

**RELIGIOUS ORGANIZATION AND POLITICAL STRUCTURE IN
PREHISPANIC SOUTHERN COSTA RICA**

by

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Ritual and religion have received considerable attention as influential factors in the development of political complexity in anthropological theory. The present investigation evaluates the role of religion in supra-local polity formation in the Upper Térraba Basin of southern Costa Rica. Regional-scale evidence on population, soils, topography, petroglyphs, funerary features, prestige items and buffer zones was collected through an 85 km² intensive survey. The data was used to explore the relationships between political organization and demographic changes, agricultural productivity, ritual and warfare.

Following an initial demographic explosion beginning at 300 B.C., small polities rapidly emerge and limited wealth accumulation and inter-polity raiding characterize the dynamics of that period. After this, population numbers remain relatively stable during the whole sequence up to Spanish conquest, but around 1000 A.D., a regional polity emerges with the local community of Rivas as its political center.

Lack of buffer zones and a dispersed population pattern evidence that warfare could not have been a prominent factor in late period political organization. A regional perspective indicates that religion and ritual were not the main forces attracting populations to nucleated centers. Burial rituals played an important role in enforcing kinship rules and the general social integration of the region. Late period petroglyphs appear associated with private and secluded rituals throughout all communities. Rivas was not excluded from these dynamics, but no

evidence that it played a central role within this system was found. An agricultural emphasis in the cultivation of alluvial lands and preliminary evidence of local exchange suggest that a more productive economic system with a higher intensity of exchange between local communities, as well as craft specialization, developed during the Chiriquí period (1000-1550 A.D.).

The emergence of Rivas, a larger and more powerful central community than any that had existed before, seems to be strongly related to changes in economics, on the one hand, and kinship and social relations, on the other. Important changes in the organization and technology of agricultural production, the decentralization of funerary rituals, and an increase in household size coincide with the emergence of this unprecedented community.

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PREFACE

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1.0 INTRODUCTION

One common way in which scholars have thought about religions is as stable and culturally specific timeless traditions, which is certainly the way many religions claim to be. But religion can either transform or be transformed by society in a dynamic and powerful relation that is evident throughout all human history and has been a central theme of investigation in social sciences. Religion has often been found to be an inseparable and significant element in the organization of states and pre-state societies and its importance in structuring political organization is rightfully acknowledged in several current theoretical models of the emergence of complex political formations (Aldenderfer 2010; DeMarrais, et al. 1996; Earle 1997; Nelson 2008).

But the role that religion may have played in the establishment of a centralized political organization varies much. In southern Central America and northern South America, factors of change in political organization have been recurrently claimed to be tightly related to religion, sometimes in hand with external economic causes (Snarskis 1992), and in other cases more locally and not dependent on the control of a material power base (Drennan 2006b; Linares 1977). But our understanding of how religion may have been modified or generated change in political organization remains limited. In some cases, a religious movement seems to have been the main element in the consolidation of regional polities when other economic and political forces of integration were weak (DeMarrais, et al. 1996; Drennan 2006b), while in other cases it

appears to be legitimizing economic interests (Earle 1991; Gilman 2001), or alternatively never have been fully tied to power building strategies (Clark and Blake 1994).

The first possibility, that a religious movement stimulated the emergence of a regional polity, is likely to show up in the archaeological record as the absence of evidence that economic specialization or differentiation were important in that society (Drennan 2006b), accompanied by evidence of substantial changes in religious practice. Such is the case of the Valle de la Plata region during the Regional Classic period where, despite a dispersed economy based on household agricultural production, the activities carried out in ceremonial-funerary centers exerted sufficient centripetal forces to form small chiefdom polities (Drennan 2006b:222).

The second possibility is that religious and economic forces are found together, driving the consolidation of a regional polity. In several cases, state religious institutions and economic enterprises go hand in hand, as the Catholic monasteries, the Mesopotamian temples, or the Khmer temple/irrigation complexes. The control of material resources through a religious ideology has been proposed as the base for the development of many chiefdoms. Restricted but rich resources have been associated with the emergence of regional polities as in Hawaii or Chaco Canyon, although how much hierarchy existed in the latter is still a matter of debate (Earle 2001, 2002). Other regions see the control of less restricted resources, such as land in Thy, and craft or agricultural production in Mississippian societies (Anderson, et al. 1995; Earle 2002; Welch 1996). In these cases, the materialization of a religious ideology has been proposed as a central form in which power was maintained (DeMarrais, et al. 1996; Knight 1986). Access to land would have been signaled by barrows in Bronze Age Denmark, and the manufacturing of special crafts would have been restricted to the ceremonial center of Moundville (Earle 1997:115; Welch 1996). These scenarios are generally evident in the archaeological record as

spatial correlations between ritual practices and the locus of resources or production. At a regional scale this will be manifested in differential involvement of central communities in craft production or their privileged access to resources accompanied by the display of symbols of restricted use.

Finally, religion may not have been an important force at all in the establishment of regional polities. Polity growth could have resulted from the organization required to face productive or military challenges; from commercial dynamics such as specialization at the local or regional level; or from individuals competing for prestige or economic privilege in a context that was not secular, but was not restricted to religious specialists. While there is always a religious base to justify social codes of conduct, and the spaces for interaction are set as ceremonies, we do not find the sacralization of an individual or a temple. An example of this kind of pattern has been suggested for the Wanka, in the Mantaro Valley; military conflict would have been the main reason for nucleation, leaders would have competed to gain control over improved agricultural lands, but elite religious ideology was little elaborated and prestige sumptuary goods were limited (Earle 1997). The recognition of this scenario in an archaeological context relies on the patterns of distribution of ritual indicators between communities. For example, it is unlikely that religion had much importance in supra-local polity formation if we do not find an emphasis on public ritual, and if there is little differentiation of religious practices between communities.

The organization of religion and ritual

An essential element in the recognition of these changing relations between religion and socio-political organization is the consideration of how religion changed internally in its organization

to drive political change or to be able to adapt to new social conditions. While this is a process that happens at different scales, from the individual to the supra-regional, I will focus here on broad elements of community organization comparable at the regional scale.

Among chiefdom societies, religious organization can be very different; the focus of ritual can range in scale and in access. Different degrees of investment and emphasis in religious activities change between regions and in time, while access to religious institutions can range from an open affiliation to one restricted to kin. The public symbols used can many times be related to other forces stimulating supra-local polity formation, such as warfare or agriculture, or the importance of the community or kinship.

Models in which economic processes have led the process of supra-local polity formation and leaders used religious ideologies to control restricted resources or in which religion is the main power base would require access to religious leadership to be restricted to kin groups and closely linked to political hierarchy. The limited access to religious offices would be manifested at the regional archaeological scale by a constrained distribution of public ritual indicators, and in the case of southern Costa Rica, this relation can be investigated by the distribution of cemeteries, sculptures and petroglyphs. An elite religious ideology can either be used for the justification of the control of material resources (Earle 2001), or for the control of ritual (restricted access to ritual knowledge) as the main element in the consolidation of chiefdoms (DeMarrais, et al. 1996; Potter 2000; Potter and Perry 2000). These discourses can take different forms, but are materialized in the display of religious symbols and objects such as monumental sculptures, mounds or gold, and lead to the establishment of social inequalities between groups and communities.

If, on the contrary, we find that materialist processes were more important in the consolidation of supra-local polities, access to religious institutions would be generalized. Indicators of ritual will be undifferentiated and equally distributed regardless of settlement hierarchy. Another process that does not require a central place for religion in building central communities is the political competition for prestige involving the control and display of prestige goods within a framework of ceremonial practices. The means for acquiring and maintaining social rank are highly ritualized and constitute an important form of social organization, but they will not have an impact on the practice of religious public rituals, and the locus of ceremonies would not need to be associated with central places in the political hierarchy. The Guaymi *krun* (balsería) is an example of such a dynamic. Communities sponsor a fiesta, preparing food for their visitors, and games take place where male participants demonstrate strength and agility. While the events are avenues to gain individual prestige, it is important to bear in mind that this is mostly an egalitarian society with a dispersed settlement pattern (Young 1971, 1976). Much wider social differences and wealth differentiation are found among the Nigerian Igbo, where political power was achieved by ritual purification and buying progressively higher and more expensive titles from the title societies (McIntosh 1999).

These phenomena are not, of course, mutually exclusive. Economic and religious centripetal forces can occur at the same time in different locations. Just such a difference has been detected in the Volcán Barú region, with varying emphasis on ritual and economic activities occurring both within and between communities (Palumbo 2009:287). Nevertheless, the analytical separation of these factors is necessary for investigating their relationships.

Religion and Ritual in the archaeology of Central America and Colombia

Religion has been a recurring theme in the explanation of the emergence of chiefdoms and is generally conceived as one of the main sources of social power in Southern Central America and Colombia (Gnecco 2005; Hoopes 2005). Ritual and religious ideology have been identified as significant forces for social organization in many Chiefdom trajectories of the region: as the central force in supra-local polity formation (Drennan 1991; Oyuela-Caycedo 2001); by the use of foreign prestige items to stress distant connections and knowledge (Helms 1986; Snarskis 2003); through “a loose network of shamans, prophets or priests” (Hoopes 2005:31); or along burial rites that explain the function and emergence of particular central sites (Linares 1977; Quilter 2004).

At the time of the appearance of large communities in southern Costa Rica, some forms of religious organization are plausible and can be explored with regional scale evidence. These can reflect aspects of the role that religion played in the formation of larger and stronger political units. The southern Costa Rica region provides ideal opportunities to study how religious institutions were organized and if the role of religion changed during the process of supra-local polity formation. Several authors have noted the development of large scale central settlements, substantial status differentiation, and the use of shamanistic iconography in gold and stone objects associated with elites, as well as the extensive use of petroglyphs (Corrales 2002; Fonseca and Cooke 1993; Snarskis 1981; Zilberg 1986). A wealth of ethnographic and ethnohistoric data on southern Central America and Colombian indigenous groups also provides abundant and invaluable data on political and religious organization, revealing a great variety of arrangements in which sometimes the religious and political spheres may have been relatively separate institutions. For example, a traditional form of institutionalization of religious and

political leadership as separate positions in the form of clans (kinship based) has been suggested for Talamancan societies based on ethnographic references (Bozzoli de Wille 1975, 2006; Cooke 2005:160; Stone 1961), and the same observation has been made based on Spanish colonial sources for Southern Costa Rica (Bozzoli de Wille 2006; Ferrero 1981). Political leadership and religious specialists seem to have been separate positions among the Kuna society of the 17th and 18th centuries (although sometimes held by the same individual) (Langebaek 2006; Wafer 1903), and both religious specialists and political leaders are mentioned as different social positions in Central Panamá during early colonial times (Helms 1994:58).

It is clear that religion is a very relevant theme for understanding the socio-political dynamics in the region, and it is important to obtain empirical information to assess its role in polity formation.

The Upper Térraba Basin and Greater Chiriquí

This investigation focuses on the Río Peñas Blancas Region, where Rivas, an important residential and ceremonial center is located. The site, an extensive residential platform complex with associated cemeteries, emerged as a central place taken to integrate a large and complex regional-scale polity (Quilter 2004; Quilter and Frost 2007). Quilter and Frost propose that the cemetery adjacent to Rivas served as a burial ground for the population of the region (especially elites) and that the main function of Rivas was to host funerary rituals and temporary visitors while it would have held only a small permanent residential population. Similar processes appear to have occurred in other regions of southern Central America, such as at Sitio Conte, which has been proposed as a regional pilgrimage burial ground used by competing elites for several centuries (Linares 1977:76-77). In general, cemeteries appear as the most important ceremonial

centers for displaying status in the whole Térraba Basin (Drolet 1992), and this emphasis on funerary ceremonies has been linked to a political organization based on kinship (Quilter and Frost 2007:51).

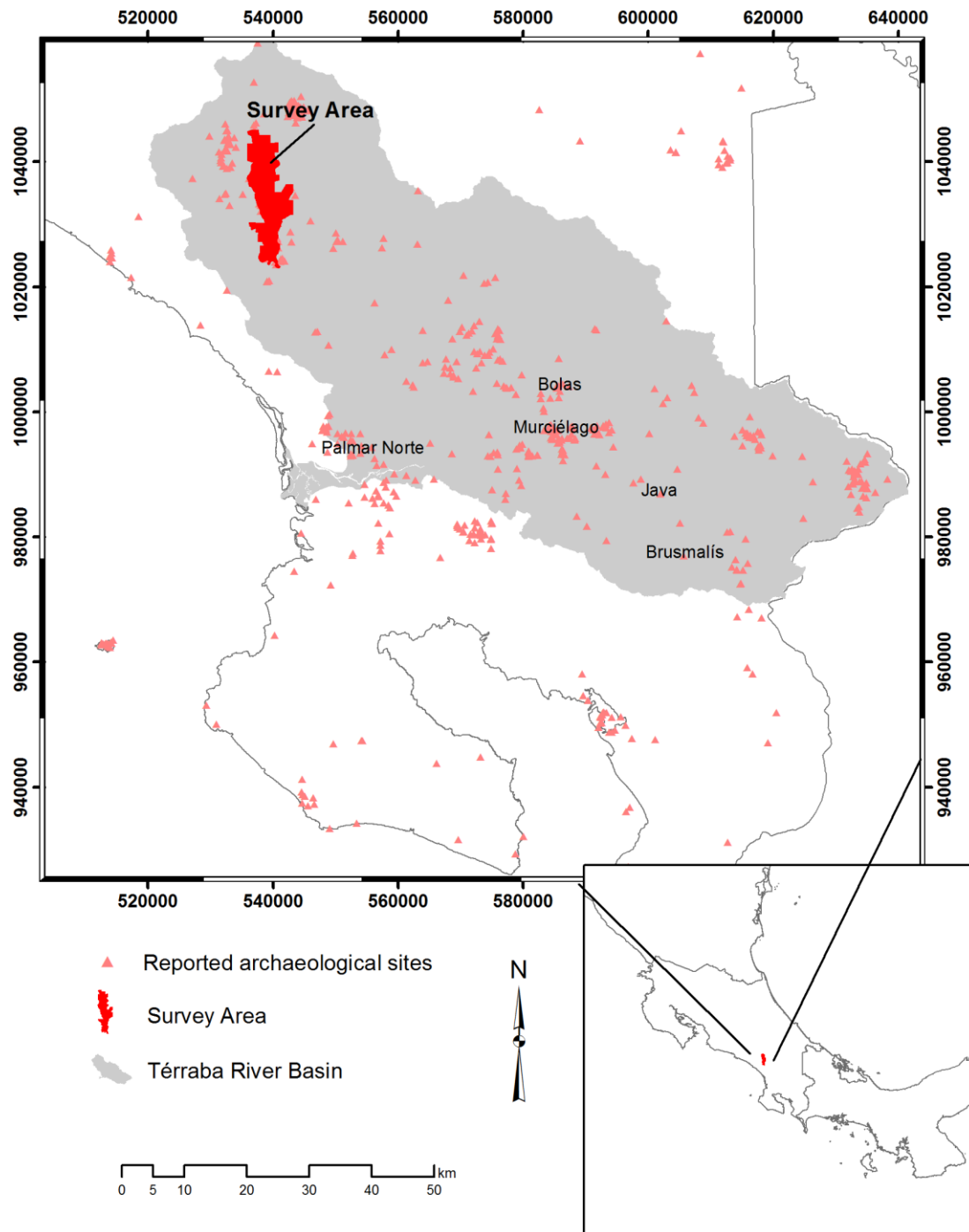


Figure 1. Location of the Study Area in Southern Costa Rica

Different lines of evidence point to marked social differences among Rivas' population: the central area of the site has considerably larger residential structures with larger stones in their foundations; burials ranged from lavish deposits of gold and other fine pottery to the absence of offerings; and while elite burials were located only in a hilltop cemetery, a wider range of smaller lower status burial grounds were closer to the houses (Quilter and Blanco 1995:209). This situation contrasts sharply with the small intra-settlement differentiation and relatively limited status differences evident in burials found in the neighboring site of Murciélago, one of the largest sites in the Térraba River drainage (Drolet 1988:185; 1992:224; Quilter and Blanco 1995). Thus, in southern Costa Rica, religious beliefs enacted in burial ceremonies have been interpreted to play an important part in the dynamics of emergence of central communities and hierarchical social relations, but the chronological depth and the role of other factors such as warfare or craft specialization in this process are still unclear.

Many of the models proposed to explain social change in southern Central America have focused on long-distance relations (Murillo 2009). Such explanations have put a particular emphasis on religious practice alongside other economic and political processes commonly centered on elites, such as:

- elite interaction through networks of prestige good exchange and/or esoteric knowledge (Helms 1979),
- changes in the subsistence economy, with the introduction of new agricultural crops and ideology (Snarskis 1981, 2003), or
- warfare, particularly with the spread of taking and displaying trophy heads, linked to the formation of priesthoods and hierarchy (Hoopes 2007).

In contrast, regional dynamics and interactions with close neighbors are proposed to have driven chiefdom formation during most of the precolumbian trajectory of San Ramón (Murillo 2009). Here, the emergence of a regional polity is accompanied by an abrupt increase in population density; while pressure on resources or social circumscription did not lead this

process, economic exchange with the neighboring region of Central Guanacaste seems to have played a role (Murillo 2009:160). Among these social dynamics that may stimulate regional polity formation and where religion was not a key element, we find the role of craft specialization and exchange. Such a scenario is proposed in the Río Parita Valley of Central Panama, with local and regional trade involved in the consolidation of a regional polity (Haller 2004). Despite the importance of trade, there seems to be no craft specialization involved in the early stages of chiefdom formation in the Río Parita Valley or the Térraba Basin; while craft specialization at the village level apparently occurred in the later periods, its minimal development has been taken as evidence that it was a result and not the cause of this process (Drolet 1992; Menzies 2009). In these cases, warfare and religion are considered as possible factors involved in the growth of political units, but so far, no clear evidence for their role has been advanced.

Warfare is evident in the ethnohistoric and archaeological record of southern Costa Rica, but there is no information on how its incidence may have changed over time (Ferrero 1981; Quintanilla 2007:48-49). Regional changes in the patterns of location or nucleation of settlements are used to briefly explore the importance of warfare in the formation of regional polities.

The reconstruction of Rivas as the integrating central place of a large regional polity has been based to a very large extent on excavations at Rivas itself, without systematic information on settlement in the regional hinterland Rivas is supposed to have dominated. There is also very little information about periods prior to Chiriquí, and thus anything we say about the antecedents of the central place attributed to Rivas in Chiriquí times is very conjectural. Earlier sites with mounds dating to Aguas Buenas times are known, and petroglyphs are known to be abundant

outside Rivas (Quilter and Frost 2007; Zilberg 1986). The research reported here sought to amplify the information provided by previous research at and around Rivas with systematic regional-scale settlement information covering the entire sequence from the earliest sedentary occupation to the Spanish Conquest.

Central Research Questions

The proposed research tried to answer the central question: What role did religion play in the trajectory of development and consolidation of a large regional polity in the Upper Térraba Basin with Rivas as its apparent main political center by Chiriquí times? That is, was religion a fundamental force in the consolidation of a regional polity? Was it simply a complement to fundamental economic forces? Or was it only minimally related to this process?

2.0 METHODOLOGY

To deal with the questions proposed a broad perspective on the dynamics operating at the regional level was necessary, evidencing how religious and political organization changed in time between interacting settlements. These social dynamics can be effectively outlined by studying the regional patterns of distribution of archaeological materials, intentionally sacrificing detail to scale and comprehensiveness (much in the way a census would do). A methodology of regional survey provides, in a relatively short time, approximate information on the extent and density of archaeological refuse, as well as a large sample of materials from different types of sites and for different periods, and this data can then be used to outline several aspects of social organization in a significant part of a political system (eg. Drennan, et al. 2003b; Fish and Kowalewski 1990). Population density (based on the extent and density of refuse) and its distribution in the landscape were used to interpret issues related to political organization at the supra-local scale (by observing centralization, nucleation, buffer zones between settlement clusters, etc.). The distribution of ceramics and lithics (the most abundant nonperishable materials in the region) provided information on wealth differentiation, craft specialization, exchange and feasting.

Of particular relevance for the present study was the characterization of political units and changes in religious organization. Supra-local polity formation has been successfully addressed in a large number of studies at the regional scale and was investigated through

demographic density maps; rank-size graphs could not be applied given the dispersed nature of the Upper Térraba Basin settlement. Special attention was given to the incorporation of data on the distribution of settlements and material objects that can be used as indicators of religious practice. These indicators included

- the location of mounds in relation to the size of the sites,
- the location of cemeteries, including how they were demarcated on the surface (such as by *empedrados* or *mojones*) and whether they are found within or outside settlements],
- the distribution and intensity of portable materials related to ritual activities such as special ceramic and lithic objects (figurines, *incensarios* and musical instruments were found in the sample and considered related to ritual activities), and
- the distribution and intensity of non-portable materials related to ritual activities (petroglyphs).

These indicators were used to determine the degree to which changes in political organization were accompanied or preceded by changes in religious practice (evident in the distinct use of symbols and the differential distribution of ritual indicators) and how ritual was organized between communities (evident in the locus, incidence and types of ritual indicators).

Among the indicators of ritual, petroglyphs had an especially important place, due to their abundance in the region. Their chronological position was inferred from a classification of styles and their association with ceramic materials in statistical terms, which was possible given the abundance of single component sites in the region. Interpretation of the social function of rock art considered the visibility of motifs to aid in understanding the character of the symbols, indicating private or public meanings. The research did not try to interpret the symbols used by the group under study, but instead examined how they were used. Similarly, it did not seek to read the local iconography as a text, but to understand its role within the social context.

Field methodology

The project carried out a full-coverage systematic regional survey over 85 km² (Figure 1), five persons walked 50 m apart in transects following cardinal orientation depending on accessibility and topography. Fieldwork was carried out during 20 weeks and an additional two months were devoted to laboratory analysis of the materials recovered.

Survey transects and field work were based on 1:25,000 scale maps from the TERRA project and the use of Geographical Positioning System (GPS) units. The location and extent of archaeological materials were recorded on the maps, and features more efficiently recorded as points (mounds, structures, petroglyphs) were recorded by GPS. Sketch maps were drawn for one funerary site with architectural features visible on the surface. The information was transferred and organized daily in order to plan to ensure the efficient recording of the required information.

When surface visibility was good and density was high, systematic collections were made by recovering all surface artifacts in transects 1 m wide and of variable length until a sample of approximately 80 sherds was obtained. This was only possible in approximately 10% of the cases since most sites had very low surface densities that would have required too much time to collect large samples. The median density found in the region produced only 0.2 sherd per square meter in surface collections and the median sample size was only 6 sherds. In areas of dense vegetation cover, shovel probes of 50x50 cm reaching sterile soil (generally at 40-60 cm) were necessary bearing a median of 4 sherds.

The procedure made it possible to measure surface artifact densities accurately for every 1 ha area of a site, and formed the basis for estimating regional population levels. Estimating

differences in the proportions of special types of artifacts between sites was possible by combining adjacent lots with similar characteristics.

Ceramic materials were the main basis for assigning the sites to time periods. Numerous investigations have defined a reliable ceramic chronology (Baudez, et al. 1994; Corrales 2000). This chronology was extended to include undecorated fragments based on paste and temper as diagnostic features (as discussed in the next section). Ceramics were also identified as to form, function, and design, while lithics were identified according to manufacture technology, form and possible use.

Specific effort was devoted during field survey to the examination of rock surfaces to observe petroglyphs and registering the associated conditions in which they are found, and thus through statistical methods, to detect potentially problematic bias in recording petroglyphs created vegetation cover or other conditions.

3.0 CHRONOLOGY

Ceramics were the main material from which archaeological sites were dated. A few funerary sites from which we were not able to collect a surface sample were dated based on their features, in particular the presence of stone pillars which were taken as indicators of the Chiriquí phase cemeteries and in some cases the description of objects that neighbors reported to have found in illegal excavations. The research questions and field methodology were not aimed towards the discovery of preceramic sites.

Numerous investigations have defined a trustworthy ceramic chronology, even though periods are still quite broad (Baudez, et al. 1993; Corrales 2000; Spang, et al. 1980). The work of Corrales, being the most recent and complete revision of the region's ceramics, analyzing materials from nine Upper Térraba Basin sites (Corrales 2000:95-98), was particularly important for integrating classifications used by different investigators. The work of Baudez et al. was very useful due to its clear and thoroughly illustrated descriptions.

While Panama ceramics have been classified mainly in "wares", based mainly on surface treatment and paste, in Costa Rica they have been classified in types, varieties and modes, with emphasis on decorative characteristics. In the Upper Térraba Basin, pastes are very different from those described for the Chiriquí highland, so that the observations of Spang et al. are not very useful. Nevertheless, decoration based classifications like the ones carried out in Costa Rica allow only for the categorization of a low percentage of samples, seriously hindering statistical

calculations and limiting chronological placement of sites in regional investigations such as this one, where sample size is usually small. For this reason, macroscopic analyses were carried out of the pastes associated with different diagnostic ceramic types, and of single-period sites with samples larger than 100 sherds. In this way, non-decorated fragments were classified based on paste types (understood here as the macroscopic characteristics of color, texture, surface finish and temper) as diagnostic features and associated to a chronology. Details on this classification can be found in Appendix A.

