Castle Bruce and surrounding enclaves according to Trouillot (1988).

Earlier, I presented the hypothesis that Castle Bruce, although centrally located in modern Dominica, may have represented a peripheral location to interaction spheres oriented north or south. The micro-region displayed many of the characteristics we might associate with an enclave-type community organization, especially diminished evidence of regionality relative to both Hampstead and Delices. There are three results in particular that lend support to this interpretation. First is the diversity in the rim shape attribute. Both Hampstead and Delices had a higher diversity in the assemblages whereas the Castle Bruce assemblage was dominated by far fewer rim shape categories. To the degree that elevated regional interaction is reflected in the diversity of vessel shaping techniques, this would seem to indicate that pottery manufacturers in Castle Bruce were more isolated and the variability in the assemblage reflects the relatively diminished expression of exogenous influences. The second result that seems to support this hypothesis was the provenance of lithic materials found in the different regions. Castle Bruce, while yielding the most abundant lithic assemblages micro-regionally, featured assemblages dominated by locally acquirable materials—even if the questionable greenstone is found to be exotic. The third comes from the ratio of decorated to undecorated wares. When Castle Bruce is compared to the other two micro-regions, particularly Delices—whose assemblages do share similar decorative elements—this dimorphism is expressed in radically different proportions, with only very few examples of decorated vessels is Castle Bruce.

As an alternative to the enclave explanation, I want to explore the possibility that Castle Bruce represents a daughter community to Delices, or some other similar centralizing locale. In addition to the similar type of decorative elements discussed, proportions of rim orientation, surface treatments, particularly when applied to interior surfaces, and the predominance of sand temper over volcanic temper, were not significantly different between Castle Bruce and Delices. The most significant differences were in orifice diameter, wall thickness, and diversity of rim shapes and decorative elements. This seems to fit the pattern, proposed earlier, in which a similar set of technical choices, perhaps reflective of shared membership in a community of practice, were nonetheless used to manufacture a different suite of vessel types. This differentiation can be explained by functional variation between the micro-regions, with Castle Bruce exhibiting an elevated signature for domestic production, and Delices exhibiting an elevated signature for ritual ceremonialism and regionality.

I see this daughter community not as independent or autonomous, as we might expect of daughter communities in a neolocal system (Blanton 1995). Rather, I propose that Castle Bruce and Delices were integrated in a center-periphery relationship organized around patterned difference, in which Castle Bruce's relationship to the wider regional community was filtered through, or mediated by, the more powerful and more regionally oriented community at Delices. Regional news, and exotic goods only filtered into Castle Bruce by way of Delices, or some other regional center. The regional ceremonialism that integrated communities and centralized authority in Delices, may have meant that the most important and elaborate public ceremonies were carried out in Delices, drawing in members from other communities abroad, including Castle Bruce. This could explain the diminished expression of small-orifice serving vessels, decorated wares and exotic lithic materials in Castle Bruce.

Some evidence for ceremonial practices was recovered in Castle Bruce, expressed in a more modest signature at CB-5, which may have served to integrate settlements in the micro-region. However the centralizing forces exhibited by household continuity strategies practiced by chiefly households in Delices, seems to have successfully maintained the structured differences between micro-regions for some time, keeping Castle Bruce marginal with respect to Delices. Following this center-periphery model, we can speculate that men from Castle Bruce may have provided labor to powerful chiefs in Delices to aid in the production of canoes, as paddlers for inter-island voyages, and as warriors for raiding parties. This scenario, in which men were occupied outside of the micro-region, could explain why sites in Castle Bruce seem to be more affiliated with female-gendered activities. That less difference was evident in certain comparisons between Hampstead and Delices than between Hampstead and Castle Bruce further supports the ideas that Delices was a regional center, and that spatial distance is not the most critical factor affecting interaction.

Hierarchical and Heterarchical Archaeological Relationships

This dissertation was designed to address three research questions. Having covered the extent to which the research was able to address the first two research questions, I now consider the third question: What types of hierarchical or heterarchical relationships characterized the organization of communities at both the local and micro-regional scale? Of the three research questions, the question of sociopolitical organization represents the most difficult to address with archaeological evidence alone, which is why specific tests were not constructed to evaluate models of social hierarchy in the previous chapter. At this stage of research, the identification of archaeological correlates to hierarchy and heterarchy is addressable only to the degree that we are willing to accept the various assumptions and interpretations presented above. Within micro-regions, particularly Castle Bruce and Delices, if we accept the gendered interpretation of spatial relations with respect to centralizing coastal villages, then there is a clear hierarchical relationship between sites, which may reflect a hierarchical division in society along gender lines. We should be cautious about interpreting in a straightforward way that males dominated society, although certainly that is a position supported by the ethnohistory (Breton 1958a, 1958b), and accepted by several scholars (Boomert 1986; Taylor 1946, 1949). Whether or not Taylor (1946:210) is correct in concluding that the patripotestal nature of Kalinago society cannot be doubted, it does seem clear that the exchange of women through various marriage alliances and the dichotomous post-marital residence pattern, is intimately linked with power relationships. Dreyfus (1983:44, emphasis in original) concludes that:

> Contrary to the commoner who, as the head of an uxorilocal family, was, in his local group, superior as a wife-giver, *the war chief was superior as a wife taker and had no obligation to provide services to his fathers-in-law* in their respective local groups.