The chronology proposed by Corrales uses only three ceramic periods, Sinancrá, Aguas Buenas and Chiriquí. Although this author's interest in macro-regional comparisons led him to use an inclusive perspective of ceramic types over an atomized one, he recognizes the possibility of local variations (2000:205). A four period scheme was applied in the current investigation: Sinancrá, Quebradas, Aguas Buenas and Chiriquí, based mainly on the chronology used by Drolet (1992) for the Upper Térraba Basin, though slightly modified in its chronological position and with additional information from the investigations of Corrales (1988, 2000) and some aspects from the classification used by Baudez et al. (1993). Period characteristics and chronological location are discussed in the following lines.

Since there are no available radiocarbon dates for the Sinancra period, its chronological location has been estimated from proposed dates for the early formative period in surrounding areas, and from dates for the following period. The 1500 B.C. date proposed by Corrales (2000), is used here to mark the beginning of this period. The end of the period is located between 500 and 300 B.C., so a provisional date of 400 B.C. (one hundred to two hundred years before the first Quebradas phase radiocarbon dates), will be used. Few sites from this period have been found in Greater Chiriquí and only scant evidence was located in the study area.

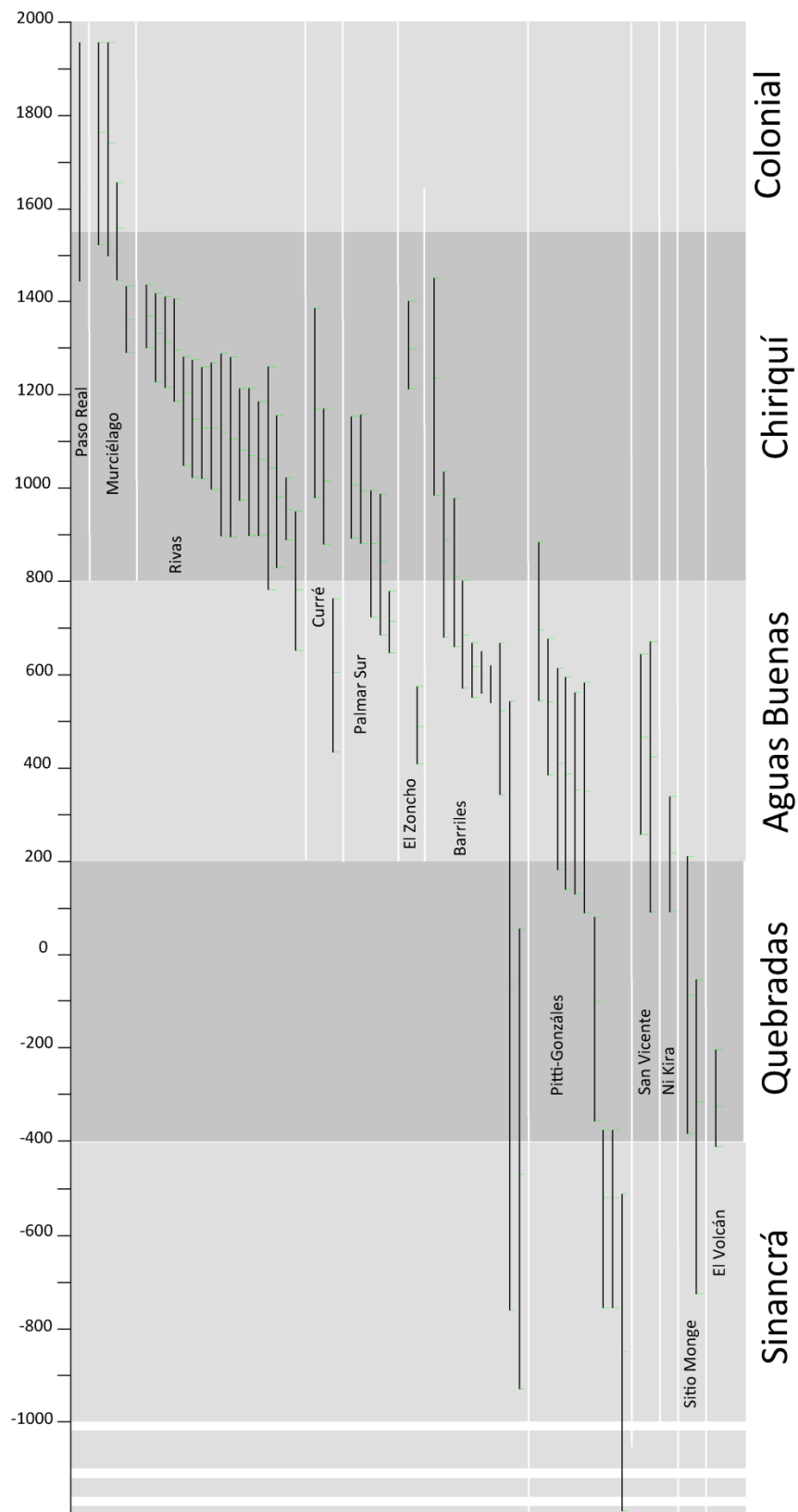


Figure 2. Radiocarbon dates from the Térraba Basin and Chiriquí Highlands

The Quebradas phase proposed for the Upper Térraba Basin, has been generally considered a local development (Corrales 1988:97; Drolet 1992:213). The profusion of incised line patterns bears similarities with the Concepción phase from Western Panama. There are two dates from the Monge site associated with this period, from 300 to 100 B.C. Thus, 400 B.C. is a preliminary date for the beginning of this phase, considering some two hundred years before the Monge site dates (new dates will be available in Roberto Herrera's PhD dissertation). The proposed chronological frame for Quebradas is similar to the much better dated neighboring Zoned Bichrome horizon Pavas phase (León and Salgado 2002) with which it shares some ceramic attributes and represents, in the central highlands, a similar phenomenon of early agriculturalist colonization in a previously little populated valley. Quebradas bears many similarities with the Camibar A phase proposed by Baudez et al., the most significant difference being among associated dates, since these authors suggest a major revision of proposed Aguas Buenas dates based on radiocarbon. Since Quebradas phase sites include Corral Rojo type ceramics, it has been proposed that this period be considered part of Aguas Buenas and Quebradas ceramics only a "ceramic type" (Corrales 2000:55). On the contrary, Drolet (1992:213) and Hoopes (1996) consider Quebradas to be extremely different from Aguas Buenas. In this investigation a clear difference was found between sites with Quebradas style (not only Quebradas type) and Aguas Buenas style ceramics. Evidence pointing to Quebradas being considered a different phase includes: 1) presence of single-period sites from these periods throughout the region, 2) important paste differences between the two periods, 3) different proportions of several ceramic types and the presence of some ceramic types exclusive in each phase. A comparison of single-period site ceramics from Aguas Buenas and Quebradas in the sample from this survey indicates that the Quebradas phase is different due to the absence or

scant presence of Bugaba Inciso, high proportion of Quebradas Inciso and Corral Rojo, low proportion of Guarumal Cebaca variety, low proportion of Cerro Punta Cotito variety, absence of Cerro Punta Cerro Punta variety, and slight use of bichrome decoration. In the Diquís Delta region, the Camibar A phase (Baudez, et al. 1993) bears many similarities with the Quebradas phase. Important differences in paste notwithstanding, in both regions Quebradas Inciso (distinguished as variety 2 in this investigation) and Corral Rojo types predominate. A radiocarbon date of between 600 and 700 A.D. is available to chronologically locate this phase in the Diquís, but this date appears to be too late and leaves little space for the following phases proposed for the Diquís: Camibar B and Sierpe. Outside the Térraba River Basin a date of 130-350 A.D. is available for an early Aguas Buenas period at the Ni-Kira site (just as in the Quebradas phase, the absence of Bugaba Esgrafiado is notable in this site) (Herrera and Corrales 2001:97, 107). In Barriles, fragments similar to Concepción ceramics are associated to two early dates with extremely high error ranges that are rejected by more recent investigations (Hoopes 1996:29).

The Aguas Buenas period has been used both to refer in a general way to the Greater Chiriquí Zoned Bichrome Horizon (including its local phases Aguas Buenas, Camibar, Barriles, Bugaba, Burica, and Aguacate), and to refer to local phases from the South of Costa Rica (Corrales 2000; Hoopes 1996). In the present study Aguas Buenas is used in its second meaning, designating a local phase with very similar materials to those described for the Camibar B phase, and which shares most types with the Bugaba phase. The Aguas Buenas name for the local phase following Quebradas was kept to give continuity to the way in which it has been used in previous investigations in the Upper Térraba. In the Térraba Basin the Aguas Buenas period has been associated with three radiocarbon dates, one from Diquís and two from Curré that date between

400 and 800 A.D. From El Zoncho site, near the Panama border, there are three radiocarbon dates between 250 and 550 A.D. (Gómez and Soto 2001). Barriles is one of the best dated and more studied sites, there is consensus between investigators that its main occupation occurred during the Bugaba period (Künne and Beilke-Voigt 2009; Linares and Ranere 1980; Palumbo 2009), and the accepted radiocarbon dates associated with this period range between 400 and 700 A.D.

Sierpe was proposed by Baudez based on his stratigraphic excavations in Diquís and is associated with two radiocarbon dates between 700 and 1000 A.D. Two dates with similar ceramic contexts to those described by Baudez at the Rivas site could also be associated with this period. Ceramic types identified by these authors as associated with the Sierpe phase were found in the sample and a first classification of the material included this category. Later, Sierpe and Chiriquí were merged, as proposed by Corrales (2000). This decision was taken due to the fact that Sierpe has not been sufficiently investigated and because the analysis was not able to satisfactorily identify the associated pastes. Being a short period with much continuity with respect to Chiriquí, it was considered that not much is lost by eliminating it from analyses. The complete dataset on ceramic classification can be found online if anyone would wish to continue analysis on this subject (available online in the University of Pittsburgh Comparative Archaeology Database <www.cadb.pitt.edu>).

Chiriquí is the best dated period on the Térraba Basin, associated to 16 radiocarbon dates from the Rivas site, one from Murciélago, two from Curré, and one from Diquís. The main occupation at Rivas goes from 1000 to 1400 A.D., coinciding with the Curré date. Dates from Murciélago place it at the end of the period, even with a post-Columbian occupation.

4.0 REGIONAL DEMOGRAPHIC RECONSTRUCTION

The demographic characteristics of precolumbian occupation in the Térraba River Basin and the way they have changed with time have been briefly studied by previous investigations. These aspects though, are closely related to political and productive organization within polities. Even community-scale interpretations can benefit from a better understanding of the demographic context, elucidating the size of the community under study with respect to others, the size of regional population, and how dispersed or nucleated settlements were with respect to preceding and later periods.

The only attempt at a systematic approximation of the demography at a regional scale comes from a survey of 30 km², selected randomly and in a stratified way from within the 400 km² of the Térraba Basin (Drolet 1983). Even though the survey was never concluded, some characteristics of the settlement pattern and sociopolitical organization have been interpreted from that survey. The authors have proposed that in the Térraba Basin, settlements progressively increased from dispersed household groups, with a mixed subsistence strategy of agriculture and wild resource collecting, to bigger and more complex communities, with agricultural and craft specialization and integration into regional polities in Chiriquí, a process in which demographic increase might have played an important role (Drolet 1988:174, 1980, 186).

In the Térraba survey, as well as in all archaeological studies in Costa Rica, the main information registry unit has been the “site”. Although many archaeological zones in the region

can be described as a continuous distribution of artifacts in a defined space, when to separate one site from another that is close by is almost always an ambiguous and problematic decision. Furthermore, variability in density, chronological components and extension can be overlooked when one focuses on continuity of ceramic fragments for establishing site limits. Various methodological alternatives help to overcome these limitations, and this investigation is based on a methodology in which the main registry unit is the lot, a collection unit that in this case measured a quarter of a hectare. This allows the description of areas with archeological material within a controlled resolution, leaving community limit definition for later methodological stages (Drennan, et al. 2003b).

With this methodology, 1274 lots were registered in 85 km², providing evidence of four distinct ceramic periods for the region. Maps in Figure 3 and 4 provide a graphic representation of the lots where ceramic fragments were found for each particular period. Other archeological data, such as cemeteries without ceramic fragments, petroglyphs or isolated lithic artifacts are not shown here. Therefore, the areas shown in the maps mainly represent domestic refuse accumulations (composed of ceramic fragments), and mainly represent the extension of precolumbian occupation.

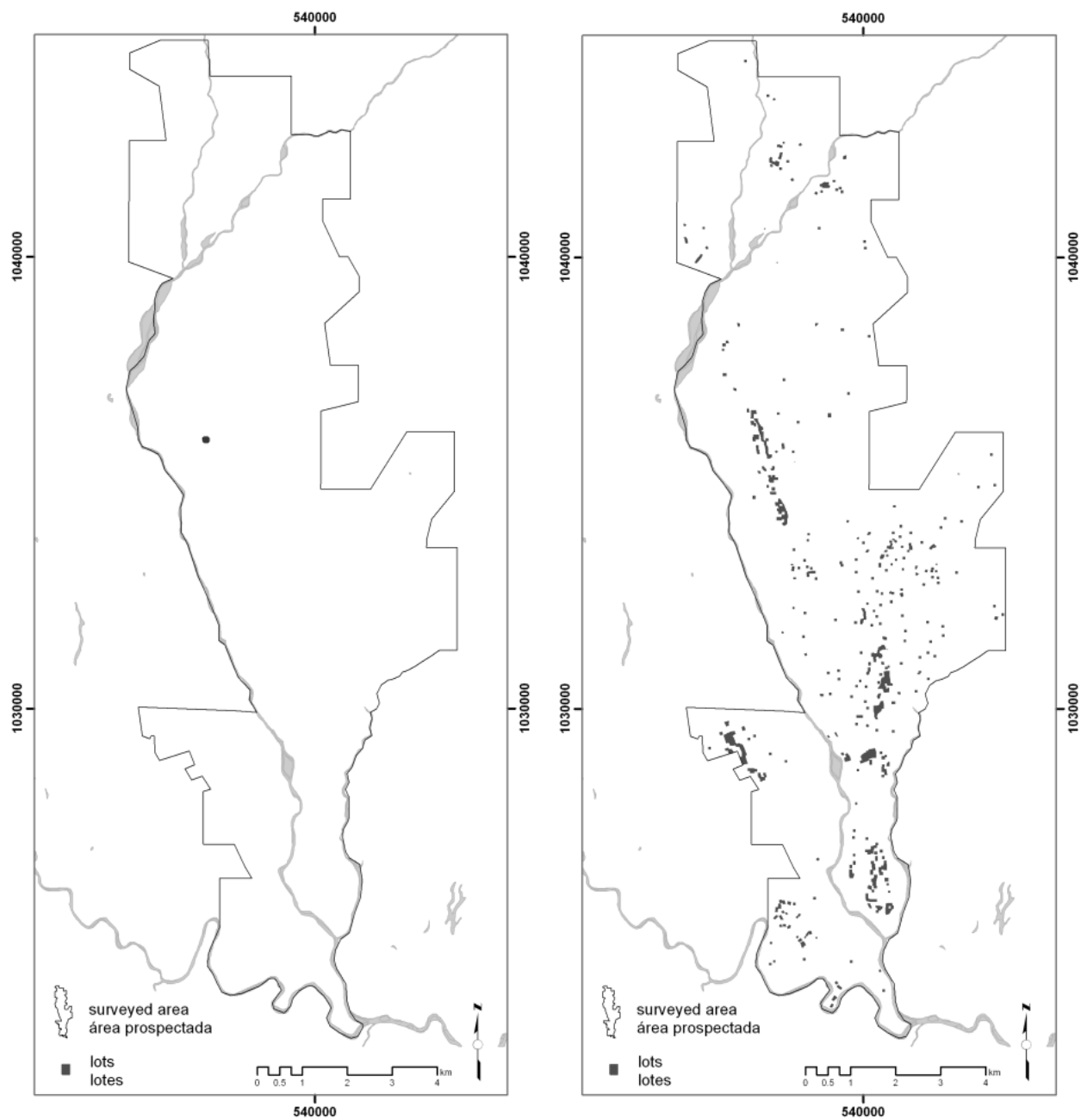


Figure 3. Distribution of precolumbian occupation. Left: Sinancrá. Right: Quebradas

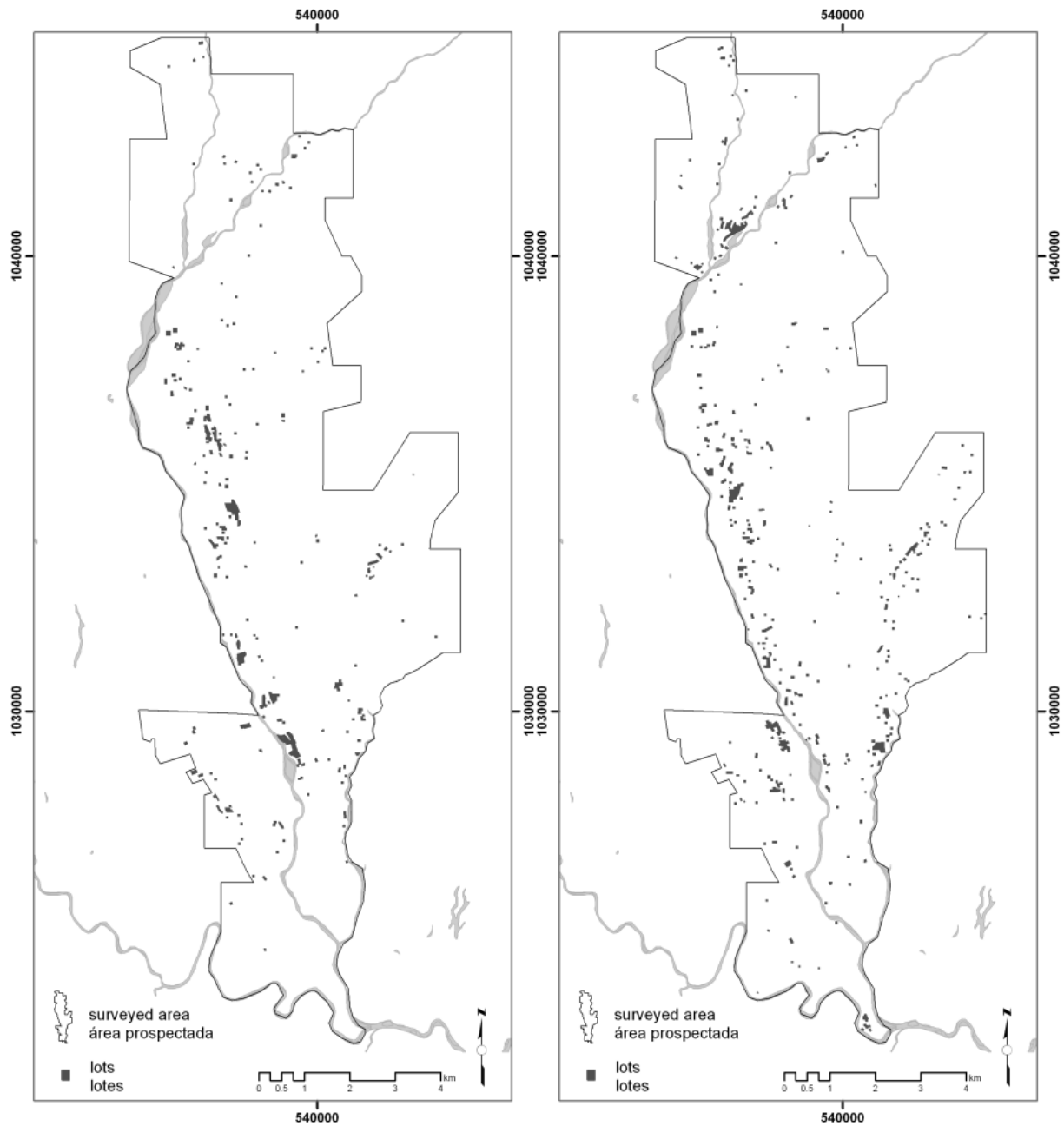


Figure 4. Distribution of precolumbian occupation. Left: Aguas Buenas. Right: Chiriquí

A brief examination of the maps reveals various aspects of population distribution. First to stand out is that during the Sinancrá period, population seems to have been minimum and in the following three periods a much larger occupation takes up most of the survey area. A closer

look reveals that after population increased, occupation was not evenly distributed across the territory, but rather presents areas of concentration, dispersion and scant occupation.

More detailed study of these distribution patterns and their implications for socio-political organization will be carried out in following chapters.

Beyond these general observations, a more detailed analysis is necessary in order to determine how population changed through time. There are various available methodological alternatives for achieving relative estimates on how precolumbian population changed. In this case, a combination of different approaches is followed, such as have been applied in various surveys with a similar archaeological record (Drennan, et al. 2003b; Haller 2004; Murillo 2009). Taking into account the characteristics of the archaeological information available for the Upper Térraba Basin and the methodology used in the survey, the most relevant sources of information are the occupied area and sherd density during each period.

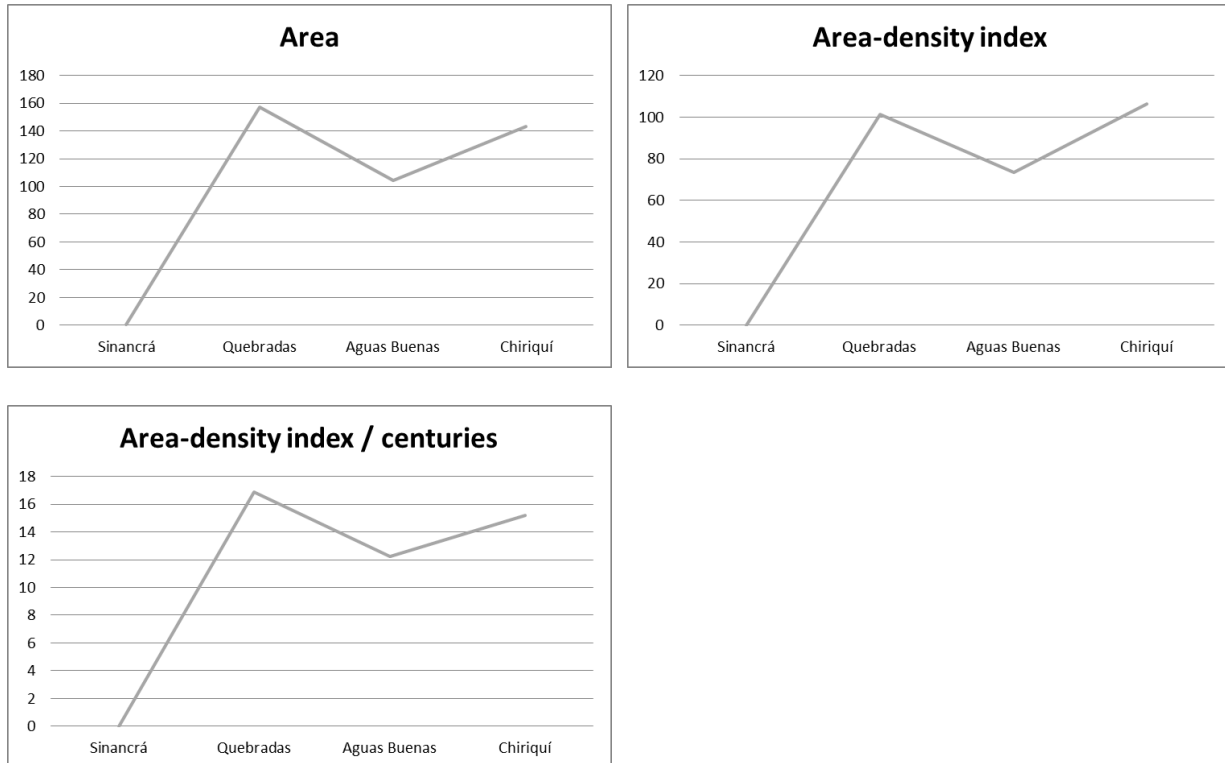
Assessment of the occupation area in each period is the most straightforward approach, relating occupation area with population size. Two factors can affect this relationship: occupation density and the length of the period (Drennan 2006a). The number of lots with presence of material in each period is a similar measurement, affected by the same factors, but also by lot size difference (although in a small way, since all lots measured approximately a quarter of a hectare). If the number of sites were counted in order to achieve this relationship, an additional element of uncertainty would be introduced, as sites can vary greatly in size. Notwithstanding, results may be similar, as has been reported in other research (Drennan 2006a; Haller 2004).

One way to deal with the limitations associated with using area to calculate population is considering sherd density per area. Sherd density is related to the time during which a family

inhabited a determined place and with the number of people that lived in the area. Therefore, a larger accumulation of waste would mean either longer occupation span or larger number of people, both aspects reflecting a higher population per period, eliminating the need for separating one possibility from the other in order to use density as a criterion for estimating population density. One risk is that there could be differences in the quantity of ceramics used by families during different periods. Though this possibility could be studied through waste density in domestic features in different periods, this will not be done in the present investigation as it surpasses the available resources. Since survey collection size is different for every lot, density is presented as the number of sherds per square meter. The area-density index presented in Table 1 corresponds to the measurement of the density per square meter, multiplied by the number of hectares. To show how this number can be affected by the duration of archaeological periods, a final number is produced, which divides the area-density index by the estimated number of centuries that each period lasts. As used here, Quebradas and Aguas Buenas would last 600 years each, while Chiriquí some 700 years. There is not sufficient data to estimate the duration of Sinancrá. Later analyses will work only with area-density index, as data for the duration of each period are not sufficiently precise for inclusion of this latter criterion, and the unevenness of their duration is small and would not have a strong impact on the interpretations.

Table 1. Relative population indicators

	Sinancrá	Quebradas	Aguas Buenas	Chiriquí
Number of lots	1	523	325	496
Number of sherds	1	8873	5042	8258
Area in hectares	0.25	157.3	104.5	143
area-density index	0.004	101.3	73.4	106.3
area-density index / centuries	-	16.89	12.23	15.18

**Figure 5.** Graphic representation of the different indexes used to quantify relative changes in population

For the Sinancrá period, it is evident that population was extremely low and only a few families seem to have lived in the region during this period. All data point to the fact that population increased rapidly during the Quebradas period, seems to have moderately decreased (between a fourth and a third) during the Aguas Buenas period, and finally recovered during the Chiriquí period. The occupied area indicates that population was largest during the Quebradas period, while if data on density is taken into account; the Chiriquí period would have a slightly

larger population. If, in effect, the Chiriquí period was longer than the others, then it would not have had a larger population than Quebradas.

Due to different data imprecisions, most important for the time being regarding these numbers is that regional population grew notably during Quebradas and even if there is a moderate decrease during Aguas Buenas, population remains relatively stable and if there were changes in political organization, demographic growth seems not to be a catalyzing element for these changes.

Absolute population data could give a different perspective on these demographic changes and how they related to political organization systems.

4.1 ABSOLUTE POPULATION ESTIMATES

In the previous section the abundance of archaeological remains is directly associated with population, and the discussion centers on the most appropriate ways to quantify the abundance of archaeological remains in the region. This clear relationship is powerful for solving questions that require only a relative perspective of the changes between one period and the other. Going from this relative perspective to an estimate of absolute population numbers widens the possibilities for analysis and only requires a way to anchor archeological data on density and area with estimates of how much population could have left a specific amount of remains. Investigations carried out in different parts of the world have developed various methodological alternatives in order to make this switch from archaeological observations to absolute population calculations, connecting different lines of evidence with ethnographic data. In this way, house area, site area, ceramic fragment density, funerary features or a combination of the above have

been used to estimate population density. Even if none of these alternatives can offer an exact population estimate, they are the only option to achieve a discussion of social phenomena and not exclusively archeological terms. Thus it is necessary to apply these methodologies in a critical, rigorous, and conscientious way, but bearing in mind that they are subject to large error ranges. The election of the method to be used depends on the type of archaeological evidence available for the region and the real world cost-benefit limitations of acquiring regional scale data. In this case the methodology used was the one developed for the survey of Chifeng, China (Drennan and Peterson 2011; Drennan, et al. 2003a), which has been recently applied in Costa Rica (Murillo 2009). These investigations rely on associating surface sherd densities in sites where population estimates can be calculated based on the area of domestic structure areas.

This kind of information is available from one site within the study area (Rivas) and one site in the lower Térraba Basin (Murciélago), both have been the subject to detailed investigation and habitation structure mapping, and surface material densities are known. These two sites were occupied during the Chiriquí period and serve as the basic examples from which to establish a relationship between quantity of ceramic waste and population. Unfortunately, there are no published maps of habitation features for the Quebradas or the Aguas Buenas periods, but data from El Cholo site will probably be available soon and might be used to improve the proposed estimates for the Quebradas period.

In Rivas, the central sector of the site is made-up by a high density of circular habitation platforms, excavations carried out in extensive areas indicate an intensive and repeated occupation of the same space during 400 years, between 1000 and 1400 A.D., and a small occupation before this date (Quilter 2004). Excavations led by Quilter concentrated mainly on the central area of the site (Operation D & E), and on a domestic compound in a peripheral sector

(Operation A). Population of these sectors was estimated using the floor area covered by habitation features. Intercultural comparative studies have indicated that roofed area may average roughly 10 m^2 per person (Naroll 1962:588). For estimating domestic feature areas, only the area of the most evident circular features was calculated, leaving out patios, paved or rectangular features detected (it is generally known that these had other social, ritual or work space functions), as well as incomplete circular features that could correspond to abandoned structures. Following this procedure, 16 multi-family houses with a total area of 5500 square meters were tallied in Op. D & E. This number was divided by 10 to estimate the population using Naroll's index, and the result was reduced by one quarter to compensate for the possibility that some houses were not contemporaneous or did not have exclusively domestic functions, obtaining a population of approximately 412 inhabitants in this sector. In the same way, in Op. A a roofed area of 268 m^2 was estimated, this number divided by 10 and reduced by one quarter results in an approximate population of 20 individuals in the sector.

In the present survey, the Rivas area was surveyed with the same methodology as the rest of the region and the lots registered during field work were defined independently from the maps obtained by the Rivas project. As can be seen on Figure 6, the area of sherd scatter defined by survey lots coincide quite well with Op. D & E from the Rivas project, even though the site extends outside the mapped area, mainly to the West. It was estimated that the ceramic dispersion area associated with the mapped features by the Rivas project in Op. D & E was 4.3 ha.

The estimated population of Op. D & E was divided by 4.3 ha, that corresponds to the approximate sherd scatter associated with these houses (observed in survey lot maps in Figure 6 and 4) to obtain the amount of population per hectare. For Op. A a sherd scatter area of 0.6 ha

was estimated, and the same procedure was followed to obtain the amount of population per hectare.

The surface sherd density associated with these areas needs to be calculated next. This last step includes a certain degree of uncertainty due to two conditions that affect fragment density estimation in Rivas: visibility in most of the terrain is limited due to the presence of grasses, and Op. D & E archaeological excavations removed an important quantity of surface material. Registered ceramic densities in lots within Op. D & E are moderate to high in comparison to data registered for the rest of the region and are 2.15 fragments/m² on average. Nonetheless, and due to the fact that the region was the object of intensive excavations, it was decided to use the maximum density of survey collections from surrounding lots (5 f/m²) as a base for the estimations. Previous excavations were less extensive in Op. A, but the same precautions were taken. The registered average in associated lots was 0.82 f/m², but it was decided to use a 1.14 density for calculations, corresponding with the maximum registered surface density within Op. A area not altered by excavation. Estimated population densities of 33 people per hectare in peripheral areas of Rivas (Op. A) would be associated with surface densities of around 1.14 f/m², while 96 people per hectare would be found in more densely populated areas of Rivas (Op. D & E), associated with surface densities of 5 f/m².

As can be seen from this discussion, the described procedure has various elements of uncertainty. Nonetheless, in all decisions taken, the option yielding a smaller population density was chosen and consequently the result must be considered a conservative estimation that might underestimate the population.

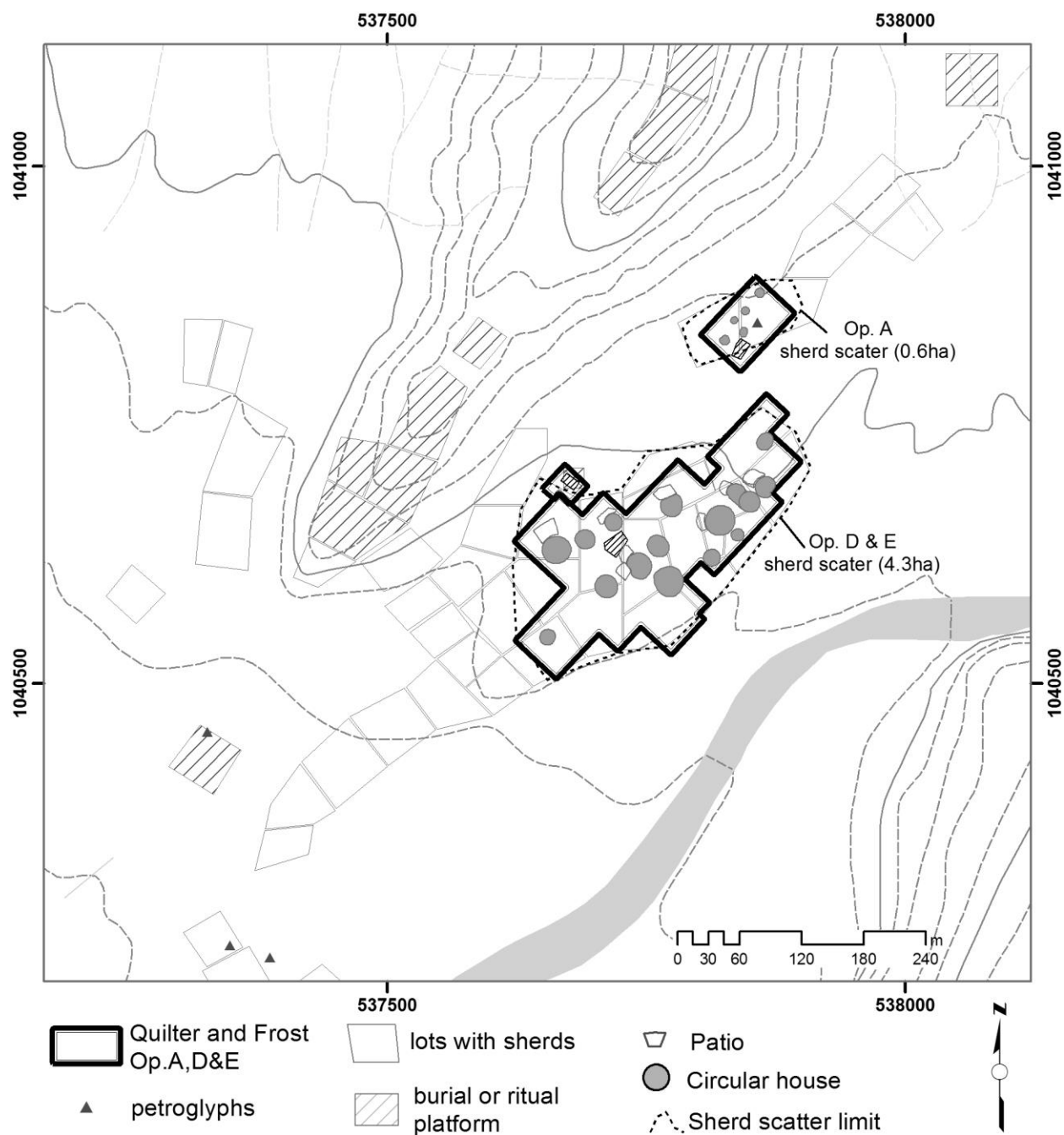


Figure 6. Rivas site plan with operations excavated by Quilter (2004) and lots defined during the current survey. Houses included in the roof area counts are highlighted

Drolet's work at the Murciélago site provides data that could confirm observations made in Rivas. Nonetheless it must be taken into account that the methodologies employed were different, since Drolet recovered the totality of surface remains in each sector. In the most

densely occupied area in Murciélago, a concentration of around 23 structures has been registered; similar to the central sector in Rivas, but there is no information on the density of surface fragments in those areas. Drolet estimates the size of the site to be 30 ha, and its population 1000, based on the size and number of habitation features (Drolet 1988:182).

The most detailed information, the one that will be used for comparisons with Rivas comes from a peripheral sector of Murciélago (4a sector), a grouping of domestic features from which the totality of surface fragments has been reported, and a map of features and refuse deposits was published. The data was used to estimate the ceramic dispersion area (Drolet 1983:46,48), Table 2 and Figure 7 shows the area, feature size and surface fragment density. Drolet reports three houses (one more is visible in Figure 7, but it is interpreted as an abandoned feature) for which a total occupation area of 800 m² was estimated (two houses were 20 m in diameter and one was 15), later reduced to a fourth of that figure in the same way that was done with the Rivas data. Using this information and Narroll's formula, population in this sector was estimated at approximately 60 people.

For this sector, 20969 ceramic fragments were collected, corresponding to the totality of fragments observed on surface, with very good visibility conditions in terrains that had been barely impacted by modern human activity (Drolet 1983:46 and personal communication 2012). This total number of fragments should be divided by the total collection area in order to obtain a surface density figure comparable to those obtained in the current survey. The total area reported by Drolet for sector 4a is 1.8 ha, though it is improbable that all fragments from this large area were collected with the same thoroughness as the smaller collection areas for the present survey. As can be interpreted from Murciélago sector 4a maps, the main ceramic dispersion area (where

refuse pits where mapped) consists of 1.2 ha, and it was considered that this collection area could be more appropriate for estimating fragment density by square meter (f/m^2) (Figure 7).

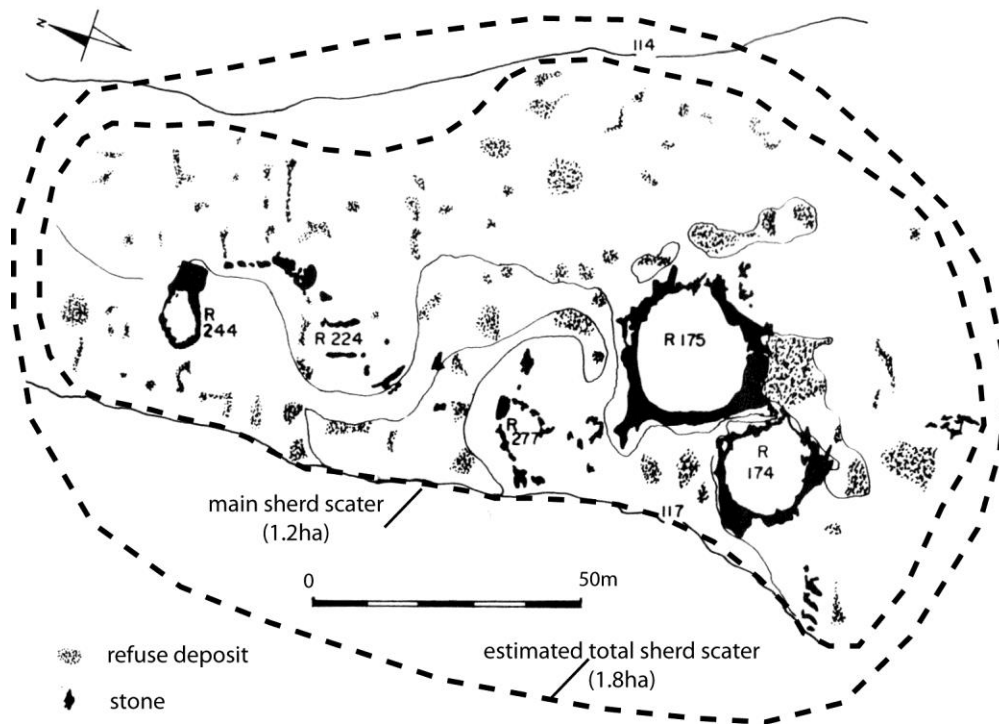


Figure 7. Sector 4a plan and surface sherd dispersion boundary

Table 2. Data used to associate ceramic density and population

	sector	area (ha)	surface density (m ²)	area-density index	houses	roof area (m ²)	population	individuals /ha	conversion factor
	Murciélago 4a	1.8	1.75	3.15	3	800	60**	33	19
	Rivas Op.E	4.3	5*	21.5	16	5503	413**	96	19.2
	Rivas Op.A	0.6	1.14*	0.68	4	268	20**	33	29

*Average surface density in the lots that coincide with Op.E was 2.15 and in Op.A 0.7. The highest reported density was used to compensate for the effect of excavations related to the Rivas Archaeological Project, which removed much of the surface material.

**The population estimate was reduced by one quarter to take into account the possibility that some houses were not contemporary or did not have solely domestic functions.

The above discussed examples from Rivas and Murciélago give information on population density and surface fragment density that can be used as a base for going from the relative population calculations, discussed in the previous section, to absolute population estimations. As synthesized in Table 2, it is possible to achieve a population by hectare estimate

by multiplying surface fragment densities by factors from 19 to 29. This factor is high in comparison to data from other Central American and Mesoamerican regions (Murillo 2011; Sanders, et al. 1979), which prompts a more detailed examination as to where this difference comes from, and alternative data will be compared with the proposed estimates.

A first possibility would be that the proposed population densities might be high; nevertheless they are backed by ethnographic and ethnohistoric observations available for the Central region of Costa Rica. For example, two small villages described by Dávila in 1566 (comprised of two houses each) were occupied by 65 and 100 people respectively. The house area reported coincides with densities of one person per 10 m² of roofed area (Murillo 2011:37, 40). Houses of leaders in early 20th century Talamanca were occupied by extended families with more than 21 people (Bovallius 2009:205). Documentary sources from the conquest period that refer to Southeastern Costa Rica are very limited, but indicate the presence of several nucleated villages occupied by 100 to 1500 people (Corrales 2006:166), thus backing estimations presented here. One of the few cases in the region where enough detail is available from the conquest period sources is the village of Coctu, comprised in 1563 by some 84 circular houses, some of which could have lodged families of more than 25 people (Vázquez de Coronado 1964:49,50). Spanish “encomienda” records from 1569 mention that Coctu and an adjoining village (“a tiro de arcabuz”, some 50 m) had 500 and 300 inhabitants respectively, population which was probably lower than in 1563 (Fernández 1976:26,27). Even though conquest period chronicles are sometimes confusing and imprecise, it is clear that there were nucleated villages with high population densities in the region. This is clearly supported by the archaeological record, as numerous mapped sites from different regions of Costa Rica show important concentrations of

habitation features, data that has led to the estimation of densities of around 100 people per hectare (Murillo 2011:41).

Information on ceramic and population densities in the Térraba Basin is still imprecise and it is convenient to use other sources of information to validate the data. For the San Ramón region, following a methodology proposed for the Chifeng project (Drennan, et al. 2003a:160-162), Murillo (2011) related the highest densities registered during his survey with the highest population densities per hectare estimated from the maps of several sites with dense occupation. From this data it was projected that sites with densities of around 16 f/m^2 represented sites with occupations of 100 people per hectare, and also that a factor of 6 times the fragment density would allow estimating the number of inhabitants.

In the Upper Térraba Basin survey, only 6 (0.5%) of the 1271 lots registered had densities superior to 5 sherds/m^2 . These six high density lots were found in different areas and seem to correspond to dense refuse pits, they do not reflect densities subject to be found in the whole area of a lot. As has been discussed previously, a prudent estimation of the population in Rivas, based on the area occupied by foundations, would indicate an occupation of at least 100 people per hectare. If it is considered that in average densities of 5 f/m^2 correspond to sites with densities of 100 people per hectare, then the factor by which to multiply densities in the region is 20. This number is within the lower range of estimates that take into account habitation feature and ceramic densities in Murciélago and Rivas, but in general the two methods coincide. In spite of the relative closeness of the two study areas (150 km), there are important differences between demographic estimates in San Ramón and Térraba, and these are mainly derived from the decision of which surface sherd density to associate with more densely populated sites. In this investigation, a density of 5 f/m^2 was used, while one of 16 f/m^2 was selected in San Ramón.

Sites in San Ramón effectively seem to be more dense, as systematic surface collections in that region had an average of 1.45 f/m^2 and a maximum of 48 f/m^2 . In Térraba the densities were 0.56 f/m^2 and 22 f/m^2 respectively. The regional average and the maximum density considered typical in densely populated San Ramón villages are three times higher than those of the Upper Térraba Basin. This difference can be attributed to more population density in San Ramón, or to less use of ceramic vessels by ancient Térraba populations. The available data would indicate that the second interpretation is the correct one and that on the Upper Térraba Basin the use of ceramics was smaller in comparison with other regions, for reasons that were merely cultural. The data on surface density from Rivas and Murciélago indicate that a surface density of 5 sherds/m^2 in the Térraba Basin effectively corresponds with high population density sites, while there are no equivalent data for the Central region of the country.

Considering these different methods of estimating population based on surface sherd density, the maximum population per hectare in the Upper Térraba Basin can be calculated at approximately 20 times the ceramic fragment density per square meter. In other words, it will be considered that an occupation covering one hectare with a density of one fragment per square meter equals a population of 20 people. Evidently, this is a general relationship and is subject to improvement with new data, particularly from Quebradas and Aguas Buenas settlement excavations. To make clear that these estimates are approximate, an error range of one third was incorporated into the calculation, the factor of 20 was reduced by a third to obtain a minimum population range (13) and increased by a third to obtain the maximum (26).

These data would indicate occupations from 1300 to 2600 people during the Quebradas period, 950 to 1900 during Aguas Buenas, and 1380 to 2763 during Chiriquí. During the Sinancrá period, the population was not constant and only few families seem to have lived in the

region late into this period. It is important to note that this is the least known period and it is possible that other factors are at play in relation to the low quantity of evidence detected. One possibility is that part of the materials that should be associated with this period were classified as Quebradas due to their stylistic similarity. Another factor could be that the Sinancrá population was not entirely sedentary or that the use of ceramics was still uncommon during this period.

Precolumbian population between 400 B.C. and 1500 A.D. can be compared with the inferior range in rural regions of contemporary Pérez Zeledón, where counties without large nucleated centers have populations of 20 to 80 people per km² (INEC 2011), while during the most populated precolumbian period there would have been between 16 and 32 people per km². Even though this density is relatively low, the population encountered would have been superior to that of the colonial period, even in regions like Talamanca, which served as refuge for indigenous people during the conquest, and this brings to light the demographic impact of conquest in the region.

Table 3. Population estimate by period in the study area

	Sinancrá	Quebradas	Aguas Buenas	Chiriquí
Area in hectares	0.25	157	104	143
Area-density index	0.004	101	73	106
Minimum estimated population	0.1	1300	950	1400
Maximum estimated population	0.1	2600	1900	2750

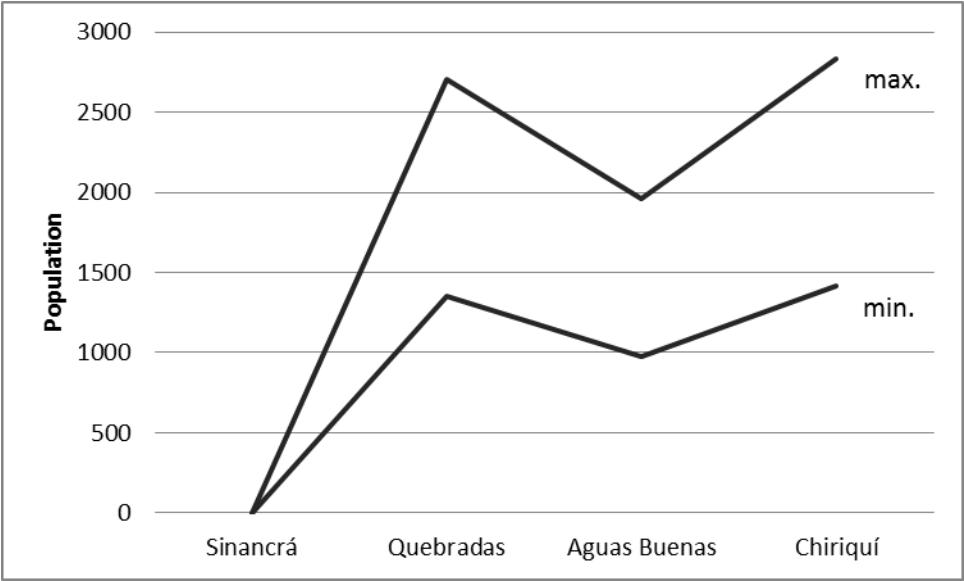


Figure 8. Absolute population estimates

5.0 SOCIAL ORGANIZATION

5.1 SINANCRÁ

The evidence found for this period is scant and limited to a few fragments throughout the region. Even though further excavation might yield more evidence for the period, it is clear that before 500 B.C. the survey area was occupied by dispersed families that did not have constant relationships with their neighbors. The same is true for the excavated sites from this period in neighboring regions, low population density and a social organization in which the family is the most important unit.

5.2 QUEBRADAS

5.2.1 General characteristics of the settlement pattern: communities?

During the Quebradas period, the population grew exponentially and a relatively dispersed population occupied the whole region during this period. We know through other investigations that the same growth occurs at a number of neighboring basins, such as Quebradas and Herradura (Corrales 1988; Kantner 1988). It is not clear how fast this demographic growth process could have taken place, but data presented in the previous chapter, it is inferred that

around 2000 (± 680) people were living in the study area, and we can conclude that this apparent continuity corresponds with the remains left by a rural, mainly dispersed population. This settlement pattern is similar to the one that occurs today in various communities within the region, with a continuum of houses distributed throughout roads and rivers, without an evident population center or precise boundaries. This also coincides with the pattern described for the Bribri population at the beginning of the 20th century in Talamanca, although with a much smaller population densities and no population concentrations (Barrantes Cartín 2009:391-457). Aside from this evident dispersion of rural population, some sectors are more densely occupied. In the archaeological record, this is evident in sectors with more continuity and density of ceramic and lithic remains. Nonetheless, the difference is not noticeable enough to allow the precise definition of their extension and boundaries. This lack of a clear differentiation with dispersed farmsteads suggests that these villages were small and surrounded by more isolated houses.