The dichotomous post-marital residence model indicates that women moved into communities only when marrying into chiefly lineages, whereas the general pattern was for men to move into a wives' village. The question then becomes, can we identify archaeological correlates to this subtle system of small-scale status reckoning? In Delices, if the inverse relationship between formal variability and paste compositional uniformity is indicative of a community that tends to draw individuals into the co-resident multisite settlement cluster, does this suggest ranked differences between Delices and the other micro-regions?

In a straightforward way, we can hypothesize that successful chiefs will gather more individuals into their household, leading to more variation in the pottery assemblages as members of different communities of practice are centralized in specific locales. This might explain why Delices returned diversity indexes for rim shape and decorative elements that were significantly higher than Castle Bruce (although time could be a complicating factor). Unfortunately, there is a circularity to this logic in which complexity leads to variability, so variability indicates complexity. This circularity is circumvented some if we accept the reading of the ethnohistoric documents and the interpretation of Delices and Castle Bruce as hierarchically ranked, and integrated under the ritualized authority of chiefly lineages practicing a centralizing household continuity strategy (Blanton 1995).

As to heterarchies, there are ways that we can see different non-center sites within micro-regions as being equally ranked, while not really belonging to an egalitarian system. For example, there are not clear rank differences between CB-1, CB-3, and CB-Tronto, but should we consider CB-5 ranked higher because of the increased presence of decorated wares and exotic lithic materials? Delices appears to exhibit a higher degree of settlement hierarchy, with more clear differences between sites such as DEL-5, DEL-7, and DEL-4 and the coastal sites DEL-2 and DEL-3. The potential that DEL-2 and DEL-3 represent some type of heterarchical arrangement is intriguing, but the lack of chronological resolution and the small scale of excavations carried out at these sites, precludes more satisfactory conclusions about these relationships.

The other type of heterarchical arrangement to consider would be between micro-regions. If Delices ranks higher than Castle Bruce in a center-periphery relationship, than how does Delices compare to other regional centers? On the one hand, the lack of difference observed between Hampstead and Delices in certain attributes could be explained as a heterarchical arrangement. However, we do not have enough evidence to evaluate Hampstead as a regional center or the possibility that communities in Hampstead and Delices were interacting, even if some apparent lack of difference between the micro-regions provisionally supports this claim. If Hampstead was not a regional center, it seems most likely that the center was somewhere in the direction of Calibishi. Furthermore, to truly evaluate Delices as a center, we should investigate other nearby micro-regions such as Petite Savanne and Grand Bay.

House Society vs. Canoe Society: Labor, Canoe Manufacture, and Voyaging

There is one more aspect of community organization that I want to explore before concluding this dissertation. The question of social hierarchy implicates the notion of control. If there was social control by an elite corporate group, what was it that they controlled? The evidence for craft specialization is weak, but there is evidence for a division of labor and a highly structured, gendered separation of space exhibited in the built environment. Regional archaeological findings such as Crock (2000), indicate that control may not be in the sphere of economic production and redistribution, as is common in many hierarchical societies when agriculture requires organized communal labor. Rather, it is in control over inter-island mobility and exchange, along with interaction with supernatural forces and powerful ancestor spirits that power is situated in Arawakan polities of the Amazon and Caribbean. Despite the apparent fact that manioc horticulture mitigates the need to mobilize communal labor for domestic production, the mobilization of communal labor for elite-sponsored activity is still often discussed in the Caribbean. In the Greater Antilles, this takes the shape of ceremonial plazas with large rock petroglyphs (Torres et al. 2014). In the Lesser Antilles, similar communal labor projects are less commonly identified (Curet 2003).

Following ideas presented by Arnold (1992) for the Chumash of California, I propose that the role of canoe building was integral to the negotiation of power relationships within and between communities in Dominica and the broader region. Echoing a sentiment by Harris (2012:82), who summarizes work in Neolithic central Europe relating the building of longhouses to community organization, the building and voyaging of canoes linked people to a particular kind of interaction with each other and with the regional community. This interactivity was defined minimally by the labor relationships surrounding the construction and voyaging of canoes, practices through which community bonds and values were negotiated and reproduced. These processes structured not only sociopolitical relations within communities who worked together to build and voyage canoes, but also structured the experience of regional interaction. Only those who could successfully control production and put together a team of paddlers could participate in regional exchanges, which is perhaps why elite-related preciosities are what tend to circulate. The sociopolitical configurations embedded in these relations become solidified through successful regional interactions, whether these were friendly exchanges, marriage alliances, or violent raids.

Over the last decade, among the Kalinago people, there has been a renewed interest in the manufacture of dugout canoes for inter-island transportation, including the ethnoarchaeological approach taken by Bérard (2012) to help understand the timing and number of paddlers required for inter-island travel.

Figure 6-9. Images of two Kalinago dugout canoes being constructed. A) Side view of the small canoe built in the village of Boetica in 2009. B) View of the same canoe with rocks and water left inside to help spread the walls. C) The same view and the same process but for the much larger canoe build in Kalinago territory in 2013. D) Side view of the same canoe with workers shaping the *bordage* that will be attached to the side of the dugout to raise the walls, technically making this a *pirogue* instead of a *canaoa* (McKusick 1960a). E) Regina, who taught us much about this canoe, sitting in the near-finished product. F) Side view of the near-finished 38-foot canoe.