Even though data on excavated sites of this period is scant, the available maps and interpretations from previous researchers point in the same direction as the survey data and suggest that population centers of the period were not dense (Drolet 1992). The best known village of this period is El Cholo, a relatively nucleated community during the Quebradas period, which continued to be used for funerary activities in later periods. El Cholo stands out within the region for its size, ceramic fragment density and the presence of earth mounds up to 50 m long over which funerary and residential features were built with cobble stones (Badilla 2009; Herrera 2005). This type of site is not exclusive to the region under study and similar sites have been reported in neighboring regions: Sitio Monge, Las Brisas and Quebradas (Drolet 1992).

Based on extension and relative high sherd density, two villages stand out within the study area: El Cholo and Quizarrá. Another four villages (General Viejo 4, CAT 156, Rivas 1 and Rivas 6) display above average densities and extension (Figure 9). Of these six villages, at least four present mounds (El Cholo, Quizarrá, Rivas 1 and Rivas 6). It is reasonable to infer that besides their residential use, these mounded sites represent places of importance for local population and that there is a high degree of coincidence between the most populated sites and those that present special architecture. How these relate with indicators of wealth or feasting activities will be explored later.

What do these data tell us about political organization within this period? The most evident conclusion is that there is not one single site that stands out over the others with regards to population. There also seems to be more than one site with special characteristics that go beyond mere residential activities. Nevertheless, only regional population organization analysis can provide a clearer indication of the influence of these communities.

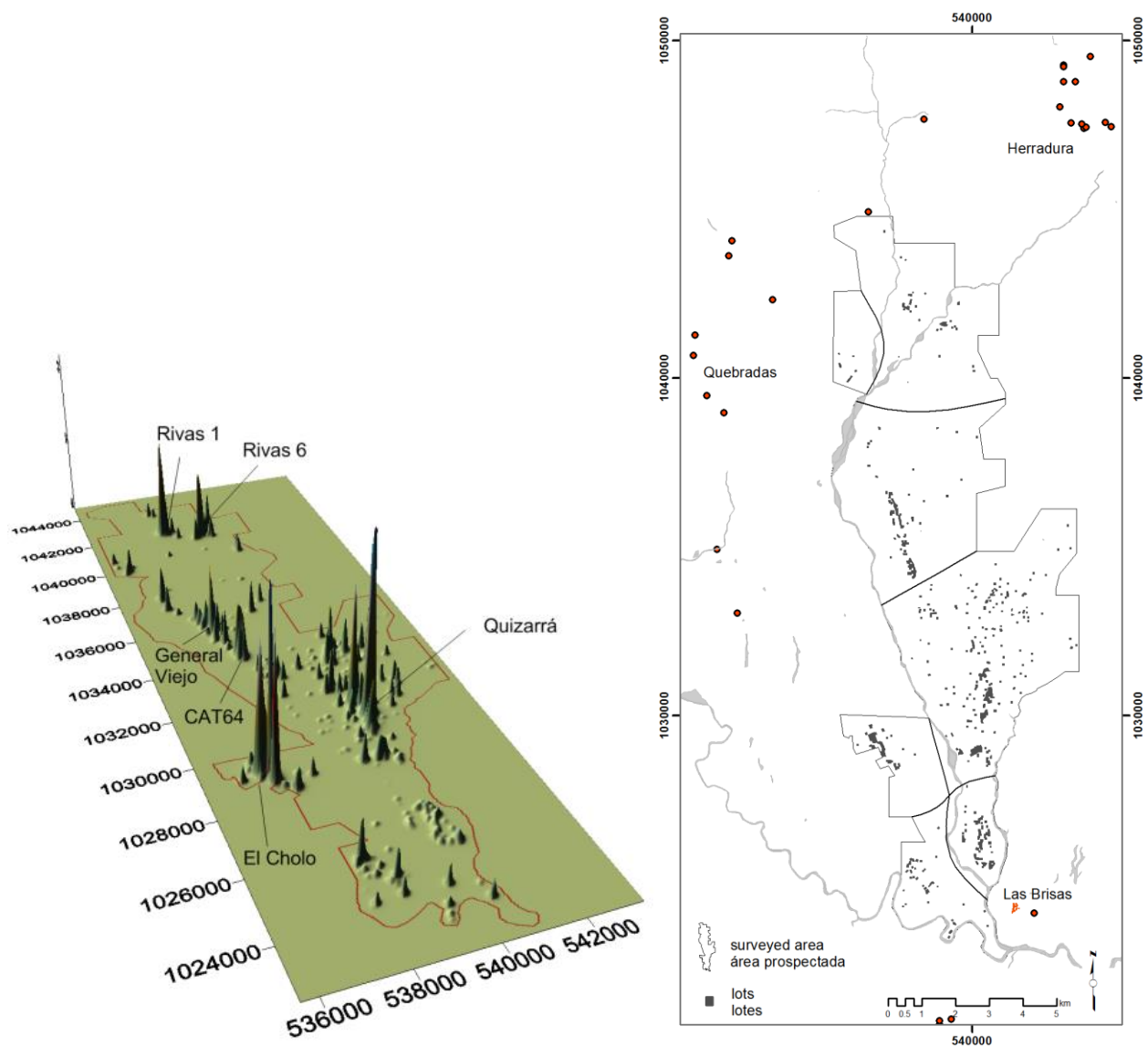


Figure 9. Left: Location and density of Quebradas archaeological remains represented in a surface interpolated by the formula of Inverse Distance to a Power of 3. **Right:** Lots with Quebradas materials within the study area and Quebradas sites reported by different projects in neighboring areas (MNCR database)

5.2.2 Districts

The map in Figure 10 (left) represents the Quebradas sherd density distribution, a surface is interpolated by the method of Inverse Distance Weighting, with a power parameter of 3, this produces a representation where higher peaks are places with a high density of surface materials and even very closely neighboring data has little effect on known points. A surface map of the Quebradas density of materials interpolated by a power parameter of 0.25 (Figure 10 right) which assigns more weight to neighboring data at even greater distances can be used to visualize distance-interaction patterns at a larger scale. At this power parameter, high population density is represented by peaks, these are separated by “valleys” where the population was scarce or absent and that represent boundaries between regional communities that will be called “districts” or polities (Peterson and Drennan 2005). Approximately seven of these districts can be defined for the Quebradas period, but some of these are only partially visible within the survey limits. The discussion will focus on four districts that have the higher population and for which the largest part falls within the survey limits, they will be referred in the text according to the name of the largest community within them: Rivas, General Viejo, Quizarrá and El Cholo.

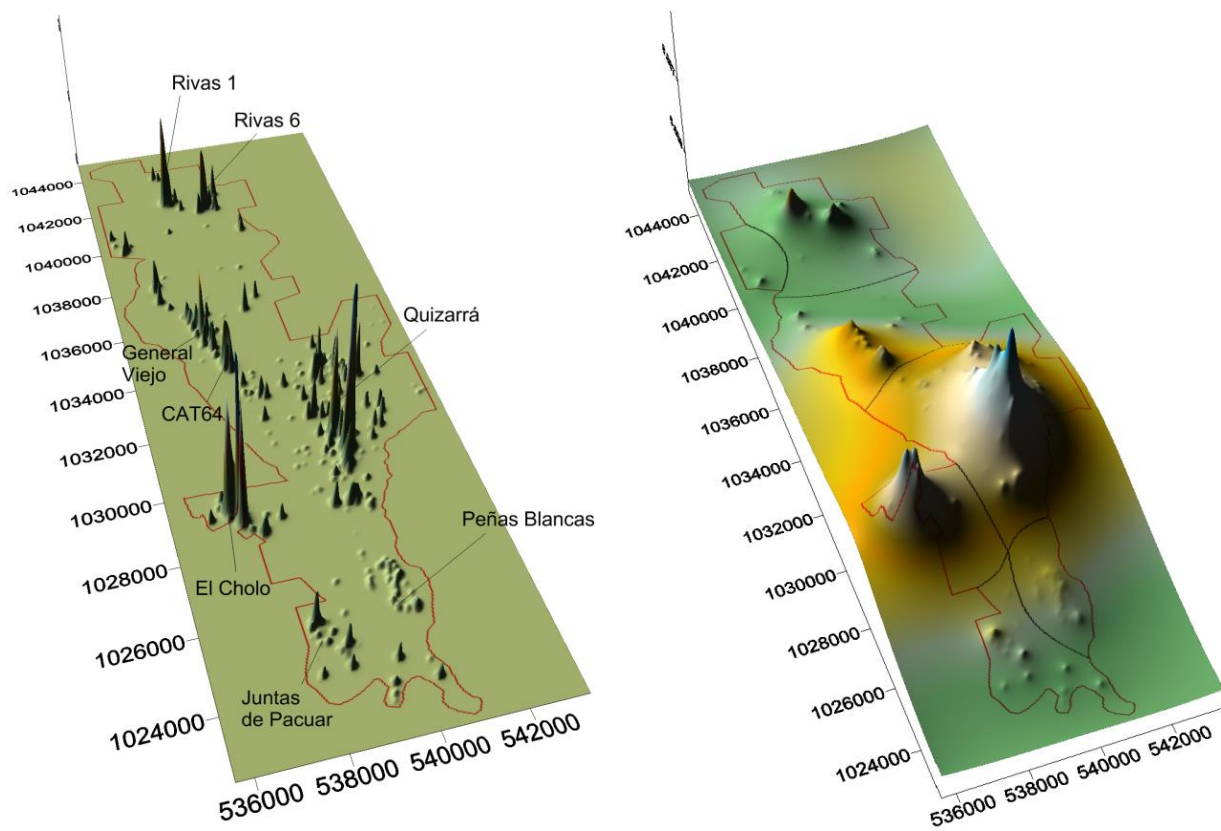


Figure 10. Districts represented by a surface smoothed by Inverse Distance to a power of 3 (left) and a power of 0.25 (right)

El Cholo and Rivas are relatively small districts, with fairly concentrated populations. El Cholo is located very close to the limits of the survey area, and while we can observe that the population did not extend to the east or to the areas immediately to the north, the population might have extended to areas that were not surveyed. We have more confidence in the pattern observed in Rivas, here the population is relatively nucleated in two sites with mounds and there are few isolated farmsteads. In contrast, the southern part of the region presents a very dispersed and extended scatter of archaeological remains in very low densities which would indicate a short occupation or the use of the area for productive activities such as agricultural fields. This area, preliminarily separated in two districts is probably closer to the influence of Las Brisas, a

large and complex community from the Quebradas period that is located outside the study area (Drolet 1992).

One district, Quizarrá, stands out notably among the rest of the survey area in population terms, particularly by the widespread presence of dispersed households. The population of Quizarrá is three times higher than the others and concentrates about half the regional population during the period (Table 4). Although Quizarrá is separated from El Cholo by the General river and about 3 km, and by more than 3 km from General Viejo, all three are aggregated at the center of the study region and may be relatively integrated in relation to other regions; however information from a larger region would be needed in order to more clearly appreciate the supra-local patterns of integration.

Table 4. Quebradas population by district

Distrito	area-density index	Pop. Min	Pop. Max	Area (ha)
Quizarrá	47.17	613	1226	2775
El Cholo*	15.86	206.18	412.36	579
Rivas	12.89	167.57	335.14	1785
General Viejo	17.61	228.93	457.86	2029

*partial data, the district limits are probably beyond the survey area boundaries

5.2.3 Status

As we have mentioned, four sites that correspond to high density of population areas have mounded architecture. We know from excavations in El Cholo that mounds from this period were used for domestic and funerary activities, and this fits well with the data from this survey, where sites with mounds present high densities of pottery which are mainly the debris of domestic activities. The residences built in these mounds are evidently made for a minority with an important status in the community. The information available indicates that the graves

associated to these features are not extraordinary in terms of investment or objects besides some polished stone pendants.

Although the survey methodology used to address questions at the regional scale sacrifices the resolution of the information in order to broaden the perspective, the samples obtained allow making a preliminary exploration of the differential use of decorated pottery between nucleated and dispersed communities which can add some insights on their organization.

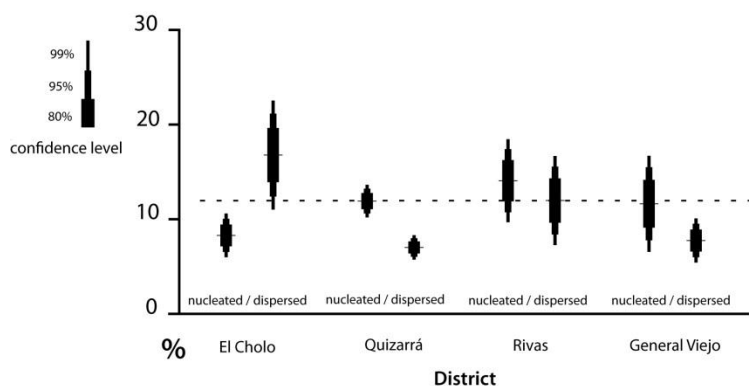


Figure 11. Proportion of decorated pottery in main Quebradas communities

Nucleated communities were defined based on areas of outstanding sherd density stretching over 1 ha or more. Surface maps and different inverse distance power levels were visually evaluated to select a cutout that encompassed areas with those characteristics.

The production of decorated pottery requires a higher manufacturing effort and is potentially associated to public activities (serving, feasting), for these reasons a high proportion of “fancy” pottery has been commonly used in archaeology as an indicator of status. While different methodologies have been proposed in order to identify more labor intensive ceramic wares, in this investigation only the presence of decoration or the proportion of bowls versus ollas were used as a proxy for status.

Use of decorated pottery is significantly different between dispersed and nucleated communities but shows distinct trends within the studied districts. Both Quizarrá and General Viejo show a similar pattern in which nucleated communities have significantly higher proportions of decorated ceramics (12%) than dispersed farmsteads (7%), an observation for which we have a high level of statistical confidence with large samples from several lots (Figure 11).

Rivas departs from this pattern, showing little difference between dispersed and nucleated communities, both showing high proportions of decorated pottery. This pattern seems to be related to the more compact settlement distribution in this district, leaving a small sample of dispersed households and encompassing two well differentiated communities separated by the river, Rivas 1 and Rivas 6. A much stronger and statistically significant difference is found between these nucleated communities, Rivas 1 ($23\% \pm 6\%$ at the 95% confidence level) triples the proportion of decorated pottery found at Rivas 6 ($9\% \pm 3\%$ at the 95% confidence level). Both communities share the presence of mounds, graves and associated polished stone pendants, the reason for such a strong difference in the uses of decorated pottery requires more investigation.

El Cholo shows yet again a different behavior, where the nucleated population appears to have used twice as much decorated pottery as the dispersed households. This pattern contrasts with the other districts in the area, Rivas 6 and El Cholo are the only nucleated communities, both with mounds that have low proportions of decorated pottery.

We have yet to explain the social dynamics governing these patterns, but the picture that emerges is one of fairly different activities taking place in each district, with some communities

in which the presence of elites and public activities such as feasting and ritual might be attracting the surrounding population.

5.3 AGUAS BUENAS

5.3.1 General characteristics of the settlement pattern: communities?

During this period an important decrease in population occurs, falling about one quarter with respect to the Quebradas population, but we cannot say at this point if this decrease occurred rapidly or along the whole period. Perhaps even more notable is the marked reorganization of the settlement pattern. The majority of the population continues to live in dispersed farmsteads, but none of the four local communities with mounds identified in Quebradas continues to have an important occupation. One of the communities with a moderate population size during Quebradas (General Viejo 4), grows and becomes the largest settlement during Aguas Buenas. Two areas show higher and larger population concentrations, General Viejo 4 and Peñas Chanchos, but they are surrounded by dispersed households that do not allow us to confidently establish the limits the nucleated communities (Figure 12). The core of General Viejo 4, the largest one, may have been a village with 140 to 270 people covering about 2 ha and is associated to burial mounds.

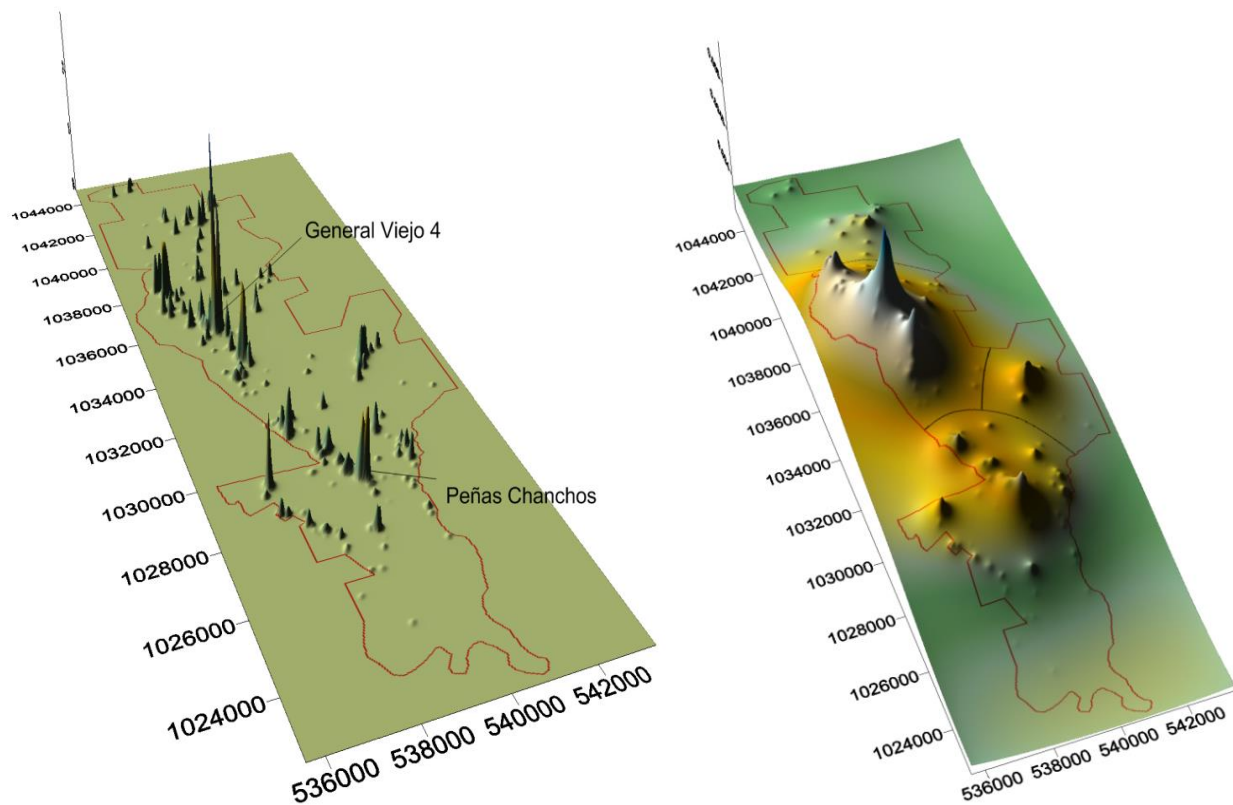


Figure 12. Location and density of Aguas Buenas archaeological remains represented in a surface interpolated by the formula of Inverse Distance to a Power of 3 (left) and a Power of 0.25 (right)

5.3.2 Districts

At the regional scale, the differences with the previous period are also strong, in Aguas Buenas only two districts are clearly defined and one has a significantly higher population (Table 5, Figure 12). The space between the two districts does not coincide with geographic features and appears to be the result of social dynamics such as the establishment of buffer zones between two small polities. The concentration of the population in the General Viejo area is evident, three of the largest peaks of occupation (representing more nucleated areas) and an important part of the dispersed farmsteads are located in that part of the basin.

The dynamics guiding this pattern appear to be related to the supra-local influence of General Viejo 4 exerting attraction in the settlement pattern, but geographical reasons for this population concentration will be evaluated in the next chapter. It seems clear that despite the population decrease, the population aggregated in each political unit continues to be similar to what occurred during Quebradas with districts that had similar population levels and central local communities with a dispersed population that are not too different from one another.

Table 5. Aguas Buenas population density by district

Distrito	Area-density index	Min Pop.	Max Pop.
General Viejo	36.82	479	957
Peñas Blancas	20.22	263	526
Pueblo Nuevo	6.71	87	175
Santa Elena	5.35	70	139

5.3.3 Status

Both the sites with higher population densities are located in areas where modern activities have had an important impact in the archaeological site conservation and it is difficult to determine if there were mounded features similar to those of the Quebradas period. Some of the features in El Cholo appear to be from this period, but this investigation indicates that its main occupation occurred during Quebradas; an unpublished dissertation in progress may soon bring more information and radiocarbon dates (Herrera 2005).

One way in which to evaluate the presence of elites is by examining the proportions of decorated ceramics, assuming that since they require more investment in their production, they may be used more frequently by elites. The information available indicates that nucleated areas of General Viejo did use more decorated ceramics than the dispersed farmsteads of the district,

but this does not seem to be the case in Peñas Chanchos, where dispersed households used more decorated pottery than nucleated areas (Figure 13a). General Viejo more densely populated areas would then tend to be also outstanding in terms of decorated pottery. The proportion of bowls, indicative of serving activities, shows a similar pattern, with some 5% more bowls in General Viejo nucleated areas (and we have some 80% confidence in this observation) (Figure 13b). This site is also associated with probable residential mounds and an area of small burial mounds, but the site has not been excavated and we know little of these features. Available information is not conclusive but there appears to be some degree of social differentiation at least in the nucleated area of General Viejo

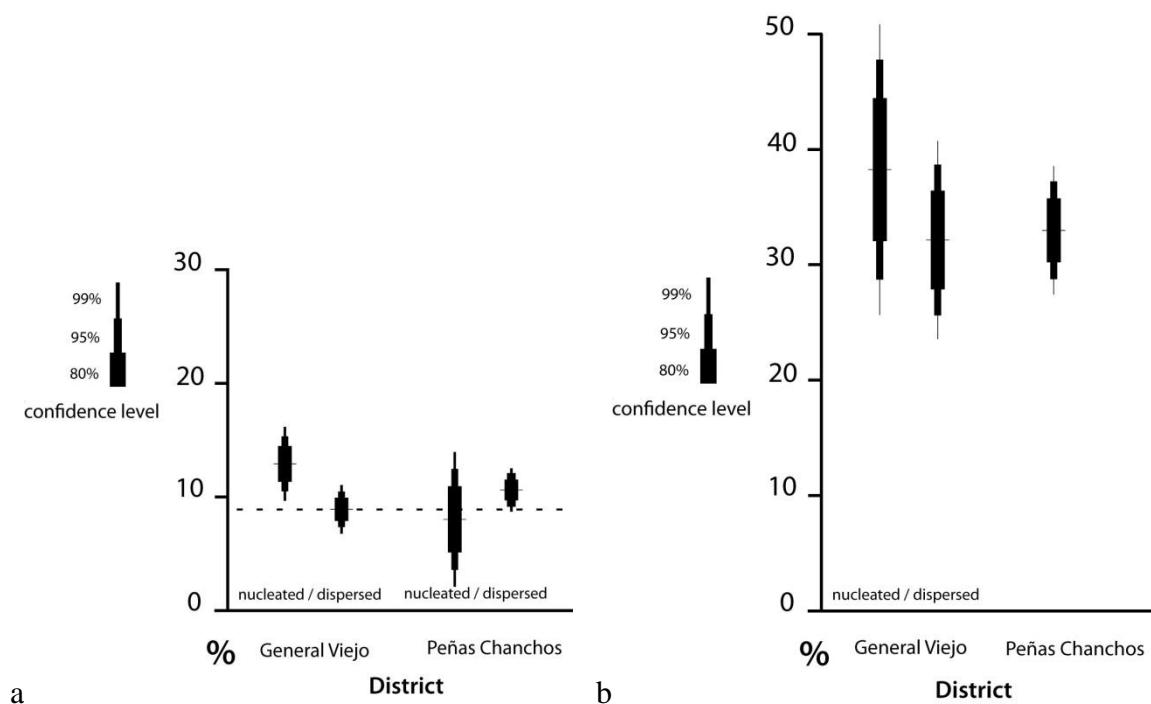


Figure 13. Left: Aguas Buenas proportion of decorated pottery in dispersed versus nucleated communities. **Right:** Aguas Buenas proportion of bowls in dispersed versus nucleated communities

5.4 CHIRIQUÍ

5.4.1 General characteristics of the settlement pattern: communities?

The Chiriquí period presents a moderate increase in population and an organization of the settlement pattern different from earlier periods. A continuity of relatively dispersed population spreads over almost the whole General and Peñas Blancas river terraces. As in the previous periods, this continuity of occupation presents some denser locations but does not make it possible to readily recognize different communities. One site, Rivas, does stand out in terms of population and is the community which in the whole precolumbian historic trajectory reaches the highest population and extent with a population between 238 and 476 persons. This nucleated core is surrounded by a periphery of dispersed households. Some sectors outside Rivas have sizeable populations (and reach similar ceramic densities, indicating that some hamlets were present and were occupied for long periods of time), but Rivas is the largest and the one that can truly be considered a nucleated village. Other fairly continuous areas of occupation can be observed in the maps, such as General Viejo, Playa Verde and Agua Buena, but they seem to represent only groups of houses located closer than average but not compact communities. It is then difficult to delimit segregated communities in the region and the population appears to have lived in dispersed households but not far from a neighbor, with the exception of the compact Rivas core.