The Kalinago frequently make smaller dugout canoes for offshore fishing and transportation, but the larger canoes for inter-island travel on the open seas are rare, as they require a greater investment of time, labor, and resources while simultaneously representing the type of inter-island mobility most commonly replaced by motorized watercraft. In 2009, and again in 2012, we had the opportunity to witness parts of the construction process of two different dugout canoes (Figure 6-9). In 2009, one was constructed in the small mountain village of Boetica, the village north of Delices. At the time when we were conducting our year of fieldwork over 2012-2013, a group of Kalinago were constructing a much larger, seafaring dugout canoe and we had the opportunity to visit with this group several times over the months-long construction period. Informal interviews helped us develop insights into the relationship between Kalinago settlement, mobility, and the actual process of making one of these massive canoes.

An informant provided some estimates of the labor involved in making a 38-foot dugout canoe intended for international seafaring. The process of cutting and preparing the tree alone takes several weeks, during which time the group making the canoe was camping high in the bush. To drag the partially hollowed tree to the coast required between twelve and thirty laborers per day, for six days. And this was with the assistance of motorized vehicles, chainsaws, and metal tools. Ethnohistoric documents situate the length of time required to build such a canoe as closer to a year (Breton 1958a; McKusick 1960a). The labor relations and economic redistribution implied in such craft specialization, can be seen as a particular kind of complex organization, underwriting a system of regional integration supported by canoe building and voyaging, and sponsored by elites that could marshal the labor and resources necessary to achieve their goals. This included the food and drink necessary to fund the work parties for moving the canoes (Breton 1958a), and to support the specialists and the paddlers while they were building and voyaging.

The critical aspect of this line of discussion is that, if we are looking for the material practices that build communities, the canoe might be more important to consider than the house. Should we go so far as to suggest that, rather than house societies, we should think of these as canoe societies? Perhaps this is extreme, and although it certainly does not matter what we call it, this does remind us that the house is not the only avenue through which to approach the materialization of social relations in the Caribbean. For now, we can only speculate as to the diverse and dynamic relationships surrounding identity, captainship, and community that become embroiled in the process of canoe building and become materialized in the finished canoe.

Directions for Future Research

The organization of labor throughout the span of manufacturing, launching, and voyaging of seafaring canoes, are among a variety of interesting topics for future ethnoarchaeological studies in Dominica that I intend to conduct over the next several years. I propose that canoe building and voyaging represent a largely overlooked aspect of labor organization in pre-Columbian communities and that future archaeological investigations should include a search for potential gommier harvest zones, along with groundstone debris or other archaeological remains potentially associated with this process.

As the project moves forward, two of the main goals—which are somewhat contradictory—are to expand the scope of inquiry by moving into new micro-regions, increasing the dimensions of the survey areas, and to simultaneously increase the resolution of fine-grained data by conducting more detailed and intensive excavations at known sites. Specifically, the Delices micro-region should be expanded to include La Plaine and Petite Savanne, where we have already developed contacts and leads. At the same time, DEL-2, DEL-3, and DEL-7 all require further investigation, as do sites in Hampstead, specifically HS-2, and in Castle Bruce, such as CB-1, CB-3, and CB-5. The Castle Bruce micro-region should also be expanded to include Rosalie in the south, and parts of Kalinago territory to the north, which would open up exciting avenues for more collaborative efforts there. The northeast presents a bigger challenge. To properly survey Hampstead and the surrounding La Soye Enclave, it would take a substantial, several-month-long survey, requiring extensive subsurface sampling.

The next major steps to consider will be to survey the west coast and portions of the interior. Unfortunately, I anticipate intensive and potentially extensive impacts from modern village infrastructure along the west coast. However, it does feature many known sites (Honychurch 2011; Petitjean-Roget 1978), each of which may belong to a yet unidentified multisite configuration like those apparently typical of the east coast. This would undoubtedly enhance our regional perspective, particularly with respect to the bounding quality of landmasses versus sea passages. A survey of the interior of Dominica is a daunting task to be sure, but I do have some ideas for how this might be accomplished. There are several footpaths that traverse the island that are said to have been first used by the Kalinago. Using these known paths as a baseline, pedestrian survey along these corridors could be useful for finding interior sites.

Another way that the scope of the project can be expanded is through collaboration with archaeologists working on nearby islands. The more interconnectivity we as researchers have, the more interconnectivity we should be able to reveal through our analyses. Because much work has already been conducted on nearby islands, it may be possible to integrate my ceramic analysis with previous analyses in order to investigate inter-island interaction more directly.

In reviewing the methods and techniques utilized in this study, while I believe they were mostly successful, there are some aspects of the approach that could be improved, refined, or expanded to improve future research. The most obvious need is to raise the sample size from certain important sites to evaluate more satisfactorily the hypotheses that this research began to explore. However, there is also a great need to understand the geologic diversity of the micro-regions so that variability in the neutron activation and petrographic data can be better understood. We need to sample more clays and drastically increase the scope of the petrographic analysis, particularly to sample pottery from INAA composition groups one, two, and three.

For the ceramic attribute analysis presented here, inferences were drawn from descriptive statistics and distributional data, which work well for this stage of research. However, future efforts could be directed toward developing a more sophisticated analytical framework with the use of multivariate statistics, such as hierarchical cluster analysis, and social network analysis, to develop more robust evidence about the interconnectedness of sites and micro-regions. Furthermore, our treatment of these attributes could use some refinement. As pointed out in Chapter 5, the categories for rim shape should be expanded to include interior and exterior thickening. In addition, it may be useful to gather metrics on orientation, rather that grouping vessels into categories. Measuring the angle of the vessel wall might help to break down the outflaring category into more meaningful distinctions.

Another major challenge for future research will be to drastically refine our understanding of the chronological relationships among sites through a more extensive radiocarbon dating strategy. Unfortunately, in Dominica, this can be easier said than done because finding datable material from reliable contexts can be difficult, and will require more intensive and larger-scale excavations at known sites, particularly those featuring good stratigraphic relationships, such as DEL-2.

Finally, in moving beyond the specifics of archaeological research, I have some very immediate goals for expanding and improving involvement with local communities and incorporating more Dominican and Kalinago perspectives into the research. I will continue to develop collaborative efforts in the Kalinago territory and expand the crew with more training and employment opportunities. At the same time, I want to continue working with Edward, Marcus, Sandy, and Garbo, and provide opportunities for them to take on more responsibility for designing and executing research strategies.

Concluding Remarks

By far, the most rewarding part of this research has been the collaboration with the Dominican crew, and it is a collaboration we are all committed to continuing. Throughout the project, as our approaches introduced new perspectives and insights, certain avenues were pursued that had not been considered previously, and as a group, the crew and I had to adapt and improvise. We learned from each other just as we were learning together about Dominica’s rich history and cultural heritage. Through our collaboration, and our commitment to education and outreach, we had a significant impact on communities in Dominica, developing ways to make the archaeology more meaningful and relatable.

When we set out, we started with dots on a map. Through our work together, we learned that many of these dots do not represent single sites. Rather, communities appear to be organized in multisite configurations that are functionally differentiated, but socially integrated. In tracing the connections between these dots, we learned that among certain communities there was more evidence for regional integration than others. We identified a number of unanticipated factors affecting settlement and community organization, including the importance of intervisibility and canoe building. While we made substantial progress toward addressing our research questions, we also have a much better idea of what the next steps will be to develop a deeper understanding of community organization and the regional orientation of pre-Columbian communities in Dominica.

APPENDIX A
DATA COLLECTION METHODS

An analysis of the pottery assemblages was conducted in Dominica by Edward Thomas (Figure 3-5E) and me over a three-month period at the end of the yearlong stay in 2012-2013. Together, we decided which attributes of the pottery to analyze and constructed a form for collecting data (Appendix C). We use a vessel unit of analysis and include only vessels that contain a portion of the rim, and which are larger than 2 cm^2. We collected data on a sample of vessels represented only by body sherds, but this proved to be too time consuming while failing to yield the morphological data we were interested in, and several weeks into the analysis, we began to focus on just vessels with rim sherds. We worked closely together to analyze every rim vessel and whenever we had to make a subjective decision in the analysis, such as membership in a vessel lot, or the abundance of aplastic inclusions, we would arrive at a consensus before making a decision.

The first step in data collection was to group sherds into vessel lots. This was accomplished by going through each site, one at a time, and following a specific procedure for grouping like vessels. Within each site, we made a visual inspection of all of the pottery recovered from within a 5-m^2 area. If two test pits were more than 5m apart, then their pottery was considered separately. Although it is possible that this resulted in a small number of vessels being counted twice, it was a necessary step because of space constraints in our lab (my living room) in Dominica. There was not enough room to lay out all of the pottery from a particular site at one time so we had to analyze it in groups. We then put all of the pottery on trays by provenience, such that each tray had all the pottery from a particular provenience. In the case of excavated pottery, each provenience represented an excavation volume of 50-x-50-x-10-cm. We then went through each tray and separated out rim sherds, grouping any other rim sherds and body sherds that could have belonged to the same vessels.

Slightly different data were collected for rim vessels, bases, and griddles. For each rim vessel lot, the following data were collected: Site number, test pit/unit/surface collection number, provenience code, count of sherds in the lot, shape of the rim, orientation of the rim, maximum height (perpendicular to rim), maximum width (parallel to rim), lip thickness, rim thickness, wall thickness, percentage of orifice represented, orifice diameter if percentage was >2.5, interior surface treatment, exterior surface treatment, interior Munsell color, exterior Munsell color, core Munsell color if core color varied from surface color, temper type, temper angularity, temper sorting, temper size, percentage of paste constituted by temper, presence and description of decoration, inferred function, and any other notes about the vessel lot. After the data were collected for each vessel lot, a rim profile was drawn using calipers and contour gauge, and photographs were taken of any noteworthy, unusual, representative or decorated sherds. During the analyses we also made note of certain vessels that would be suitable for neutron activation analysis and/or petrography based on unique or representative characteristics. Griddles and bases were analyzed in the same manner with minor modifications for rim shape and orientation, and where the maximum and minimum dimensions were taken. For each variable, I discuss their relevance and include some remarks on how they were assessed in this analysis.

Rim Shape

Rim shape is a nominal-scale descriptive category used to quickly identify the shape of the rim by its cross section. This category is therefore also reflected in the rim profiles taken from each vessel lot. The most common categories that make up rim shape include flanged, flat, rounded, and pointed. Certain of these categories also had modifiers based on lip modification, such as when a rim was thickened at the lip. A rim would be thickened/pointed if there was a thickening before it became pointed, or thickened/round if the rounding was accompanied by a thickening. Also, certain sherds did not fall neatly into these categories, for example, if a rim was rounded with a flattening on the lip, in which case dual categories, such as rounded/flat, had to be created. The special decorated category was created to account for rims that had unusual modification along the rim to create a space for other decorative elements. These usually elliptical or semi-circular panels tend to extend up from the rim, altering the overall shape of the rim, and often feature broad line incision patterns or small eye adornos, and some of them feature multiple design elements where incision patterns, adornos or lugs, and paint all co-occur.