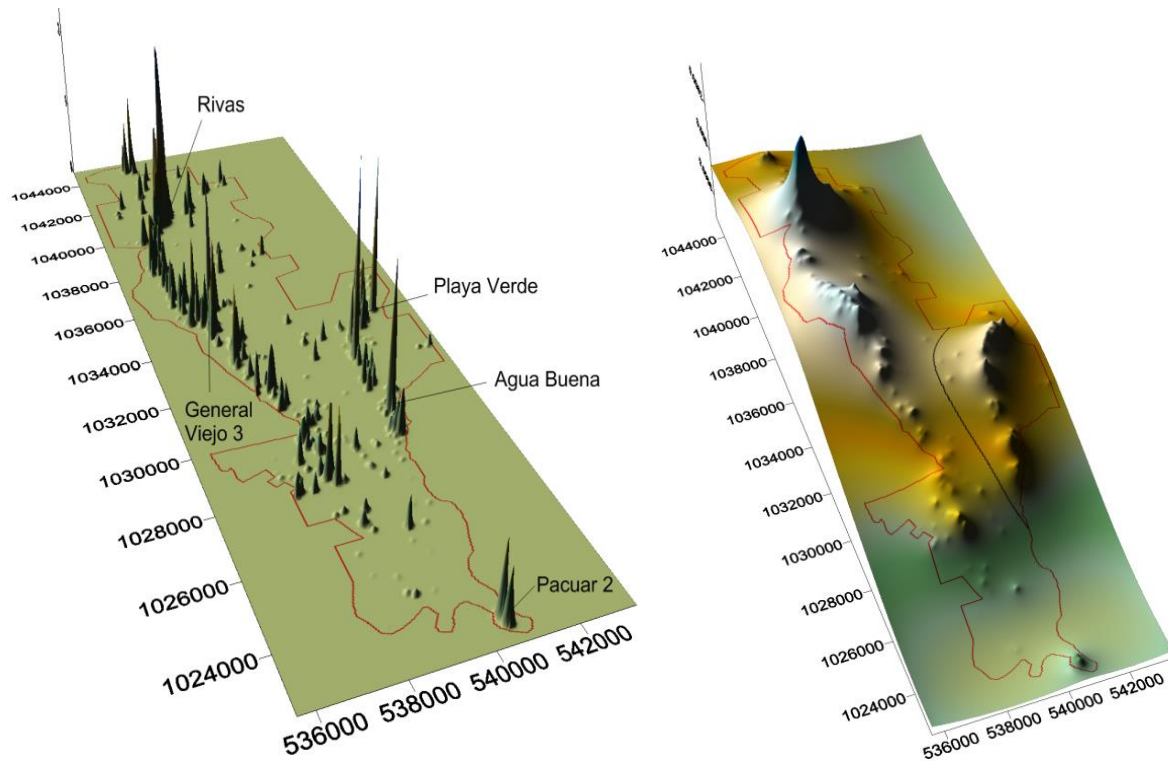


Figure 14. Location and density of Chiriquí archaeological remains represented in a surface interpolated by the formula of Inverse Distance to a Power of 3 (left) and a Power of 0.1 (right)

5.4.2 Districts

A higher degree of smoothing makes it possible to grasp more general patterns that may reveal supra-local dynamics (Peterson and Drennan 2005). The occupation follows a linear pattern along the main rivers (Figure 14), two different “districts” can be recognized, each occupying one river basin. The separation between these two districts is clearly influenced by the geographic characteristics of the region, but the social significance may be none the less important. Geographic characteristics may have influenced social organization (for example making contact less frequent), or social considerations may have taken advantage of geography (as the use of natural features as buffer zones). These alternative interpretations will be further

discussed in the next chapter dealing with topographic and soil influence in the settlement pattern. The southern part of the survey area presents almost no occupation, with the exception of an isolated hamlet, Pacuar 2; this hiatus of occupation may be the evidence of a buffer zone separating Rivas from another polity, but the survey limits do not allow seeing the whole pattern so as to confirm this observation.

Within this lineal arrangement of a fairly continuous occupation, some population concentrations are also visible as around General Viejo and Playa Verde, but these are not compact communities and were not surrounded by buffer zones. A higher density of occupation seems to concentrate in the north towards Rivas, this community was exerting some level of attraction but the population was mainly living in a dispersed pattern.

The Rivas district has a population that is more than three times larger than that of Playa Verde, and although the survey stops to the north of both districts, the main occupation in Playa Verde probably does not continue north (the slopes become stronger and there are few reports of archaeological sites), but may continue to the southeast (where we were not granted access to pineapple plantations). This difference at the regional level is also strong at the local level; the Rivas community core comprises more than one fifth of the regional population, and these differences suggest little possibilities for Playa Verde to be an autonomous polity competing with Rivas (but this needs to be confirmed by expanding the survey to the southeast).

Table 6. Population estimate in the larger communities

District	Community	Area-density index	Min. pop.	Max. pop.
Rivas		85.44	1111	2221
Playa Verde		26.84	349	698
	Rivas Core	18.31	238	476

5.4.3 Status

Rivas stands out in the region as the site with the higher investment in domestic architecture evident in the size and number of the rocks moved to build the community, which is not found in any of the other habitation sites of the region. The house foundations in the Rivas core have also much larger diameters ranging from 20 m to 30 m, while houses in its periphery have diameters ranging from 10 m to 15 m. Architecture is considered a good indicator of status, suggesting that the inhabitants of the Rivas core had a higher status than other members of the society. Ethnographic accounts from Talamanca (southern Costa Rica) at the beginning of the 20th century present examples of political leaders living in large circular houses and displaying gold necklaces (Fernández and González 1997; Gabb and Ferrero 1981:154); despite the important changes taking place in the precolumbian society at the time, there is little doubt that these were symbols recognized by the society to display status. The size of the houses is also related to larger families and this is well documented ethnographically in southern Costa Rica (see Chapter 3.1), this may be part of the strategy used by leaders to increase their influence and wealth.

Funerary offerings make another useful line of evidence of status, we know that a large number of individuals interred in Rivas accumulated a large number of sumptuary objects in the form of gold (Quilter 2000). There is little information that allows defining how concentrated were these objects, but apparently much of the Rivas population did not have gold, and at a regional scale, most of the gold objects come from Rivas and other sites only appear to have had isolated findings (Frost 2009; Quilter 2000). Rivas would then be a community that stands out regionally in terms of population, nucleation and different features that we can associate to status and political influence beyond the local scope.

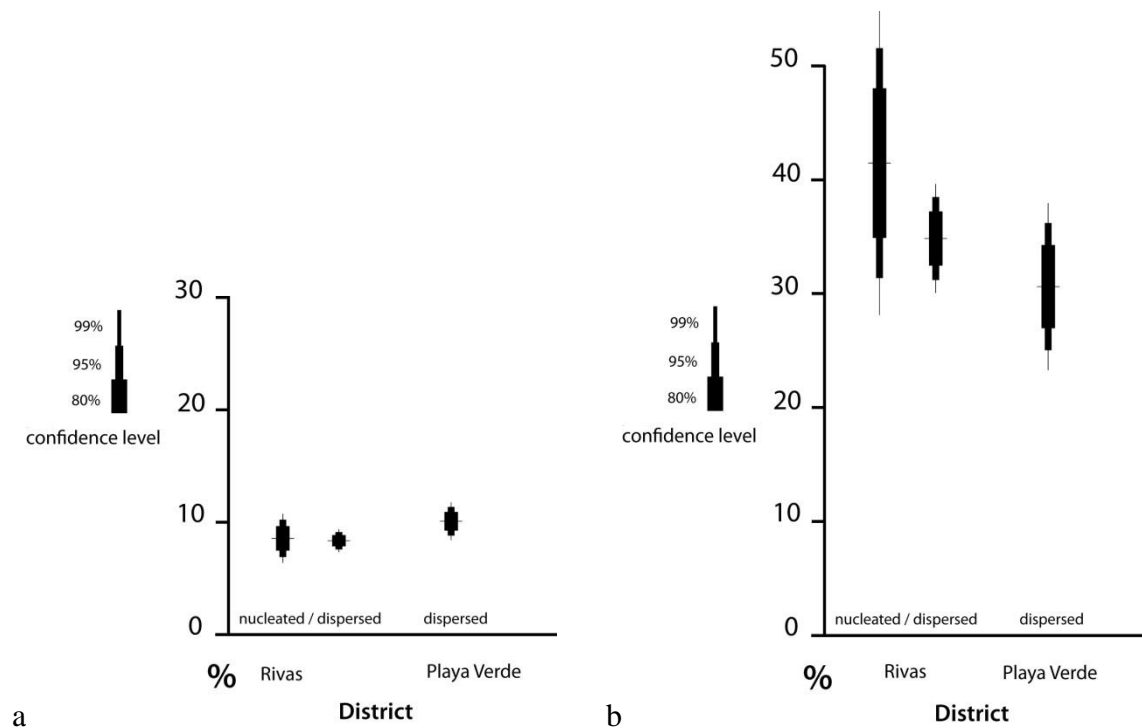


Figure 15. a) Proportions of decorated pottery. b) Proportions of serving vessels

Pottery can be used as another indicator to evaluate the activities taking place in different parts of the region in this period. Nucleated and dispersed households in the Rivas district appear to have used very similar proportions of decorated ceramics, while the Playa Verde households had only a slightly higher percentage of decorated ware (Figure 15a). Since other status markers show the contrary pattern and strongly suggest that the inhabitants of Rivas had higher status, the small difference in proportions would tend to indicate that decorated pottery may simply not be a relevant way in which status was expressed during this period in the area.

Much stronger differences can be seen in the use of serving vessels, with the Rivas nucleated households using over 10% more serving vessels than the Playa Verde dispersed households, and 6% more than the rest of the Rivas district, although at this point our data shows relatively high error ranges that do not permit a high degree of confidence in these numbers (Figure 15b).

5.5 SYNTHESIS

During Quebradas some four political units identified as “districts” are present and are composed of modest populations, no larger than 600 to 1200 individuals. Each of these political units is associated to central local communities that have evidence of public activities that go beyond mere residential settlements, but none of those stands out over the others with regards to population or status indicators. Clear buffer zones between “districts” and the presence in all districts of local central communities with similar characteristics suggest that a regional polity is not fully integrated.

A population drop and political reorganization occur during Aguas Buenas. Two separate districts can be identified in the region and within those, central local communities with relatively more nucleated population and possibly the presence of differentiated elites. As in Quebradas, one district stands out in population with respect to the others but the difference is smaller, central local communities in those districts have similar demographic characteristics. The population of the largest Aguas Buenas district is similar to that of the largest Quebradas district, suggesting that the capacity of integrating population did not changed much.

Political organization during Chiriquí bears clear evidence of some degree of population concentration, high elite differentiation, and in general of the consolidation of a polity integrating the region’s disperse population. We cannot be sure if the whole survey area was under the influence of Rivas –but even if we consider Playa Verde to be an independent polity (our data

suggest it was not)– the Rivas polity would have aggregated from 1000 to 2000 individuals, a population twice as large as that of the largest district from previous periods. Rivas excavations and radiocarbon dates bear evidence of the stability of this system over some four centuries.

In general, we can conclude that the regional pattern tends towards regional integration and higher differentiation of a single central site.

6.0 FACTORS AFFECTING SOCIAL ORGANIZATION

To determine the role that public ritual played in the demographic and political organization of the upper Térraba Basin it becomes necessary to address how other factors influenced the settlement patterns in the region. A regional survey can provide general data on a broad range of social phenomena, and suggest avenues of investigation to approach at the community or household scale.

6.1 SOILS AND TOPOGRAPHY

One of the factors that can have an important impact in settlement patterns is resource productivity. In this case one of the most important aspects was soil productivity, given that we are working with sedentary communities relying heavily on agricultural production and given that wild resources and water courses are relatively equally distributed in the region.

The study area ranges in altitude from 480 to 1660 masl, with mean temperatures from 24 to 30 °C and precipitation between 4000 and 8000 mm/year. The whole area is subject to a long rainy season (when 75 to 80% of the annual rainfall occurs) and suffers from a marked dry season from mid-December to mid-April (M.A.G. 2000a:24).

Detailed agricultural studies are available for the upper Térraba Basin, different factors affecting use capacity have been mapped at a 1:50000 scale (M.A.G. 2000b).

6.1.1 Topography

A wide range of topographic conditions can be found within the study area (M.A.G. 2000a), an alluvial terrace up to 1 km wide stretches along the course of the General River, and a narrower terrace is found in the course of the Peñas Blancas River (both terraces associated to 0-3% slopes). Ancient and recent alluvial fans (between 45000 and 65000 Radiocarbon YBP) with a relief of rolling hills (3-8% and 8-15% slope) follow the river terraces. The north and northeast of the survey area are topped by steep slopes of the Chirripó Mountains.

The area of occupation in each landscape category was calculated for each period (Table 7), indicating that the decisions that guided settlement location during the different periods in the survey area were strongly related to topographic conditions.

Population during Quebradas had a strong preference for the occupation of lands on rolling hills and in general avoided alluvial terraces, which comprise some 24% of the study area, but where only 11% of the occupation is found. It is easy to visualize from Table 7 and Figure 16, that the majority of the Quebradas occupation is found in the hills adjacent to river terraces, suggesting easy access to resources from the alluvial terrace or the river.

During the Aguas Buenas period the pattern changes dramatically, and about half the occupation takes place in alluvial soils. During the span of this period the population changed its preference from hills to alluvial terraces and by the beginning of Chiriquí, 70% of the occupied area occurs in alluvial terraces. During the whole sequence the area of steep slopes northeast of the survey region had only a small dispersed occupation. These preferences are not a result of a disproportionate availability of a particular class of topographic conditions, as can be seen in Table 7.

The maps in Figure 16 and 17 represent the classification of areas according to the dominating terrain inclination, which correspond well to the geographic categories discussed above. Slopes from 0 to 3% correspond to alluvial terraces of the Peñas Blancas and General Rivers, slopes from 3% to 15% correspond to rolling hills, and beyond 15% they correspond to steep slopes.

Table 7. Proportion of occupation by slope categories

Slope Class			Quebradas			Aguas Buenas			Chiriquí		
Class	Area km2	% of total area	area	% occupation	% slope class	area	% occupation	% slope class	area	% occupation	% slope class
0-3%	24.31	28	0.17	11	0.7	0.49	48	2.0	0.99	71	4.1
3-8%	12.18	14	0.79	50	6.4	0.40	39	3.3	0.19	14	1.5
8-15%	13.84	16	0.39	24	2.8	0.05	5	0.4	0.08	6	0.6
15-30%	25.14	29	0.18	12	0.7	0.06	6	0.2	0.07	5	0.3
30-60%	8.84	10	0.05	3	0.5	0.02	2	0.2	0.05	3	0.5
60-75%	2.56	3	0.01	0	0.2	0.00	0	0.0	0.00	0	0.1
Total	86.87	100	1.58	100	1.8	1.02	100	1.2	1.38	100	1.6

*Total areas do not correspond exactly to numbers given in other parts of the text due to rounding and the method of calculation, which was generated from a raster file with a 5x5m grid.

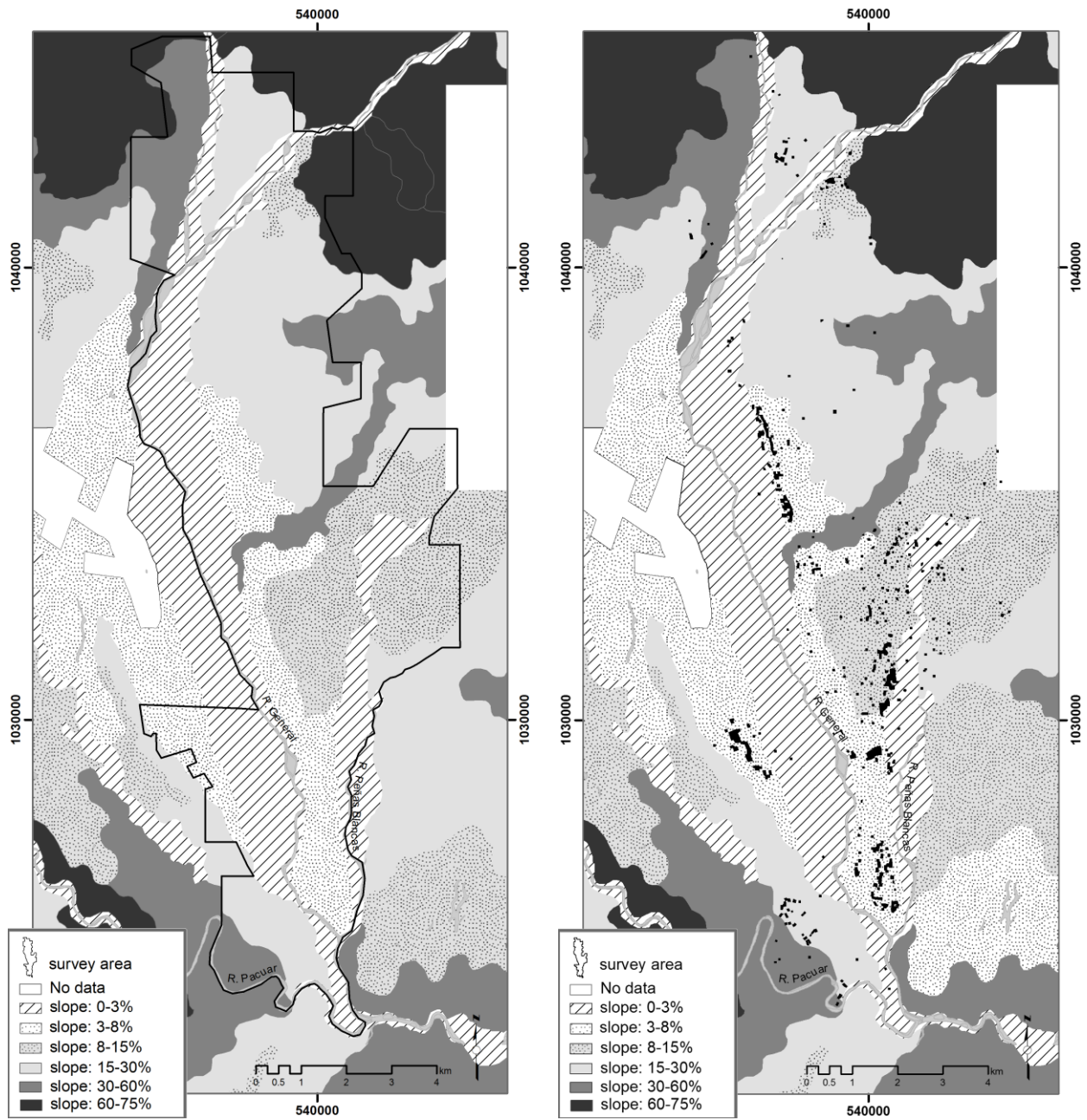


Figure 16. Left: Slope categories in the Upper Térraba Basin. **Right:** Quebradas Period archaeological sites

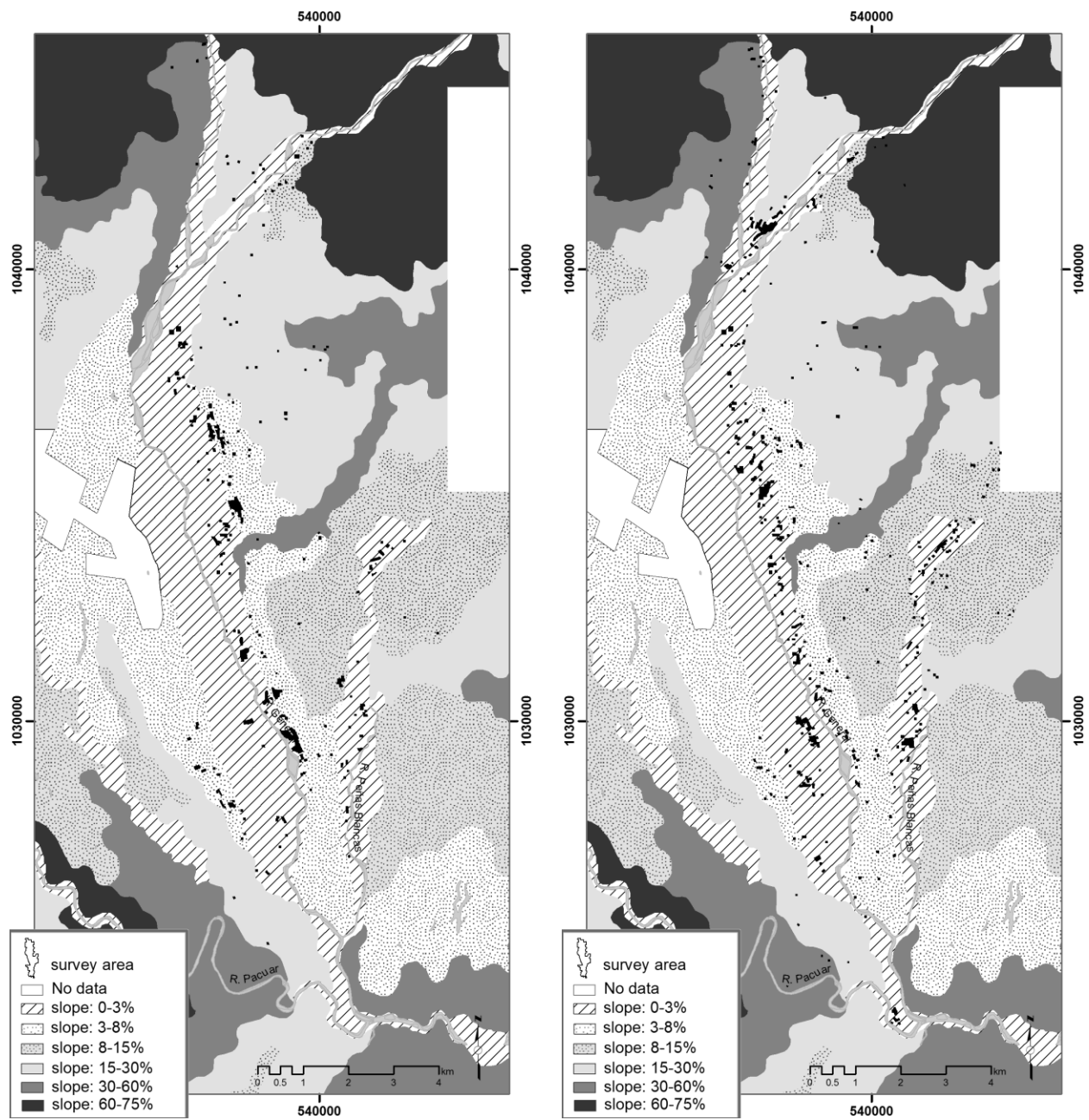


Figure 17. Left: Aguas Buenas Period archaeological sites. **Right:** Chiriquí Period archaeological sites

6.1.2 Soil Fertility

Soil fertility is an obvious candidate to have driven the change in the settlement pattern from the hills to alluvial soils. A stretch of land from a few meters up to 400 m from the General River is subject to a high risk of flooding and very little soil development mostly devoid of archaeological occupation; this area is flooded during extraordinary climatic events sometimes even changing the river course. Although a few sites were found in this area it is improbable that any considerable occupation was located in this zone. The larger part of the General and Peñas Blancas River terraces are represented by Entisols, Typic Ustifluvents and Lithic Ustifluvents with high rock fragment content, moderate fertility, good to excessive drainage and small risk of flooding. North of General Viejo and including Rivas, the river terrace presents young superficial Entisols, Lithic Ustipsamments, with high rock fragment content, moderate fertility, excessive drainage and moderate risk of flooding. The southern part of the river terrace is characterized by deep Inceptisols, Fluventic Dystrusteps and Fluventic Haplustepts with good drainage and moderate to high fertility associated to the confluence of the Pacuar and General River. Rolling hills above the alluvial terraces are characterized by deep soils with good drainage, and moderate to low fertility, Inceptisols, Fluventic Dystrusteps and Typic Dystrustepts, and Ultisols, Ustic Haplohumults developed from rocks and colluvial materials.

The taxonomic classification of soils confirms that in general, younger, more productive soils are found in the alluvial terraces, and older, but still moderately productive soils are found in the hills. This agrees with the historic land use in the region, where tobacco plantations (an exacting crop) are found in the alluvial soils, while coffee and sugar cane are more widespread.

This information strongly suggests the use of more demanding crops or an interest in higher productivity during Chiriquí. Despite this general trend, small areas of very fertile lands in

Juntas de Pacuar were only sparsely occupied during Chiriquí, while the Rivas is located in an area of narrow alluvial terraces. This pattern indicates that, while there was a preference for alluvial soils in the late period, there was not a perfect relationship where only soil productivity was the factor allowing the growth of a particular community.

The Térraba Project proposed that the population during Quebradas occupied “scattered highland settlements situated in secondary upstream valleys [...] bordering hill tops” and explained this by its orientation towards a mixed economy of agricultural and wild resources, while in the Chiriquí period population growth stimulated the location of larger settlements along the river banks due to the an increased reliance on agriculture (Drolet 1988:173-175). The information from the current intensive survey confirms a strong preference for the occupation of rolling hills during Quebradas and preference for alluvial soils in Chiriquí, but no important population growth during Chiriquí; population levels seem to have been similar. Agriculture was definitively an important part of the productive system during Quebradas times; macrobotanical remains of corn and beans have been reported for sites of this period (Blanco and Mora 1995) and manos and metates are part of the domestic assemblage. One of the most common lithic instruments in the Upper Térraba Basin is a flaked double-bitted axe made in relatively soft volcanic stone, abundant in most Quebradas and Aguas Buenas sites in southern Costa Rica (Drolet 1992:217; Johnson 1987). This instrument can be interpreted as a multipurpose tool of expedient manufacture probably used for field clearing more than wood cutting given its poor resistance. The widespread presence of flaked axes associated to domestic areas during Quebradas suggests that the population was intensively cultivating lands adjacent to domestic spaces. The more acidic soils of the hills would not have been a major limitation for cultivation,

especially for crops such as manioc. Defense may have been important in the preference for hilltops during Quebradas, a possibility that will be explored in section 6.3.1.