Orientation

Orientation is a nominal-scale descriptive category that refers to the direction the rim was pointed. Categories include; inflaring, outflaring, and straight. It was very rare for the orientation to be perfectly straight; rims were frequently almost straight but were just slightly inflaring or outflaring in which case they were categorized as outflaring/straight or inflaring/straight. Orientation is interesting from a functional perspective as inflaring vessels are better suited for storage, particularly liquid storage, and some types of cooking, whereas outflaring vessels are better suited to serving and food processing (Braun 1983; Rice 2005). Finally, rims were categorized as necked when they flared outward after they flared inward, indicating a restricted orifice above a shoulder.

Size

The maximum height and width of the sherds were recorded, which reflects the degree to which the vessel was broken but can also reflect post-depositional processes. Although these data were recorded, they are not analyzed in this study.

Thickness

Measurements of thickness were made with calipers on all vessels to capture the range of thicknesses present on different parts of the vessel body. These measurements are helpful for characterizing the range of variation in a particular assemblage as well as for comparing variability in the functional characteristics or assemblages between sites. On rim vessels, at least one measurement was made on the body, between 3 and 5 cm below the lip depending on the size of the sherd. When body thickness varied, a maximum and minimum thickness measurement was recorded. Rim and lip thickness were measured where rim thickness was taken at the thickest part of the rim and lip thickness was measured at the thinnest part. Therefore, a straight flat rim would have the same measurement at the lip and rim, a rounded or pointed rim would have a larger rim than lip measurement, and thickened flat rim would have a larger lip than rim measurement. On flanged rims, the rim thickness was taken from the interior to the exterior of the rim and the lip thickness was taken from the top to bottom of the flange.

Wall thickness relates to the intended performance characteristics of the pot—affecting thermal conductivity, strength/resistance to breakage, and thermal shock resistance (Braun 1983)—and to the more generalized skill and learning of pottery producers, thinner walls representing perhaps a greater challenge to the potter. For cooking pots, the balance between the three performance characteristics is critical because as walls get thicker, pots become stronger, but also less conductive and less resistant to shock (Braun 1983). For non-cooking pots, I assume that large thick-walled vessels would be better suited for storing and processing, domestic functions, whereas serving and ceremonial vessels may tend to have thinner, more finely crafted walls. Therefore variability in wall thickness provides a means to assess the functional character of assemblages and more importantly, how these functional characteristics of the assemblages vary between sites within micro-regions. Furthermore, the degree of similarity in vessel wall-forming practices between micro-regions provides insight into the degree of similarity in producer skill, as well as the range of functions the potter intends for a vessel, characteristics I assume to vary more between communities of practice than within.

Orifice Diameter

All rims were checked against a rim orifice chart. As long as the rim preserved more than 2.5% of the rim, the orifice diameter was measured. The percentage preserved was also recorded as an approximation of the accuracy of the diameter measurement. For example, a measurement from a 10% rim can be considered more accurate than a 2.5% rim, but for a very large rim, the 2.5% may be adequately accurate. Orifice diameter is a useful metric in determining the overall size and shape of a vessel but must be considered in tandem with rim orientation. For example, an inflaring vessel with a restricted orifice will have a much smaller diameter than an equivalently sized vessel with an outflaring unrestricted orifice. As with wall thickness, orifice diameter provides an indication of overall vessel shape and lends insight into potential intended use functions. For example, a small-orifice-diameter vessel with an inflaring rim orientation might be the ideal shape for liquid storage, but less useful as a serving vessel, which might have a similar orifice diameter with an outflaring rim. The composition of assemblages with respect to orifice diameter can then be used to make interpretations about site function.

Surface Treatment

Surface treatment is a nominal-scale descriptive category that reflects manufacture technique, or technological style, as well as intended use or function because surface treatment can alter the performance characteristics of the vessel. Surface treatment is often used as an aesthetic, or decorative characteristic to describe different ceramic series in the Caribbean. For example, the Suazoid series is often characterized as having scratched or scraped surfaces, a trait that makes its first appearance in the Mamoran Troumassoid subseries (Petersen et al. 2004). Other series, such as the earlier Saladoid series, are characterized as having more finely smoothed and polished surfaces.

We used an additive coding, such that a surface could be categorized as smoothed, or smoothed and finished if a paint or slip was applied after smoothing. With regard to scratched or scraped surfaces, we coded these as brushed when it looked like a brush, or bundle or reeds, was used to finish the surface, although it is also possible shells were used to achieve this surface (Van Gijn and Hofman 2008). In some cases, it appeared as if the potter had used a brush to form the surface, and then went back and burnished the brushed surface, but failed to eradicate the evidence of brushing. In this case, we coded the surface as brushed/burnished. Smoothed surfaces were further distinguished into poorly smoothed, smoothed and well smoothed categories. The well smoothed category reflects the glassy feel that certain non-burnished but highly consolidated sherds had. It seems likely that these well smoothed vessels were finished and polished with some kind of soft tool, perhaps a rounded potsherd such as the one found at DEL-3 (Figure 3-7) (Van Gijn and Hofman 2008). Pottery was considered poorly smoothed if it was poorly consolidated or if coils were only partially smoothed away. The additive coding system allowed us compare the surface finishes from the perspective of a series of techniques, or steps. For example, there are more steps involved in brushing, then burnishing, and then painting a surface than in simply smoothing a surface.

Color

Color can be a useful category for differentiating manufacturing technique and clay selection, but can be deceiving because of factors such as firing temperature and taphonomy. Nevertheless, color was recorded for all vessels. Edward and I made all color measurements in natural light using a Munsell color chart. Color measurements were made on fresh breaks on the interior, exterior, and core if a firing core existed. Additional color measurements were made on painted or slipped surfaces, meaning that some vessels had as few as one color, whereas others had as many as five.