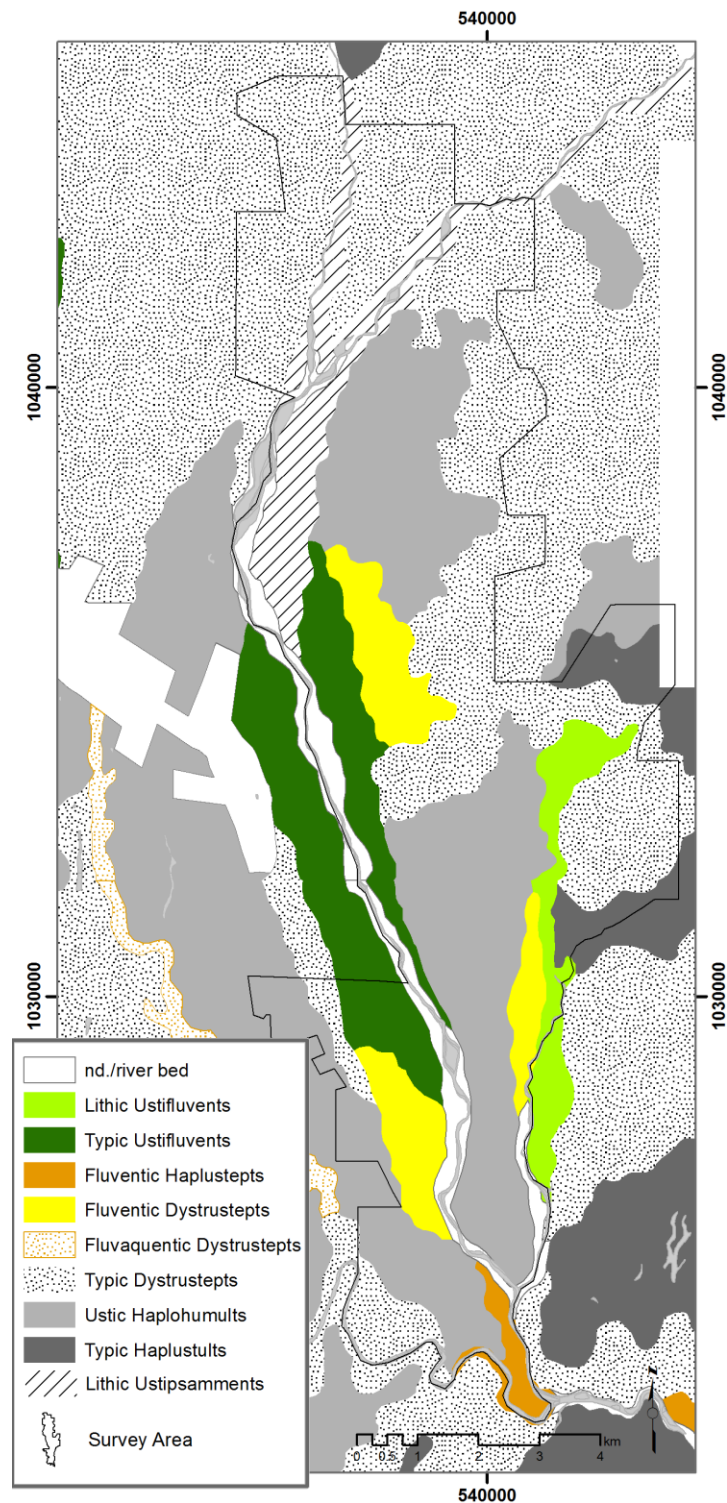


Figure 18. Soil Taxonomic Classification

Other reasons for the settlement change could have been the soil impoverishment in the hills, or changes in the agricultural technology and crops, but we need more direct data to confirm these possibilities.

While we carried no specific analysis to address the possibility that population pressure and soil fertility depletion may have driven change in the settlement pattern, several lines of evidence make it an improbable possibility. Low population density and a dispersed population across the region, large areas of cultivable land in zones of high to moderate slopes were only scantily occupied.

Food processing in Rivas

Rivas is, like most of the habitation sites of the late period, located on alluvial soils (Figure 17). Although survey data indicates that it was the largest and more densely occupied site in the region, Rivas has been interpreted mainly as a place for feasting and not a residential settlement. The main argument on which this interpretation is based is the scarcity of metates found at the site (Quilter 2004:190), which implies that food was prepared with metates in the surrounding habitation sites. The current survey makes it possible to test this hypothesis by contrasting the information of Rivas with the surrounding population, comparing the proportion of grinding tools (manos and metates) in the total sample of lithic tools.

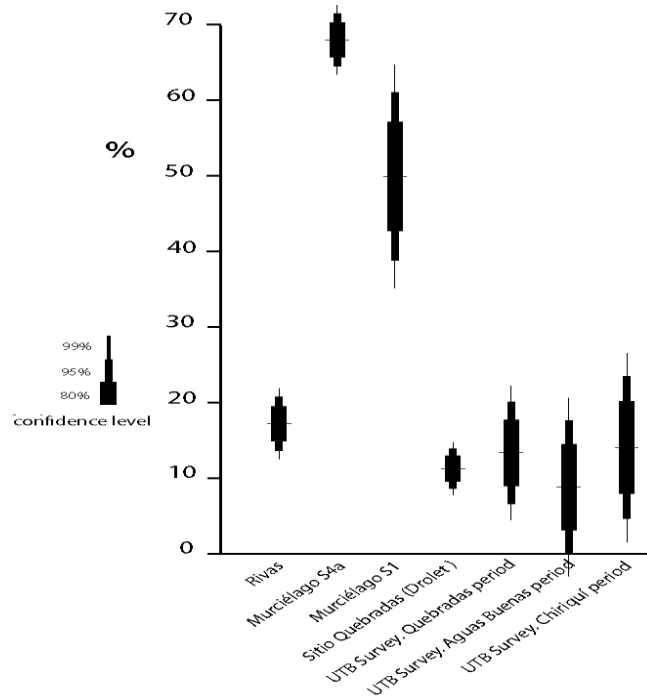


Figure 19. Proportion of grinding tools (manos and metates) from the total lithic sample

As illustrated in Figure 19, a regional perspective makes possible to note that the inhabitants of the Upper Térraba Basin during all periods used very low proportions of grinding tools compared to Murciélago. Indeed Rivas has a somewhat higher proportion of manos and metates compared to the sample from this survey. Although the different methodologies (intensive surface collection in Murciélago and Quebradas, excavation in Rivas and regional survey in the Upper Térraba) and the high error ranges do not allow us to have high levels of statistical confidence, the consistency and strength of the results suggest that the observations are valid. Thus, it seems that the scarcity of grinding tools in the Upper Térraba is the result of cultural practices and that Rivas population was typical in their use of grinding stones in the context of the survey region.

6.2 RITUAL LANDSCAPE

One of the main objectives of this investigation is to evaluate the importance of ritual in the political organization of the region and how it changed through time. To accomplish this with archeological data we need to understand which communities were particularly involved in ritual and their influence in the settlement pattern. This chapter discusses the region's available archaeological evidence that can be related to ritual: funerary practices, ritual objects and petroglyphs.

6.2.1 Petroglyphs

The most abundant line of evidence for ritual in the region were petroglyphs (n=191), and this comes with a drawback, the difficulty of dating them and of interpreting their function. A contextual analysis will be offered to provide an interpretation of the function of petroglyphs in the region, while a stylistic classification will be the base for associating petroglyphs to a chronological framework.

Chronology

A classification of the petroglyph designs and their proximity to ceramics were used to build a petroglyph chronology. This analysis was important to verify that rock art was indeed associated to the precolumbian chiefdom social dynamics.

Petroglyphs are clearly associated to sites from the Quebradas, Aguas Buenas and Chiriquí periods. From the 191 petroglyphs identified during the survey, 57 are closer or associated to Quebradas ceramic materials, 85 to Aguas Buenas and 116 to Chiriquí. Considering

association only to single component lots, 20 are closer to Quebradas, 46 to Aguas Buenas and 66 to Chiriquí. This long term use indicates that the manufacturing of petroglyphs was done during many generations by few individuals. Despite the profusion we find today, the elaboration of just one every 10 years would have been enough to make them.

The long term use of petroglyphs indicated by spatial association is also confirmed by contextual information of petroglyphs associated to features of different periods. During the Chiriquí period, petroglyph 193 is associated to the perimeter of a house foundation in Rivas, petroglyph 164 was found as part of a burial southwest of the study region. During Aguas Buenas, petroglyph 110 was used as part of a funerary mound in General Viejo 4. No cases of Quebradas features with petroglyphs were observed during the survey, but they have been reported from neighboring regions (Alvarado 2008).

Since the main goal of the investigation was to register the location of petroglyphs, sherds and lithics in a regional perspective, less effort was dedicated to the registration of the motifs, which was mainly limited to photographic record and some sketches. Given the limitations of the field record and limited variability of the petroglyph motifs, designs were classified intuitively according first to the organization of the designs and in second term to the dominant motifs.

The sample of 191 petroglyphs was classified into 19 groups, of which 6 showed to be diagnostic of temporality. Future investigations might be able to refine the classification with more detailed recording of the designs, a modal classification of motifs, and the use of similarity analysis.

The 6 diagnostic groups included from 5 to 19 petroglyphs, one group was associated with the Quebradas period, three mainly to Aguas Buenas, and two mainly to Chiriquí. These are described in Appendix B.

Function of petroglyphs

There is ample evidence that within Greater Chiriquí the social function of petroglyphs varied widely depending on the community, region, and period. Several central communities such as Java, Barriles, Brishá Cra and Brusmalís bear evidence of the use of petroglyphs at the core of the community, associated to elite sculpture and architecture (Fonseca and Chávez 2003; Galiano 2007; Palumbo 2009; Sol 2001). Petroglyphs have often been reported as located nearby or incorporated to funerary features (Sol 2001:132; Zilberg 1986:344). There are also specialized ritual sites such as Vista in the Lower Térraba Basin (Alvarado 2008), in which petroglyphs appear to be associated to a roofed structure (probably a temple), in proximity but not associated to burials.

Survey data in the Upper Térraba Basin has provided a valuable database and the necessary ample context for the interpretation of petroglyphs' social function. As can be noted in Figure 20, there is little correspondence between the petroglyph distribution and the location of the most populated communities during Quebradas. Neither Rivas, El Cholo or General Viejo have associated petroglyphs and only Quizarrá has a group in its periphery.

During Aguas Buenas the pattern is similar, the larger community of General Viejo has only a few associated petroglyphs in its periphery, while smaller communities like Peñas Chanchos, a small community north of General Viejo, and the dispersed households in Playa Verde are associated to petroglyph concentrations.

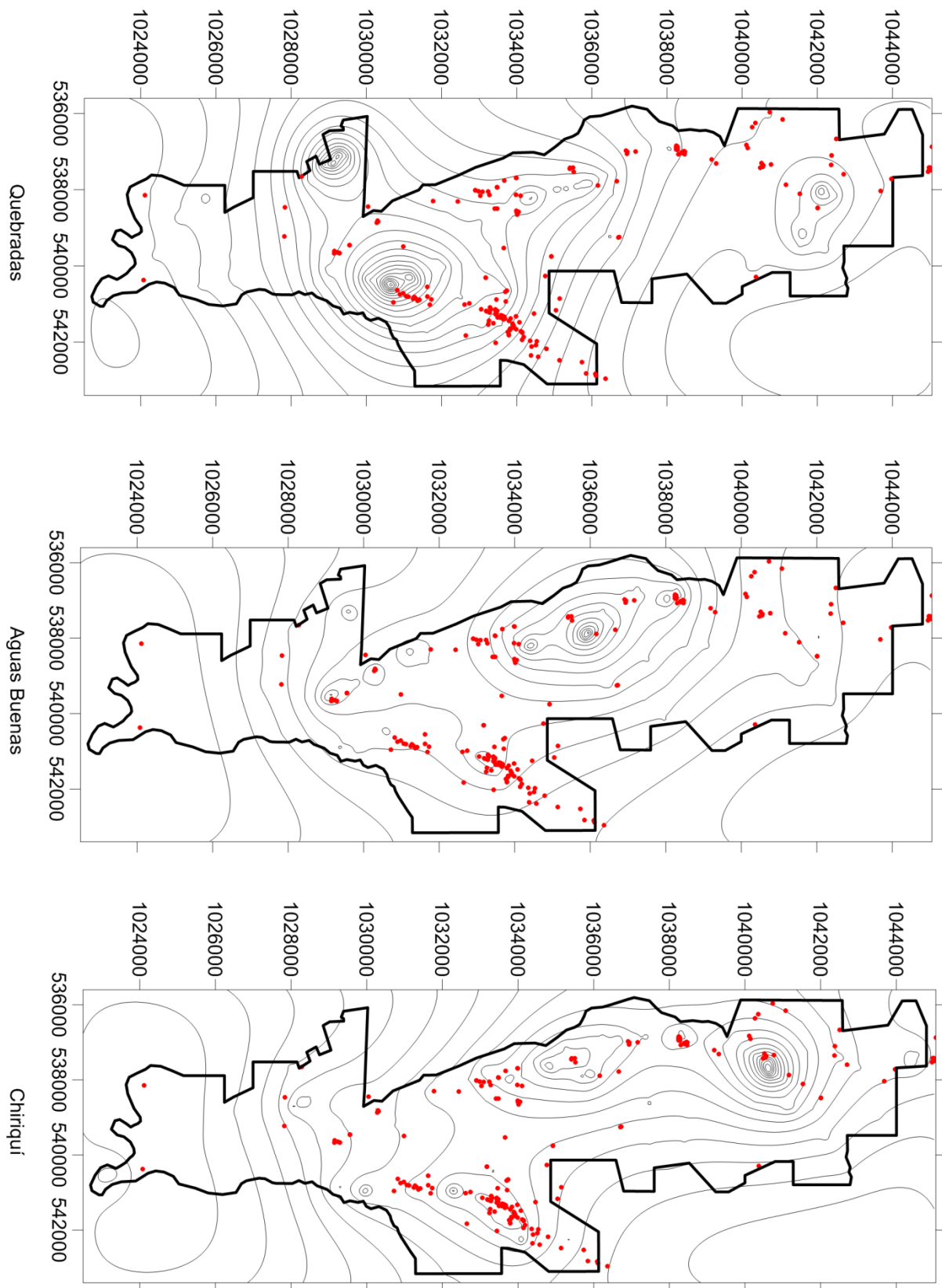


Figure 20. Petroglyph distribution by period

Again during Chiriquí, the larger communities do not stand out by large numbers of petroglyphs. Indeed Rivas has only a few of them in its periphery, while the Playa Verde district, composed of several dispersed farmsteads displays the largest concentration of petroglyphs in the region.

Another element that does not coincide with the interpretation of rock art as a public symbol is the visibility of motifs. 30% of the petroglyphs have designs located on the upper face of the rock and are more than 1.50 m high, which makes them difficult to see without climbing the rock. Only 10% of the petroglyphs have designs on a lateral face of the rock and even then, would have to be painted in order to be easily appreciated.

In the Upper Térraba Basin only a few funerary sites are associated to petroglyphs (five to the Chiriquí period and one to Aguas Buenas) and no petroglyphs are found in the architectural core of the central sites identified in the region. Neither are petroglyphs associated to areas of high population densities, undermining the possibility that they could have been used as agricultural field landmarks.

Most of the petroglyphs of the Aguas Buenas and Chiriquí period in the Upper Térraba have a very limited variation of motifs, almost exclusively circles, lines and spirals. This limited variation in motifs, their dispersed distribution across the whole region, and their limited visibility would have made them poor markers of ethnic affiliation. It is thus improbable that petroglyphs in the region were used by an ethnic or political group for territory demarcation.

During Quebradas, the ritual function of at least some of the petroglyphs associated to this period is evident. An example is a petroglyph found in Santa Elena (Figure 21), a 4 m high trapezoidal boulder, its southern face carved with a miniature stairway parallel to a usable one and three large basins, flanked by carvings of circles, human and saurian forms, the usable

stairway continues in its northern face. This complex association of features suggests its continued use as part of a ritual, such as a rite of passage or a metaphor of “shamanic” transformation and cosmic travel such as described in ethnographic cases (e.g. Reichel-Dolmatoff 1978). But even these “monumental” petroglyphs are located outside domestic areas and are not associated with central communities.



Figure 21. Petroglyph associated with Group 1, Quebradas period

The social use of petroglyphs in the case under study differs greatly from their use in other regions in Greater Chiriquí. In the region, petroglyphs tend to be located in the periphery of habitation areas and are not associated to the larger population centers. This pattern fits better with a “small tradition” cult, associated to rural populations and not incorporated into an “elite tradition”.

6.2.2 Funerary features

Funerary activities took place in segregated cemeteries, sometimes within the community and in other cases on hilltops nearby or at a considerable distance. Cemeteries within the community were the typical arrangement during Quebradas and Aguas Buenas, while hilltops are common during Chiriquí. During the survey 114 lots with funerary evidence were located, 61% of which were located outside habitation sites. It is possible that in the survey many burial areas within habitation lots were not recognized; excavations at Rivas and El Cholo identified funerary features associated to domestic areas that would have been difficult to identify with a surface survey.

The construction of funerary earth mounds with cobble stone features (walls, graves or floors) and the associated burial offerings were the most conspicuous form of ritual towards which the community devoted considerable effort during Quebradas, Aguas Buenas and Chiriquí.

During Quebradas times, funerary and habitation features are generally found together, but few burial places without mounds from this period were located during the survey since they were not marked by special features visible in the surface. Areas of more nucleated populations are found to be associated to mounded architecture as discussed in more detail in the political organization section. These mounds appear to have been associated to ritual, elite and funerary functions and the four central communities identified for Quebradas invested in their construction. During this period, mounds seem to be related to the ritual or political importance of a particular community.

The correspondence of large Aguas Buenas communities with earlier or later sites makes the evidence less clear, but General Viejo appears to be the largest community in terms of population, and it is also associated to a large mounded cemetery.

In contrast, mounded funerary sites did not correspond well to the size of the neighboring population in the Chiriquí period. A much larger sample of funerary sites is available for the Chiriquí period, since mounds and the use of stone pillars become much more common. Some 20% of the funerary sites presented mounds but these are found throughout the region and not associated with particularly large communities.

Panteón de la Reina as a regional necropolis?

Investment in funerary ritual in Panteón de la Reina (Rivas' hilltop cemetery) is not extraordinary compared to other sites in the region. However the most striking example of labor investment is a large concentration of funerary features south of the survey region, which includes at least six platforms up to 50 m long and spreading over more than 400 m (Figure 23), which are far from any notable population concentration and in an area sparsely occupied during the Chiriquí period.

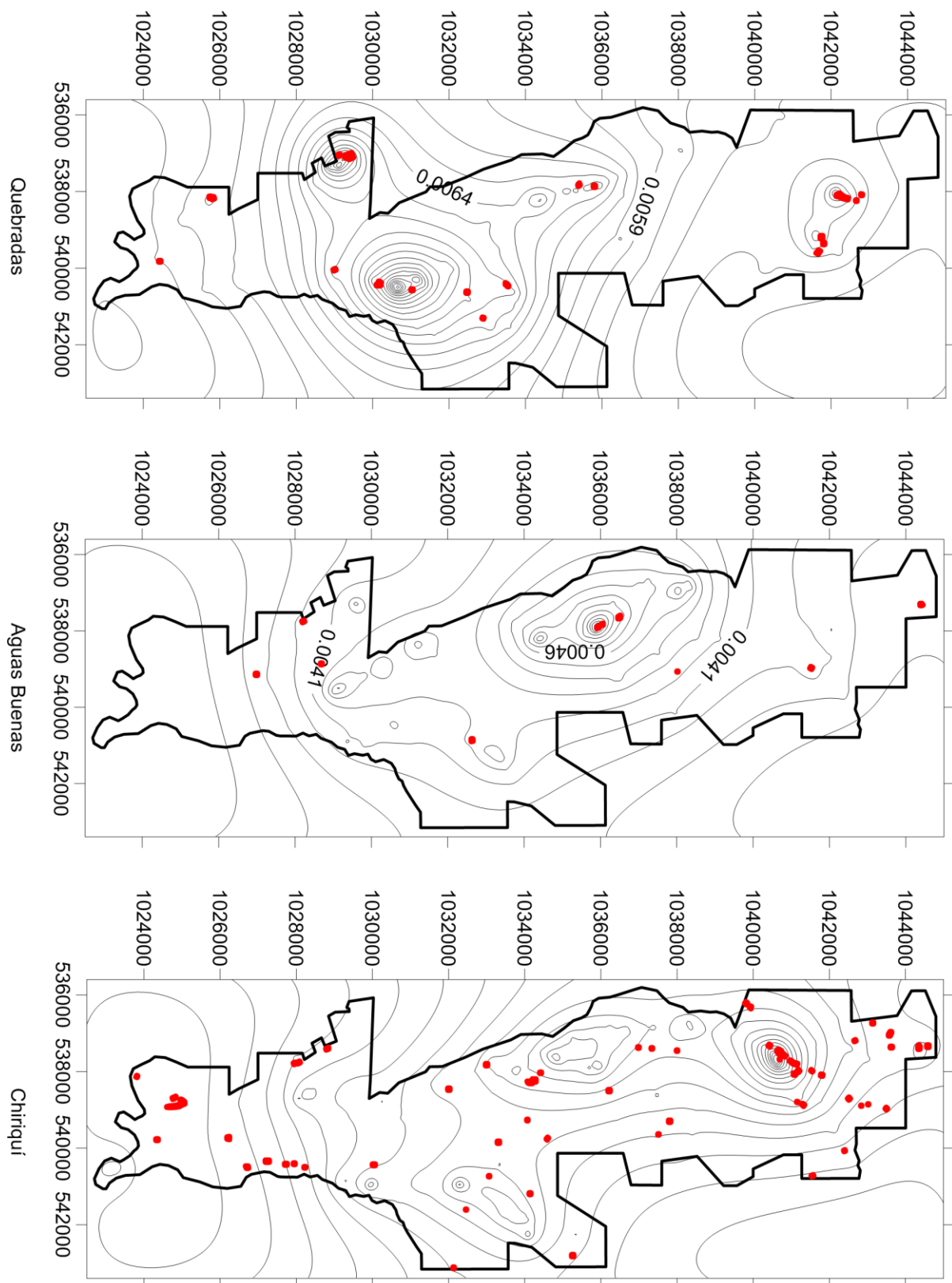


Figure 22. Funerary features and population density by period Chiriquí (left), Aguas Buenas (center), Quebradas (right). Contours represent population density, white dots the location of funerary features

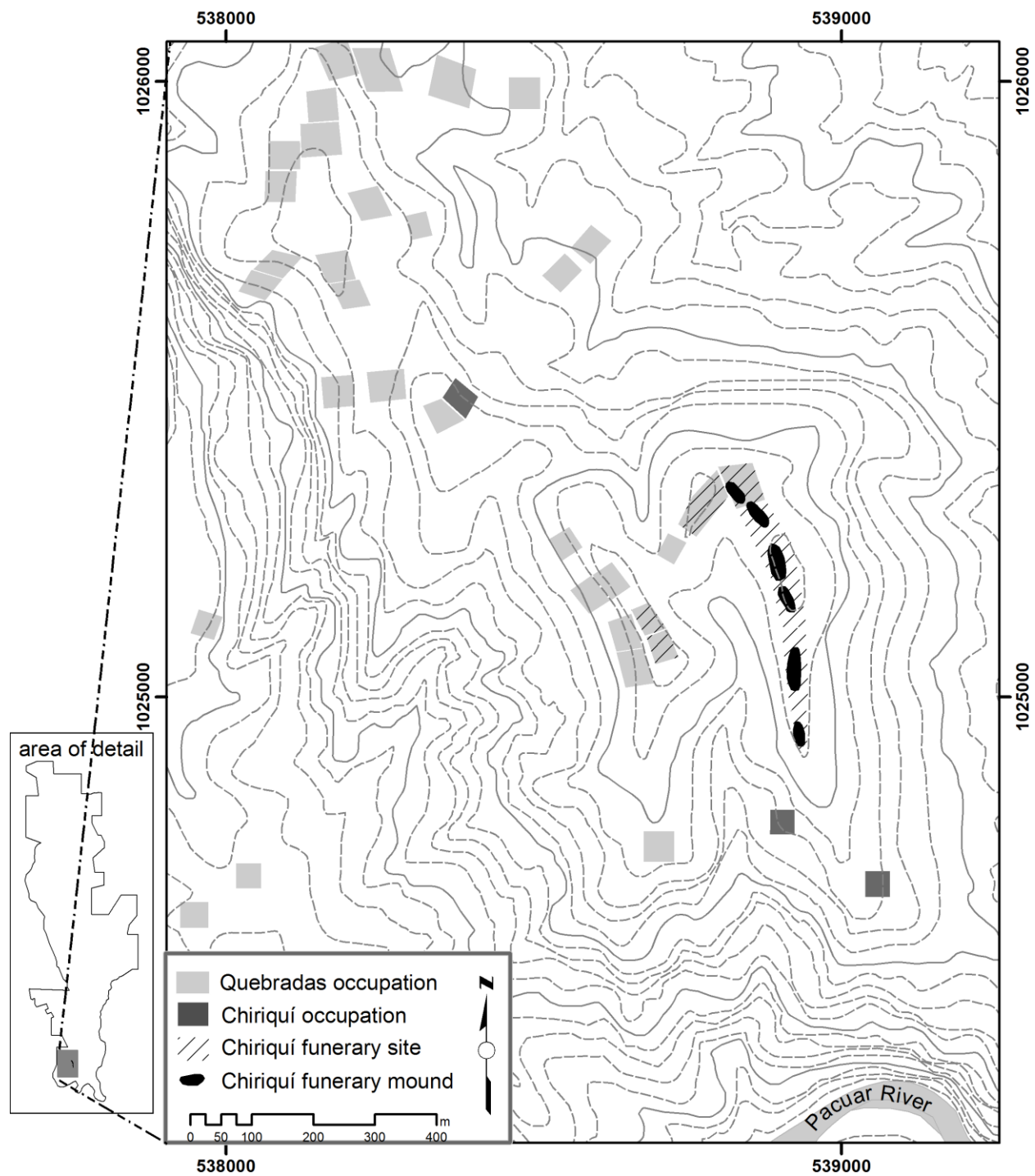


Figure 23. Chiriquí funerary mounds in the southern survey region (Juntas de Pacuar)

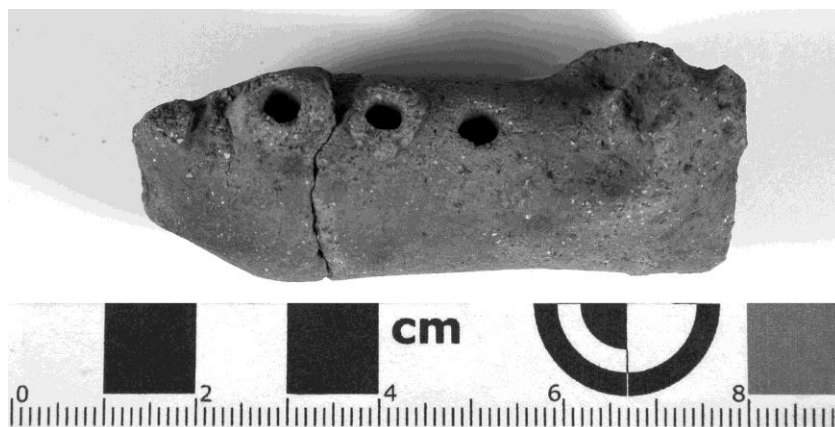


Figure 24. Aguas Buenas period ceramic flute from General Viejo community

While musical instruments, figurines and incense burners were present in small numbers in all periods and many sites, no concentration of portable ritual instruments was found. This absence of concentration of artifacts associated to ritual indicates at least that ritual activities were not especially prominent in any particular community.