Temper

Temper is a critical aspect of manufacturing technique but can also reflect intended use or function. Aplastic inclusions can enter ceramics as purposefully added temper, or as naturally occurring inclusions in the clay. Five categories of data were collected pertaining to temper. All vessels were given a fresh break during analysis, and the fresh break was observed under 20x magnification. The types of minerals used as tempering agents were recorded as the presence/absence of broad mineral types, including opaque light, opaque dark, translucent, mica, red minerals, grog, and organic. Almost all sherds had a mix of opaque light, opaque dark, translucent, and micacious minerals, with more variety in the inclusion of the other three types. Angularity was estimated using a visual comparison to the chart seen in Figure A-1. When temper contained a mixture of angularities, we selected the predominant or representative angularity to classify the vessel. Sorting was a simple two-category classification of well sorted or poorly sorted, which was a reflection of size. If more than one size category of temper was present, it was poorly sorted, but if all temper fell into one size category, it was well sorted (Figure A-1). Size categories were determined with visual comparison to the chart in Figure A-1, and included fine sand, medium sand, coarse sand, and very coarse sand (granules). The clay and silt categories were not included because every sherd contained such fine-grained particles and could not be considered aplastic inclusion. Size was recorded as a range, for example, if a vessel contained fine, medium and coarse particles, it was recorded as fine-coarse. Finally, an estimation of the abundance of aplastic inclusions was made with visual comparison to the chart in Figure A-1. For all classifications in the temper category, visual comparisons were made by Edward Thomas and me, and we arrived at a consensus before making a recording.

Decoration

Decoration was a text category describing any decorative elements applied to the vessels, including paint, slip, adornos, incised patterns, et cetera. Notes were made of the location of the decoration on the vessel. Most decorated sherds were drawn as well as photographed. After data collection, the decorative elements were grouped into categories based on the techniques used to apply them, such as simple broad line incision (BLI), BLI pattern, simple painted, painted pattern, simple appliqué, eye motif, anthropomorphic adornos, zoomorphic adornos, white on red, and zone incised crosshatch (ZIC). Additional categories were constructed when multiple decorative techniques co-occurred, for example, *BLI pattern + eye motif + paint*. Vessels were then sorted into these categories, some of which also had modifiers to indicate if decorative elements were applied to the interior or exterior of the vessel.