Synthesis

Funerary sites, petroglyphs and ritual artifacts were distributed throughout the whole region, but there was no geographic relation between sites with political importance and a higher intensity of funerary activities, presence of petroglyphs or abundance of ritual artifacts. Indeed, the largest concentration of petroglyphs is associated with a part of the region occupied only by dispersed households and one of the largest funerary mound sites is found in a part of the region with a low population density.

During Quebradas, while burial and residential activities occur in close proximity, petroglyphs are generally found in the periphery of communities or more secluded settings, probably as the prerogative of ritual specialists. Available information indicates that in the region, petroglyphs were clearly associated to shamanic rituals but were not emphasized within

elite or funerary contexts and can best be interpreted as “small tradition” religious rituals. Funerary areas are incorporated to domestic spaces and while surely associated rituals were notable occasions in the community, they do not seem to have been an arena to display wealth or power by themselves, status was more clearly displayed in mounded architecture.

A large degree of continuity can be seen in Aguas Buenas ritual organization. There appears to be an increase in the use of petroglyphs but they remain a “small tradition” ritual that elites do not emphasize as is the case in other sites in the Lower Térraba Basin. Funerary activities are still not well documented for this period in the study area, but at least in terms of architecture they seem less conspicuous. The exception is the central community of General Viejo where a segregated cemetery with small mounds was located.

During Chiriquí, there is an increase in the use of petroglyphs, special cemeteries become separated from domestic settlements and are associated with mounds and stone pillars. A proportion of the imported gold artifacts found in looted burial contexts show iconographic elements that can be associated with religious specialists (Quilter 2000:191), but whether those who used them were such specialists is unknown. Ample excavations in Rivas have failed to recognize temples or the households of religious specialists, and the identified ritual spaces are associated with burial activities. Petroglyphs appear to be located in the periphery of the site and generally not associated with burials, but one example is associated with a small domestic structure. This suggests that petroglyphs were part of a “small tradition” religion, while funerary ritual became a more public affair. During Chiriquí there is an increased investment in funerary ritual seen in mound construction in communities all over the region and an increased investment in grave goods, especially in Rivas. The fact that several small communities begin to make use of funerary mounds (when in previous periods these were mostly associated to central

communities), indicates that burial practices became an important arena for cementing social positions.

This information contradicts the hypothesis that religion and ritual were the main driving force behind population nucleation, or the basis for the organization of a supra-local polity in the Upper Térraba Basin during the Chiriquí period. The interpretation that Rivas functioned as a regional funerary center, and the possibility that this role could be the main element for regional political organization, is not supported by regional scale evidence. While evidence for centers specialized in ritual does not seem strong for Quebradas or Aguas Buenas, more evidence is needed to propose an interpretation of the functions associated to the mounded centers of these periods.

6.3 EXCHANGE

Data on exchange gathered from this regional survey and previous work in the region is presented here in form of a broad overview of the subject, since little work has been done regarding source materials and our sample of tools other than pottery is not large enough to investigate how craft production was organized.

During the Quebradas period there is no evidence of any important level of long distance exchange in the Upper General River, although some polished stone pendants might be trade items from neighboring regions and it is probable that with more investigation some exceptional foreign objects could be found. Almost the totality of the Quebradas sherds in our sample has characteristics that have only been reported for the Upper General River although a very small proportion may come from the Lower General River but no source analysis are available for the

region. Based on the high proportion of stone axes in Las Brisas, it has been proposed that some sites from this period specialized in the production of axes which were then exchanged at the regional level (Drolet 1992:217). High proportions of flaked axes were found in most Quebradas sites during this survey and their low resistance and expeditious manufacture do not seem to place them as strong candidates for regional exchange. More studies are evidently necessary on this topic, but the Quebradas communities appear to be mostly self-sufficient with little intra or extra regional trade taking place during this period. It is evident that the display of foreign precious objects was not an important part of status building during Quebradas.

Pottery from the Aguas Buenas period is harder to differentiate from that of other parts of the Térraba River and little is known from elite burials in the central sites located in this survey. The general impression is again one of little intra or extra regional exchange, but information is still too scarce.

The Chiriquí period has been previously described as one of increased sophistication of crafts and a system of intra-regional exchange (Drolet 1992). Craft specialization at the village level has been proposed relying on the comparison of artifact assemblages from different sites in a regional survey of the Térraba Basin; different products such as maize, polychrome wares and polished stone axes would have been exchanged between communities (Drolet 1992:223-235). Increase in the quality of craftsmanship during the Chiriquí period has also been used as evidence of craft specialization in the late period and lack of it during Quebradas. Additionally, colonial period ethnohistoric references mention the exchange of salt, axes, dogs and cotton between indigenous communities of southern Costa Rica (Corrales 2006:170).

Some evidence of tools for craft production was found during the survey, including spindle whorls and polishers, but our sample is still too small to allow for a detailed evaluation of site scale craft specialization.

Prestigious individuals from Rivas were able to obtain an important number of gold objects, originally manufactured in polities from the Lower Térraba Basin, where the sources of gold ore are located (Fernandez and Quintanilla 2003:221-222) (although it is still a possibility that some objects may have been crafted in Rivas that remains improbable as no evidence of molds or crucibles has yet been found in the extensive excavations). A small number of pottery fragments from neighboring regions as far away as Central Panama have been identified in Rivas, but they constitute only a handful from the 600,000 sherds collected (Quilter 2004:158-163).

Preliminary evidence indicates that some degree of craft specialization, inter village local exchange, and long distance exchange of prestige items was present during Chiriquí but appear to have been of little importance during Quebradas. The change in settlement patterns towards more fertile lands seems to be compatible with an increase in craft specialization and exchange, since a more productive agricultural system would have provided surplus for exchange or more time for craft production. A more regular and intense exchange between neighboring communities would also be compatible with the consolidation of a regional polity during Chiriquí, and the position of Rivas as a central community, with elites having access to prestige items obtained from long distance exchange. Thus, currently available information indicates that craft specialization and regional exchange grew in importance over time and were a vital part of Chiriquí social organization.

The highly restricted access to long distance objects and their apparent importance in signaling status in Rivas is certainly reminiscent of Mary Helms' well known proposal that long distance exchange had an important role in the consolidation of elite claims to power (Helms 1979). While this probably was a significant element of elite dynamics, it is relevant to note that the distances of exchange partners for the vast majority of elite objects are less than 100 km from Rivas and must have been known groups with much in common to the Upper Térraba River groups. More importantly, this theory does not explain the conditions that sustained the social position of elites; furthermore, an important wealth accumulation must have been needed to gather the necessary resources for barter in precious objects and travel. Brief references in the ethnohistoric literature of the area suggest that raid and ransom dynamics were common ways to obtain gold (Vázquez de Coronado 1964:31), and cannot be discarded for Rivas. It would appear that the concentration of gold objects in Rivas was more a result of its position in the socio political system, than an avenue for building prestige and power.

6.4 WARFARE

Although the Spanish accounts are scarce, there is clear evidence of warfare in early written records in southern Costa Rica before the impact of the conquest had altered the social dynamics. A relatively detailed account by Vázquez de Coronado (1964:32-35) describes a situation in 1563 where the Quepo chiefdom had recently been raided by the Coctu chiefdom (about 100 km away), and the chief's sister Dulcehe is taken captive. The case exemplifies practices of long distance raids, elite captives, decapitation and fortified villages, taking place in regional polities.

Archaeologically there are numerous examples of representations of warriors, trophy heads and captives in precolumbian statuary dating from the Aguas Buenas period onwards, particularly common in the iconography of stone sculptures from the Diquís Delta (Quintanilla 2007:48-49). Although sculpture is very scarce in the Upper Térraba Basin, there is at least one example of a petroglyph depicting decapitated anthropomorphic figures.



Figure 25. Quebradas period petroglyph depicting a possible decapitation scene

As discussed by several authors (Keeley 1997), warfare has been present in all human societies throughout history, thus it is more useful to discuss warfare in terms of whether it was more or less prevalent in a particular period and the scale at which it occurred (local, inter-regional, raiding, etc.).

Regional scale information can be marshaled towards exploring the incidence of warfare in different periods through the evaluation of population nucleation, the presence of buffer zones and settlements in defensive locations. As discussed in previous chapters, the settlement pattern in the Upper General River is characterized by a large proportion of dispersed households and

some small communities with imprecise boundaries. This indicates that the population was not living in fortified villages but still some degree of nucleation is present, an impression that is stronger given that specific topographic conditions are sought for the settlements. At a regional level some areas do show sparse or no occupation, a situation that can be due to geographic conditions, the attraction exerted by particular communities or buffer zones unoccupied for defensive reasons.

The preference for particular topographic conditions needs to be discussed as an alternative explanation to some of the patterns that can be seen in the surface maps from which the districts were delimited. Availability of hilltop lands is an important factor for Quebradas settlement location, nevertheless buffer zones between districts includes areas of hilltops that were not settled, indicating that these buffer zones were not merely areas where the desired geographic conditions were not found but political frontiers. This is even clearer during Aguas Buenas period, when the district boundaries do not correspond to geographic conditions and the marked buffer zone clearly corresponds to social considerations. For the Chiriquí period the situation is different, the two identified districts are located in two different river courses and settlements are dispersed over most of the available flat river terraces with adequate fertility. The position of Rivas as the only central local community identified in the study region with no secondary or primary center associated to the neighboring river course, further suggests that the division between the two districts is more related to geographic conditions than to political organization. The decrease in population towards the southern part of the survey area, in areas with alluvial terraces similar to those to the north, suggests a buffer zone that might become clearer with a broader perspective that is not currently available.

In an effort to address more systematically changes in the degree of nucleation between periods an Average Nearest Neighbor analysis was performed based on the centroids of the lots defined for each period, and using the survey area as the limit. Attention was placed to the ratio of the Observed Mean Distance to the Expected Mean Distance, to compare the degree of nucleation in different periods but bearing in mind that different factors can be motivating the nucleation. This way of using the ANN circumvents the problem of which criteria to use to define the region, since the same limits are used for each period, and avoids focusing on categories of nucleation or dispersion as absolute statements (Javier Giraldo, personal communication 2011).

Table 8. Average Nearest Neighbor analysis for the different periods in the study area

Period	Ratio	Z Score	Pvalue
Quebradas	0.619	-16.674	0.0000
Aguas Buenas	0.557	-15.293	0.0000
Chiriquí	0.639	-15.368	0.0000

Although the scores are similar and there is not a radical change in the degree of nucleation in any of the periods, it is possible to note that the lower ANN Ratio occurs during Aguas Buenas, coinciding with the presence of only two well defined districts and large tracts of unoccupied land. The Chiriquí period is when the population was more dispersed, suggesting that less intraregional conflict was occurring, probably because the region was integrated in a single polity. The larger number of districts identified for Quebradas would suggest a stronger incidence of intraregional conflict, but the ANN Ratio is closer to the Ratio for Chiriquí, indicating a similar degree of dispersion that might be due to the presence of occupation along the whole survey area although in contrast with the Chiriquí period, several buffer zones were maintained between districts.

The settlement pattern during Quebradas can be interpreted as influenced by defensive considerations since there is a marked preference for hilltops, these locations probably presented advantages in visibility but not much in defensibility if the occupation was dispersed. The central communities of Rivas 1, Rivas 6, General Viejo, CAT64 were located in hilltops surrounded by steep slopes, but while El Cholo and Quizarrá were also in hilltops, these were much broader and less restricted.

The scenario that can best account for these different lines of evidence is that warfare in the form of raids was more common during Quebradas, affecting mainly the central communities but it was not so prevalent as to discourage the dispersed occupation of the Quizarrá district. The defensive benefits provided by the occupation of hilltops seem to become less important during Aguas Buenas as the alluvial lands begin to be occupied. Still warfare does not seem less important as one of the central communities is located in a hilltop and large areas between districts are unoccupied. Thus, a sensible diminishment in the risk of raids does not seem to have been the factor that propelled the occupation of alluvial lands. The integration of a regional polity during Chiriquí may have diminished the levels of intraregional raiding, which can explain the spreading of farmsteads along the rivers.

7.0 CONCLUSIONS

7.1 SUMMARY OF THE UPPER GENERAL BASIN PREHISPANIC TRAJECTORY

Quebradas

Although the Upper General River was sparsely and probably irregularly occupied since pre-ceramic times, it is not until around 300 b.C. that the region becomes regularly occupied and population densities increase. An economic system that included a strong agricultural component allowed a demographic explosion that has also been noted in the Central Caribbean Coast and Central Valley of Costa Rica around this period (Snarskis 1981:42).

Soon after this population explosion, political organization surpassed the kin group. The Quebradas period is characterized by numerous small polities (at least four only within the study area) ranging from 150 to 300 individuals and from 600 to 1200 individuals, with central sites associated to ritual, funerary activities and elite residences, but only scant population concentration and minimal wealth accumulation.

At a local scale the core of these central communities had similar population levels and all made use of small scale architecture in the form of mounds and cobble stone platforms that required some degree of supra-household labor for their construction and were used for residential and funerary activities. Preliminary investigations in one of these centers, the site of

El Cholo, indicates that they were fairly stable, occupied for long periods of time and with an even more extended funerary use (Herrera 2005).

At a regional scale the small polities (districts) had markedly different population numbers and Quizarrá is three times the size of its neighbors in this aspect. The central area of Quizarrá yields a much higher proportion of decorated pottery than the dispersed households that surround it, indicating that its population probably had high status and was more involved in public activities such as feasting, although excavated burials from this period suggest minimal wealth accumulation.

The lack of restricted resources in the region and the lack of association between productive soils and central communities are clear evidence that elites did not exert control over particularly productive resources. Foreign prestige items are not in use during this period, suggesting that local elites were not claiming to have special foreign connections; additionally the scarcity or absence of ritual paraphernalia or petroglyphs associated to central communities supports the interpretation that elites were not underscoring their role as religious specialists to sustain their position. There is no evidence of craft specialization and exchange during this period. There is a marked preference for the occupation of rolling hills atop alluvial terraces, possibly due to defensive reasons that suggests some degree of raiding was present, but the lack of a strong population nucleation would indicate that warfare was not a pervasive problem. Political organization can be best described as one of small scale disintegrated but stable polities, and little social differentiation with central communities lead by corporate groups.

Aguas Buenas

A moderate demographic drop and a reorganization of the population occurred during Aguas Buenas, but political organization seems to have remained at a similar scale. As in Quebradas, one district strongly stands out with a larger population than any other, but the population of the largest Aguas Buenas district is similar to that of the largest Quebradas district, suggesting that the capacity of integrating population did not change much. There is a very clear buffer zone separating the two districts of this period, indicating some degree of raiding and conflict but the preference for settling hilltops is progressively abandoned, and it is during this period that the occupation extends to the alluvial terraces.

The central area of the largest Aguas Buenas district is associated with burial mounds and to a somewhat higher proportion of decorated pottery, setting this sector of the local community apart and suggesting a higher status for its population, although no lavish burials have been reported through excavation or by looters. No local communities for the Aguas Buenas period have been excavated in the region, which limits our knowledge of their social organization. The regional perspective suggests that central communities were not outstanding in their proportion of ritual paraphernalia, use of public sculpture, architecture or petroglyphs, and no evidence was found for craft specialization or for exchange, either local or long distance.

Chiriquí

During this period Rivas, with some 250 to 500 inhabitants, emerged as a much larger and more nucleated local community than any that had existed before. Systematic regional settlement data confirm the notion that it served as the central locus of a large regional polity. Although regional population levels increased only slightly, the reduction in the number of regional polities to a

single one dominated by Rivas evidences that it integrated a much larger population than any of its predecessors. During this period some individuals, particularly from Rivas, begin to be interred with important quantities of gold, use more serving vessels and their houses become larger and with large stone foundations, indicating an increase in social differentiation. Craft specialization and local exchange apparently became more important as suggested by the presence of more craft-related tools from this period and artifact assemblage comparisons in the region (Drolet 1992). While supra-regional exchange is present as shown by some objects found in Rivas, it is practically limited to elite commodities and no foreign materials were found during the survey.

Throughout the Chiriquí period, power was strongly asserted through funerary rituals that emphasized kinship and descent and these were clearly part of a religious worldview. This is evident in the separation of burials from the domestic sphere (in contrast to previous periods), and the construction of cemeteries in higher grounds above the settlements, marked by mounds and standing stones. Following different lines of evidence, it can be interpreted that Rivas was not a regional center specialized in ritual or funerary activities: small plazas that do not allow large population concentrations, absence of ritual artifact concentrations, low density of petroglyphs, and cemeteries that are not outstanding in size or structure scale compared to others in the region. Instead of an elite regional necropolis, its cemetery Panteón de la Reina appears to have been the burial place for different social sectors that inhabited Rivas, including lavish elite burials. Three aspects change notably towards late period organization and parallel the positioning of Rivas as a central community: a settlement pattern that centers on alluvial terraces, generalized use of funerary mounds in most communities all over the region, and increase in size of domestic units found exclusively in Rivas. All these lines of evidence point to changes in

economic and social organization, agriculture, kinship ties and domestic mode of production associated with the central area of the Rivas community; all of them strong candidates for explaining the emergence of Rivas. The importance of Rivas was not centered upon religious aspects but on a prominent role in local exchange and kinship that allowed their inhabitants to acquire status, wealth and supra-local influence.

7.2 FACTORS OF CHANGE

The Upper Térraba River Basin presents a rich and varied precolumbian history that constitutes an excellent scenario in which to investigate the processes of polity formation. Different factors influencing the social organization and settlement patterns were explored: geographical factors, warfare, status and ritual.

After an initial demographic explosion, small polities rapidly emerge. While they have some capacity to mobilize labor beyond the domestic group, they show little craft specialization, exchange or wealth accumulation. Previous Quebradas artifact assemblage analyses in the region have described it as a domestic tool industry with little specialization or exchange (Drolet 1992; Rago 1988), and excavated graves from this period show very modest offerings even in graves located in mounds (Badilla 2009). An important degree of status inequality was surely present in human interactions very early in the Térraba sequence, materialized in the construction of mounds for a few small houses and burials, but mechanisms preventing wealth accumulation by leaders must have also been in place for that period.

Preliminary evidence for warfare indicated by buffer zones between polities and defensible locations for settlements; and the presence of influential communities that were able

to organize work parties beyond household members for the construction of mounds, suggest that these dynamics were fundamental to the organization of early polities during Quebradas. Raiding parties and supra-household labor for special circumstances were probably organized through feasting in these central sites given the different proportions of decorated ceramics associated with these sites. Considering the stability of central sites and the association of platforms with small domestic and funerary features, it is very likely that particular lineages or clans held places of authority in this system, but mechanisms of competitive generosity must have held wealth accumulation in check. These hypotheses can be tested with studies at the local community scale, searching for evidence of feasting, public spaces for gathering, and a better understanding of the differences between those who lived in mounds and the majority of the population that did not.

After the demographic explosion during Quebradas times, the overall picture is one of increasing polity size, inequality and wealth accumulation, as evidenced in the regional polity of Rivas, although changes in political organization were slow and modest in scale. Population numbers remain relatively stable during the whole sequence up to Spanish conquest; demographic growth or population pressure were not catalyzing elements for changes in the formation of a regional polity and the increase in social differentiation and wealth accumulation.

Warfare in the form of raiding seems to have been stronger during Quebradas, which is evident in a settlement pattern with a strong preference for hilltops. During Aguas Buenas there is some evidence of intra-regional raid decline; with hilltop settlement preference giving way to a pattern of dispersed occupation of river terraces, which becomes the norm during the Chiriquí period. While warfare may have had a role in shaping and consolidating early supra-local polities, this process could not have resulted from population pressure, given the relative demographic stability and low population levels. The impetus that drove population to the

alluvial terraces, abandoning hilltops, predates the establishment of Rivas as a central site and occurs during the Aguas Buenas period when occupation covered both areas, suggesting that the process was slow and progressive. This important change in the location of settlements is not yet fully understood but it has also been recognized in the rest of the Térraba Basin. It has been proposed that it may be related to a higher emphasis on agricultural strategies during Chiriquí (Drolet 1988), but it is still necessary to explore if soil depletion, changes in environmental conditions or changes in agricultural technology may be in place. Since this settlement change coincides with an increase in wealth accumulation, it is possible to suggest that political strategies for the maximization of agricultural production were at play. For example it is possible to hypothesize that surplus production may have become necessary to participate in exchange networks, or to support communal feasting. Although currently there is only limited evidence that craft specialization and exchange within the region increased during Chiriquí, this possibility would fit very well with dynamics of surplus production and exchange.

The soils available to the Rivas community were not the most fertile or ample in the region, demonstrating that control of productive agricultural lands was not a reason for the central position of this site. Nevertheless, it is clear that surplus was available, and part of it was used for obtaining gold objects outside Rivas' area of influence. The presence of particularly large domestic structures in Rivas may hint at a distinct organization of labor in this community, with larger kin groups that encouraged an edge in the production of surpluses, competitive generosity or other practices to establish alliances. The increased effort in construction of burial mounds in communities of all sizes throughout the region may be indicative of the importance of stressing and promoting clan affiliation and associated rights and obligations for access to resources or trade partners.

The model proposed by Stanish (2004) further helps in explaining how craft specialization can be tightly related to the emergence of elites and central communities; considering that craft specialization creates a more productive system without labor input increase, requiring instead the administrative role of elites. In such a model, Rivas would have emerged and consolidated as a central community with power at the regional scale not only for the ability of its population to generate surplus, but also because it played an important role in regulating the more intensive intra-regional exchange relations of the Chiriquí period in the Upper Térraba River. Furthermore, in this scenario it is not necessary for Rivas to have direct control over productive resources, or military superiority, since general population benefits from its role in the political economy of the region. While this model stresses craft specialization, the proposed late period intensification of agricultural production (for exchange or to allow time for craft production) can be easily integrated into these dynamics.

Studies on the organization of craft production and regional exchange are perhaps one of the most important pieces of evidence required to advance our knowledge of the Upper Térraba Basin socio-political organization. A comparison of Rivas residential features and associated middens would be particularly helpful for confirming the higher importance of craft specialization during Chiriquí and the hypothesis that this may have been a crucial element in the positioning of this community as a central location in the region. If our interpretations are correct we would expect at least some degree of household or village specialization in craft production and evidence of exchange at the regional level. A comparison of the proportions of specific tools such as metates, axes, spindle whorls and others, in different areas of the site, would provide such information.

While Quebradas (and probably Aguas Buenas) small polities and elites appear to have relied on temporary labor, probably attracted in a context of feasting, that allowed the construction of communal infrastructure and the organization of raids to competing communities, Chiriquí elites built a regional polity upon more permanent socio-political dynamics, where surplus from more productive agricultural systems and probably craft specialization were regulated through well defined kinship rules.

While some degree of political competition for prestige involving feasting within a framework of ceremonial practices is plausible even during Chiriquí, these dynamics do not appear to be at the core of status building in the region. These events were probable avenues towards accumulation of individual prestige and organization of labor, but the general stability and uniqueness of Rivas suggests the presence of hereditary or otherwise defined succession rules for political positions. The acquisition and display of foreign goods does not appear to have been a main strategy for obtaining prestige but rather a result from it, since its presence is much more common in Rivas than in other region cemeteries, and this pattern would not result from a more individualistic dynamic of prestige building. These interpretations would need further testing with field data at the settlement level.

Models in which economic processes have driven the formation of a regional polity and religious ideologies have been used to control access to key resources, or in which religion is the main power base would require that access to religious leadership be restricted to kin groups and closely linked to political hierarchy. Regional information indicates more materialist processes such as warfare, surplus production and local exchange, lead the course of consolidation of a larger polity. Regional-scale evidence indicates that religion and ritual were not the main forces attracting populations to nucleated centers. Access to religious offices does not seem to be

constrained in any way within the study area and the distribution of public ritual indicators was not dominated by any particular community, suggesting that access to religious institutions was generalized.

Although elites were not secular and did materialize their prestige and authority through more labor intensive houses and foreign gold objects charged with sacred meaning, ritual activities occurred throughout the region and were not more intensive or qualitatively different at Rivas. The regional increase in petroglyph use had little to do with Rivas as a central site, since none are found at its core and only six are located in the surrounding area. Regional evidence for the location, as well as design and visibility of petroglyph motifs indicate that they can be better understood as local community (peasant) “shamanic” practices that were not prominent in Rivas as in other central sites of the Térraba Basin. Increase in burial efforts for this period (cemeteries segregated from communities, burial mounds marked with standing stones) also occurred at a regional scale and a cemetery larger in extension and mound size compared to Rivas (Panteón de la Reina), was located in the opposite part of the region. This widespread location of cemeteries fits better with the regional importance of kinship, which probably allowed broader social integration networks, and does not correspond either with a scenario of centralization for the elites of Rivas, whose cemetery does not seem to have functioned at a regional scale, but was rather dedicated to the local population. The widespread presence of burial mounds can be interpreted as an integrative communal religious structure common to all communities in the Chiriquí period of the Upper Térraba Basin, and not a vehicle towards power building. Furthermore, in Rivas there is little evidence of the building of public spaces such as plazas, roads linking to neighboring communities, or the use of sculptures and other non-portable public symbols, while all these features are common in other central communities of the region in the

Térraba River. This argument should not be misinterpreted as a negation of the pervasive presence of religious thought in explaining social status quo in most (or all) societies. What is proposed from the survey data is that elites in Rivas were not giving ritual a special role as a control strategy.

A wealth of ethnographic and ethnohistoric data on southern Central America and Colombian indigenous groups supports a great variety of socio-political arrangements in which sometimes religious and political spheres may have been relatively separate institutions, a separation that would fit data for the Upper Térraba Basin. Based on ethnographic information, theoretical models, or archaeological data, several “Chibchan” polities have been interpreted as organized around religious specialists and changes driven by religious movements (Drennan 2006b; Hoopes 2005; Oyuela-Caycedo 2001). The Upper Térraba Basin is but one example in which religion can be clearly distinguished archaeologically as an important aspect of precolumbian society, but not the main motor for the consolidation of a regional polity.

Burial rituals played an important role in enforcing kinship rules and the general social integration of the region. Late period petroglyphs appear associated with private and secluded rituals that accompanied “shamanic” practices or “rites of passage” throughout all communities. Rivas was not excluded from these dynamics, but no evidence that it played a central role within this system was found. There is no indication of warfare or population pressure, but different lines of evidence (agricultural emphasis in the cultivation of alluvial lands and preliminary evidence of local exchange) suggest that a more productive economic system with a higher intensity of exchange between local communities, as well as craft specialization, developed during the Chiriquí period.

This evidence indicates that in the Upper Térraba Basin, elites did not have control of material resources (Earle 2001), nor did they claim restricted access to ritual knowledge as the main element in the consolidation of their power (DeMarrais, et al. 1996; Potter 2000; Potter and Perry 2000). Important changes in the organization and technology of agricultural production, and increases in household size, coincide with the emergence of the unprecedented community of Rivas. The rise of Rivas as a larger and more powerful central community than any that had existed before in the Upper Térraba Basin seems more strongly related to changes in economics on the one hand, and kinship and social relations, on the other.

APPENDIX A

CERAMIC MODES FROM THE UPPER TÉRRABA BASIN

Table 9. Ceramic types and varieties

TYPE	VARIETY	REFERENCES / DESCRIPTION
Quebradas	V1	This type corresponds to the description of Quebradas Inciso from Baudez et al. (1993:57-58). Sample: 640 Paste: In our sample, variety 1 is asociated to paste 6. Temporality: Quebradas Figure: 26a
	V2	Similar to V1 but with a different paste, lip is less pronounced and walls are thinner. Sample: 111 Paste: P16 Temporality: Aguas Buenas Figure: 26c
	V3	In addition to the characteristics of Quebradas Inciso V1, this variety includes the use of red slip in the rim and the internal part of the vessel. Incisions are deeper and in several examples the lip is less Sample: 33 Paste: P6 Temporality: Quebradas/Aguas Buenas? Figure: 26b
Guarumal Inciso	Cebaca	See description of Guarumal Inciso V. Cebaca in Baudez et al. (1993:67). Sample: 55 Paste: P13 Temporality: Quebradas /Aguas Buenas Figure: 26d
Cerro Punta anaranjado		Cerro Punta Anaranjado V. Cerro Punta in Baudez et al. (1993:62-63) Sample: 21 Paste: P16 or P11 Temporality: Aguas Buenas

Cotito		<p>Figure: 26g</p> <p>Cerro Punta Anaranjado V. Cotito in Baudez et al. (1993:64) y Corrales (2000:321)</p> <p>Sample: 30</p> <p>Paste: P6, P11</p> <p>Temporality: Quebradas /Aguas Buenas</p>
Corral Rojo	v1	<p>Figure: 26h</p> <p>Corral Rojo Variedad Corral and Variedad Coronado in Baudez et al. (1993:60-61)</p> <p>Sample: 113</p> <p>Paste: P6</p> <p>Temporality: Quebradas /Aguas Buenas</p>
v2	v2	<p>Figure: 26e</p> <p>The same as Corral Rojo V1 but with a different paste.</p> <p>Sample: 12</p> <p>Paste: P11</p> <p>Temporality: Aguas Buenas</p>
Bugaba		<p>Figure: 26f</p> <p>Bugaba Grabado Variedad Bugaba in Baudez et al. (1993:72-73)</p> <p>Sample: 34</p> <p>Paste: P7, one case:P6</p> <p>Temporality: Aguas Buenas (rare in Quebradas)</p>
Ceiba Rojo Café	Inciso V1	<p>Figure: 26i</p> <p>Ceiba Rojo Café Variedad Incisa in Baudez et al. (1993:81-84)</p> <p>Sample: 78</p> <p>Paste: P1, P3</p> <p>Temporality: Chiriquí</p>
Buenos Aires Policromo	v1	<p>Figure: 27c</p> <p>See Baudez et al. (1993:85-88).</p> <p>Sample: 129</p> <p>Paste: High proportion of fine temper. Cooked at a low temperature. Similar to P1</p> <p>Temporality: Chiriquí</p>
Buenos Aires Policromo	v2	<p>Figure: 27d</p> <p>The same as V1 but with a different paste.</p> <p>Sample: 15</p> <p>Paste: Similar to P1 but more compact paste and paint, probably fired at a higher temperature than V1.</p> <p>Temporality: Chiriquí</p>
Papayal Grabado		<p>See Baudez et al. (1993:94-96).</p> <p>Sample: 26</p> <p>Paste: varies, P1, P3, P4</p> <p>Temporality: Chiriquí</p>
Seul Grabado		<p>Figure: 27a</p> <p>See Baudez et al. (1993:96-98).</p> <p>Sample: 6</p> <p>Paste: P3</p> <p>Temporality: Chiriquí</p>

Turucaca	<p>Figure: 27b See Baudez et al. (1993:88-90). Sample: 15 Paste: P1 Temporality: Chiriquí</p>
Sangría Rojo Fino	<p>Figure: 27e See Baudez et al. (1993:76-80). Sample: 6 Paste: P17 Temporality: Chiriquí</p>
Chánguena Negro sobre Rojo	<p>See Corrales (2000:356-357) Baudez et al. (1993:99). Sample: 8 Paste: similar to P17 Temporality: Chiriquí</p>
Rivas inciso	<p>Figure: 27f Composite silhouette bowls with straight walls, brown slip and red paint inside incised panels. Identified by Quilter (2004:161-162). Sample: 3 Paste: P2/P10 Temporality: Chiriquí? Figure: 27g</p> <hr/>

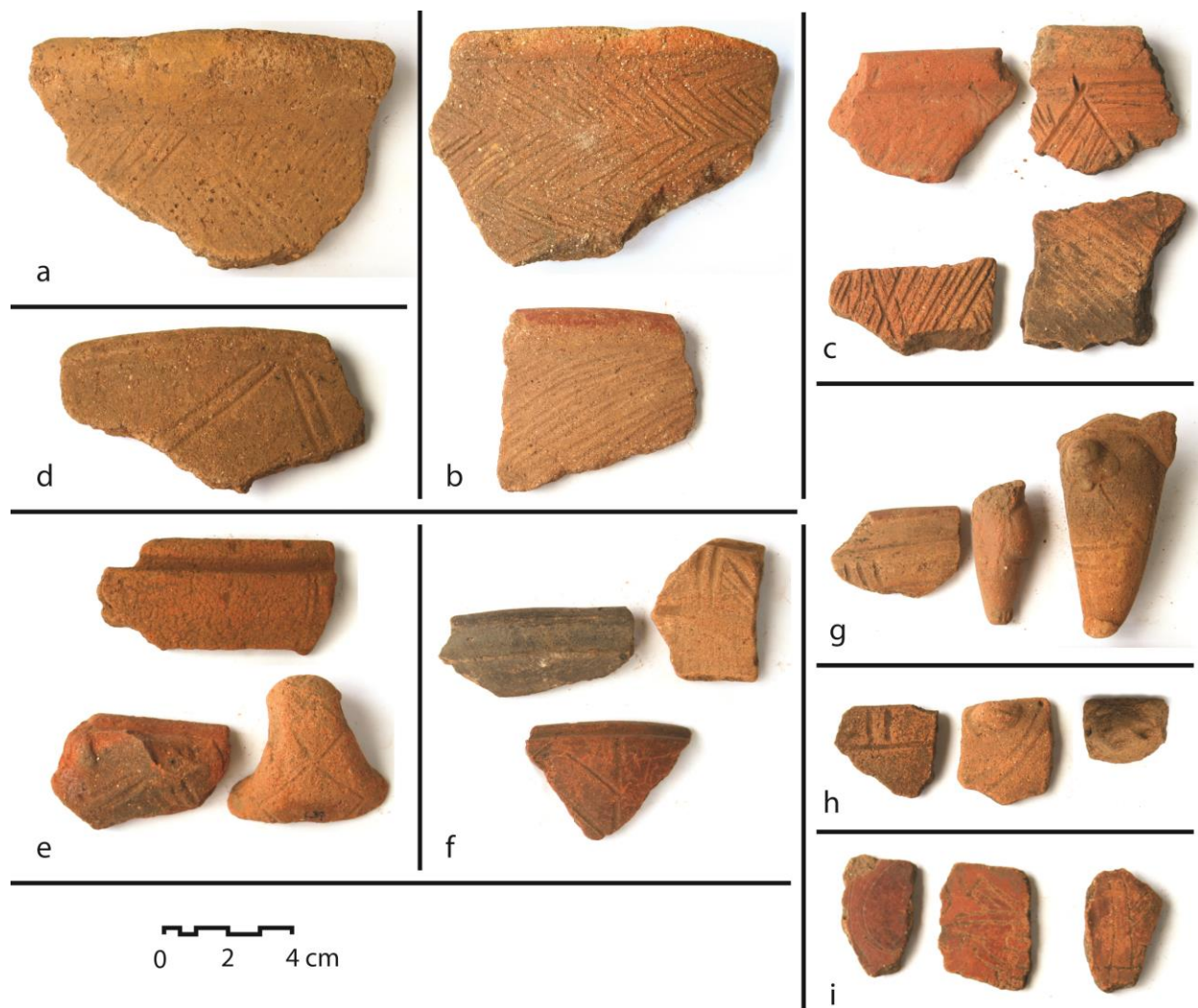


Figure 26. Ceramic Types, Quebradas and Aguas Buenas Periods

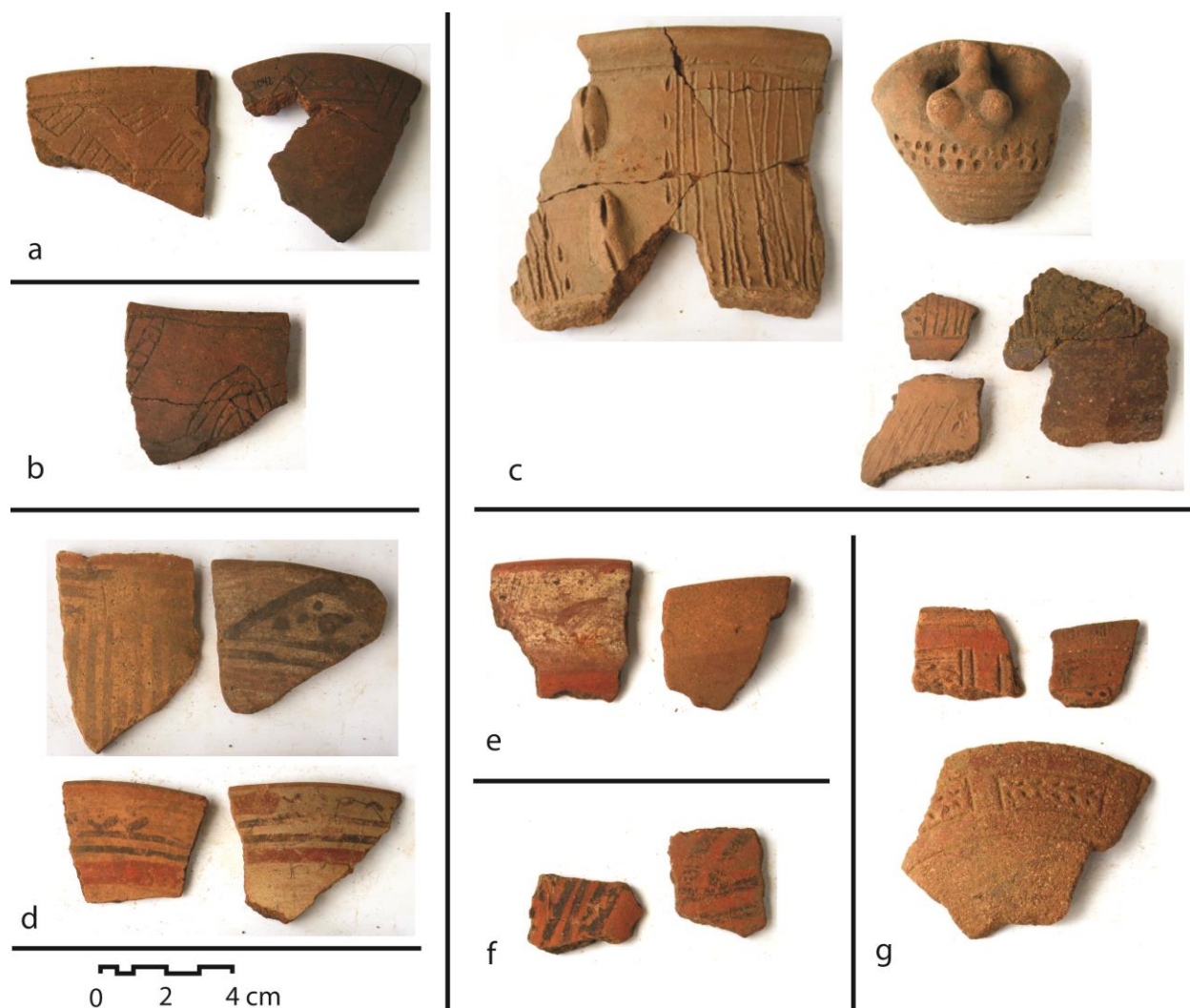


Figure 27. Ceramic types, Chiriquí period

An essential step in the chronological identification of ceramics was its classification by paste modes. The classification consisted in a combination of macroscopic observations on temper, surface finish and hardness / firing. These paste categories allowed the classification of a high proportion of the ceramics that are generally considered “non diagnostics”, as well as helping in that of decorative modes that had not been described in previous studies.

Table 10. Description of paste modes

PASTE MODE	CHARACTERISTICS	TEMPORALITY
P1	<p>Temper: Moderate amount of white subangular particles 0.5 to 1 mm (some up to 2mm), black angular particles and occasional red rounded particles up to 5mm.</p> <p>Clay matrix: Compact, brown to orange.</p> <p>Surface finish: Sliped, polished. Brown to orange.</p>	Chiriquí
P2	<p>Temper: Abundant white subangular particles 0.5 to 2mm, moderate amount of black angular particles and occasional red rounded particles up to 5mm.</p> <p>Clay matrix: Frail and tends to erode, brown to orange.</p> <p>Surface finish: Orange polished slip.</p>	Chiriquí
P3	<p>Temper: Scarce amount of red rounded particles up to 5mm.</p> <p>Clay matrix: Hard, compact, brown to orange.</p> <p>Surface finish: Sliped, polished. Brown to orange.</p>	Chiriquí
P4	<p>Temper: Abundant, high proportion of white subangular particles from 0.7 to 1.4mm.</p> <p>Clay matrix: Hard, compact, reddish brown.</p> <p>Surface finish: Polished, light brown slip on both sides.</p>	Chiriquí
P5	<p>Temper: Low to moderate amount of white subrounded particles.</p> <p>Clay matrix: Hard, compact, heterogeneous grain.</p> <p>Surface finish: Generally polished on both sides, sometimes with brown slip.</p>	Chiriquí
P6	<p>Temper: Very abundant white subrounded particles from 0.7 to 1.4 mm. Small amount of pyroxene, subangular fragments from 0.5 to 0.7mm.</p> <p>Clay matrix: Not compact, sandy, heterogeneous grain, brown to orange.</p> <p>Surface finish: Eroded; unslipped and smoothed.</p>	Quebradas
P7	<p>Temper: Scarce to medium amount of white subrounded particles from 0.3 to 0.5 mm.</p> <p>Clay matrix: Compact, heterogeneous, reddish brown.</p> <p>Surface finish: Polished, deep red thick slip remains in the interior and sometimes exterior.</p>	Quebradas / Aguas Buenas
P8	<p>Temper: Abundant white subangular particles from 0.7 to 1.4 mm.</p> <p>Clay matrix: Compact, homogenous grain, often with dark incomplete oxidation core.</p> <p>Surface finish: Polished, orange to reddish slip on both sides.</p>	Chiriquí
P9	<p>Temper: Abundant, heterogeneous, sometimes with a high proportion of black angular particles.</p> <p>Clay matrix: Compact, homogenous grain, reddish-brown to orange.</p> <p>Surface finish: Unslipped and smoothed.</p>	Chiriquí/ Aguas Buenas

P10	Temper: Moderate amount of white subangular particles. Clay matrix: Compact, heterogeneous, beige to redish beige. Surface finish: Orange polished slip in one or both sides.	Chiriquí/ Aguas Buenas
P11	Temper: Moderate amount. White subrounded particles 0.4 to 0.7 mm, red rounded particles 0.4 to 0.7 mm, rock fragments 0.4 to 1 mm. Some cases without white particles. Clay matrix: Compact, usually homogeneous grain, cream-beige to light orange. Surface finish: Thin red-orange slip, on exterior or both sides.	Aguas Buenas
P12	Temper: Abundant, white subrounded particles from 0.4 to 0.7 mm. Some cases with abundant rock particles from 0.4 to 1.5 mm. Clay matrix: Thick, not compact, heterogenous, dark brown interior. Surface finish: Polished on both sides, orange slip exterior. Shallow scraped incisions in different directions on the exterior.	Chiriquí/ Aguas Buenas
P13	Temper: Abundant, white subrounded particles 0.5 to 0.7 mm, red subrounded particles 0.5 to 1 mm. Clay matrix: Sandy compact, homogenous grain, beige to orange. Surface finish: Unslipped and smoothed on both sides.	Aguas Buenas
P14	Temper: Abundant white subrounded particles 0.5 to 1 mm, red subrounded particles 0.5 to 1 mm. Clay matrix: Hard, compact, homogeneous, cream to beige. Surface finish: Polished, cream colored slip.	Chiriquí/ Aguas Buenas
P16	Temper: Abundant white subrounded particles 0.5 to 0.7 mm. Abundant black angular particles 0.5 to 0.7 mm. Clay matrix: Compact, beige-orange. Surface finish: Polished on both sides, without slip.	Aguas Buenas
P17	Temper: Moderate amount, white subrounded particles 0.5 to 0.7 mm. Clay matrix: Compact, homogenous grain, beige to orange. Surface finish: Polished or burnished red slip generally in the interior and sometimes both sides.	Chiriquí

APPENDIX B

PETROGLYPH DESIGN GROUPS FROM THE UPPER TÉRRABA BASIN

Group 1

Temporality: Quebradas:

Sample: 6

Description: Separate and diverse designs (in our sample all are located in rocs larger than 2m long). This group contrasts with all other petroglyphs in the sample which feature a very limited set of motifs (almost exclusively spirals and circles) interconnected by lines. Reptiles, “suns” and crossed panels feature prominently in several of the examples.

Examples: P1, Figure 27, P64 Figure 23 and P194 Figure 19

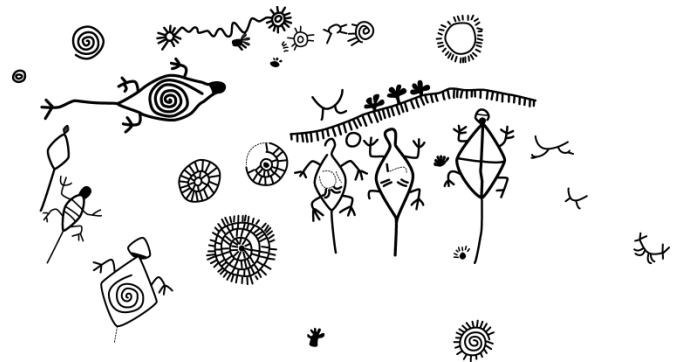


Figure 28. Petroglyph 1, Group 1, Quebradas period

Group 2

Temporality: Aguas Buenas and smaller proportion Chiriquí

Sample: 10

Description: Dense composition of long interconnected lines forming hooks with strong angles. Double line patterns are common and motifs do not include spirals.

Examples:



Figure 29. Left: P133. Right: P139

Group 5

Temporality: Chiriquí and smaller proportion Aguas Buenas:

Sample: 13

Description: A continuous network with a principal long curved line from which separate short lines topped with a spiral or circle are projected.

Examples:



Figure 30. Left: Petroglyph 15. Right: Petroglyph 86

Group 11

Temporality: Aguas Buenas and smaller proportion Quebradas

Sample: 12

Description: A single intricated long line ending in a spiral.

Examples:



Figure 31. Left: Petroglyph 5. **Right:** Petroglyph 16

Group 12

Temporality: Chiriquí and smaller proportion Aguas Buenas

Sample: 19

Description: Long curved central line from which short lines with spirals (and in a smaller proportion circles) separates.

Examples:

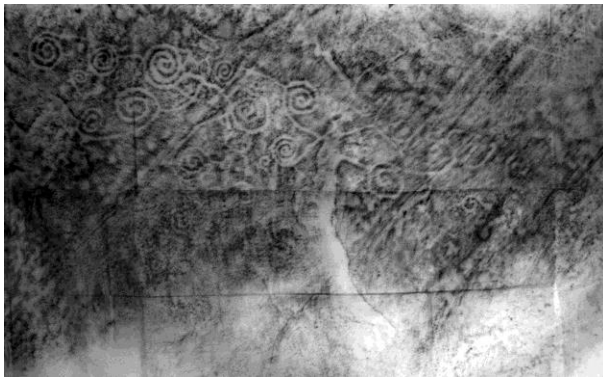


Figure 32. Left: Petroglyph 2. **Right:** Petroglyph 121

Group 16

Temporality: Chiriquí

Sample: 18

Description: Small and with few motifs but incorporates a spiral and a circle.

Examples:



Figure 33. Left: Petroglyph 154. Right: Petroglyph 110

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