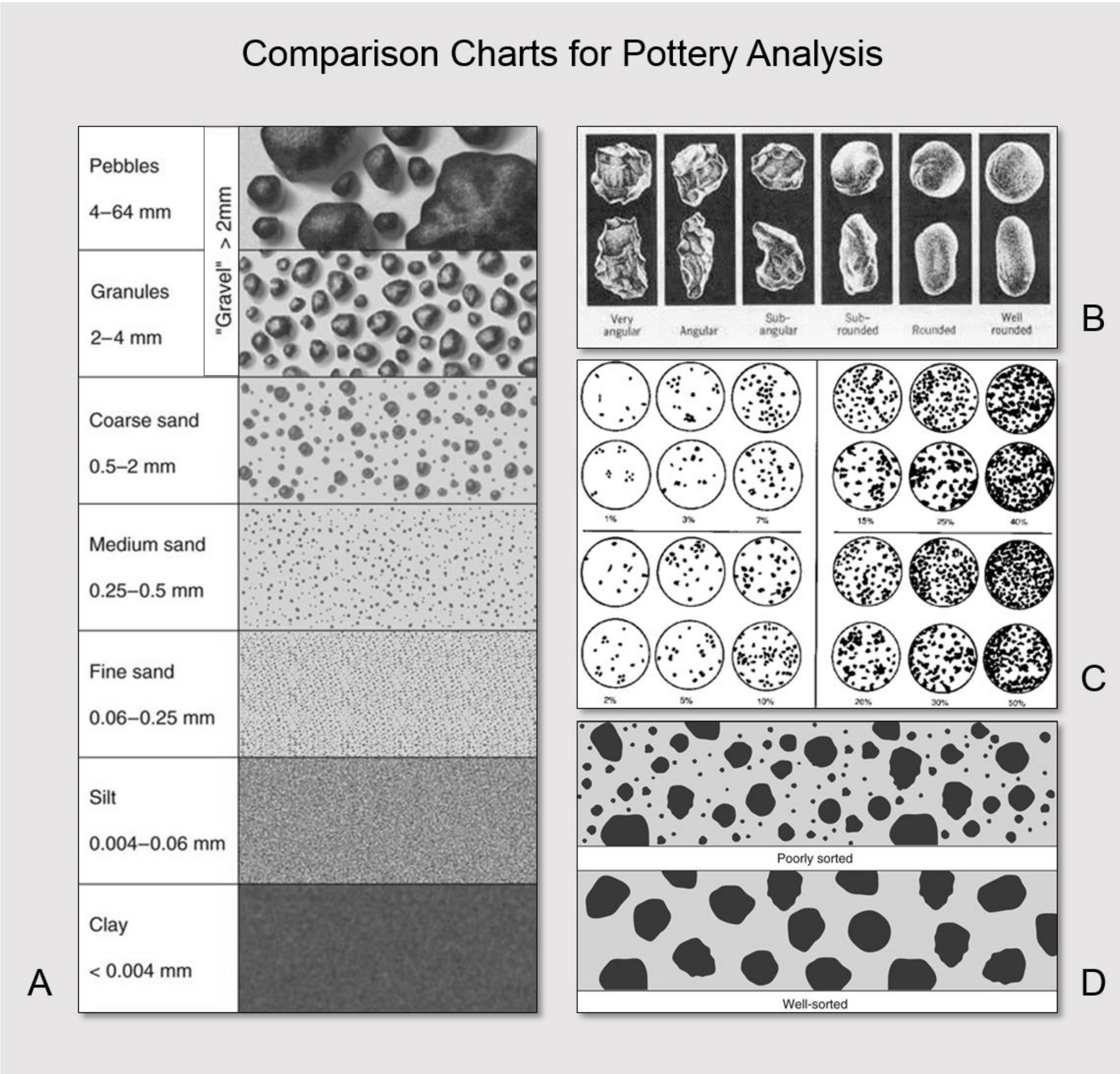

Figure A-1. Visual comparison charts used for the ceramic analysis. A) Grain size chart. B) Power's scale of roundness chart. C) Percent abundance chart. D) Sorting chart (Jones 2003).

Inferred Function

Inferred function was recorded for vessels based on the impression that we got from the other attributes—specifically, shape, orientation, orifice diameter, surface treatment, use-wear, coloration, presence of soot or oxidation, et cetera—at the time of analysis. This was highly speculative, and does not represent an actual analytical category, but an inference about intended or actual use, recorded while the attributes of the vessel were fresh in our head. Common categories include storage/processing, liquid storage, cooking, serving, and ceremonial.

APPENDIX B
STATISTICAL EQUATIONS UTILIZED

Simpson's Diversity Index (shown in figures as 1-D)

$$D = \sum_i \left(\frac{n_i}{n}\right)^2$$

Approximate confidence intervals for diversity indices are computed with a bootstrap procedure. The given number of random samples (default 9999) are produced, each with the same total number of individuals as in the original sample. For each individual in the random sample, the taxon is chosen with probabilities proportional to the original abundances. A 95 percent confidence interval is then calculated (PAST v.3.0 documentation).

Berger Parker Dominance Index

$$d = n_{max}/n$$

Where n_{max} is the number of individuals in the most abundant species, and n is the total number of individuals in the sample.

Diversity *t*-test

$$t = \frac{(D_1 - D_2)}{\sqrt{(Var\ D_1 + Var\ D_2)}}$$

Where:

$$Var\ D = \frac{4N(N-1)(N-2)\sum p_i^3 + 2N(N-1)\sum p_i^2 - 2N(N-1)(2N-3)(\sum p_i^2)^2}{N^2(N-1)^2}$$

Pearson Chi-Square (χ_2)

$$\chi_2 = \sum_i \sum_j \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

Where O_{ij} = observed frequency in cell (i, j) and E_{ij} = expected frequency for cell (i, j). The degrees of freedom associated with a contingency table possessing r rows and c columns equals (r - 1)(c - 1) (Minitab 17 documentation).

Cramer's *V*

$$V = \sqrt{\frac{\chi^2}{n_{min}(S-1)}}$$

Where S is the number of rows or columns in the contingency table, whichever value is smaller (Drennan 2009).

Kruskal-Wallis (H)

$$H = \frac{12 \sum n_j [\bar{R_J} - \bar{R}]^2}{N(N+1)}$$

Where, n_j is the number of observations in group j, N is the total sample size, $\bar{R_J}$ is the average of the ranks in group j, and $\bar{R}$ is the average of all the ranks (Minitab 17 documentation).

2-Sample *t*-test

$$t = ((\bar{X}_1 - \bar{X}_2) - \delta_0) / _s$$

Assuming unequal variance, the sample standard deviation of $\bar{X}_1 - \bar{X}_2$ is:

$$s = \sqrt{\frac{{s_1}^2}{n_1} + \frac{{s_2}^2}{n_2}}$$

One-way ANOVA

(Fisher's multiple comparison)

$$\bar{y}_i - \bar{y}_j \pm t_{1-\frac{\alpha^*}{2}, n_J - r} \; {}^{s}\sqrt{(\frac{1}{n_i} + \frac{1}{n_j})}$$

Where *t* = upper α/2 point of the Student's *t*-distribution with u df.

$\bar{y}_i$ = sample mean for the i^{th} factor level

$\bar{y}_j$ = sample mean for the j^{th} factor level

n_i = the number of observations in level i

r = the number of levels

s = the pooled standard deviation or sqrt(MSE)

u = the degrees of freedom for error

α = the simultaneous probability of making a Type I error

α^* = the individual probability of making a Type I error

Simultaneous Confidence Level = $1 - \alpha = P(Q \leq \sqrt{2} \times t_{1-\alpha^*/2,u})$

APPENDIX C
FIELD AND LAB FORMS

1. **PN.** Location Number. Assigned to the smallest significant provenience or location unit (e.g. quad and level). Each distinct location receives a distinct PN. **Use a separate PN for artifacts found *in situ.***

2. **Unit Type.** Recorded to identify the collection unit type. S=Surface collection, P=Test Pit (.5m x.5m), and U=Excavation Unit (1m x 1m), X=Irregular sized excavation.

3. **Grid N/S/TR.** The north/south number that refers to the southwest corner of the excavation unit. When excavating Test Pits this column refers to the Transect number.

4. **Grid E/W/TP.** The east/west number that refers to the southwest corner of the excavation unit. When excavating Test Pits this column refers to the Test Pit number.

5. **Quad.** Quads are the four subunits of a 1.0 m x 1.0 m unit. NW, NE, SW, SE. When referring to more than one quad, designate the half unit: NH, SH, EH, WH. When expanding a test pit to a 1.0 m x 1.0 m unit use TQ for Test Quad. Use AL when all quads of a unit are excavated without separation.

6. **Level.** Levels are arbitrary, 10 cm thick, horizontal units that are assigned numbers relative to depths below or above an arbitrary datum. If a level is greater than 10 cm it should be designated by a range, i.e. 13-15. When excavating Test Pits 0-10 cmbs is level 1, 10-20 cmbs is level 2, etc.

7. **Strata.** A letter designation for soil stratigraphy within the arbitrary levels. These are alphabetical starting with A. Transitional stratum may be designated with a slash, i.e. A/B.

8. **Top Depth.** This is the top of the excavation level, recorded to the nearest centimeter, either below datum (BD) or below surface (BS).

9. **Bottom Depth.** This is the bottom of the excavation level, recorded to the nearest centimeter, either below datum (BD) or below surface (BS).

10. **BD or BS.** This is the designation for the method of measuring depth, either below datum (BD) or below surface (BS).

11. **Feature Number.** Record the number of the Feature here, if excavating within a Feature

12. **In Situ Grid.** When artifacts are recovered *in situ* the exact north/south grid location is recorded here

13. **In Situ Grid.** When artifacts are recovered *in situ* the exact east/west grid location is recorded here

14. **Artifact Catagories.** These are the abbreviated field codes for artifact material classes

Ceramic-Amerindian	**PTRY**	Lithic Other	**LOTH**
Ceramic-European	**CERM**	Bone	**BONE**
Glass	**GLAS**	Shell	**SHEL**
Metal	**METL**	Organic Other	**ORGO**
Lithic Debitage	**LDEB**	Soil-Feature	**FEAS**
Lithic Fire Cracked Rock	**LFCR**	Soil-Other	**SOIL**
Lithic Tool-Ground	**LTGR**	Other	**OTHR**
Lithic Tool-Flaked	**LTFL**	Unknown	**UNKN**
Lithic Unmodified	**LUNM**	Synthetic	**SYNT**

15. **Number of Bags.** Number of bags of artifacts for this PN. This is used in the lab to make sure we have everything collected in the field.

16. **Discarded.** This is used in the lab to note anything that upon further inspection was discarded in the lab.

17. **In Lab.** This column is used to check all bags into the lab.

Figure C-1. PN Sheet, back. Adapted from University of Vermont Consulting Archaeology Program (UVMCAP).

Project Name and Year:

Site Name: | **Site Number:** | **Excavators:**

PN Block: | **Page of** | **Other:**

PN	*Pit*		*Horizontal Info*				*Vertical Information*						*In Situ Grid Poin*		*Field Analysis*	*Other*	
PN	SPUX	N/S	GRID COOR.	E/W	GRID COOR.	Quad	Level	Strata	Top Depth	Bottom Depth	BD or BS	Feature #	CM FROM SOUTH	CM FROM WEST	Artifact Catagories	# of Bags	In Lab
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Figure C-2. PN Sheet, front. Adapted from UVMCAP.

Site __________ **Artifact Catalog** Pg. ____ of _____

ID	TP/TU	PN #	Body Count	Body Weight	Rim Count	Rim Weight	Deco Count	Deco Weight	Griddle Count	Griddle Weight	Lithic Count	Lithic Weight	Other Count	Other Weight	Notes

Figure C-3. Artifact Catalog form.

Site __________ **Lithic Materials Analysis** Pg. ____ of ____

TP/ Unit	PN#	Type	Manu. technique	Material	Color	Prov. L/E/U	Size max L	max W	Thk.	Wt.	Retouch	Use-wear	Notes

Figure C-4. Lithic Material Analysis form.

Site __________ **Rim Vessels** Pg. ____ of ____

TP/	PN	Cnt	Shape	Orient.	Size		Thickness			Orifice		Surf. Treat.		Color			Temper					Deco.	Inf.	Notes
Unit	#				mx H	mx W	Lip	Rim	Wall	%	Diam.	Interior	Exterior	Interior	Exterior	Core	Type	Ang	Srt	Size	%		Func.	

Figure C-5. Rim Vessel form.

Site __________ **Griddle Vessels** Pg. ____ of ____

TP/ Unit	PN#	Cnt.	Type	Shape	Size		Thickness		Base		Surf. Treat.		Color			Temper					Deco.	Notes
					mx L	mx W	Max	Min	%	Diam	Interior	Exterior	Interior	Exterior	Core	Type	Ang	Srt	Size	%		

Figure C-6. Griddle/Base Vessel form.

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BIOGRAPHICAL SKETCH

Isaac Shearn received his bachelor's degree from the University of Vermont, where he majored in anthropology under the mentorship of John G. Crock and the late James B. Petersen. His first archaeological experience was as their field school student in Anguilla in 2003. After graduating, he spent three years working in Cultural Resource Management, during which time he volunteered for Benoît Bérard and Joshua R. Toney's 2006 field season for the *Mission-Sud-Dominique*. In 2007 he returned to Anguilla to serve as TA for the University of Vermont field school. Later that year, he began work toward his master's degree at the University of Florida, under the mentorship of Michael J. Heckenberger, himself a graduate of the University of Vermont and one of Petersen's first students. After analyzing ceramics from Rendezvous Bay in Anguilla for his master's degree, he shifted focus in 2009 to Dominica for his dissertation research, for which he received his doctorate in 2014.